



MaintSmart Enterprise version 5.0

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Standard Conventions Used by MaintSmart

Standard Conventions Used by This Program

In this manual the word “plant” is used to represent the top-level equipment hierarchy. You may define these equipment hierarchies any way you want. Depending on your maintenance operation the top-level equipment hierarchy could be : plant, building, fleet, campus, complex or whatever.

Navigation

1. The icons at the top of the screen are used to navigate to the various screens. The screens may also be accessed from the start screen by selecting the menu item **View**. Icons with a yellow background are configuration screens. Icons with green backgrounds are analysis screens.

Using Data Grids

1. Select rows from data entry and configuration grids by left mouse-clicking the row that contains the record of interest. The color of the row changes indicating that it is the active record.
2. Left mouse-click the top row of any grid to alternately sort the grid based on the column clicked.
3. Some grids allow you to merge similar data into one grid cell thereby grouping records with similar data. Right mouse-click the grid and select **Merge Columns** from the pop up menu.
4. Data grid columns may be resized as follows: Place the mouse cursor over a vertical grid line in the first row of the grid. Hold down the left mouse button and drag the vertical grid line the desired horizontal direction.

Help

1. Entire user manual is included in the Help file.
2. Many of the objects on the screen have help or an explanation of their purpose or the data that needs to be entered. Access this type of help by using the tab key to tab over to the object (text box, drop-down box, button or grid). A brief explanation of the object appears in the status bar at the very bottom of the screen.
3. Web help is available for many screens. Select the menu items **Help>>Web Help**.

Editing or Adding Data That May Affect Other Plants (Top-Level Entities)

Many screens have the menu item **Options>>Edit/Add Records to Other Plants**. When you select this menu item a checkmark appears next to it (provided you have been granted the required security access). Once checked you now have access to other plants' data and data that could possibly affect other plants. The following is a list of data that is shared between all plants and therefore requires **Options>>Edit/Add Records to Other Plants** is checked before the data can be edited or new records may be added.

1. Equipment Groups
2. Equipment Descriptors
3. Task Groups
4. Task Names
5. Cause Groups
6. Cause Names

Buttons

1. Most data entry and configuration screens have buttons that function in the same manner.
2. Pressing **New** enables data entry boxes for a new record.
3. Pressing **Delete** permanently deletes the selected (grid row) record.
4. Pressing **Save** either save a record that has been edited or saves a new record.
5. Pressing **Cancel** clears the data boxes in most cases and resets the other buttons.

Right Mouse-Click

1. Most data grids have additional capability available by right mouse-clicking on the grid.
2. Many downtime cause and task selection boxes allow filtering by right mouse-clicking.

What's New in MaintSmart 5.0?

General Additions and Enhancements

- * Microsoft Project style scheduler added
- * Technician shift now alphanumeric.
- * Shift definition at plant level.
- * Added Overall Equipment Effectiveness (OEE) data and reporting.
- * Some multiple plant analysis and reporting.

Administration

- * New permission to allow user to select who uses a part for a job. Default is link user login to Technician name for parts usage.
- * Configure work order approval levels and approval requirements.

Equipment

- * Easier to delete equipment.
- * Automatically create equipment details records using default values for new or existing equipment.
- * Consolidate multiple equipments into one equipment item.

Inventory

- * Added Critical part field to inventory database.
- * Select multiple parts at one time from parts usage screen.
- * Automatically use parts on same day as job work order or PM.
- * New permission to allow user to select who uses a part for a job. Default is link user login to Technician name for parts usage.
- * Delete unapproved requisition items easily from closed or open requisitions.
- * Easily delete requisitions.

Preventive Maintenance/Work Orders

- * Optionally create qualified approvers for work orders.
- * Require any combination of approvals to work orders.
- * Temporarily assign Technician then restore default Technician.
- * Copy one PM list to another equipment with details and all field data.
- * Extensive reporting for Percentage (%) PMs Completed.
- * Set days back to determine average PM task duration.
- * Added several more options to edit archived PMs.
- * Optionally add default Comment field text to new work orders.

Downtime

- * Added more defaults to downtime data entry.

Supported Platforms:

- * Windows XP
- * Windows Vista
- * Windows 7 (32 bit)
- * Windows 7 (64 bit)
- * Windows 8
- * Windows 2008 Server
- * Windows 2003 Server
- * SQL Server 2000-2008 (32 bit)
- * SQL Server 2008 R2
- * Crystal Reports 2008 runtime (full product not included)

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Initial Configuration - Steps by Step

Initial Configuration: The first time you start MaintSmart © the 'Initial Program Configuration' screen displays. Once MaintSmart © is seeded with the initial values from this window you are able to start using the program. You are able to add up to 900 plants (top-level entities) with all of their equipment, personnel, inventory, downtime, work orders and other records. Each plant's data is separate from the others.

Step 1. Begin with step 1 on this screen by entering your company name. (Example: Widget Manufacturing Inc.)

Step 2. Enter the plant (top-level entity) code and address information. The plant code must be a number between 100 and 999. Please choose this number carefully as it may apply to your company's situation. Once this number has been set and data has been entered into MaintSmart © the plant code cannot be changed without possible data loss. A good starting point for this number is 100. If your company has multiple plants the plant code is the means by which MaintSmart © keeps the plant data separate from each other. Enter the 2nd and 3rd equipment hierarchy descriptions (operational). These may be changed later if needed. Enter the 2nd equipment hierarchy (maintenance). Lastly enter the maintenance personnel descriptor.

Step 3. Enter the top-level hierarchy code (100). The address, city, state, and zip code settings should be for this plant code. You may have multiple plants but still want to treat their data as one plant. It is OK to do this too.

Step 4. Next enter the program administrator's user name and password. Be sure to record both of these values in a safe place, as you won't be able to access any part of the program without them. The password can be number or letters or a combination thereof at least 4 characters in length but not more than 8 characters in length. You must enter the password twice to confirm.

Note: For steps 4 through 7 you may use the default values. These values can be edited later once the initial configuration has been completed. See page 8 for a full description of how hierarchies (entities) are used and defined.

Step 5. Next enter a starting number for equipment hierarchy #2 (depicted as 'work area'). Each work area is assigned a number and a descriptive name. Each plant contains its own work area numbers separate from all other plants. This allows all plants to start their area numbers at 1 if they wish and still keep their data separate from all other plants. Unless there is a reason its probably best to use the default value of 1.

Step 5. MaintSmart © uses employee ID numbers to track wages, work completed, skills, etc. This number must be between 1 and 9999. Enter the starting number in Step 5 of Initial Configuration.

Step 6. How many separate accounts does your technician/maintenance line utilize? Enter a number or use the default of 1. You may easily add more accounts later. The starting account number may be up to 9 digits. You are able to add descriptive names to all accounts once the program has been seeded with this initial data.

Initial Program Configuration

File Options Help

Step 1: Enter your company/organization name. The 'Company' can contain many top-level entities. Each of these contain their own data (step 2).

Company Name: My Company

Step 2: MaintSmart provides three operational equipment hierarchies and one maintenance related equipment hierarchy. Name these to describe situation or use the defaults. These may be changed at any time. Examples for a building maintenance situation might be "Complex", "Building", the operational and perhaps "Work Cell" for the maintenance hierarchy. Additionally the maintenance hierarchy may be used to implement "zone maintenance" if needed.

Heirarchy #1 Top-Level (plant, complex, fleet): Plant

Heirarchy #2-B (Work area/Location): Work Area/Location

Heirarchy #2-A (Process, building, make): Process

Heirarchy #3 (Line, department, floor, model): Line

Equipment Equipment Equipment Equipment Equipment

Step 3: Please enter a number between 100 and 999. This number will be used throughout the program to identify your plant or other user-defined entity ie: building, school, fleet, etc. Enter address data in the appropriate boxes.

Plant Code: 100 Plant Address: 123 Ferguson Ave. Plant City or Identifier: AnyTown

State: OR Postal Code: 97420 Maintenance Technician Description: Engineer

Step 4: Please enter the user name and password for the main administrator of this program. DO NOT LOSE THIS USER NAME/ PASSWORD COMBINATION! CASE SENSITIVE.

Administrator User Name (up to 12 chars.): ADMIN Password: (4-8 chars): **** Re-Enter Password: ****

Save

Step 7. Many plants produce more than one definitive product. For example a commercial baking operation may produce bread, rolls, Danish pastry, etc. MaintSmart © uses 'processes' to describe these separate entities within one plant if needed. Plant lines are further divided into lines. For example in a commercial bakery the Bread Line (process) may consist of two lines such as Bread Production and Bread Wrapping. It's also possible to have multiple processes for the same product. For example there may be two separate bread lines with separate ovens, wrappers etc. These could be termed Bread Line 1 and Bread Line 2. Each of these lines may have two lines; Bread Production 1(dept.) and Bread Wrapping 1(dept.) for Bread Line 1(process) and Bread Production 2 and Bread Wrapping 2 for Bread Line 2. By keeping these lines separate it makes it possible for MaintSmart © to better isolate solutions to issues such as equipment failure and expenses. With building maintenance instead of 'process' and 'line' you may want to use the terms 'building' and 'floor'. This descriptor is user-defined so you can call these hierarchies anything you want.

Step 8. If you want to continue with program configuration at this time (suggested) you should check the box that says 'Let Program Guide You Through Configuration' before pressing the 'Save' button. Otherwise exit and complete the second part of MaintSmart © configuration later. This may be accomplished by selecting (from the main start screen) the menu item "Initial Configuration". Once initial configuration is complete this menu item dims and is no longer available.

Configuration - Database Creation and Linking

Please refer to the enclosed document on setting up MaintSmart's SQL Server 2008 - 2014 database or the Access database. Contact MaintSmart for specific instructions by email or download. +1-541-751-0450 Skype: maintsmart

Access Database Set-Up

Simply choose the Empty Database option from the initial Tips screen that appears when MaintSmart first starts up.

NOTE: If you cannot see the database options on the Tips screen press <CTRL> + <F5> while the Tips screen has screen focus and the database options will appear.

SQL Server Database Set-Up

This task is usually performed by a database administrator, although anyone with the necessary SQL Server permissions may do it. It is assumed that the person creating the database is familiar with SQL Server and its utilities and has the necessary permissions.

There are three main tasks that must be completed to set up the MaintSmart database.

First, create the database on an MS SQL Server (2000-2008)

Second, create the MaintSmart schema within the database by running the following database scripts in order:

- 1.) Tables.sql
- 2.) UserDefinedFunctions.sql
- 3.) Views.sql
- 4.) StoredProcs.sql
- 5.) Translator.sql (MaintSmart 5.0 and above)
- 6.) Load.sql (sets versioning data)
- 7.) LoadForNoImport.sql (optional if not importing data from existing database)

Third, possibly create a SQL Server User Login to use for connecting to the database.

Configuration - Hierarchy Descriptions

Plant (equipment hierarchy #1) Information: Each workstation computer must have a default plant set in the **Configuration** section of MaintSmart©. Select the plant configuration button from the button bar . Select the tab labeled **Configuration**. Locate the frame labeled **Plant Information**. Enter the requested information in all of the text boxes with in frame. Be certain to enter a valid plant code. Press the button labeled **Make This Plant the Default Plant**. From this point forward MaintSmart© will use this plant code for data entry, queries, and analysis. In order for users to access other plants they must have been explicitly give that access permission by the administrator. Without permission to edit/add records to other plants the user can not alter or add records that could possibly affect a plant other than the default plant. These include break down cause descriptions, task descriptions, data specifically pertaining to that plant and other data tables.

Other Equipment Hierarchy Descriptions

MaintSmart provides a multi-dimensional equipment hierarchy. Additionally you may define maintenance personnel as needed (Example: "Technician", "Technician", etc.) MaintSmart comes with entity descriptions as follows: "Plant" (top-level entity), "Process", "Line", "Work Area/Location" and "Technician". These may all be changed to suit your individual needs. These **Entity Descriptions** may be saved as local or global settings.

Here's a brief description of each hierarchy. These are simply examples and you may set these values anyway that works for your operation below this section are some examples of how you can define these hierarchies:

Hierarchy #1 (top-level entity): There may be as many as 900 of these configured. Typically only one is needed though. Each top-level entity is referenced internally by MaintSmart as a 3 digit code. Top-level entities contain their data separate from other top-level entities (if any) except for shared data such as equipment descriptors, task names, failure cause descriptions, etc.

Hierarchy #2-A: This level is below top-level entity. This hierarchy contains yet another hierarchy level that may be used to group equipment

Hierarchy #3 : This level is directly below level #2-A and contains equipment. A wage rate can be assigned to this/these hierarchy. This wage rate would be applied to lost opportunity cost due to equipment failure if needed.

Hierarchy #2-B: This is also a level 2 hierarchy directly below the top-level entity and containing equipment. This is simply another way to group equipment. Since this level #2 is not related to level #2-A you have the ability to create a very flexible (3-dimensional) equipment hierarchy if needed. This level can be used to aid in setting up an efficient zone-maintenance system if needed.

Maintenance Personnel Description: This is simply a user defined label for your maintenance personnel.

Connection String
TSMART2;Use Encryption for Data=False;Tag with column collation when possible=False

Always Use This Database (should be checked unless testing Demo database(s))

Default Plant or Top-level Entity (top level of equipment hierarchy)

Name: Tastee Baking Company Plant: 327

Address: 1234 Main St. City: Sacramento

State: CA Postal Code: 96554

Hierarchy #1: Top-Level Entity (Plant, Building, Fleet) (12 char.)

Hierarchy #2-A: This level contains hierarchy #3 (20 char.)

Hierarchy #3: This level contains equipment (20 char.)

Hierarchy #2-B - This level contains equipment (20 char.)

Maintenance Personnel Description (20 char.)

The above hierarchy descriptions must be unique. NO DUPLICATES.

Save All Above As Global Settings On Exit From This Screen

Example: Manufacturing

Hierarchy #1 (top-level entity or hierarchy): Plant represents a one manufacturing plant in a company of possibly many plants. Each plant has it's own top-level entity code and data for each is stored and displayed separately.

Hierarchy #2-A: Process. This could represent a production line in a manufacturing plant.

Hierarchy #3: Line. This could represent a line in a process. Remember lines contain the actual equipment, processes contain the lines. You may have a Bread Line (process). This bread line is composed of two separate lines: Bread Production and Bread Wrapping.

Hierarchy #2-B: Work Area/Location could be a logical grouping of equipment for the purpose of zone-maintenance (if needed), a geographical grouping or whatever you need.

Maintenance Personnel Description: Maintenance Technician

See Appendix C for graphical Equipment Hierarchy examples.

continued next page...

Configuration - Hierarchy Descriptions, Skill Definitions

Example: Building Maintenance

Hierarchy #1 (top-level entity): Complex represents a group of buildings; perhaps an apartment complex. Each complex has its own top-level entity code and data for each is stored and displayed separately.

Hierarchy #2-A: Building.

Hierarchy #3: Floor. A floor on the building. This method of naming may aid in isolating equipment more efficiently.

Hierarchy #2-B: Work Cell could be a logical grouping of equipment for the purpose of zone-maintenance (if needed), a geographical grouping or whatever you need.

Maintenance Personnel Description: Technician.

Example: School

Hierarchy #1 (top-level entity): District represents a group of schools. Each district has its own top-level entity code and data for each is stored and displayed separately.

Hierarchy #2-A: Campus. One location (school house) within the district.

Hierarchy #3: Classroom. A classroom at this campus. This method of naming may aid in isolating equipment more efficiently.

Hierarchy #2-B: Work Cell could be a logical grouping of equipment for the purpose of zone-maintenance (if needed), a geographical grouping or whatever you need.

Maintenance Personnel Description: Technician.

To set entity descriptions follow these steps:

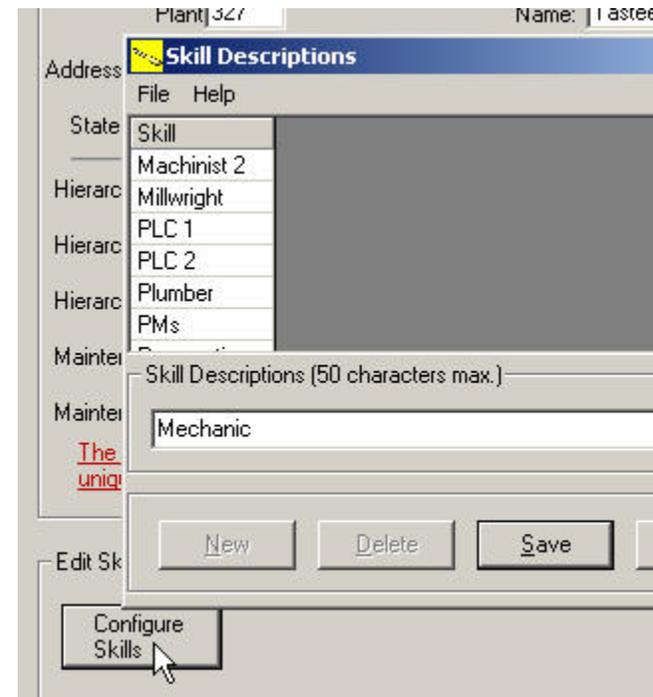
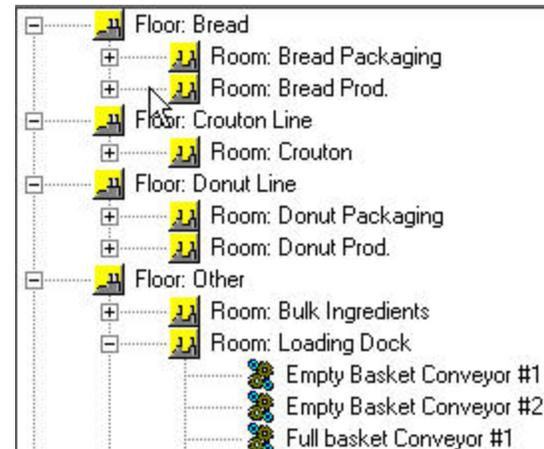
1. Open the **Program Configuration** screen.
2. From the first tab (labeled: **Configuration**) enter the various hierarchy descriptors in the boxes.
3. To save as global settings (database write) be certain to check the checkbox labeled as such.
4. When you exit this screen these hierarchy descriptions are saved. They appear on all screens, labels, reports, file names, etc.

Edit Skill Definitions for All Plants: Skills are the skills owned by each individual maintenance technician. Unlimited skills are maintained on a company-wide level. Changes to the skill list are reflected in all plants. Skills are used to determine which technician is best suited to maintain each piece of equipment. Skills are mapped to preventive maintenance tasks. This helps the maintenance manager allocate labor resources in the most efficient way.

To edit the skill definition list go to the **Configuration screen**. Select the menu items **View>>Configure Skills...**

Warning: Changes to skill definitions affect all plants.

See Appendix A for more equipment hierarchy examples



Configuration - Fiscal Year, Max. Query Days, Downtime Goal

Fiscal Year and Financial Periods: Fiscal periods may be assigned from the start screen by selecting the menu items **View > Configuration > Configure Program Parameters**. Select the tab labeled **Configuration**. Locate the frame labeled **Fiscal Year and Financial Periods**. If your company uses financial periods that coincide with the calendar months you may simply check the checkbox labeled **Use Calendar Months**. Next enter the amount of years data you wish to create in the text box labeled **Create This Many Years**. (10 to 20 years should be adequate. Press the Save button to create financial periods.

If your company uses financial periods that do not coincide with the calendar months you need to do the following:

1. Determine the fiscal year for your company by consulting with the accounting line. Enter this year in the drop-down box labeled **The Fiscal Year is**.
2. Determine how many periods consist of one fiscal year. **Example:** (Many companies use 13 fiscal periods of 28 days each. This is approximately one calendar year. This also provides for period of equal length and helps period to period data remain consistent.) Enter this number in the text box labeled **Periods Per Fiscal Year**.
3. Enter the amount of days in the text box labeled **Days Per Period**.
4. Enter the current period number in the text box labeled **Begin With This Period Number**.
5. Next enter the current period's period start date in the text box labeled **Begin With This Period Start Date**.
6. Create 10 to 20 years worth of records by entering the amount of years data in the text box labeled **Create This Many Years**.
7. Press the **Save** button to create the needed records.

Set Maximum Query Days: The maximum query days setting sets the default maximum amount of days records retrieved from the database. The user may still explicitly ask for more data when working with many of the screens. However on most simple data entry screens the Maximum Query Days setting limits the user. The purpose of this setting is two-fold. First it prevents the program from having to work unnecessarily hard retrieving large data sets. This speeds up the retrieval process. Secondly there may be a reason why you would not want normal users to be able to see older data records. This setting is in days. A typical setting might be 90 days. Enter the amount of days in the text box and press **Save**.

Do Not Auto-load Equipment: If checked this setting causes the drop-down boxes for equipment to not load when the screen opens. Using an equipment filter instead to load the drop-down after the screen has opened.

Allow Delete of Linked Requisitions: Checked allow requisitions that are linked to POs to be deleted.

More information regarding most of the above menu items and their function is on page 12.

Fiscal Year	Period Num	Start Date
1996	1	1/1/1996
1996	2	2/1/1996

The Fiscal Year is: [] Periods Per Fiscal Year: [12] Days Per Period: [30]

Begin With This Period Number: [1] Begin With This Period Start Date: [6/30/2001] Create This Many Years: [20]

Use Calendar Months [Save] [Clear All]

Database Settings: Database Command Timeout (0 = Indefinite) [0] [Save]

Use Global Part Descriptions: Checking this menu causes part descriptions used in all Plants to become available for new part creation. Part descriptions are not physical parts that exist in inventory but are text items used to create these physical parts. If using multiple plants and one is already configured for parts then it might be a good idea to check this menu so as to use consistent part descriptions. Otherwise leave this un-checked.

More Program Configuration

Set Other Program Parameters: Many other options exist on the **Configuration More** screen tab. The notes below explain what these options do. The left side of this screen is devoted to the print scheduler and metered work order settings. These are explained in detail in the MaintSmart Print Scheduler Manual.

The screenshot shows the 'Configuration - More' window with several callout boxes explaining various settings:

- Work Order, Auto-Print Scanner and Rep User:** Always Print Scheduled Print Jobs Rep User, Only Print Scheduled Print Jobs Linked to User, Disable All Scheduled Print Jobs. Callout: "Type or Grid search any text string in any position (not just the beginning) by unchecking this item".
- Check For Expired Meters:** Check For Expired Meters. Automatically Create Work Orders From Expired Meters, Auto-Print Work Orders Created From Expired Meters, Automatically Refresh Date Meters, Automatically Refresh OPC Meter Links. Callout: "These options are explained in detail in the MaintSmart Print Scheduler manual."
- Meter Scan Rate (min.):** 1, **Schedule Scan Rate (min.):** 1. Callout: "Checking this item causes MaintSmart to log all Work Order status changes."
- How To Use Parts For Metered Work Orders:** Disable Parts Usage Linking (does not remove parts from work order). Callout: "Set the optionally lock how MaintSmart links (default) work orders to cost centers and accounts (optional)."
- Report Format For Metered Work:** Print Attachments, Print Attachments. Callout: "Scan schedules/meters by workstation setting (All Users) or by local registry key entry (user specific).."
- Cost Center/Account Assignment Settings for All Work Orders:** Log Work Order Status Changes, Show Currency Value(s) for Work Order and Attachments, Global Meter Scanning (default = checked), Global Schedule Scanning (default = checked). Callout: "Save data grids as Excel (.xls), Comma Separated Value (.csv), Web Page (.html) or as simple text (.txt) then open appropriate program automatically to displayed saved data grid."
- Workstation Preferences:** Auto-Check Top-Level Entity Permission Menu Item For Administrators, Automatically Open Files Created When Saving Grid Displays, Available, Grid Search Only Beginning of String, Make Hot Sheet the Default Screen, Display Long Error Message Information. Callout: "Hide inactive data items".
- Inactives:** Hide Inactive Equipment In Drop-Down Boxes, Hide Inactive Maintenance Personnel In Drop-Down Boxes, Hide Inactive Requestors In Drop-Down Boxes.
- Set Grid Colors:** Grid Row Selection Color, Grid Lines Color, Grid Back Color, Grid Font Color, Alternate Row Color. Callout: "Required field color and grid style."
- Screen Colors:** Required Field Color (Green), Available. Callout: "Required field color and grid style."
- Grid Style:** Office 2010 Silver. Callout: "Required field color and grid style."

More Program Configuration - 'View' and 'Settings' Menu Items

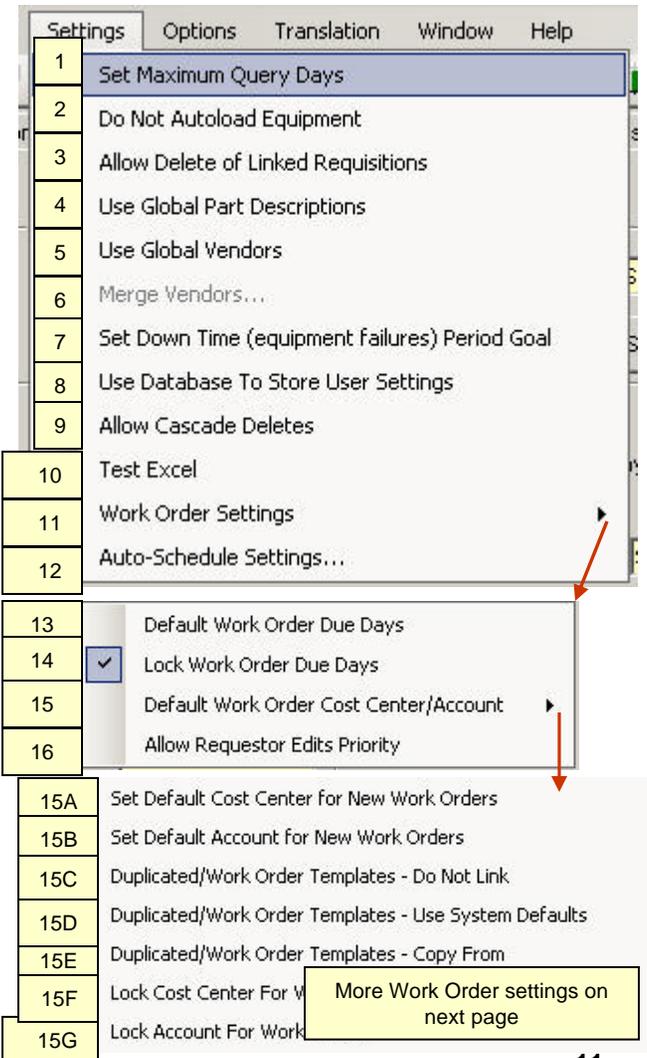
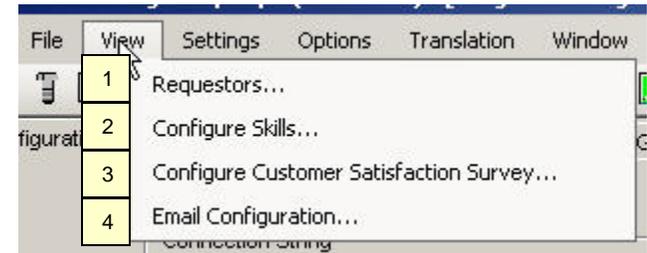
Program Configuration Menu Items: Below are the Program Configuration menu items and a description of their functions:

View menu items

1. **Requestors...**: Displays the Requestor configuration screen
2. **Configure Skills...**: Displays the Skill Configuration screen.
3. **Configure Customer Satisfaction Survey...**: Displays Customer Satisfaction Survey Configuration screen.
4. **Email Configuration...**: Displays Email Configuration screen. This configuration is for setting up the SMTP (outbound) email parameters and must be configured before using the emailing system.

Settings menu items

1. **Set Maximum Query Days:** This setting (numeric in days) is used to populate data grids with date sensitive data. The setting is used to limit the days before "Today" that are included in the data grid. Typical settings are 30, 180, 365, 720, etc.
2. **Do Not Autoload Equipment:** Checking this menu item causes equipment drop-downs to not load with equipment when the screen is opened. To load an equipment drop-down in this case you would use the Equipment Filter button to load the equipment items. In situation where there are thousands of equipment items leaving this unchecked could cause the screen to load slowly.
3. **Allow Delete of Linked Requisitions:** Checking makes it possible to delete requisitions that are linked to purchases and/or approved purchase items. Use care and consideration when checking this as deletes are permanent. Checking this item does not automatically delete requisition but only makes it possible to manually delete them from the Requisition screen.
4. **Use Global Part Descriptions:** Checking this menu causes part descriptions used in all Plants to become available.
5. **Use Global Vendors:** Checking this item causes MaintSmart to use the same vendors for each Plant. The default is unchecked with each Plant using Plant-specific vendors. If this setting is checked then Vendors will also need to be specified global in the Vendor Configuration screen. This setting is best set initially however it is possible to consolidate plant-specific vendors.
6. **Merge Vendors:** Contact customer support first. This is used to consolidate global vendors.
7. **Set Downtime Period Goal:** Used as a baseline on one downtime report as the fiscal period goal for total equipment downtime.
8. **Use Database To Store User Settings:** For backward compatibility only. In nearly all cases this should be unchecked. Causes settings to be stored in registry.
9. **Allow Cascade Deletes:** This must be checked by Administrator when deleting certain data items that may cause child data items to also be automatically deleted as a result of parent deletion. Must be set on a session by session basis.
10. **Test Excel:** Determines if Excel OLE automation components are available on this workstation.
11. **Work Order Settings: Default WO Due Days:** Sets the default days from Date Assigned that a work order is due.
12. **Auto-Schedule Settings...**: Displays screen for setting the auto-scheduling defaults for new work orders that are placed into the Scheduler module. See the Scheduler topic on page 00 for more information on this function.
13. **Default Work Order Due Days:** Sets default work order due days from Date Assigned. Calculates Due Date.
14. **Lock Work Order Due Days:** Do not allow default work order due days to be edited from Work Order screen.
- 15A: **Set Default Cost Center for New Work:** Populates Cost Center field for new work orders.
- 15B: **Set Default Account for New Work:** Populates Account field for new work orders.
- 15C: **Duplicated/Work Order Templates - Do Not Link:** For duplicated or work orders from templates do not link an account or cost center.
- 15D: **Duplicated/Work Order Templates - Use System Defaults:** For duplicated or work orders from templates use system defaults set from Cost Center and Account set up screen Options menu.
- 15E: **Duplicated/Work Order Templates - Copy From:** For duplicated or work orders from templates copy the account and/or cost center from the source.
- 15F: **Lock Cost Center For Work Orders:** Lock the drop-down box for Cost Centers on the work order screen thereby forcing the Cost Center.
- 15G: **Lock Account For Work Orders:** Lock the drop-down box for Accounts on the work order screen thereby forcing the Account.
16. **Allow Requestor Edits Priority:** Enables Priority Field for Requests Only permission account.



More Program Configuration - 'Settings' Menu Items

Program Configuration Menu Items:

Settings menu items

1. **Comment Text:** Enter up to 255 characters of work order comment text that will populate work order Comment field automatically if 2. Below is switched on (checked).
2. **Append Existing Comment:** Turns automatic work order comments on/off.

The screenshot shows the 'Settings' menu with the following items:

- Set Maximum Query Days
- Do Not Autoload Equipment
- Allow Delete of Linked Requisitions
- Use Global Part Descriptions
- Use Global Vendors
- Merge Vendors...
- Set Down Time (equipment failures) Period Goal
- Use Database To Store User Settings
- Hide Tips
- Allow Cascade Deletes
- Reduce Screen Flicker
- Test Excel
- Work Order Settings ▶
- Auto-Schedule Settings...
- Load Report Component at Start-Up
- Optimize Speed...
- 17 Use 24 Hour Clock
- 18 Inactivity Timeout
- 19 Disable Inactivity Timeout for User

Program Configuration Menu Items (continued): Below are the Program Configuration menu items and a description of their functions:

View menu items

17. **Use 24 Hour Clock:** Displays time fields in drop-down boxes as military time (24 hour clock).
18. **Inactivity Timeout:** This value (in Minutes) determines how long the program will remain idle before closing automatically. The purpose of this is to prevent licenses from being tied up when not in use. Typical settings are 15-180 minutes.
19. **Disable Inactivity Timeout:** Disables inactivity timeout for the current logged in user only. The purpose of this is in some cases users that are Administrators may not want the inactivity timeout to activate. For example is the program is left to run unattended for the print scheduler having an inactivity timeout would cause the program to close instead of continue to scan for print and email jobs.

More Program Configuration - 'Options' Menu Items

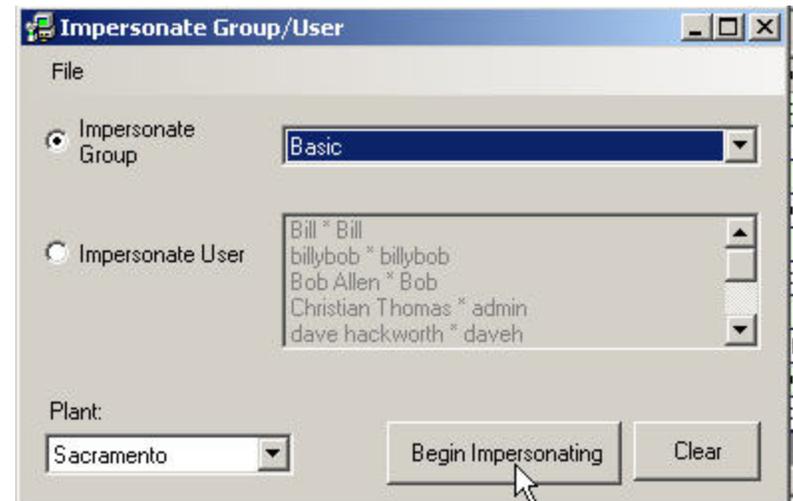
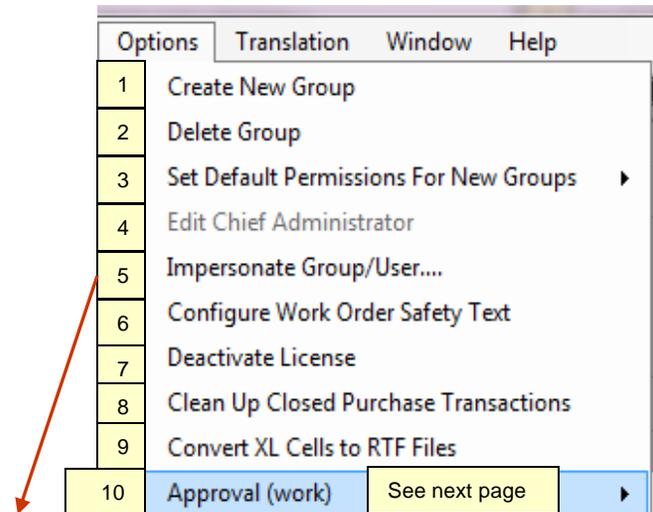
Program Configuration Menu Items: Below are the **Program Configuration** menu items and a description of their functions:

Options menu items

- 1 **Create New User Group:** Creates a new user group. Once the group has been created the permissions for this group may be set or edited.
- 2 **Delete Group:** Deletes an existing user group. Be sure to remove all users from this group before deleting the group. Since user groups are global this may involve removing users (Passwords) from multiple plants.
- 3 **Set Default Permissions for New Groups:** Used to set some common default user group permissions in the case where a new user group is being created.
- 4 **Edit Chief Administrator:** The Chief Administrator is the administrator user name/password combination that is created when the Initial Configuration screen is displayed the very first time you start MaintSmart with a completely empty database.
- 5 **Impersonate User/Group:** Impersonating users gives the Administrator account users an opportunity to set user settings for users other than the logged in user. These settings may be applied to individual users or entire user groups.
- 6 **Configure Work Order Safety Text:** Displays Email Configuration screen. This configuration is for setting up the SMTP (outbound) email parameters and must be configured before using the emailing system.
- 7 **Deactivate License:** Deactivates the current MaintSmart license for this computer. **ALWAYS** deactivate your license if you plan to remove a computer, format a drive or move MaintSmart. Failure to do so may result in a lost license. Follow the deactivation prompts and instructions then be sure to send in the resulting deactivation codes to retain your license.
- 8 **Clean Up Closed Purchase Transactions:** This function sets all requisition statuses to PO Closed for PO that were at some point closed.
- 9 **Convert XL Cells to RTF Files:** This is a specialized function that will convert long text Details from an Excel spreadsheet into rich text format (rtf) files. The purpose of these files would be for later use as details for POs, work orders, etc.

Impersonating Users: Impersonating users is a function available to Admin accounts that provides a way for an administrator to set user settings for other users. This is useful when you are not giving these users permissions to set their own settings. Select the menu item #5 depicted above. When the Impersonate User screen appears choose either to impersonate selected users (Impersonate User) by multi-selecting users from the list or impersonate an entire user group at one time. Next set and user settings you want throughout the program on any screen(s). As these settings are set they are logged against all impersonated users.

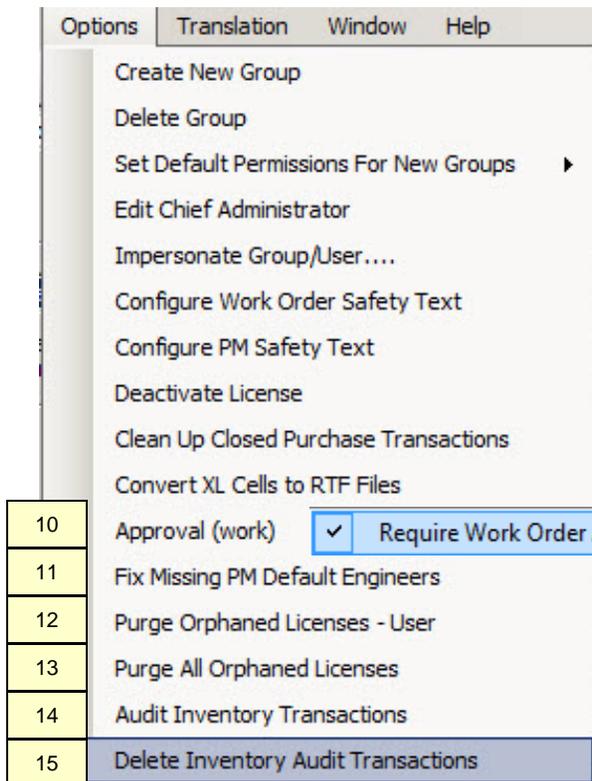
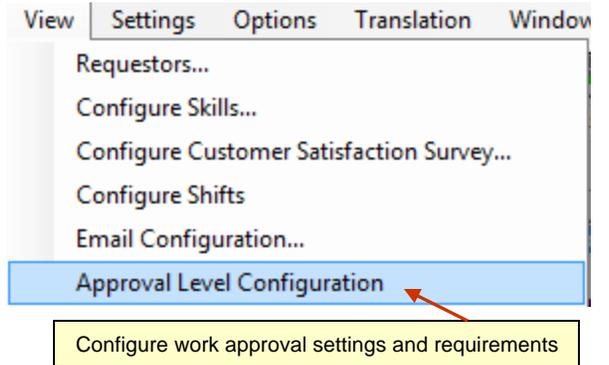
Configure Work Order Safety Text: To set the red safety text items and checklist items that appear at the bottom of printed work orders select the menu item #6 above then type in the desired text.



More Program Configuration - 'Options' Menu Items - Work Approval

Work Order Approval Overview: This optional feature give you a way to record and report on approval(s) of work. Approval levels are defined. These approval levels (examples depicted below) are next linked to specific user IDs. Requirements are then set for what approver levels and how many of each approver level is required to complete the approval of any existing work order. Work orders can later be approved by these users. Work orders may only be unapproved by the approving user and approvers may only approve each work order once (in the case where multiple approvals are required). Once approval levels, approvers and requirements are configured you may turn on/off requiring approvals for work by checking the menu item depicted below.

Configure Approval Levels: To set up approval levels simply create arbitrary names for the various levels needed. These approval level definitions are global and shared by all plants. To create a new approval level click the **New** button then enter text into the available box. Press **Save**. To edit or delete an Approval level left click the grid row containing the record you want to work with then either edit the text and press Save or press **Delete** to permanently delete this record.



Program Configuration Menu Items: Below are the **Program Configuration** menu items and a description of their functions:

Options menu items

- 10 **Approval (work):** Requires approval of work orders.
- 11 **Fix Missing PM Default Engineers:** Deletes default engineers for preventive maintenance tasks where the engineer is no longer a valid engineer.
- 12 **Purge Orphaned Licenses - User:** Purges licenses orphaned by the current logged in user.
- 13 **Purge All Orphaned Licenses:** Purges any and all orphaned licenses.
- 14 **Audit Inventory Transactions:** keeps a running audit of any changes to the inventory data regardless of how or where the change occurs.
- 15 **Delete Inventory Audit Transactions:** Deletes inventory audit history. This does NOT delete any other inventory data, usage data, purchasing data or invoice data.

More Program Configuration - Work Approval (continued)

Work Approval Permissions: Link user names to specific approval permissions. Once this has been done logged in users may approve work based upon their approval permission.

Configure Work Approval Requirements: This screen tab is where you set up what approval levels are required to approve work and how many of each level. In most cases it will be only one or two approvals but this is dependent upon your company requirements and there are no limits on how many approvals you can require before work is fully approved.

User Display Name	Approval Level	User ID	Approval Level ID	Approval Permission ID	Plan
Christian Thomas	Maintenance Manager	admin	2	1	Sacr
Bob Allen	Safety Inspector	Bob	3	2	Sacr

Set work approval permissions based upon user log in ID

Approval Permissions

Plant: Sacramento

User Name: Bob

Approval Level Description: Safety Inspector

Approval Permissions

New Delete Save Cancel

The actual process of approving work is described in the Work Order Data Entry section of this manual..

Approval Type	Count of Approvals Needed	Approval Level	Approval Level ID	Plant Identifier
	1	Maintenance Manager	2	Sacramento

Set how many approvals and what combination of approval levels are needed to fully approve work.

Required Approval

Plant: Sacramento

Approval Type: Work Order

Approval Count: 1

Approval Level Description: Maintenance Manager

Required Approval

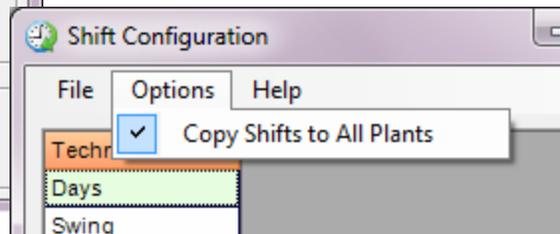
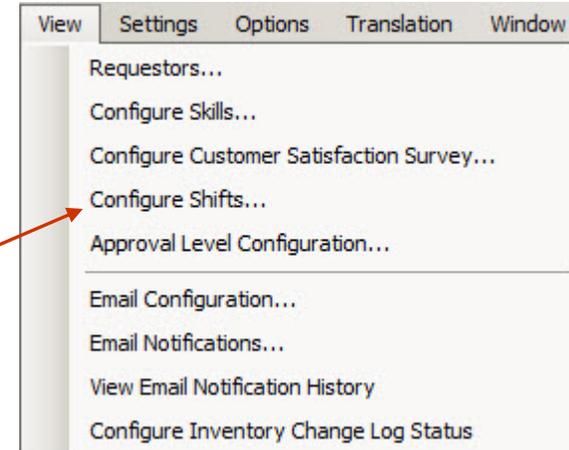
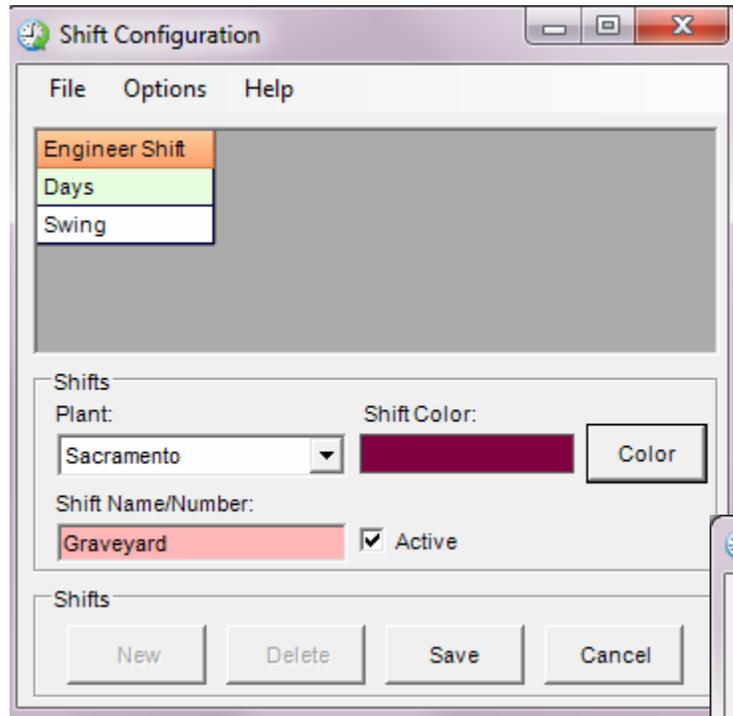
New Delete Save Cancel

More Program Configuration - Configure Shifts

Overview of Technician Shifts: Prior to version 5.0 technician shifts consisted of a numeric field. In MaintSmart 5.0 you may create technician shifts that are composed of alphanumeric characters. Text length is up to 50 characters. Technician shifts are specific to the plant. This is necessary because these shifts are also used by the new Gantt style work scheduler included in this version of MaintSmart. There is no requirement that you used the new Gantt scheduler and all existing numeric shift data is converted to text data for existing users that are upgrading from MaintSmart 4.0 to higher versions.

Adding New Technician Shifts: To create a new technician shift click the **New** button select a shift color (not used in program yet) enter the new shift name and then click the **Save** button.

Editing Technician Shifts: To edit a technician shift click the grid row containing the shift you want to change then make the changes in the boxes below the grid area. Click the **Save** button.



Checking will create same named shift for all plants whenever a new shift is created.

Temporarily Changing the Default Top Level Entity (equipment hierarchy level #1)

In some cases it's useful to be able to change the default top-level entity temporarily in order to add or edit data records in a top-level entity other than your normal default top-level entity. Simply select the menu item **View a Different Plant** (or other top-level entity) from the **View** menu item on then start up screen. Next enter the top-level entity code that you wish to work with. This top-level entity now becomes the default.

This function is only available to users with Administrator access rights and only affects the work station in use at the time.

Example: Suppose you are a maintenance manager with authority over 5 other plants. It is your responsibility to validate completions for all of the work orders for the other plants. You don't want any of the employees in the other plants to be able to edit work orders however they may create work orders as needed. You need to be able to jump around to different plants easily while validating these work orders.

Give these other plants access rights that are less than Administrator (Power User for example). In the Power User permissions grid (located in the program configuration screen) give these users the right to add work orders but not the right to edit or delete work orders. Now you have the control you need but can access any of these other plants with 2 mouse-clicks.

Note: You may also select the menu items **Options>>Edit/Add Records to Other Plants** then select the plant (top-level entity from the drop-down box labeled Plants (top-level entities).



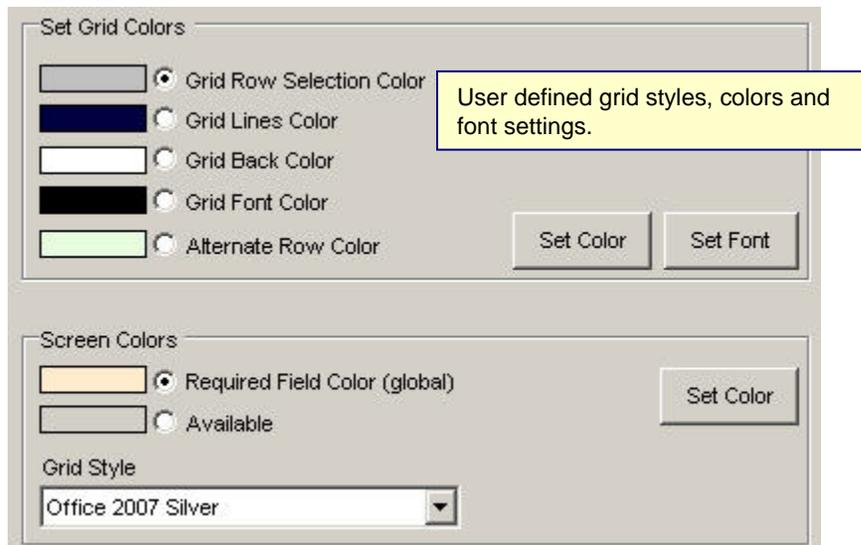
Selecting a different default top-level entity is simple. Select the menu item pictured above then enter the new (temporary) default top-level entity code. Now you can easily edit/add data records to other plants, buildings, etc. Requires Administrator access permission.

Program Configuration - Database Back Up, Grid Colors and Other Options

Database Backup Options (Access Database Only): MaintSmart © provides a way for the administrator to be prompted for database back up at intervals set by the administrator. To use this option go to the **Program Configuration** screen and select the menu items: **Prompt for Database Backup**.

Note: You must explicitly backup the database. The prompting feature is merely a reminder and does not backup the database by itself.

Set Grid Colors: To set the default selected grid row color go to the **Configuration** screen. Go to the **Configuration More** tab and find the frame labeled **Set Grid Colors**. Press the button **Set Color** after selecting which grid object radio button to set to bring up the color selection dialog box. Select a color from the dialog box then press **OK** to use that color. The grid font may also be set. Care must be taken when setting the font so that the font fits the grid cells and is easily visible.



Set Grid Colors

Grid Row Selection Color

Grid Lines Color

Grid Back Color

Grid Font Color

Alternate Row Color

Set Color Set Font

Screen Colors

Required Field Color (global)

Available

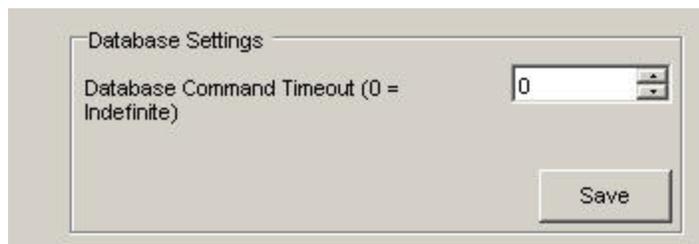
Set Color

Grid Style

Office 2007 Silver

User defined grid styles, colors and font settings.

Database Command Timeout: MaintSmart © provides a way for the administrator to set the command timeout. The command timeout setting dictates how long SQL Server will wait for a command to execute and return a data set. Setting to zero is interpreted as indefinite timeout wait. Thirty seconds is the practical minimum setting. Reasons for long command execution times could be related to database maintenance such as index fragmentation. Be certain that your SQL database is being properly maintained before resetting the command timeout.



Database Settings

Database Command Timeout (0 = Indefinite) 0

Save

More Program Configuration – Email (event) Notifications

Overview of Email Event Notifications: The purpose of the MaintSmart Event Notification feature is to notify specified users by email when certain type of important events take place.

The events are configurable by a MaintSmart administrator. The following types of events can trigger Event Notification.

1. Work Order-Related Events
 - a. Work Order Created
 - b. Work Order Edited
 - c. Work Order Status Changed
 - d. Work Request Created
 - e. Work Request Edited
2. Purchasing-Related Events
 - a. Quote Request Created
 - b. Requisition Created
 - c. Requisition Status Changed
 - d. Requisition Line Item Approved
3. Downtime-Related Events
 - a. Downtime Created
 - b. Downtime Edited

The recipients of the Event Notification emails can be configured by a MaintSmart administrator. Each event type can have a different list of recipients.

- 1.) Sender (The MaintSmart user that performs the create or edit.)
- 2.) Work Requestor (Work Requests only.)
- 3.) MaintSmart Users with email addresses
- 4.) Arbitrary email addresses

Configuring Events and Email Addresses: To configure Event Notifications navigate to the main Configuration screen and select menu "View" > "Email Notifications". The Event Notification Configuration screen will open and Event Notifications can be configured.

On this screen you can define up to one rule for each type of event per plant. A rule consists of the type of event that will trigger the notification and a set of users and email addresses to send the event notification to. To create an event notification rule all that is necessary is to pick the type event you want to create a rule for and specify the recipients to be notified each time the event occurs. Status Change events require that you specify which status values will trigger the event notification.

EvNotRuleID	Notification Type	Plant Identifier	NotifyRequestor	NotifyEng	NotifySender	Expr1
1	WOCreated	Sacramento	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sacramento
3	WorkRequestStatusChanged	Sacramento	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sacramento

Work Order Event Notification Configuration

Plant: Sacramento Event Type: WorkRequestStatusChanged

Users: Bill Wilson - bwilson@msn.com, chad = feedback@mainsmart.com, Charlie Huston - c.huston@yahoo.com, Christian Thomas = sales@mainsm.com

Notify Sender/Requestor: Notify Engineer(s):

Work Order Status: Active, Cancel, Request Change To Status: Done, In Progress

View Settings Options Translation Window

- Requestors...
- Configure Skills...
- Configure Customer Satisfaction Survey...
- Configure Shifts...
- Approval Level Configuration...
- Email Configuration...
- Email Notifications...
- View Email Notification History
- Configure Inventory Change Log Status

More Program Configuration – Email (event) Notifications

Selecting Event Notification Recipients:

The sender or requestor is the MaintSmart user that creates or edits a MaintSmart item such as a Work Order. If you want the Sender to be notified when an event takes place, then place a check in the "Notify Sender" or "Notify Sender/Requestor" check box.

Notifications may also be sent to any MaintSmart users for whom email information has been provided. Select from the list of users with emails in the left-hand ("Users") list box and click the ">" button to move the user into the right-hand list box ("Send To Users"). To remove users from the list of "Send To Users" users, select the user to remove from the right-hand list box and click the "<" button.

To enter arbitrary email addresses type or paste the email address into the "Email Addresses" text box and click the "+" button. The Email address will be added to the list box. To remove an email address from the list box select it by clicking on it with the mouse and then either click the "-" button or press the delete key.

A Note On Email Addresses: Only recipients with email addresses that have been entered in MaintSmart will be displayed in the "Users" list-box. Recipients and Emails that appear in the "Users" and "Send To Users" list-boxes come from three different places in MaintSmart.

Users

Email addresses are used that were entered for MaintSmart Users in the "Program Configuration Settings" screen that is accessible from the MaintSmart toolbar. The name and email address that are displayed in the list-box are separated by an equal sign. For example: "Keith DeSilva = kdesilva@xyz.com".

Engineers (Applies only to Work Order events)

Email addresses are used that were entered for Engineers in the "Plant / Mechanic Configuration Screen". The name and email address that are displayed in the list-box are separated by a hyphen. For example: "Jon Schank - jschank@xyz.com".

Requestors (Work Order Requestors)

Email addresses are used that were entered for Work Order Requestors in the "Work Order Requestors" that are accessible from the "Options" > "Requestors..." menu on the Work Order entry screen.

The name and email address that are displayed in the list-box are separated by a tilde. For example: "Carol Cook ~ ccook@xyz.com".

Cloning Event Notification Rules:

If you need to create a new rule and use the same or similar set of recipients as a rule that has already been created you may clone an existing rule. Cloning a rule will copy all of its recipients into the rule entry form and all you will need to do is specify the rule type and optionally edit the set of recipients. To clone a rule you must not be currently editing or creating a new rule. Right-click in the grid on the rule you want to clone and select the "Clone" menu item.

Event Type	Plant Identifier	NotifyRequestor	Not
WOSStatusChanged	Sacramento	<input type="checkbox"/>	
RequestStatusChanged	Sacramento	<input type="checkbox"/>	

Clone

More Program Configuration – Email Notifications for Work Order Events

Setting Up Work Order Event Notifications:

First, select the type of Work Order event.

Note that a Work Request differs from a Work Order in that it is created by a user who is a Work Order Requestor and immediately after creation its status is "Request".

All Event Types for which rules have not yet been created will be displayed in the "Event Type" drop-down box.

Work Order Event Notification Configuration

Plant: Sacramento

Event Type: WOCreated, WOStatusChanged, WOEdited, WorkRequestCreated, WorkRequestStatusChanged

Notify Sender/Requestor

Notify Engineer(s)

Work Order Event Notification Configuration

Plant: Sacramento

Event Type: WOSTatusChanged

Notify Sender/Requestor

Notify Engineer(s)

Work Order Status: Active, Cancel, Request, In Progress

Change To Status: Done

If the type of Event Notification Rule is "WOSTatusChanged" or "WorkRequestStatusChanged", then it is necessary to specify each status value for which the event will trigger a notification. In the example shown, the notification will occur whenever the status of a Work Order is changed to "Done". Multiple status values can be selected for a single rule.

Notify Sender/Requestor

Notify Engineer(s)

If "Notify Sender/Requestor" is checked, then the user that created the Work Order will be notified.

If "Notify Engineer(s)" is checked, then all engineers (for whom email addresses have been entered in MaintSmart) that are assigned to a Work Order will be notified.

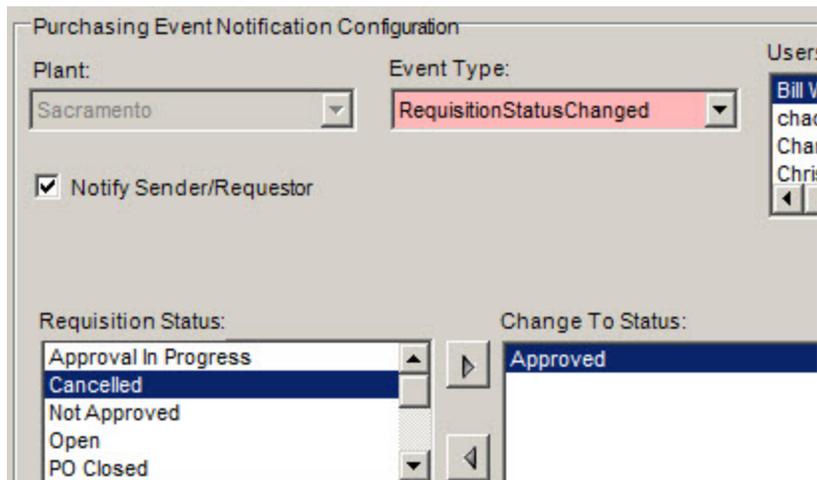
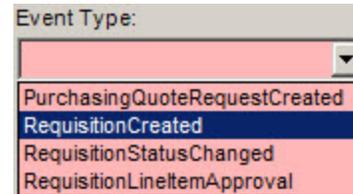
More Program Configuration – Email Notifications for Purchasing Events

Setting Up Purchasing/Requisition Event Notifications:

Purchasing Event Notifications notify users of the occurrence of events related to Quote Requests and Requisitions.

First, select the type of Purchasing event.

All Event Types for which rules have not yet been created will be displayed in the "Event Type" drop-down box.



If the type of Event Notification Rule is "RequisitionStatusChanged", then it is necessary to specify each status value for which the event will trigger a notification. In the example shown, the notification will occur whenever the status of a Requisition is changed to "Approved". Multiple status values can be selected for a single rule.

If "Notify Sender/Requestor" is checked, then the user that created the Quote Request or Requisition will be notified. Note that in the context of Purchasing Event Notifications, this is not in any way related to a Work Order Requestor.

More Program Configuration – Email Notifications for Downtime

Setting Up Downtime Event Notifications:

Downtime Event Notifications notify users of the occurrence of events related to Equipment Downtime. First, select the type of Downtime event.

All Event Types for which rules have not yet been created will be displayed in the "Event Type" drop-down box.

Down Time Event Notification Configuration

Plant: Sacramento

Event Type: DownTimeEdited

Minimum Severity: Very High

Notify Sender

Users: chad = feedba, Charlie Huston, Christian Thom, dave hackwor

Email Address

It is necessary to specify the minimum downtime Severity for which downtime Event Notifications will occur. In this example a minimum severity of Medium has been selected so Event Notification will only occur for downtimes with severities of "Medium", "High", and "Very High." In other words, any downtimes with severities of "Very Low" and "Low" will not trigger Event Notification. The cause ALL downtimes to trigger notifications, select the least severe state--the first severity value in the drop-down box (in this case "Very Low"). The "Minimum Severity" drop-down box will always have the least severe state at the top and the most severe state at the bottom of the drop-down box. Severities are sorted from least to most severe from top to bottom of the drop-down box.

If "Notify Sender " is checked, then the user that entered the downtime will be notified.

Notify Sender

Minimum Severity:

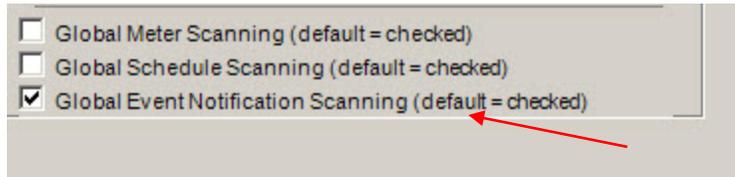
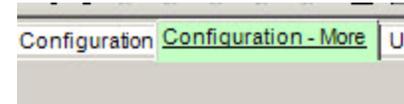
- Very Low
- Very Low
- Low
- Medium
- High
- Very High

More Program Configuration – Controlling How MaintSmart Checks for Events

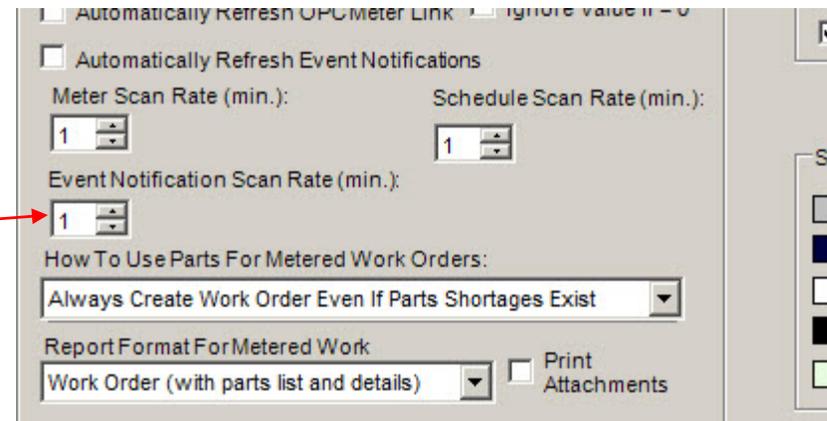
Controlling How MaintSmart Checks for Events:

MaintSmart checks for events at a regular interval and sends emails for any events for which Event Notifications have been configured. MaintSmart administrators can control how MaintSmart checks for events from the "Configuration-More" tab on the Program Configuration Screen.

Event Notification is activated by checking the "Automatically Refresh Event Notifications" Checkbox. To set the interval in minutes at which MaintSmart checks for events enter the number of minutes in the "Event Notification Scan Rate" box.



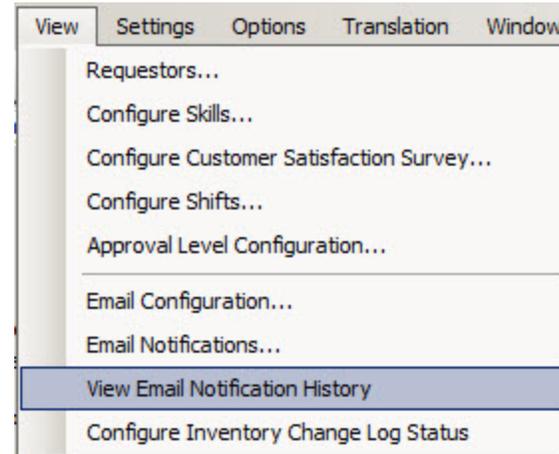
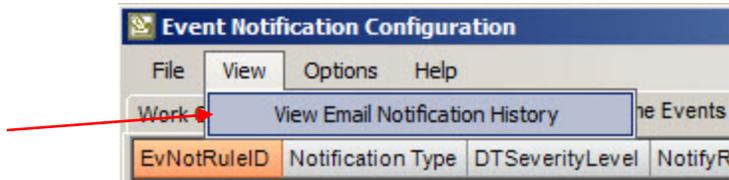
The Event Notification Scan Rate (minutes) determines how often the program checks for events.



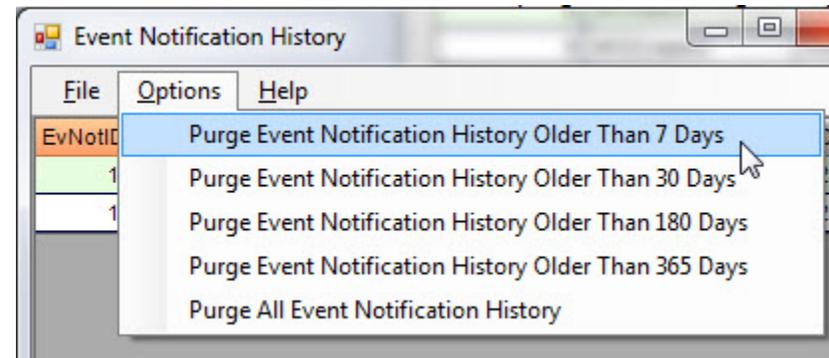
More Program Configuration – Viewing Event Notification History

Viewing Event Notification History:

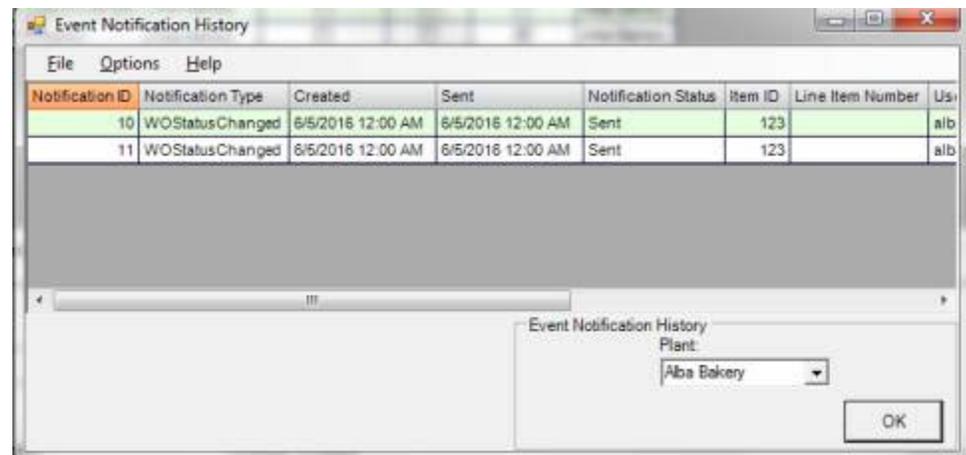
Administrators can view the history of Event Notifications. From the Event Notification Configuration screen select the "View" > "View Email Notification History" menu item or from the main Configuration screen and select menu "View" > "View Email Notification History". The list of all Event Notification records will be displayed.



This will display the type of notification, dates, and the status of the Event Notification (Pending, Sent, or SendFail) as well as some information on the Work Order, Requisition, or Downtime that triggered the notification. The "Item ID" in the grid is the ID number of the Work Order, Requisition, or Down Time that triggered the notification.



Purging Notification History: As time goes on there will be many old Event Notification record accumulated and it will be desirable to purge the older ones. Old Event Notification records can be purged using the Event Notification History screen's "Options" menu. Choose the appropriate number of days past which all Event Notification records should be deleted. Only records for the current plant will be deleted or choose to delete all history. If any unsent notifications are older than the specified time they will be deleted and will never be sent. After the records are purged, a message will pop up informing you of the number of records purged.



Program Configuration - User Access and Concurrent Licensing

User Access and Concurrent Licensing Explained: This screen allows you to see who has been using MaintSmart when and how long they were logged in. This screen also tracks concurrent users and provides a way to purge orphaned licenses. Beginning in MaintSmart 5.0 the licensing changed from “per-seat” to concurrent. The difference for the user is as follows (for example): If user possesses two per seat (2) licenses the software could be installed on two computers only. With the new concurrent licensing two (2) licenses may be installed on up to four (4) computers with two (2) active users logged into the program at any given moment in time.

This screen is also used to purge orphaned licenses thereby restoring the full available license count possessed by this organization. It is important to set the Inactivity Timeout from the Settings menu to a value high enough that users are not constantly being prompted to take action but low enough that if a user walks away from their computer with MaintSmart running for an extended period of time the program will close automatically and release the license to another user. Exit State 2 is an example of a situation where MaintSmart timed out for inactivity and closed properly. Ideally the exit states listed in the grid pictured below should predominantly be Exit State = 1. This would indicate that users are normally logging out of the program as they should when finished.

User Display Name	User ID	GroupID	Login Time	Logout Time	ExitState	Plant ID
Christian Thomas	admin	1	1/11/2017 11:25:28 AM	1/11/2017 1:26:27 PM	2	Sacramento
Christian Thomas	admin	1	1/11/2017 8:39:27 AM	1/11/2017 11:07:42 AM	2	Sacramento
Christian Thomas	admin	1	1/10/2017 3:12:57 PM	1/10/2017 4:27:06 PM	2	Sacramento
Christian Thomas	admin	1	1/11/2017 5:27:23 PM	1/11/2017 6:20:03 PM	1	Sacramento
Christian Thomas	admin	1	1/12/2017 7:42:50 AM	1/12/2017 7:42:50 AM		Sacramento

Exit States Legend:
 Abnormal = 0, Normal = 1, Timed Out=2, Invalid User=3, Too Many Users=4, Nothing=5, Orphaned = 6

Query User Access Filters:
 All Plant: Sacramento User Name: [] Log On Date/Time Between These Dates/Times: 01/05/2017 07:42:56 to 01/13/2017 07:42:56
 User Group: [] Common Name: [] Exit State: [] Default Days Before Today: 7
 Filter By Currently Logged On and Abnormal

Buttons: Inquire, Print, Purge Selected, Purge All, Cancel

Status: 1/1 Licenses In Use

The **Exit State** identifies how the program was exited. A blank cell indicates **Exit State 0**. If the count of exit state 0 exceeds the actual logged in users at any moment in time this indicates that there are **Orphaned Licenses**.

All drop-down boxes in this framed area are used for filtering the grid display.

Explanation of Exit States.

Program Configuration - User Access and Concurrent Licensing

Working With User Logins and Purging Orphaned Licenses: In some cases licenses will be orphaned due to the program not being closed properly. This can occur in the case of a power outage or other unexpected shutting down of a computer that is currently running MaintSmart. These orphaned licenses use part or all of the user license count and prevent other users from accessing the program. These licenses must be purged from the system to recover them as shown below.

Purging Orphaned Licenses at Start-Up: If all licenses are in use any additional users attempting to log in will be prompted that there are no available licenses left. This blocks any additional users from accessing the program. This is normal behavior. There are a few solutions to this as follows:

Purchase additional licenses if there are no orphaned licenses and more user will routinely be using the program.

If a MaintSmart Administrator is logging in the Administrator role has the ability to purge orphaned licenses from the log in screen. This makes sense to be able to do this because if a user is completely blocked due to license over-use then there would be no way to access the Configuration screen to purge these orphaned licenses as described above and depicted below.

The screenshot shows the 'User Access' configuration screen in MaintSmart. It features a table of active users and a 'Purge Selected' button. Annotations provide instructions on how to handle license over-counts and how to use the purge functionality.

User Display Name	User ID	GroupID	Login Time	Logout Time	ExitState	Plant Identifier
		1	1/11/2017 11:25:28 AM	1/11/2017 1:26:27 PM	2	Sacramento
		1	1/11/2017 8:39:27 AM	1/11/2017 11:07:42 AM	2	Sacramento
		1	1/10/2017 3:12:57 PM	1/10/2017 4:27:06 PM	2	Sacramento
		1	1/11/2017 5:27:23 PM	1/11/2017 6:20:03 PM	1	Sacramento
		1	1/12/2017 7:42:50 AM	1/12/2017 7:42:50 AM		Sacramento

MaintSmart Time Out
All licenses in use. MaintSmart will now close.
1
Close MaintSmart

Log On Date/Time Between These Dates/Times
2017 08:59:36

Exit States: Abnormal = 0, Normal = 1, Timed Out=2, Invalid User=3, Too Many Users=4, Nothing=5, Orphaned = 6

Do You Want to Purge Orphaned Users to Free Up Licenses? This May Also Terminate Active Sessions of Other Logged On Users of MaintSmart. Continue?
Yes No

Purge Selected **Purge All** **Cancel**

Annotations:

- If over license count at log in the users that are NOT Administrators see this screen.
- To purge a license (orphaned) left mouse-click the grid row containing the license or multi-select by holding the <CTRL> key and left-click. Next click the **Purge Selected** button.
- If over license count at log in the users that are Administrators see this screen. Simply clicking the Yes button automatically purges all user licenses immediately.
- Purges all orphaned user licenses immediately.

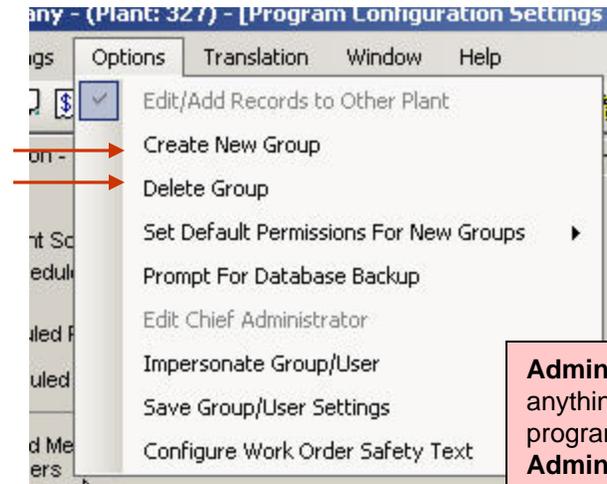
Program Configuration - User Groups

User Groups: User groups are groups of users with varying database and other access permissions. The administrator creates groups and places users into these groups. Typically users with less experience or in non-managerial positions receive fewer access permissions. A typical application would probably need 5 user groups or less. Examples of user group names might be: Power User, Advanced, Accounting, Basic, etc. Groups including their users may be deleted. However the Administrators group cannot be removed.

Groups/Permissions: MaintSmart © allows the administrator to create user groups for the purpose of restricting access the screens and data access. The administrator has the option of restricting access to the following : viewing certain screens, printing, adding new records, editing or deleting records, querying data, and accessing plants other than the default plant's data. User access duration may also be logged.

Creating User Groups: To create a user group go to the **Configuration** screen. Select menu item **Options>Create New Group**. Enter the group name when prompted. A new group is created with default permissions. Select the tab labeled **Groups/Permissions** to see the newly created group. After user groups are created users are added to these groups and passwords are assigned to them. Users cannot access this program without a password.

Deleting User Groups: To delete a user group go to the **Configuration** screen. Select menu item **Options>Delete Group**. Enter the group name when prompted. **Deleting user groups permanently deletes all users in the group.**



Administrator (group) can do anything and go anywhere in the program. A user must be an **Administrator** to access the **Program Configuration** screen.

MaintSmart comes with some user groups already set up. You can add as many custom groups as you need though and/or modify the existing groups to fit your requirements.

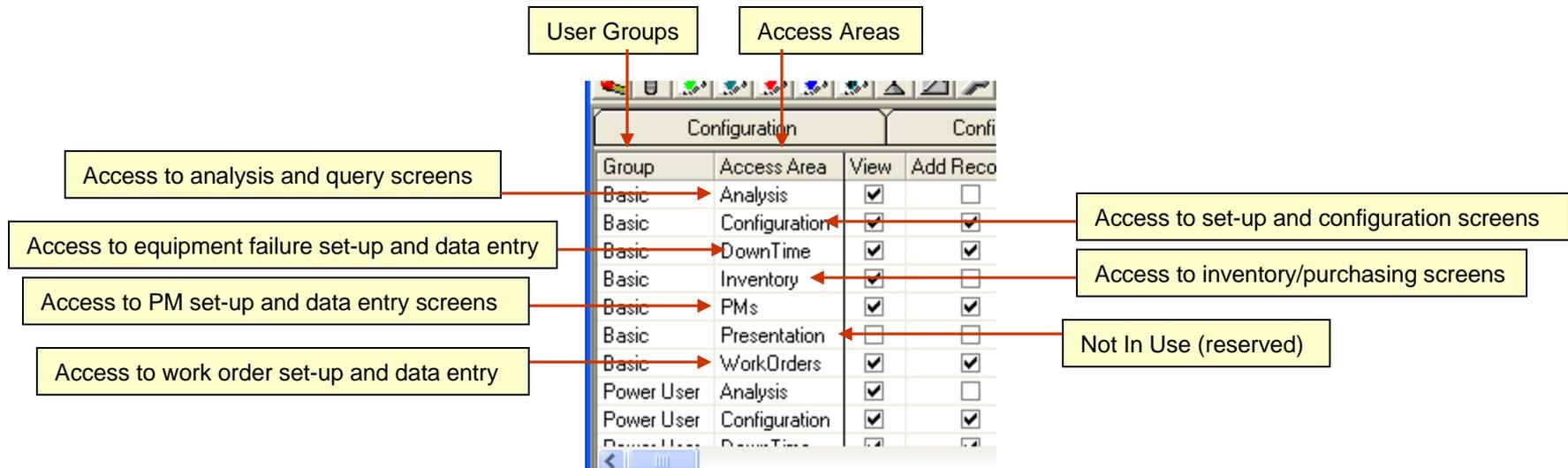
Program Configuration - Group Permissions, Access Areas

Setting User Group Permissions: To set user group permissions go to the **Configuration** screen. Select the **Groups/Permissions** tab.

Left mouse click on the row in the grid that contains the group and access area that you want to add or remove permissions to/from. Check the appropriate check boxes. Press **Save** to keep these permissions.

Access Areas: This program contains seven different access areas. Each access area has seven permissions associated with it. This gives the administrator a very flexible security system allowing maximum use of this program by all members from managers to line maintenance personnel.

Example: Line maintenance personnel may be given permission to add downtime records only. Maintenance foremen may be given the same permission as line maintenance *and* permission to create and print work orders, log inventory usage and update PM task lists as they're completed. Managers may get permission to analyze data and move personnel and equipment within the program.



Configuration - Permissions

General Overview of MaintSmart Permissions: Permissions provide a way for you to allow or deny access to certain features and function in MaintSmart. For example perhaps you'd like to have some users only be able to enter a work request, others to add new work orders and still other be able to edit and print work orders. This is possible with MaintSmart permissions. *Permissions are assigned to User Groups then users are added to these user groups.* When a user logs into MaintSmart the program determines his user permissions based upon the user name and the user group that the name belongs to. Permissions pertain to various Access Areas. For example to edit the **Quick Add Task** permissions you would select either the **Work Orders** or **PMs Access Areas** (row) not the **Inventory** row because this permission doesn't pertain to inventory.

Permissions may be assigned and edited at any time by Administrators only. The next few pages describe each available permissions **Access Area** and grouped by type of permission:

Basic	Analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basic	Configuration	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basic	DownTime	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basic	Inventory	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basic	PMs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
Basic	Presentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Editing User Group: Basic

General Permissions 1 | General Permissions 2 | Inventory/Purchasing Permissions 1 | Inventory/Purchasing Permissions 2

Access Area: Configuration

<input checked="" type="checkbox"/> View	<input type="checkbox"/> Edit/Add Records to Other Plant	<input type="checkbox"/> Add Equipment Run Time Hours	<input type="checkbox"/> Meters Other Plants	<input type="checkbox"/> Edit Global Setting
<input checked="" type="checkbox"/> Print	<input type="checkbox"/> Submit Service Requests	<input type="checkbox"/> Edit Equipment Run Hours	<input type="checkbox"/> Work Order Invoices	<input checked="" type="checkbox"/> Edit Plant Setting
<input checked="" type="checkbox"/> Add Records	<input type="checkbox"/> Configure Auto-Print Scheduler	<input type="checkbox"/> Print Equipment Run Hours	<input type="checkbox"/> Customers	<input type="checkbox"/> Edit User Setting
<input checked="" type="checkbox"/> Edit/Delete Records	<input type="checkbox"/> Quick Add Task	<input type="checkbox"/> Equipment Run Hours Other Plants	<input checked="" type="checkbox"/> Add Global Setting	<input checked="" type="checkbox"/> Edit Registry Setting
<input type="checkbox"/> Query Database	<input type="checkbox"/> Quick Add Cause	<input type="checkbox"/> Edit Meter Readings	<input type="checkbox"/> Add Plant Setting	
<input checked="" type="checkbox"/> View Records at Other Plant	<input type="checkbox"/> View Wage Information	<input type="checkbox"/> Configure Meters	<input checked="" type="checkbox"/> Add User Setting	
	<input type="checkbox"/> (Reserved)	<input type="checkbox"/> Configure Meter Data Links	<input type="checkbox"/> Add Registry Setting	

Configuration - Permissions - General Permissions 1

Analysis Permissions

View: View the analysis screens (any).

Print: Print reports from any analysis screen.

Query Database: Ability to run queries on analysis screens (usually if View is selected then this permission should also be selected).

View Records at Other Plants: Ability to view select a plant other than your default plant for analysis.

Configuration Permissions - General Permissions 1

View: View the data configuration screens that are not specifically controlled by other permissions.

Print: Print reports from data configuration screens that are not specifically controlled by other permissions.

Add: Add new records to data configuration screens that are not specifically controlled by other permissions.

Edit/Delete Records: Edit or delete records from data configuration screens that are not specifically controlled by other permission.

View Records At Other Plants: Ability to work with data from other plants where data configuration screens that are not specifically controlled by other permissions.

View Wage Information: Allow user to view wage information.

Use Scheduler: User may use scheduler with this permission.

Add Equipment Run Time Hours: Add equipment run time hours.

Edit Equipment Run Time Hours: Edit or delete records from equipment run time hours.

Print Equipment Run Time Hours: Print reports from equipment run time hours and non-maintenance wage costs.

Equipment Run Time Hours Other Plants: View and edit/delete equipment run time hours for other plants..

IMPORTANT NOTE REGARDING SETTING PERMISSIONS: In most cases you'll want to give users permissions for all setting options except possibly Edit settings for Global and Plant in some cases.

Add Global Setting: User can add global (all plants in one database).

Add Plant Setting: User may add a plant setting (stored in database).

Add User Setting: User can add settings for their own log in (stored in database).

Add Registry Setting: User can add registry setting. These settings are stored in either HKEY_CURRENT_USER or HKEY_LOCAL_MACHINE.

Edit Global Setting: User can edit global (all plants in one database).

Edit Plant Setting: User may edit a plant setting (stored in database).

Edit User Setting: User can edit settings for their own log in (stored in database).

Edit Registry Setting: User can edit registry setting. These settings are stored in either HKEY_CURRENT_USER or HKEY_LOCAL_MACHINE.

User Access			Passwords			Groups/Permissions	
ds	Query	Print	Edit Others	View Others	Request	Approval (default)	Use Parts
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

/Purchasing Permissions 1 | Inventory/Purchasing Permissions 2 |

<input type="checkbox"/> Add Equipment Run Time Hours	<input type="checkbox"/> Meters Other Plants	<input type="checkbox"/> Edit Global Setting
<input type="checkbox"/> Edit Equipment Run Hours	<input type="checkbox"/> Work Order Invoices	<input type="checkbox"/> Edit Plant Setting
<input type="checkbox"/> Print Equipment Run Hours	<input type="checkbox"/> Customers	<input checked="" type="checkbox"/> Edit User Setting
<input type="checkbox"/> Equipment Run Hours Other Plants	<input checked="" type="checkbox"/> Add Global Setting	<input checked="" type="checkbox"/> Edit Registry Setting
<input type="checkbox"/> Edit Meter Readings	<input checked="" type="checkbox"/> Add Plant Setting	
<input type="checkbox"/> Configure Meters	<input checked="" type="checkbox"/> Add User Setting	
<input type="checkbox"/> Configure Meter Data Links	<input checked="" type="checkbox"/> Add Registry Setting	

Configuration - Permissions - General Permissions 2

Configuration Permissions - General Permissions 2

View Scheduler: View the data configuration screens that are not specifically controlled by other permissions.

Add Schedules: Print reports from data configuration screens that are not specifically controlled by other permissions.

Edit/Delete Schedules: Add new records to data configuration screens that are not specifically controlled by other permissions.

Print Schedules: Edit or delete records from data configuration screens that are not specifically controlled by other permission.

View PM Configuration: Ability to work with data from other plants where data configuration screens that are not specifically controlled by other permissions.

Add PM Configuration : View the data configuration screens that are not specifically controlled by other permissions.

Edit/Delete PM Configuration : Allow user to view wage information.

Print PM Configuration :User may use scheduler with this permission.

PM Configuration Other Plants: Add equipment run time hours.

View Cause Configuration: Allow viewing of failure cause configuration screen.

Add Cause Configuration : Add failure causes and failure cause groups.

Edit/Delete Cause Configuration : Edit/delete failure causes and failure cause groups.

Print Cause Configuration :Print failure causes and failure cause groups.

View Print Job Scheduler: View print schedules, print job log, metered work order log and report definitions.

Add Print Job Scheduler : Add print schedules and report definitions.

Edit/Delete Print Job Scheduler : Edit/delete print schedules and report definitions.

Print Print Job Scheduler :Print print schedules, print job log, metered work order log and report definitions.

Print Job Scheduler Other Plants: Add report definitions, print job log, metered work order log for other plants.

View Process Configuration: View process and line configuration screen. (Second and third level of equipment hierarchy.)

Add Process Configuration: Add process and line configuration data. (Second and third level of equipment hierarchy.)

Edit/Delete Process Configuration : Edit/delete process and line configuration data. (Second and third level of equipment hierarchy.)

Print Process Configuration :Print process and line configuration reports. (Second and third level of equipment hierarchy.)

Process Configuration Other Plants: Add process and line configuration screen (second and third level of equipment hierarchy) for other plants.

View Work Area/Location Configuration: View Work Area/Location configuration screen. (Second and third level of equipment hierarchy.)

Add Work Area/Location Configuration: Add Work Area/Location configuration data. (Second level of equipment hierarchy.)

Edit/Delete Work Area/Location Configuration : Edit/delete Work Area/Location configuration data. (Second and third level of equipment hierarchy.)

Print Work Area/Location Configuration :Print Work Area/Location configuration reports. (Second and third level of equipment hierarchy.)

Work Area/Location Configuration Other Plants: Add Work Area/Location configuration screen (second and third level of equipment hierarchy) for other plants.

Configuration Permissions - General Permissions 2

View Equipment Configuration: View Equipment configuration screen.

Add Equipment Configuration: Add Equipment configuration data.

Edit/Delete Equipment Configuration : Edit/delete Equipment configuration data.

Print Equipment Configuration :Print Equipment configuration reports. (Second and third level of equipment hierarchy.)

Equipment Configuration Other Plants: Add Equipment configuration screen for other plants.

View Technician Configuration: View technician configuration screen.

Add Technician Configuration: Add Technician configuration data.

Edit/Delete Technician Configuration : Edit/delete Technician configuration data.

Print Technician Configuration :Print Technician configuration reports. (Second and third level of Technician hierarchy.)

Technician Configuration Other Plants: Add Technician configuration screen for other plants.

Power User	WorkOrders					
Requester	Analysis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Editing User Group: Power User		
General Permissions 1	General Permissions 2	Inventory/Purchasing Permis
Access Area: Configuration	<input type="checkbox"/> Edit/Delete PM Configuration	<input checked="" type="checkbox"/> Add Print Job S
	<input type="checkbox"/> Print PM Configuration	<input type="checkbox"/> Edit/Delete Pri Scheduler
<input checked="" type="checkbox"/> View Scheduler	<input type="checkbox"/> PM Configuration Other Plant	<input checked="" type="checkbox"/> Print Print Job :
<input checked="" type="checkbox"/> Add Schedules	<input checked="" type="checkbox"/> View Cause Configuration	<input checked="" type="checkbox"/> Print Job Sche Plant
<input type="checkbox"/> Edit/Delete Schedules	<input checked="" type="checkbox"/> Add Cause Configuration	<input type="checkbox"/> View Process (
<input checked="" type="checkbox"/> Print Schedules	<input type="checkbox"/> Edit/Delete Cause Configuration	<input type="checkbox"/> Add Process C
<input type="checkbox"/> View PM Configuration	<input type="checkbox"/> Print Cause Configuration	<input type="checkbox"/> Edit Process C
<input type="checkbox"/> Add PM Configuration	<input checked="" type="checkbox"/> View Print Job Scheduler	<input type="checkbox"/> Print Process C

Inventory - Inventory/Purchasing Permissions 1

Inventory Permissions - Inventory/Purchasing 1

Add RFQ: Add a request for quote.

Edit/Delete RFQ: Edit or delete a request for quote tied to user log in.

RFQ Other Plants: View RFQ from other plants tied to user log in.

Print RFQ: Print request for quote.

Manage All RFQ: Work with RFQ other than those tied to user log in default plant.

Manage All RFQ Other Plant: Work with RFQ other than those tied to user log in in any plant.

Add Purchase Requisition: Add a purchase requisition tied to user log in.

Edit/Delete Purchase Requisition: Edit or delete a purchase requisition tied to user log in.

Purchase Requisition Other Plants: View purchase Requisition from other plants and all users.

Print Purchase Requisition: Print purchase requisition.

Approve Requisitions Other Plants: Approve line items on purchase requisition for plants other than default plant. Need at least one level of Approve Requisition for this to have any effect.

Request Inventory Transfer: Ability to submit request for an inventory transfer from another plant.

Approve Inventory Transfer: Ability to approve submitted request(s) for an inventory transfer from to plant.

Manually Use Parts: Allow manual use of parts from parts usage screen, work order or PM screens. Doesn't affect automatic parts usage links already in place.

Edit Parts Usage: Edit or delete parts usage records of parts from parts usage screen.

Use Parts Other Plants: Allow manual use of parts from parts usage screen for plants other than default plant.

Release P.O.: Allow PO number to be created and line items added to PO. This permission may be used in conjunction with the requisition approval screen or users with this permission may directly create a PO and add line items.

Print P.O.: Can print a PO.

Quick Add Part: Allows user to quick add a part. This provides basic configuration of the part created without allowing access to main parts configuration (inventory set-up) screen.

Approve Requisitions Level 0 - 5: Allow line item approval of requisitions. These permissions control the maximum approval level (line item) given to each user group. Additionally each of the approval levels may require one or more signatures from different approvers. When items are selected for approval the required approval level is displayed and items requiring more than one signature are not fully approved until all required signatures are collected.

How To Set Approval Levels

These approval levels may be set by the program administrator. Multiple signatures may be required. Check the check box granting this permission then click the currency symbol button. Next set the currency limit for this permission and the signature count needed for approval of requisition line items.

Check an Approval Level checkbox then enter the maximum approval level (default currency) and the required signature count

	Signatures	Purchase (\$)	Limit
<input type="checkbox"/> Manually Use Parts	1	500	<input checked="" type="checkbox"/> Approve Requisitions (default)
<input type="checkbox"/> Edit Parts Usage	1	5000	<input checked="" type="checkbox"/> Approve Requisitions (level 1)
<input type="checkbox"/> Print Parts Used	2	10000	<input checked="" type="checkbox"/> Approve Requisitions (level 2)
<input checked="" type="checkbox"/> Use Parts Other Plant	2	10000	<input type="checkbox"/> Approve Requisitions (level 3)
<input checked="" type="checkbox"/> Release P.O.	3	50000	<input type="checkbox"/> Approve Requisitions (level 4)
<input checked="" type="checkbox"/> Print PO	4	100000	<input type="checkbox"/> Approve Requisitions (level 5)
<input type="checkbox"/> Quick Add Part			

Inventory - Inventory/Purchasing Permissions 2

Inventory Permissions - Inventory/Purchasing 2

Add/Edit Cost Centers: Add, edit or delete cost centers for default plant.

Add/Edit Accounts: Add, edit or delete accounts for default plant.

Add/Edit Vendors: Add, edit or delete vendors for default plant.

NOTE: In order to configure accounts, cost centers and vendors associated with plants other than your default plant you must first have the **Configuration** permission **Edit/Add Records To Other Plant**.

Use Other Cost Centers: Ability to use Cost Center other than those associated with the default plant.

Use Other Accounts: Ability to use Account other than those associated with the default plant.

Use Global Vendors: Ability to use vendors (share) from other plants. In order for this to display vendors from other plants the menu setting: **Setting>>Use Global Vendors** must first be checked.

NOTE: Users of MaintSmart versions 3.3 or lower must first consolidate their vendors if vendors already exist in more than one plant and the decision is made to make vendor global. See the topic in the Inventory and Purchasing manual for instruction on how to accomplish this.

Receive Inventory/Services: View Cost Center from other plants tied to user log in.

Print Inventory Received: Print received items.

Receive Inventory Other Plant: Work with RFQ other than those tied to user log in default plant.

Add Inventory: Permission to add part stock (inventory) to **Inventory Set-Up** screen.

Edit Inventory: Permission to edit part stock (inventory) to **Inventory Set-Up** screen.

Delete Inventory: Permission to delete part stock (inventory) to **Inventory Set-Up** screen.

Print Inventory: Permission to print part stock reports including barcode labels from **Inventory Set-Up** screen.

Inventory Other Plant: Permission to add part stock (inventory) to **Inventory Set-Up** screen.

Configure Part Groups, Item Types and More: This permission provide the ability to edit configuration data that is needed to create parts stock items (inventory).

Add Invoice Payment: Permission to add invoice payments for received items.

Edit Invoice Payment: Permission to edit invoice payments for received items.

Delete Invoice Payment: Permission to delete invoice payments for received items.

Edit Invoice Payment Other Plant: Permission to edit invoice payments for received items from plants other than user's default plant.

Delete Invoice Payment Other Plant: Permission to delete invoice payments for received items from plants other than user's default plant.

Select Who Used Parts: Unchecked Technician must be linked to a User Login name. If so this forces the user's linked Technician name to be entered as who used the parts. Checked is user can select who used the part.

Editing User Group: Basic

General Permissions 1 | General Permissions 2 | Inventory/Purchasing Permissions 1 | **Inventory/Purchasing Permissions 2**

Access Area:

<input type="checkbox"/> Receive Inventory/Services	<input type="checkbox"/> Inventory Other Plant	<input type="checkbox"/> Delete Invoice Payment Other Plant
<input checked="" type="checkbox"/> Add/Edit Cost Centers	<input type="checkbox"/> Print Inventory Received	<input type="checkbox"/> Configure Part Groups, Item Types, and More
<input checked="" type="checkbox"/> Add/Edit Accounts	<input type="checkbox"/> Receive Inventory Other Plant	<input checked="" type="checkbox"/> Add Invoice Payment
<input checked="" type="checkbox"/> Add/Edit Vendors	<input checked="" type="checkbox"/> Add Inventory	<input type="checkbox"/> Edit Invoice Payment
<input type="checkbox"/> Use Other Cost Centers	<input type="checkbox"/> Edit Inventory	<input type="checkbox"/> Delete Invoice Payment
<input type="checkbox"/> Use Other Accounts	<input type="checkbox"/> Delete Inventory	<input type="checkbox"/> Add Invoice Payment Other Plant
<input type="checkbox"/> Use Global Vendors	<input checked="" type="checkbox"/> Print Inventory	<input type="checkbox"/> Edit Invoice Payment Other Plant

Work Orders, downtime and PMs - General Permissions 1

Work Orders - General Permissions 1

View: View **Work Order** screen.

Print: Print from work order screen.

Add Records: Add new work orders.

Edit/Delete Records: Edit or delete existing work orders.

Query Database: Query data for work orders.

View Records At Other Plant: View work orders for other than logged in user default plant..

Edit/Add Records At Other Plant : Access work orders for other than logged in user default plant for purpose of adding new or editing/deleting work orders.

Submit Service Requests: Submit service request to work order system. This permission must be used when working with requestors. By using this permission with requestors a special user is created that can only created service requests. Service requests are simply work orders with a **Request** status.

Quick Add Task: This permission provides the user the ability to add a task on the fly without being able to access the entire task set-up system. Tasks may only be added (not edited or deleted).

Edit Meter Reading: Create new or update a meter reading in the **Meters** screen.

Configure Meters : Create meter units, work order template to meter links and otherwise configure the base data needed to set-up a meter reading record.

Configure Meter Data Links: Configure DDE and OPC meter data sources.

Meters Other Plant: Work with meters for records associated with plants other than user default plant.

Work Order Invoices: Add, edit or delete work order invoices.

Customers: Add, edit or delete customers that are linked to work order invoices.

View All Users Data: If unchecked then logged in user only see work orders assigned to them. This requires the user login name be linked to the Technician name in the Plants, Work Areas, Personnel Configuration screen

Downtime - General Permissions 1

View: View **downtime** screen.

Print: Print from downtime screen.

Add Records: Add new downtime records.

Edit/Delete Records: Edit or delete existing downtime records.

Query Database: Query data for downtime.

View Records At Other Plant: View downtime for other than logged in user default plant..

Edit/Add Records At Other Plant : Access downtime for other than logged in user default plant for purpose of adding new or editing/deleting downtime records.

Quick Add Cause: This permission provides the user the ability to add a downtime cause on the fly without being able to access the entire downtime cause set-up system. Causes may only be added (not edited or deleted).

Editing User Group: Basic

General Permissions 1	General Permissions 2	Inventory/Purchasing Permissions 1	Inventory/Purchasing Per
Access Area: WorkOrders	<input type="checkbox"/> Edit/Add Records to Other Plant	<input type="checkbox"/> Allow Edit PM Date Completed	<input type="checkbox"/> Meters Other Plant
<input checked="" type="checkbox"/> View	<input checked="" type="checkbox"/> Submit Service Requests	<input type="checkbox"/> Add Equipment Hours	<input type="checkbox"/> Work Order Invoices
<input checked="" type="checkbox"/> Print	<input type="checkbox"/> Delete Work Order	<input type="checkbox"/> Edit Equipment Hours	<input type="checkbox"/> Customers
<input checked="" type="checkbox"/> Add Records	<input type="checkbox"/> Configure Auto-Print Scheduler	<input type="checkbox"/> Print Equipment Hours	<input type="checkbox"/> Add Global Setting
<input checked="" type="checkbox"/> Edit/Delete Records	<input checked="" type="checkbox"/> Quick Add Task	<input type="checkbox"/> Equipment Hours Other Plant	<input type="checkbox"/> Add Plant Setting
<input checked="" type="checkbox"/> Query Database	<input type="checkbox"/> Quick Add Cause	<input checked="" type="checkbox"/> Edit Meter Readings	<input type="checkbox"/> Add User Setting
<input type="checkbox"/> View Records at Other Plant	<input type="checkbox"/> View Wage Information	<input checked="" type="checkbox"/> Configure Meters	<input type="checkbox"/> Add Registry Setting
	<input type="checkbox"/> View All Users Data	<input type="checkbox"/> Configure Meter Links	<input type="checkbox"/> Edit Global Setting

PMs - General Permissions 1

View: View PM update (validate PMs) data entry screen.

Print: Print from PM update (validate PMs) screen.

Add Records: Add new PM if applicable.

Edit/Delete Records: Edit or update existing PMs.

Query Database: Query data for PMs.

View Records At Other Plant: View PM update (validate PMs) for other than logged in user default plant..

Edit/Add Records At Other Plant : Access PM update (validate PMs) for other than logged in user default plant.

View All Users Data: If unchecked then logged in user only see PMs assigned to them. This requires the user login name be linked to the Technician name in the Plants, Work Areas, Personnel Configuration screen

Allow Edit PM Date Completed: If checked the user may edit PM date completed. Unchecked forces date completed to today's date

Analysis - General Permissions 1

View: View analysis data screens (work orders, PMs, downtime and Inventory/Purchasing.

Print: Print analysis data screens (work orders, PMs, downtime and Inventory/Purchasing.

Query Database: Query analysis data screens (work orders, PMs, downtime and Inventory/Purchasing.

View Records At Other Plant: View analysis data screens (work orders, PMs, downtime and Inventory/Purchasing.

Presentation (Access Area)

Reserved for future use.

Configuration - Passwords and User Defaults

Passwords: Passwords are assigned to users when the user is created. Users are members of groups. Groups contain permissions to the various access areas in MaintSmart ©. Passwords must contain between 4 and 8 alphanumeric characters.

Adding New Users and Passwords: To set user passwords go to the **Configuration** screen. Select the **Passwords** tab. Press **New** button. Fill in the requested information. Passwords may be letters, numbers, or a combination of both. User name is not case sensitive. Press **Save** to keep the new record.

Note: It is highly recommended that you fill in all user default data for each user. For users creating requisitions or other purchasing data the **Cost Center, Account and Line** fields automatically populate data thereby saving the user time while providing consistent data entry.

Passwords and User Defaults			
Plant:	Available User Groups:	User Name (Up to 12 chars.):	Password (Up to 8 chars.): Re-Type Password:
Sacramento	Power User	Edward	**** ****
Display Name (optional, displays on reports, etc.):	Department/Location:	Office:	
RQ	Plant (General)	None	
Address:	City:	State:	
1234 Ocean Ave.	North Bend	OR	
Postal Code:	Country:	Phone:	Cell Phone:
97459	USA	543-009-2436	
Fax:	Email:	Notes:	
Cost Center (default):	Account (default):	Line (default)	Language (default):
CC-123-456 - AnyTown Plant	MR-5552-0098712 - Building Repairs	Label Line #1	

Configuration - Editing Passwords and User Defaults

Deleting or Editing Passwords: To delete a user and their password go to the **Configuration** screen. Select the **Passwords** tab. Left mouse click on the user in the grid to select. Press the **Delete** button to permanently delete the user and all access log files associated with the user.

To edit the user select the user in the grid as above. You may change the user group, name, or password as needed. Press the **Save** button when the required changes are complete.

Moving a User to a Different Group: To move a user to a different user group go to the **Configuration** screen. Select the **Passwords** tab. Left mouse click on the user in the grid to select. Use the drop-down box to select a different user group. Press the **Save** button when the required changes are complete.

Editing the Administrator Password: To edit the chief administrator's password go to the **Configuration** screen. Select the menu item **Options>Edit Chief Administrator**. Follow the prompts. Be certain to store the password and user name in a secure location.

Note: Administrators have complete control over all aspects of MaintSmart ©. Choose your administrators carefully.

Plant Identifier	User Group	User ID	User Display Name	Name	Department/Location	Office	Address	City	St.
Sacramento	Requestor	chad	chad	chad	Dept 8	100			
Sacramento	Basic	daveh	Dave Hackworth	Dave Hackworth					

Configuration | Configuration - More | User Access | **Passwords** | Groups/Permissions

Plant: Sacramento Available User Groups: Basic User Name (Up to 12 chars.): daveh Password (Up to 8 chars.): Re-Type Password:

Display Name (optional, displays on reports, etc.): Dave Hackworth Department/Location: Office:

Address: City: State:

Postal Code: Country: Phone: Cell Phone:

Fax: Email: feedback@cmms-software.net Notes:

Cost Center (default): CC-123-456 - AnyTown Plant Account (default): MR-5552-009899 - Machine Repairs

Check this checkbox to set user default to simple work order input mode.

Edit or Delete Passwords

Language (default): Default (English) Simple Work Order Input Save Last Entries

New Delete Save Cancel

Plants - Equipment Hierarchy Level #1 (top-level entity)

For the purposes of this user guide the term “Plant” refers to the top-level entity (or equipment hierarchy #1). Please substitute your own top-level entity for the term plant (i.e. company, complex, fleet, school, location, etc.).

Overview of Plants(Top-Level Entity): MaintSmart© may have up to 900 plants configured at once. Each plant is its own entity and is designated a unique plant code. It contains processes, lines, work areas, equipment, personnel, etc. The plant code is used internally to identify each plant. Therefore it is possible for MaintSmart© to distinguish between two or more plants in the same city. Once you have established a plant and begun entering data for that plant it is recommended that you do not change the plant code.

Default Plant (Top-Level Entity or Equipment Hierarchy #1 or Equipment Hierarchy #1): Each workstation computer must have a default plant set in the **Configuration** section of MaintSmart©. Select the plant configuration button from the button bar . Select the tab labeled **Configuration**. Locate the frame labeled **Plant Information**. Enter the requested information in all of the text boxes within the frame. Be certain to enter a valid plant code. Press the button labeled **Make This Plant the Default Plant**. From this point forward MaintSmart© will use this plant code for data entry, queries, and analysis. In order for users to access other plants they must have been explicitly given that access permission by the administrator. Without permission to edit/add records to other plants the user can not alter or add records that could possibly affect a plant other than the default plant. These include break down cause descriptions, task descriptions, data specifically pertaining to that plant and other data tables.

Adding a New Plant (Top-Level Entity or Equipment Hierarchy #1): To add a new plant to MaintSmart© select the plant configuration button  from the button bar. Select the tab labeled **Plants**. Go to the menu item **Options** then choose the menu item **Edit/Add Records for Other Plants**. If you are unable to access this menu item then you do not have security access rights to change data related to other plants. (In this case ask the system administrator to either give you that access permission or have the administrator make the addition of the new plant.) Enter the data in all of the yellow boxes under the Location/Contact screen tab. The **Location/Unique Identifier** is the data field that you will interface with when selecting a plant. After the information has been entered here go to the next screen tab on the **Plant Configuration** screen labeled **Billing Information**. The billing information is used to populate P.O. **bill to** data fields (by default).

Plant		Work Area/Location		Technician		Technician-Skills		Tech
Plant ID	Plant Identifier	Address	City	State/Province	Postal Code	Country	Phone	FAX
327	Sacramento	1234 Main St.	Sacramento	CA	96554	USA	399-9263	399-8230
328	Plant 7665	216 S. Fairmont	Lodi	CA	95240	U.S.A.	209-367-0450	209-369-9396
329	Raw Materials	322354 Comercial Ave	Knoxville	TN	65887	USA		

Location/Contact

Billing Information

Plants

Plant Code:	Location/Uniqued Identifier:	Address:
<input type="text" value="327"/>	<input type="text" value="Sacramento"/>	<input type="text" value="1234 Main St."/>
City:	State/Province:	Postal Code:
<input type="text" value="Sacramento"/>	<input type="text" value="CA"/>	<input type="text" value="96554"/>
Country:		
<input type="text" value="USA"/>		
Contact:	Phone:	FAX:
<input type="text" value="Bob Schluff"/>	<input type="text" value="399-9263"/>	<input type="text" value="399-8230"/>
Notes:		
<input type="text" value="Muffin plant"/>		

Plants - Equipment Hierarchy Level #1 (top-level entity)

Editing or Deleting a Plant (Top-Level Entity or Equipment Hierarchy #1): Once the menu item **Edit/Add Records for Other Plants** has been selected a check mark will appear next to it and the **New** button will become enabled. Press the **New** button, enter the appropriate data then press **Save** or **Cancel** as needed.

To edit or delete the plant configuration button  from the button bar. Select the tab labeled **Plants**. Go to the menu item **Options** then choose the menu item **Edit/Add Records for Other Plants**.

If you are unable to access this menu item then you do not have security access rights to change data related to other plants. You may not delete or edit the default plant without security permission to **Edit Other Plants Data**. (In this case ask the system administrator to either give you that access permission or have the administrator make the edit or deletion.)

Once the menu item **Edit/Add Records for Other Plants** has been selected a check mark will appear next to it. Left mouse click on the plant you want to edit/delete. Make the changes in the textboxes then press **Save**.

Warning: Changing a top-level entity code may result in data loss. Deleting a top-level entity code will result in permanent loss of ALL records associated with that top-level entity code. Be extremely careful in your decision to take this action. In order to delete a plant you must first delete all associated records linked to the plant such as lines, lines, equipment, personnel, etc. You must then go to the Program Configuration screen and check the menu item **Allow Cascade Deletes**.

323 Raw Materials 322304 Commercial Ave Knoxville TN 60867 USA

Location/Contact Billing Information ← Default plant billing information populates P.O. *Bill To* fields optionally.

Bill To Company:	Bill To Contact:	Bill To Address:	
Tastee Baking Company	Bill Swanson	66165 Postside Rd.	
Bill To City:	Bill To State/Province:	Bill To Postal Code:	Bill To Country:
North Bend	OR	97345	USA
Bill To Phone:	Bill To Fax:	Bill To Email:	
514-645-6387	514-549-7765	feedback@maintsmart.com	
Bill To Notes:			
Billing Notes			

Copy Location Data -> Billing Data

Work Areas/Location (user-defined equipment hierarchy #2-B)

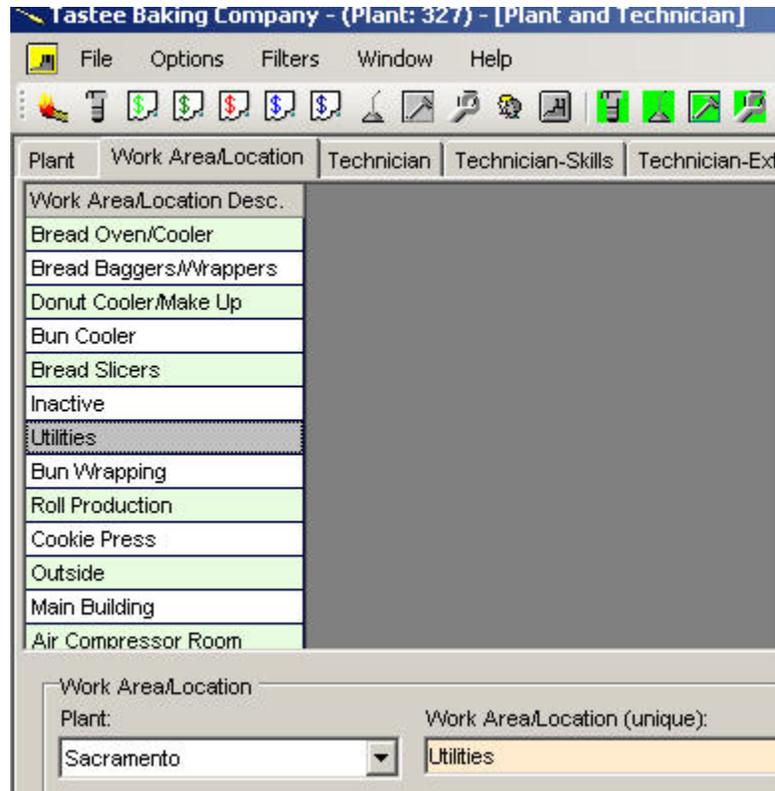
Overview of Work Area/Location (Hierarchy Level 2A): Work area/location are logical groupings of one or more equipment or maintained equipment. Each work area/location may optionally be assigned to one technician and a PM task list (zone-maintenance). There may be as many as 9999 work area/location in single plant.

It is important to note that work area/locations are simply another way to group equipment and the term 'work area/location' may be changed to reflect your operation's equipment hierarchy. Some examples might be: Sector, Work Cell, Building, Room, Line, Skill, Craft, etc.

Adding a New Work Area/Location: Select the menu item or menu button  **Configure Plants, Areas, Personnel, and Skills**. Select the tab **Work Area/Location**. Press **New**. Enter an area description in the designated box. This text must be unique at the plant level. Press the **Save** button to save the record. An internal Work area ID number is also created by MaintSmart©.

Editing or Deleting a Work Area: Warning: Deleting a work area causes all equipment in the deleted area to be moved to 'No Area Assignment - XXX' (where XXX represents the plant code for the deleted work area).

Select the menu item or menu button  **Configure Plants, Areas, Personnel, and Skills**. Select the tab **Work Areas**. Select a record to edit by clicking the left mouse button on the record in the grid. Enter the edit(s) in the boxes below the grid. Press the **Save** button to save the record or **Cancel** to restore the original values. To delete a record follow the same steps above but instead of pressing the **Save** button press the **Delete** button.



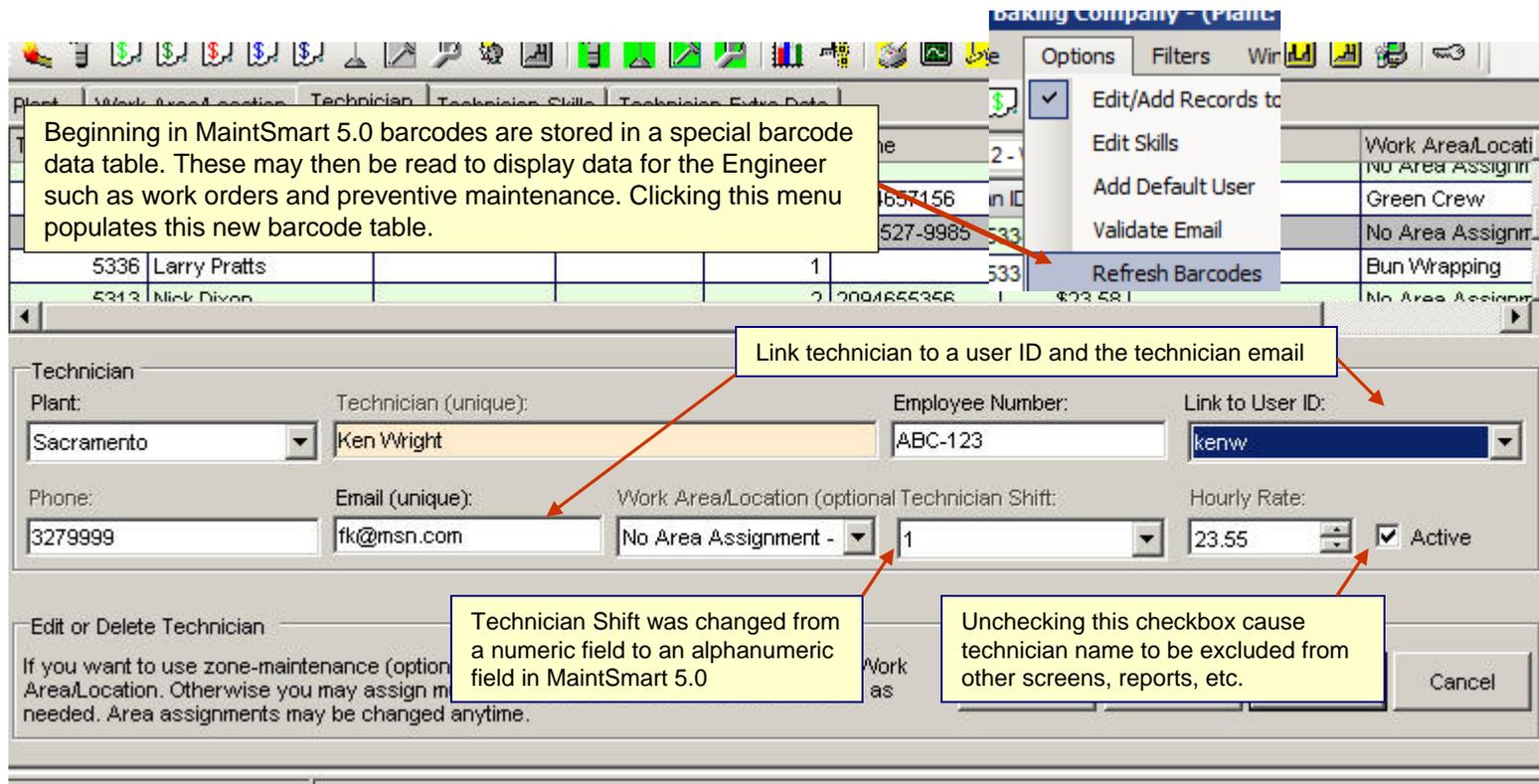
Personnel and Skills

Overview of Personnel and Skills: For the purpose of this manual personnel are called 'Technician'. You may define this term as you see fit. Personnel are the maintenance Technicians that are assigned to care for the equipment. Each maintenance technician is responsible for one work area and the equipment contained therein. MaintSmart© uses personnel wage information in calculating the cost to own equipment. Skills are the skills owned by each individual maintenance technician. Unlimited skills are maintained on a company-wide level. Changes to the skill list are reflected in all plants. Careful consideration should be given to the skill list prior to naming the skills. Skills are used to determine which technician is best suited to maintain each piece of equipment. Skills are mapped to preventive maintenance tasks. This helps the maintenance manager allocate labor resources in the most efficient way.

Adding New Personnel: To add personnel and their associated skills select the  button from the button bar. Select the tab labeled **Personnel**. Press the New button, enter the appropriate data then press **Save** or **Cancel** as needed. The technician's information is added to the database as is a record containing this technician's skill set. Select the tab labeled **Skills**. Click on the row that contains the technician's record. Check the checkboxes below the grid that correspond to this technician's skills. **Link technician to a user login and email for full utilization of the program.**

Editing or Deleting Personnel: To edit/delete personnel and their associated skills select  from the button bar. Select the tab labeled **Personnel**. Select the row containing the desired record from the grid. Enter the appropriate data then press **Save** or **Cancel** as needed. To edit the skills set select the tab labeled **Skills**. Click on the row that contains the technician's record. Check the checkboxes below the grid that correspond to this technician's skills.

Deactivating Personnel: To deactivate without deleting a personnel record select the grid row containing the record you want to deactivate then uncheck the **Active** checkbox. Press **Save**. Conversely you could activate as personnel record by checking the **Active** checkbox.



Beginning in MaintSmart 5.0 barcodes are stored in a special barcode data table. These may then be read to display data for the Engineer such as work orders and preventive maintenance. Clicking this menu populates this new barcode table.

Link technician to a user ID and the technician email

Technician Shift was changed from a numeric field to an alphanumeric field in MaintSmart 5.0

Unchecking this checkbox cause technician name to be excluded from other screens, reports, etc.

Plant	Work Area/Location	Technician	Technician Skills	Technician Extra Data	Hourly Rate	Active
Sacramento	No Area Assignm	Ken Wright		ABC-123	23.55	<input checked="" type="checkbox"/>
	Green Crew					<input type="checkbox"/>
	No Area Assignm					<input type="checkbox"/>
	Bun Wrapping					<input type="checkbox"/>
	No Area Assignm					<input type="checkbox"/>

Personnel (Technician) and Skills

Overview of Technician Options: For the purpose of this manual maintenance personnel are called 'Technician'. The term 'Engineer' may also be used in some MaintSmart documentation to represent maintenance personnel. You may define this term as you see fit. From the Options menu on the Plant, Work Area, Technician screen  the following menu items are described below:

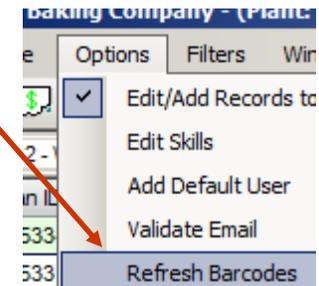
Edit Skills: This is available only to logged in MaintSmart Administrators. This opens the Skill Definition dialog screen so that skills may be added, edited or deleted. These skills are global and shared by all plants.

Add Default User: This is the default user for the purposes of the Print Scheduler. In most cases this may be left as it is and requires no user action.

Validate Email: Checking this menu causes the program to check the syntax of the email address for the record being edited and warns user if the syntax is incorrect.

Refresh Barcodes: Beginning in MaintSmart 5.0 barcodes are stored in a special barcode data table. These may then be read to display data for the Engineer such as work orders and preventive maintenance. Clicking this menu populates this new barcode table.

Beginning in MaintSmart 5.0 barcodes are stored in a special barcode data table. These may then be read to display data for the Engineer such as work orders and preventive maintenance. Clicking this menu populates this new barcode table.

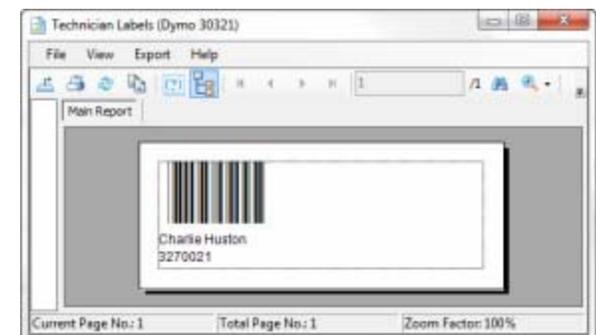


Technician Skills: Skills may be defined then linked for each Technician. Each time a new Technician is created a corresponding skill record is added automatically. To edit the associated skills left-click the grid row then check or uncheck the checkboxes in the selected row as needed, Click the **Save** button when skill for this Technician have been set as needed.

NOTE: this one of only a few data grids in the program where data is edited directly in the grid itself.

Technician ID	Technician	Computer	Electrician	Fabricator	Hydraulic	Leader	Machinist	Mechanic
5334	Bernie Grayson	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5331	Bill Raymond	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5314	Bob Wright	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Technician Barcode Labels: To print a single technician barcode label selected the technician from the data grid then right-click in the grid area to display the pop-up (context) menu. Choose the menu: **Medium Single Label (Dymo 30321)**.



Personnel Extra Data and Certificates (optional)

Extra Data: Personnel extra data provides a place to enter additional information about your maintenance employees. See picture below.

Adding New Personnel: To add personnel extra data select the  button from the button bar. Select the tab labeled **Personnel-Extra Data**. Press the **New** button, enter the appropriate data then press **Save** or **Cancel** as needed. The technician's information is added to the database. Add file attachments such as photos, certifications, etc in the **Personnel File Attachments** frame at the bottom of the screen.

Editing or Deleting Personnel: To edit/delete personnel and their associated skills select  from the button bar. Select the tab labeled **Personnel-Extra Data**. Select the row containing the desired record from the grid. Enter the appropriate data then press **Save**, **Delete** or **Cancel** as needed.

Note: Press the **Manage Certificates** button to add, edit or delete certificates to/from employees.

Plant	Work Areas/Location	Maintenance Personnel	Personnel - Skills	Personnel - Extra Data
Position	ChargeRate	SSN	CellPhone	Pa
Engineer II	\$20.02	564-99-0098		
	\$12.50			
Mechanic Leadman	\$21.05	552-99-0098	406-998-198	40

Note: MaintSmart provides a place for entering the **Charge Rate** for each employee (as opposed to wage rate located on **Maintenance Personnel** tab) . Use this to bill external customers with MaintSmart's work order invoicing system.

Personnel - Extra Data

Engineer Name: Position (optional): Charge Rate (optional):

SSN/Other ID Number (optional): Cell Phone (optional): Pager (optional):

Certificates:

Engineer Name	Certificate	Description	E
Elmo Smith	Electrical Engineer		

Notes (optional 255 chars. maximum):

Personnel File Attachments (optional pictures, documents, notes, etc.)

Edit or Delete Personnel Record
 Extra personnel data is optional. You may also create and manage employee certifications from this screen.

Processes (or equipment hierarchy #2-A)

Overview of Processes and Lines:

For the purpose of this manual 'Process' refers to equipment hierarchy level #2-A and 'Line' refers to equipment hierarchy level #3. Define these any way you choose.

In many cases only one plant manufacturing line and/or line is needed. To work with processes and lines select  from the button bar. Plant lines are contiguous production lines. Contrasted with lines that may make up an entire process or may only make up part of a process.

Example: A widget plant may have three production lines that all produce widgets. These three lines all produce exactly the same product. Their process number and name could be: 100; Widget Line 1, 101; Widget Line 2, 102; Widget Line 3.

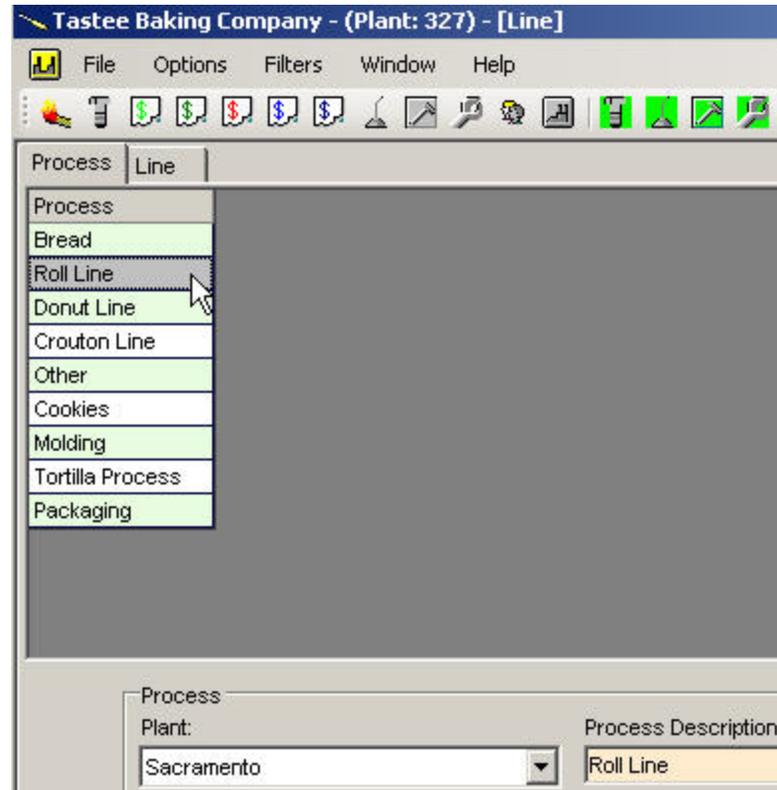
In this example all of these processes together make up six lines: Widget Production 1, Widget Packaging 1, Widget Production 2, Widget Packaging 2, Widget Production 3 and Widget Packaging 3. Three Widget production lines (processes) originate in the Widget Production (line) and all three Widget packaging lines (processes) terminate in the Widget Packaging line.

The reason (example) for the delineation between processes and lines is that often different parts of a production line (process) may be broken up into two or more lines. Each line may have its own wage rate. Since MaintSmart© wants to accurately analyze the cost of a piece of equipment it must know these details. Also in many manufacturing environments a failure in packaging, for example, may lead to lost production time and impact to the schedule in the production end of the process.

Alternatively a you may want to reduce complexity by placing all of the plant manufacturing lines in one process and then simply break up this process into perhaps two lines (Widget Production 1 and Widget Wrapping 1). By combining all three processes into one process and only two separate lines you make the job of entering manufacturing hours easier. This is because when entering manufacturing labor hours each line must be entered separately. In short by splitting each production line into a separate process you gain accuracy; by combining processes into one process you gain simplicity in entering manufacturing labor hours data.

Tip: By breaking up manufacturing lines into lines and processes MaintSmart© can offer greater flexibility and accuracy in data analysis. This helps the maintenance manager or plant technician make well-informed decisions using good reliable data.

Adding a New Process: To add a new process select  from the button bar. Select the tab labeled **Processes**. Follow these steps to add a new process.



1. Press **New**.
2. It's best to let the program enter the internal process ID number.
3. Enter the process description. Its best to end the description with the word 'Line' to make is easy to differentiate processes from other entities.
4. Press **Save** to keep this new record.

Editing or Deleting Plant Manufacturing Lines: **Warning:** deleting a process also deletes all lines, all equipment, and all records that use those equipment items including but not limited to downtime records, work orders, and PM records. The internal ID (process number) may not be changed, only the description may be changed.

To edit or delete a process select  from the button bar. Select the tab labeled **Processes**. Select the grid row containing the record you want to edit or delete. Enter the new process description then press **Save** to keep this record.

Lines (or equipment hierarchy #3)

Adding a New Line: To add a new line select  from the button bar. Select the tab labeled **Lines**. Follow these steps to add a new line:

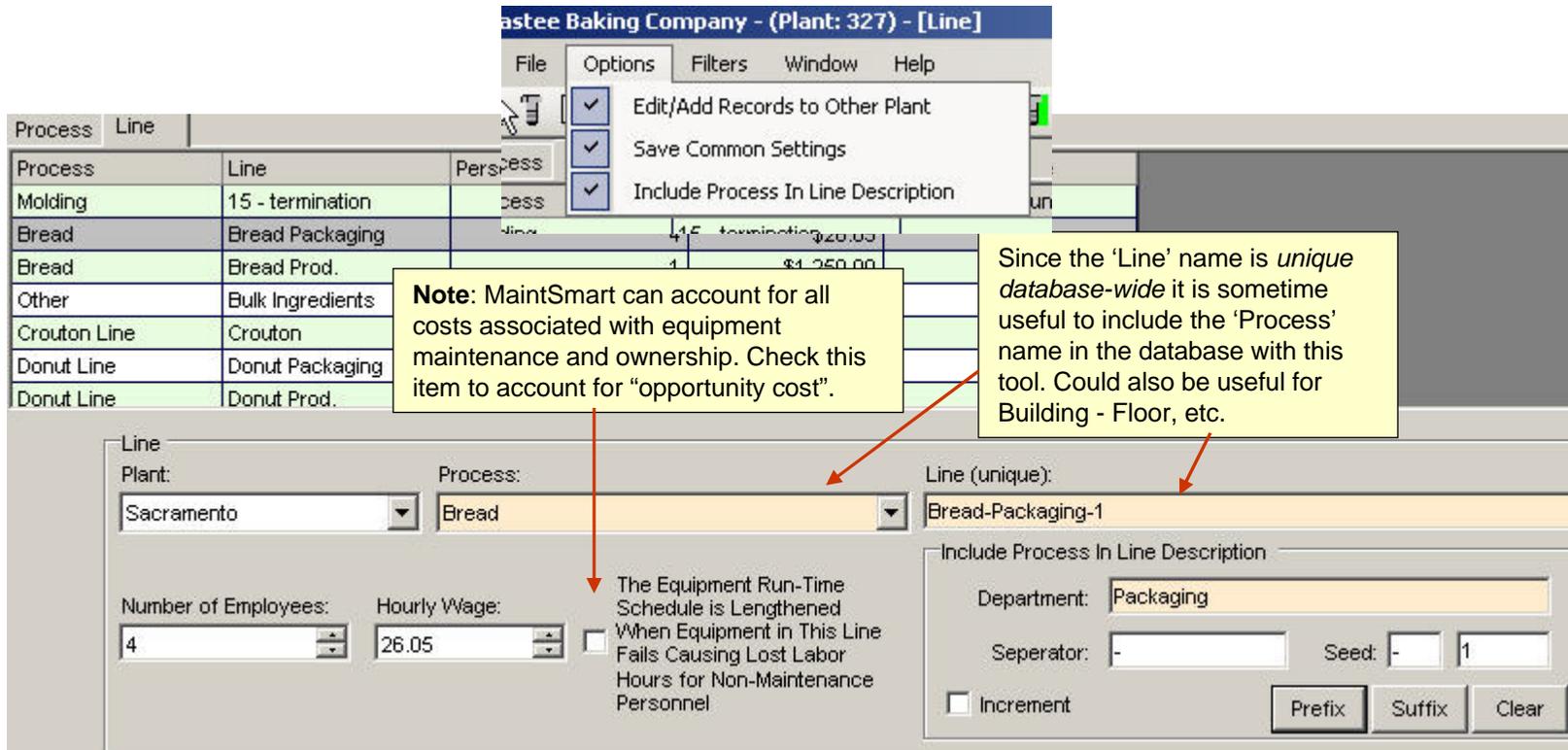
For the purpose of this manual 'Process' refers to equipment hierarchy level #2-A and 'Line' refers to equipment hierarchy level #3. Define these any way you choose.

1. Select the process that the new line is associated with.
2. Enter a line name. For best results follow the line naming recommended convention.
3. Enter the average number of employees working in this line *at any one time*. Do not enter all of the employees from all of the shifts.
4. Enter the average hourly wage rate (based on straight time) for each employees. Do not use the total wage expense for all employees combined.
5. If an equipment item breakdown in this line causes the equipment run-time schedule to be lengthen then check the box labeled **The Production Schedule is Lengthened When Equipment in This Line Breakdown**.
6. Press **Save** to keep this record.

Note: Line names must be unique.

Editing or Deleting a Line: Warning: deleting a line also deletes all equipment items, and all records that use those equipment items including but not limited to downtime records, work orders, equipment run-time schedule history and PM records.

To edit or delete a line select  from the button bar. Select the tab labeled **Lines**. To edit select the menu item **Options>>Edit/Add Records to Other Plants**. Select the grid row containing the record you want to edit or delete. Change the data in the boxes below the grid. Press **Save** to keep the changes. Press Delete to permanently delete the record.



astee Baking Company - (Plant: 327) - [Line]

Process	Line	Pers	Spess
Molding	15 - termination	ness	un
Bread	Bread Packaging	line	4.15 termination \$20.00
Bread	Bread Prod.		1 \$1,250.00
Other	Bulk Ingredients		
Crouton Line	Crouton		
Donut Line	Donut Packaging		
Donut Line	Donut Prod.		

Note: MaintSmart can account for all costs associated with equipment maintenance and ownership. Check this item to account for "opportunity cost".

Since the 'Line' name is *unique database-wide* it is sometime useful to include the 'Process' name in the database with this tool. Could also be useful for Building - Floor, etc.

The Equipment Run-Time Schedule is Lengthened When Equipment in This Line Fails Causing Lost Labor Hours for Non-Maintenance Personnel

Line (unique): Bread-Packaging-1

Include Process In Line Description

Department: Packaging

Seperator: - Seed: 1

Increment

Prefix Suffix Clear

Equipment Groups

Overview of Equipment Groups and Equipment: To work with equipment groups and equipment select  from the button bar. Equipment is grouped to help organize them and to speed data entry. Equipment groups make it easier for the user to locate equipment by associating them with a group of similar equipment or equipment located in a similar geographic area. Equipment groups should be kept relatively small. Between 10 and 50 equipment items in a group is ideal though they can contain many more than 100. Naming conventions for equipment groups should be logical and consistent. Equipment may be moved to and from various equipment groups at anytime.

Adding an Equipment Group: To add a new equipment group select from  the button bar. Select the tab labeled **Equipment Groups**. See Overview of Equipment Groups and Equipment before adding equipment groups. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Press **New** enter a logical equipment group name. Enter the minimum and maximum equipment numbers for this group. Press **Save**.

Editing or Deleting an Equipment Group: Warning: Changes to equipment groups affect ALL plants. Deleting an equipment group deletes all equipment in that group and all records that used any of the equipment items in that group including but not limited to work orders, PM lists, downtime records, inventory records and completed PM records.

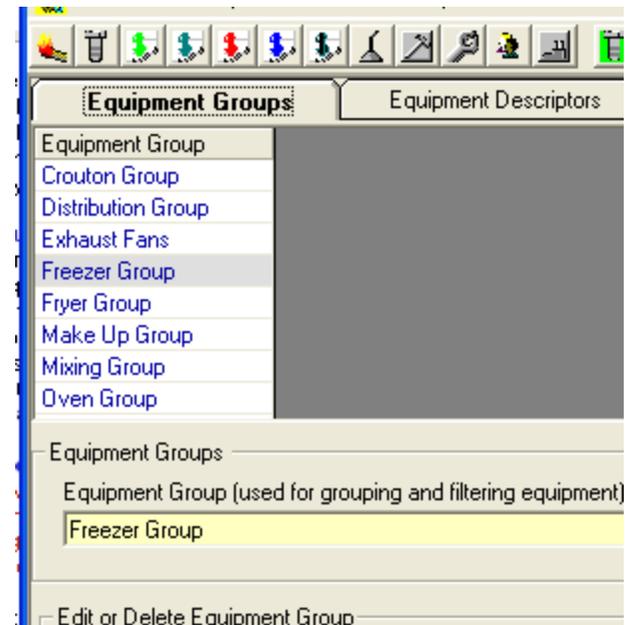
To edit or delete equipment group select  from the button bar. Select the tab labeled **Equipment Groups**. See Overview of Equipment Groups and Equipment before adding equipment groups. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Left mouse click the grid row containing the record you want to work with. Make needed changes then press **Save** or **Delete**.

Important Note: Equipment groups are simply groupings of similar equipment items. Equipment Groups (like all 'groups') in MaintSmart are used primarily for filtering. Equipment Groups are sometimes called Equipment Classes.

Equipment Descriptors(names) are merely "building blocks" for the actual equipment items.

Equipment items are the actual physical equipment you maintain.

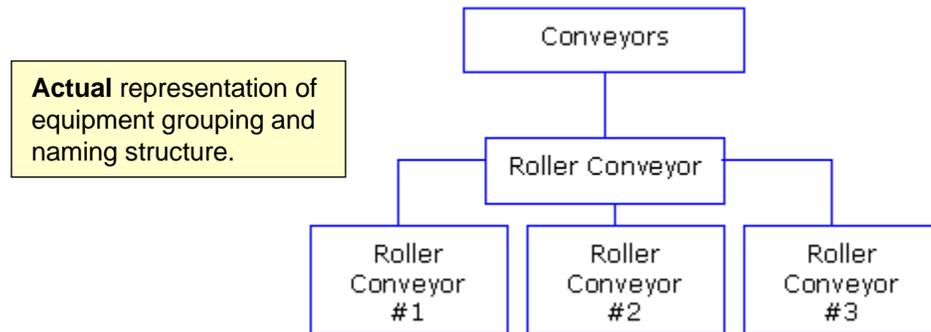
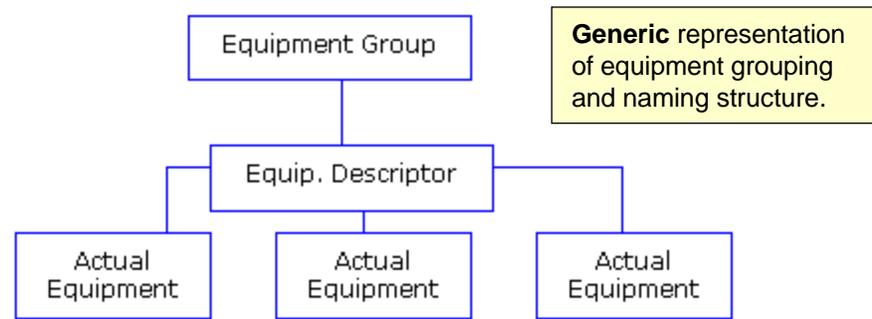
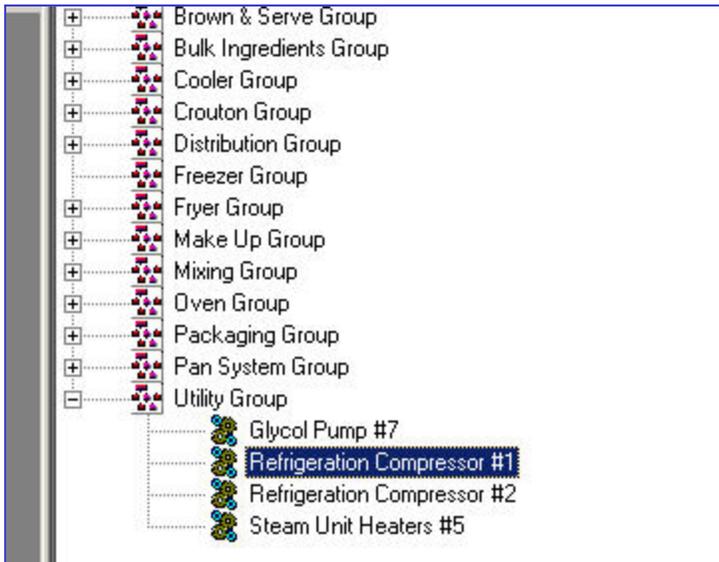
NOTE: This system of naming and identifying provides a way for you to create up to 2.1 billion equipment items.



Equipment Groups Relation to Equipment

A Graphical Example of the Relationship Between Equipment Groups and Equipment:

Equipment Groups contain Equipment Descriptors (names) and actual equipment, Equipment Items are created from the Equipment Descriptors. By using Descriptors you may quickly create equipment by reusing the descriptors over and over. This applies when your maintenance operation has more than one similar equipment item.



1. **Equipment Group** contains equipment descriptors.
2. **Equipment Descriptors** are used to build equipment items.
3. **Equipment Items** uniquely identify equipment in a plant.

Equipment Descriptors

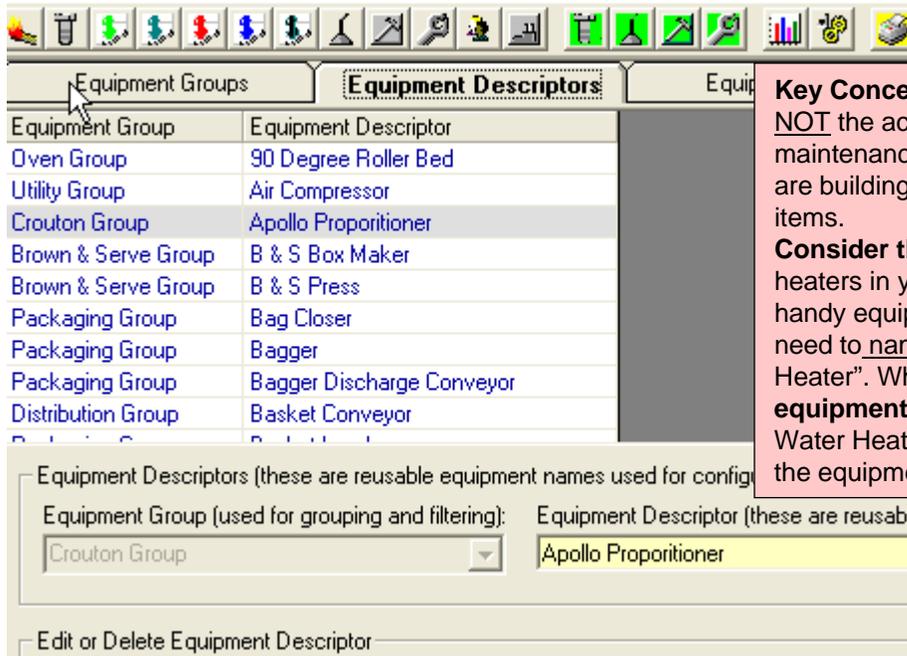
Adding a New Equipment Descriptor: To add a new equipment name select  from the button bar. Select the tab labeled **Equipment Descriptors**. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Press the **New** button. Select the appropriate equipment group from the drop-down box. Enter a descriptive equipment name. Press **Save** to store this equipment name.

Editing or Deleting an Equipment Descriptor:

Warning: Deleting an equipment item name results in ALL records referenced by this equipment name to be permanently deleted. It best not to delete equipment descriptors and to only take this step as a last resort.

To edit an equipment item name select  from the button bar. Select the tab labeled **Equipment Descriptors (names)**. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Select an existing equipment name from the grid by left mouse clicking on the row containing the record. The equipment group may be changed when editing an equipment item name. You may also change the text portion of the equipment. Press **Save** to store this equipment name or delete to permanently remove this equipment name.

Remember: equipment or equipment descriptors are simply that; names. They do NOT identify a specific piece of equipment but rather are used as part of an equipment specification to build equipment items.



Equipment Group	Equipment Descriptor
Oven Group	90 Degree Roller Bed
Utility Group	Air Compressor
Crouton Group	Apollo Proporrioner
Brown & Serve Group	B & S Box Maker
Brown & Serve Group	B & S Press
Packaging Group	Bag Closer
Packaging Group	Bagger
Packaging Group	Bagger Discharge Conveyor
Distribution Group	Basket Conveyor

Equipment Descriptors (these are reusable equipment names used for config)

Equipment Group (used for grouping and filtering):

Equipment Descriptor (these are reusabl)

Edit or Delete Equipment Descriptor

Key Concept: Equipment Descriptors ARE NOT the actual equipment items in your maintenance operation. **Equipment Descriptors** are building blocks for the actual equipment items.

Consider this example: You have 10 hot water heaters in your operation. With MaintSmart's handy equipment identification system you only need to name one equipment name "Hot Water Heater". When you create the **actual physical equipment item** you'll reuse the name "Hot Water Heater" 10 times by simply incrementing the equipment index. See next page for details...

Equipment Items

Adding a New Equipment Item: To add a new equipment item select  from the button bar. Select the tab labeled **Equipment item List**. To create an equipment item for a piece of equipment in your plant press **New**, select the line and technician work area where the equipment is physically located. Next select the equipment name and equipment index. Press **Save** to create this equipment within your plant. To add equipment items to other plants select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Follow the same procedure as above after selecting the appropriate plant from the drop-down box.

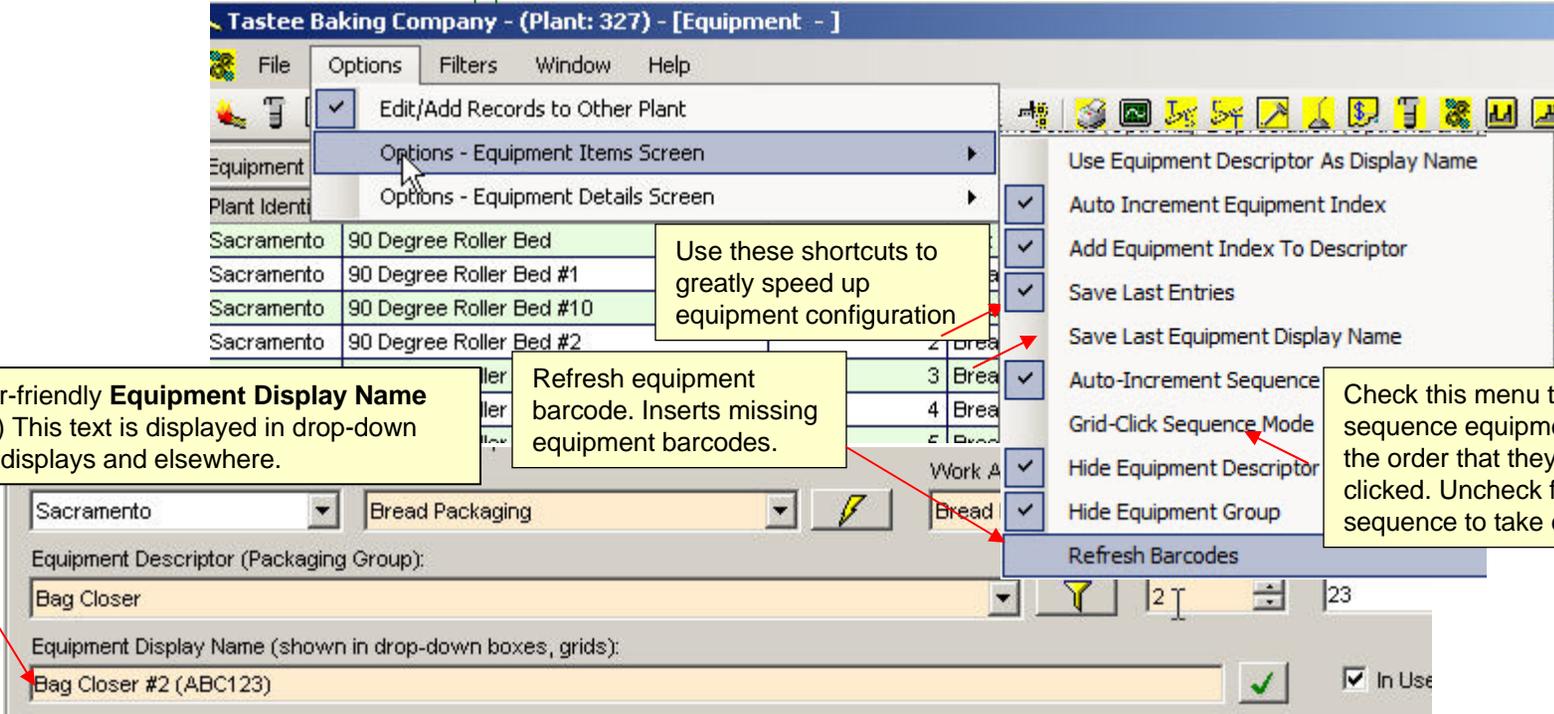
Editing or Deleting an Equipment Item:

To edit or delete an equipment item select  from the button bar. Select the tab labeled **Equipment Item List**. Select an existing equipment item record from the grid by left mouse clicking on the row containing the record. Select the line and work area/location where the equipment is physically located. Next select the equipment name and equipment index. Press **Save** to create this equipment within your plant or delete to permanently delete this equipment code. **Warning: Deleting an equipment item results in ALL records referenced by this equipment code to be permanently deleted. This includes ALL records that contain that equipment item including but not limited to downtime, work orders, inventory and PM completion records.** In order to delete equipment all records referencing this equipment must first be manually deleted. After all linked records have been deleted go to the Program Configuration screen and check the menu item labeled **Settings>>Allow Cascade Deletes**.

You may optionally enter an Equipment Sequence. Equipment sequence may be used to sequence equipment in the Equipment tree. Additionally equipment sequence may be used in conjunction with PM task sequence to order the sequence of tasks performed on the equipment.

To edit/delete equipment items to other plants select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Follow the same procedure as above after selecting the appropriate plant from the drop-down box.

Note: See pages 140-144 for information on how to create barcoded equipment labels.



Enter a user-friendly **Equipment Display Name (255 chars.) This text is displayed in drop-down boxes, grid displays and elsewhere.**

Use these shortcuts to greatly speed up equipment configuration

Refresh equipment barcode. Inserts missing equipment barcodes.

Check this menu to sequence equipment in the order that they are clicked. Uncheck for sequence to take effect.

Plant	Equipment Name	Equipment Index	Work Area
Sacramento	90 Degree Roller Bed		
Sacramento	90 Degree Roller Bed #1		
Sacramento	90 Degree Roller Bed #10		
Sacramento	90 Degree Roller Bed #2		

Equipment Descriptor (Packaging Group):
 Bag Closer

Equipment Display Name (shown in drop-down boxes, grids):
 Bag Closer #2 (ABC123)

In Use

Equipment Detailed Information

Detailed Equipment Information:

Detailed information regarding each equipment item may be entered by selecting the tab labeled **Extra Data** from the Equipment Configuration screen . Reports generated from this data produce additional useful information. Most of these data fields are optional.

Add attachment files to individual equipment items. These files may be of any type or size such as pictures, prints, data files, text documents, etc.

Equipment **Details** are used on PM list and work order page headers. This information is also needed if you want to use the equipment depreciation screen.

Equipment information list. Create a report from this data by selecting the menu items **File>>Print>>Report>>Equipment Information List.**

Defaults speed up data entry, but may be easily changed if needed. After setting defaults turn the defaults on or off by checking this menu item.

Add up to 255 file attachments to each equipment item.

Equipment Item File Attachments (optional pictures, diagrams, prints, notes, etc.)

Retired Date	Start Date	Warranty Expires	Manufacturer

Equipment Details (optional) ~ (9)

Plant: Sacramento
Equipment: Apollo Proportioner #1
Warranty Expires: 1/23/2007
Vendor: Delta Rubber
Location: Building K
Cost Center: CC-123-456 - AnyTown Plant
Account: MR-5552-0098722 - Utility
Technician: Shannon Reeves
Equipment Status: Retired

Equipment Item File Attachments (optional pictures, diagrams, prints, notes, etc.)

C:\aaa-MaintSmart-VB6-fina\MaintSmart.pdf
C:\aaa-MaintSmart-VB6-fina\E5Crew.jpg

Edit or Delete Equipment Information

New Delete Save Cancel

Equipment Detailed Information – Map Coordinates

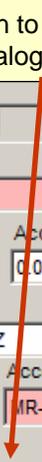
Detailed Equipment Information (Equipment Coordinates):

Beginning in MaintSmart 5.0 map coordinates may be entered for each equipment item. This will be used by the mobile MaintSmart program for Android coming late 2017. Clicking the coordinates button offers the input of either coordinates or degree, minute, second values.

Equipment Group	Equipment Status	Equipment Priority	Acquired Date	Start Date	Warranty Expires
90 Degree Roller Bed	Retired	Critical	1/25/2006	1/25/2006	1/25/2010

Equipment Details (optional)		Degrees Decimal	DMS
Plant:	Equipment Item:	Latitude:	81.0000000
Sacramento	90 Degree Roller Bed	Longitude:	-26.0000000
Warranty Expires:	Manufacturer:		
1/25/2010	AMF		
Vendor:	Account:		
McMaster Carr	00		
Location:	Building:		
100-A	Warehouse Z		
Cost Center:	Account:		
CC-123-456 - AnyTown Plant	MR-		
Latitude:	Longitude:		
81° 00' 00.000" N	26° 00' 00.000" E		
Extra Info:			

Click this button to display the Equipment Map Coordinates dialog screen.



Equipment Detailed Information - Auto-Populating, Consolidating Equipment

Detailed Equipment Information Auto-Create:

Equipment details may be entered automatically beginning with MaintSmart 5.0 from the Equipment Configuration  screen Equipment Details tab. In order to begin using this tool you must first create default values for each of the menu items under the Defaults menu (depicted below). There are several menu options as follows:

NOTE: These options will permanently overwrite existing data in some cases. Be certain to back-up your database before executing any of the last four menu options.

Create Equipment Details for New Records Only: With this menu checked each time you create a new equipment item from the Equipment List tab a corresponding equipment details record is also created.

Populate All Existing Equipment Details Records Where Missing: This option fills in the blanks (with current defaults) for all equipment in equipment list where equipment detail records do not already exist.

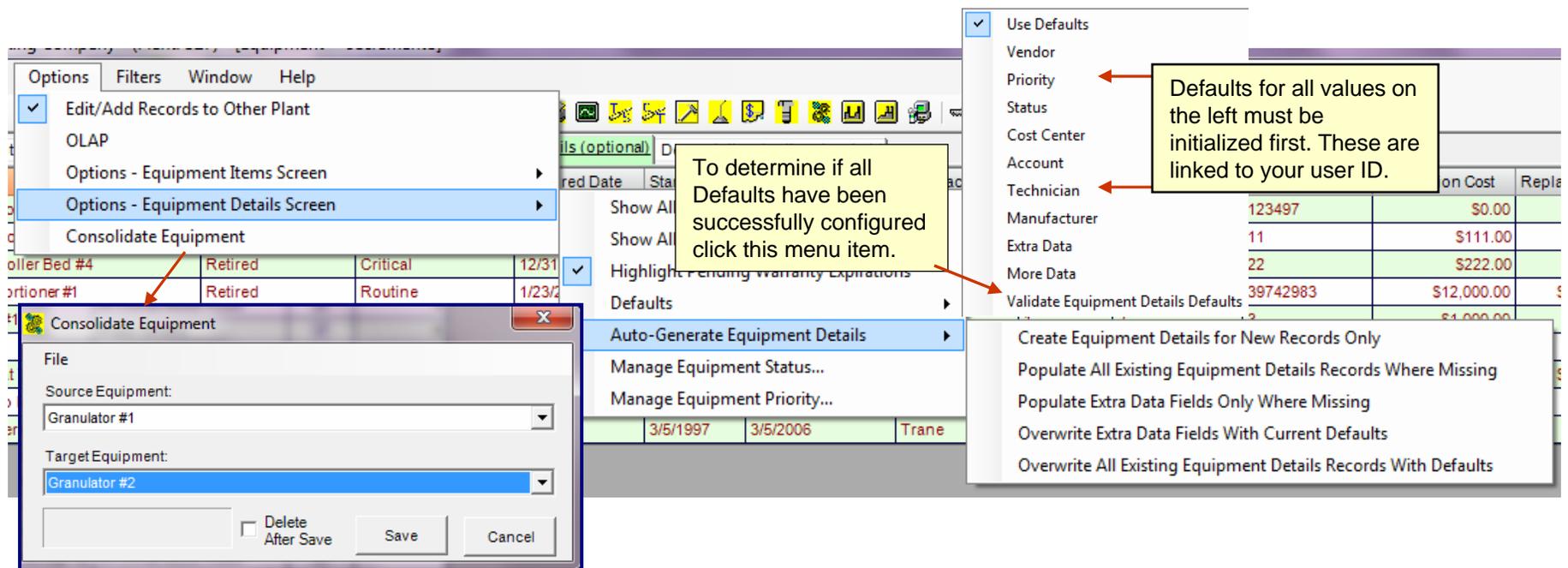
Populate Extra Data Fields Only Where Missing: For existing equipment detail records only fill in missing Extra Data and More Data field data only with latest defaults for Extra Data and More data.

Overwrite Extra Data Fields With Current Defaults: Overwrites existing Extra Data and More Data fields information in existing equipment details records with latest defaults.

Overwrite All Existing Equipment Details Records With Defaults: Overwrites all data for all existing equipment details records with latest defaults.

Consolidating Equipment:

An equipment item may be consolidated into another equipment item using the Consolidate Equipment menu item. The Source equipment data will be copied to the target and permanently be disassociated from the source equipment. You may also optionally permanently delete the source equipment by checking the Delete After save menu item.



The screenshot displays the software's menu system and a dialog box. The 'Auto-Generate Equipment Details' menu is open, showing options like 'Create Equipment Details for New Records Only', 'Populate All Existing Equipment Details Records Where Missing', 'Populate Extra Data Fields Only Where Missing', 'Overwrite Extra Data Fields With Current Defaults', and 'Overwrite All Existing Equipment Details Records With Defaults'. A yellow callout box points to the 'Auto-Generate Equipment Details' menu item with the text: "To determine if all Defaults have been successfully configured click this menu item." Another yellow callout box points to the 'Use Defaults' menu item with the text: "Defaults for all values on the left must be initialized first. These are linked to your user ID." The 'Consolidate Equipment' dialog box is also visible, showing 'Source Equipment' as 'Granulator #1' and 'Target Equipment' as 'Granulator #2'. The background shows a table with columns for 'Retired Date', 'Status', 'Priority', 'Cost Center', 'Account', 'Technician', 'Manufacturer', 'Extra Data', and 'More Data'.

Retired Date	Status	Priority	Cost Center	Account	Technician	Manufacturer	Extra Data	More Data	on Cost	Repla
12/31	Retired	Critical				123497			\$0.00	
1/23/2	Retired	Routine				11	22		\$111.00	
									\$222.00	
									\$12,000.00	
									\$1,000.00	
3/5/1997										Trane

Equipment Tree

Equipment Tree Display and Analyzer:

The equipment tree provides a graphical way to look at equipment hierarchies and equipment while also providing several powerful analysis tools. To use the **Equipment Tree** click the icon next to the bar chart icon. The equipment tree displays equipment hierarchies in three different ways. To change the tree view select the desired hierarchy from the drop-down box labeled Tree View. Alternatively you may simply press the Refresh Tree button at anytime to refresh the tree view with the selected tree display hierarchy. The tree view does more than simply display equipment. Right mouse-click the tree display (or select from the **Options** menu) and a pop-up menu appears. Select the desired **Grid Display Mode** from this pop-up menu. Next left mouse-click any equipment item from the tree view to display or analyze based upon the Grid Display Mode selected. If any historical data for the selected equipment item exists for the selected **Grid Display Mode** this data appears in the grid on the right side of the screen. Additional details regarding the selected equipment item appear in the white area near the bottom of the screen. Additional functionality is available from the grid. If data appears in the grid after clicking an equipment item in the tree view left mouse-click the grid row you want to work with then right mouse-click to further utilize this grid row. For example: when using **Grid Display Mode: All Work Order History** you may right-click selected grid rows then duplicate or print a copy of this work order.

To analyze equipment failure for an equipment item or **for an entire hierarchy left mouse-click the equipment or hierarchy** the right click the item and select **Print Failure History** from the pop-up menu. This powerful tool enables you to obtain very quick access to your equipment list, history and even issue corrective action with a couple of mouse clicks.

The screenshot shows the software interface with a tree view on the left and a data grid on the right. The tree view is expanded to show 'Plant Line: Donut Line' and its sub-items. The data grid shows a row for 'Cooler #3' with 'Job Ref: 29' and 'WorkOrderText: WD-109930'. A context menu is open over the grid row, showing options like 'Grid Row Selection', 'Create Work Order', 'Duplicate/Print Work Order', 'Print Selected Work Order', and 'Print Grid'. A callout box points to the tree view, stating: 'Right mouse-click the tree area to display the pop-up menu. Select a display mode from this menu.' Another callout box points to the grid row, stating: 'Left mouse-click any equipment item to display data about this equipment in grid on right.' A third callout box points to the context menu, stating: 'Left mouse-click any grid row containing the data just generated then right mouse-click the grid to determine the action (if any) to take on this grid row of data. For example: duplicate this work order then print it.v'. A fourth callout box points to the 'Grid Display Mode' menu, stating: 'This is a useful and very powerful tool. For example: you have a problem in Building A Floor 22. Quickly locate this area by using the equipment tree. Locate the problem equipment. Check for history on this equipment. History found? A similar issue occurred in the past? You have the information to resolve this issue at your fingertips. You can even create a work order (duplicate with WO new number) from this screen in a couple of mouse-clicks.' The 'Grid Display Mode' menu is open, showing options: 'All Work Orders History', 'All PMs History', 'All Failures History', 'Equipment Failure-Recommended and Linked Tasks', 'Equipment Failure-Part(s) Used For Repair', 'Equipment Failure (Where Linked To Work Order)-Part(s) Used For Repair', and 'Work Order-Part(s) Used For Repair'. The 'All Failures History' option is selected. The 'To Date:' field is set to '12/2/2003' and the 'Refresh' button is visible.

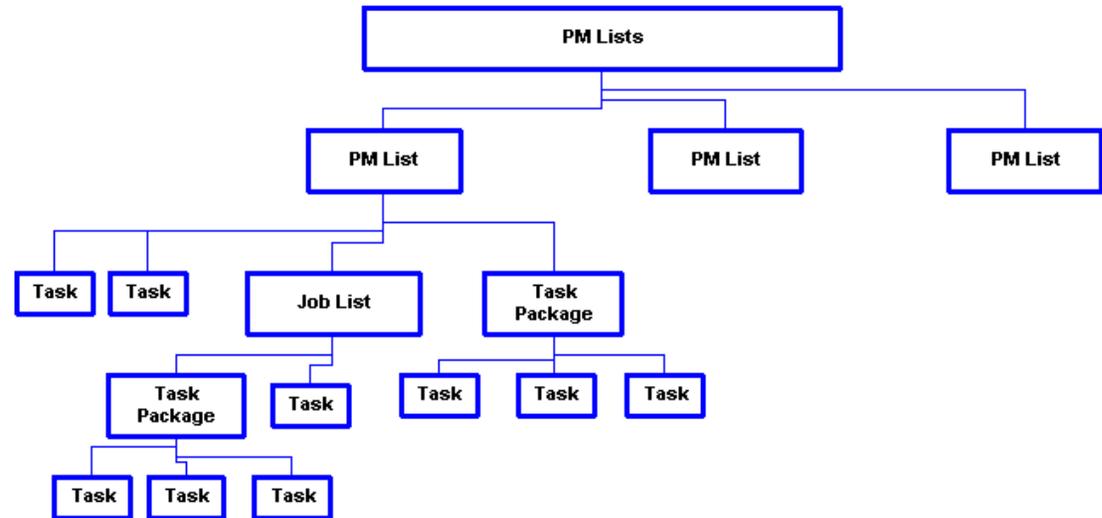
Overview of Preventive Maintenance (PMs)

To work with preventive maintenance (PMs) select  from the button bar. MaintSmart© has a logical, structured, yet very flexible way of working with and analyzing PMs. **Task groups** contain similar tasks. Up to 2.1 billion different user configurable tasks can be created to fit your company's specific needs. Tasks use an internal Task ID Number that is a composite of the task number and the task interval.

Once task groups and tasks are created they may be added to **Task Packages**. Task packages allow you group tasks based on similarity of task or application. This feature was included to make creating PM task lists easy and fast. Examples of task packages might be grouping all tasks that apply to a certain type of electric motor together. This task package might include electrical tasks such as "Replace Brushes" and mechanical tasks such as "Lubricate Shaft Bearings". These tasks and many more could be placed into a task package and applied simultaneously to an equipment item. This task package could also be applied to any other electric motor PM lists as needed. Task package names should describe the tasks and the interval. For example electrical tasks to be performed every 30 days could be named ELECPACK30. Deleting a task package does not delete the tasks from PM lists that have previously used this task package.

Job List Templates are groups of tasks that apply to a certain piece of equipment contrast to task package that generally applies to a component of a piece of equipment. Perhaps you have a commercial bakery and your company has 24 dough mixers. Each of these mixers has several motors, many bearings, drive chains, pneumatics, electrical motor control components, etc. You may place task packages for motors, task packages for drive chains, individual tasks for bearings, etc. all into a job list template for this particular equipment or process. This job list template may now be applied to the 24 dough mixers with a few mouse clicks saving hours of work in constructing PM lists. Once this job list template has been applied to these 24 mixers each PM list may be tweaked by adding or removing tasks and/or changing time intervals as needed.

When PM lists are created the tasks are assigned a start date. If the task is not marked completed by the start date + interval then the task is marked as late. PM lists should be printed and distributed to maintenance personnel for completion. Completed PM lists are then turned in and marked as complete in the **Update PMs Status** (PM Validation) part of this program. When a PM task is marked completed a new due date is automatically generated on a new PM list. All of this PM completion data is permanently stored. The user may query this data at any time to analyze who is getting what done and when. The analysis section of MaintSmart© helps the plant technician decide how to allocate his resources efficiently and point to areas of needed change.



PM lists consist of tasks. These tasks can be added to a PM list in the form of individual tasks, task packages, or job list templates. Tasks are removed from PM lists individually.

Overview of Task Packages and Job List Templates: Once task groups and tasks are created they may be added to **Task Packages**. Task packages allow you group tasks based on similarity of task or application. This feature was included to make creating PM task lists easy and fast. Examples of task packages might be grouping all tasks that apply to a certain type of electric motor together. This task package might include electrical tasks such as "Replace Brushes" and mechanical tasks such as "Lubricate Shaft Bearings". These tasks and many more could be placed into a task package and applied simultaneously to an equipment item. This task package could also be applied to any other electric motor PM lists as needed. Task packages should be descriptively named. For example a task package containing electrical tasks that are to be completed every 30 days could be named ELECPACK30. This makes it easy for you to remember what they contain when you apply these task packs later. Task packages are shared by all plants.

Job List Templates are groups of tasks that apply to a certain piece of equipment contrast to task package that generally applies to a component of a piece of equipment. Perhaps you have a commercial bakery and your company has 24 dough mixers. Each of these mixers has several motors, many bearings, drive chains, pneumatics, electrical motor control components, etc. You may place task packages for motors, task packages for drive chains, individual tasks for bearings, etc. all into a job list template for this particular equipment or process. This job list template may now be applied to the 24 dough mixers with a few mouse clicks saving hours of work in constructing PM lists. Once this job list template has been applied to these 24 mixers each PM list may be tweaked by adding or removing tasks and/or changing time intervals as needed. Unlike task packages job list templates are not shared by all plants but instead are specific to one piece of equipment in one plant.

When PM lists are created the tasks are assigned a start date. If the task is not marked completed by the start date + interval then the task is marked as late. PM lists should be printed and distributed to maintenance personnel for completion. Completed PM list are then turned in and marked as complete in the PMs Update part of this program. When a PM task is marked completed a new due date is automatically generated on a new PM list.

Note: Although you create a job list template for a particular equipment it is not be applied to a PM list until you explicitly apply the job list template to the equipment under the PM Lists tab.

Overview of Task Groups and Task Descriptions

PM tasks are grouped to help organize tasks and to speed data entry. Task groups make it easier for the user to locate tasks by associating them with a group of similar tasks. Task groups should be kept relatively small. Between 10 and 50 tasks in a group is ideal though they can contain many more than 50. Naming conventions for task groups should be logical and consistent.

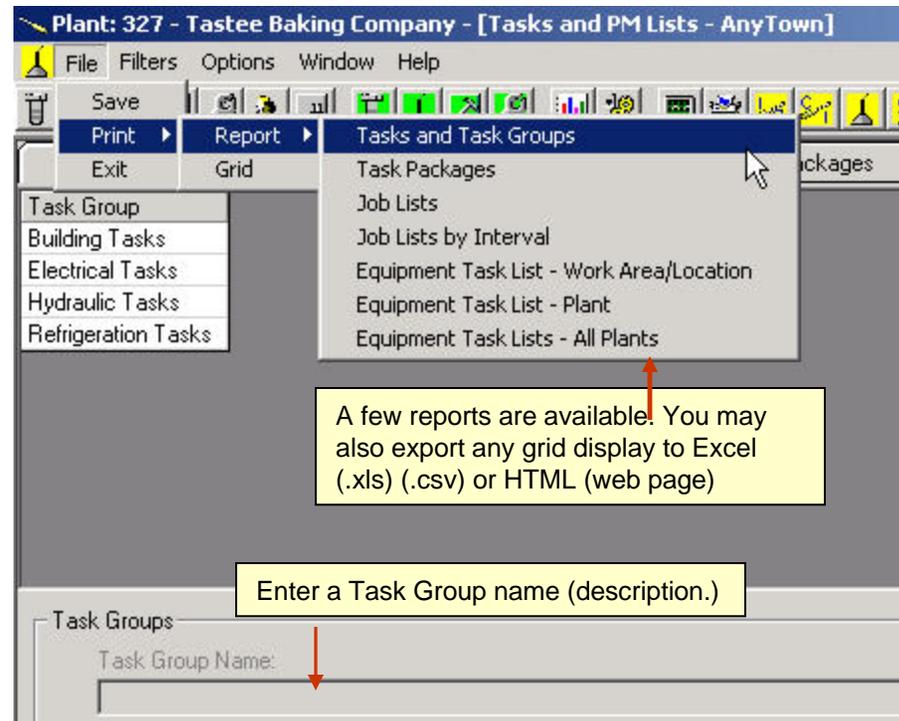
Example: Rather than simply having an Electrical task group you might want to break it down further into a Electrical Panel group, Electric Motor group, and perhaps an AC Drive task group.

Adding a New Task Group: To add a new task group select  from the button bar. Select the tab labeled **Task Groups**.

See Overview of Task Groups before adding task groups. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Press **New** enter a logical task group name. Press **Save**.

Editing or Deleting a Task Group: **Warning:** Changes to task groups affects ALL plants. Deleting a task group deletes all tasks in that group and all records that used any of the tasks in that group including but not limited to work orders, PM lists, completed PM records. In order to delete a task group all records referencing this group must first be manually deleted. After all linked records have been deleted go to the Program Configuration screen and check the menu item labeled **Settings>>Allow Cascade Deletes**.

To edit or delete a task group select  from the button bar. Select the tab labeled **Task Groups**. See Overview of Task Groups before editing or deleting task groups. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Left mouse click the grid row containing the record you want to work with. Press **Save** or **Delete**. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Press **New** enter a logical task group name. Enter the minimum and maximum task numbers for this group. Press **Save**.



Tasks

Adding a New Task Description: Task descriptions are used in PM lists and work orders. Once again MaintSmart® is extremely flexible and allows complete customization to your specific situation. Tasks are created from word lists or you may directly type them.

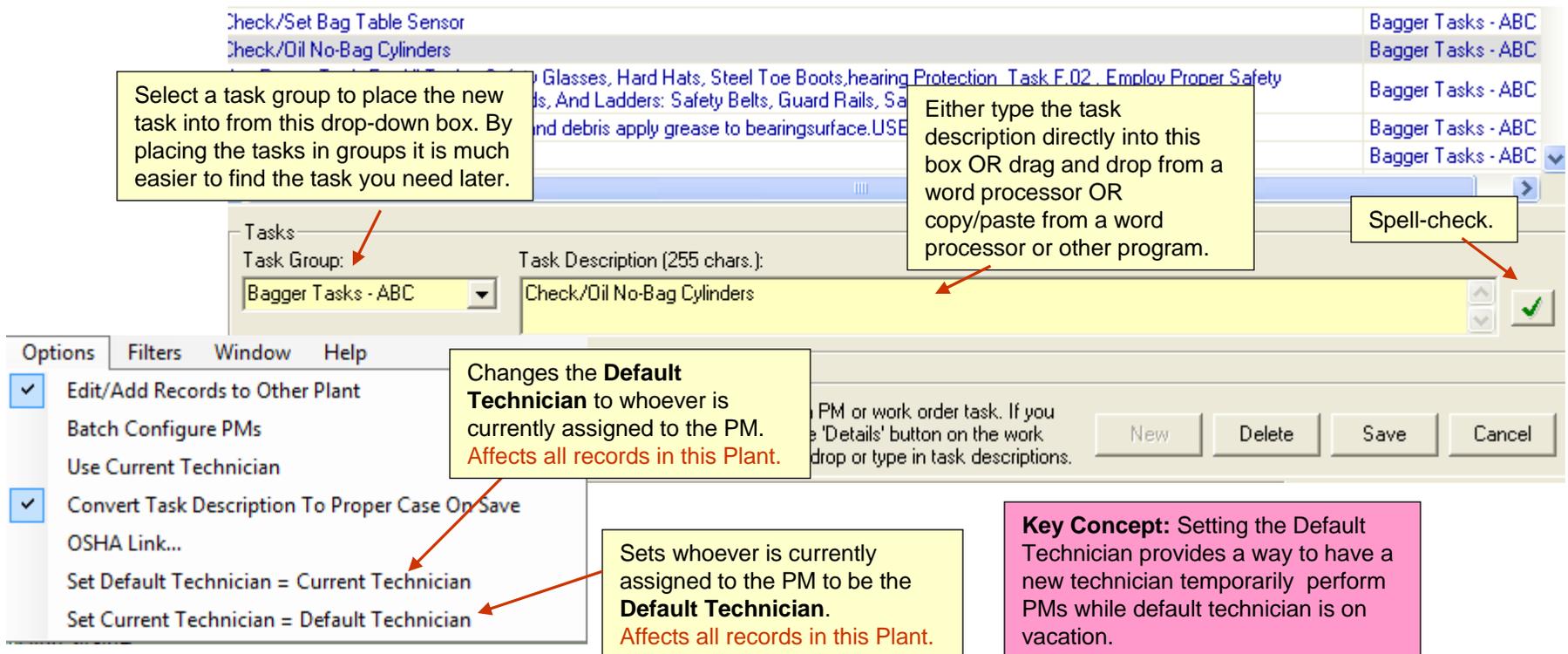
To add a new task description select  from the button bar. Select the tab labeled **Tasks**. To add a new task you must have permission to Add/Edit_Records for Other Plants. Check the menu items **Options>> Add/Edit Records for Other Plants**. This is required because task descriptions are global data items used by other top-level entities where applicable.

Press **New**. Select the task group that you want to add the task to from the drop-down box. From the three list boxes, select with the left mouse button, then drag the word you want to use to the text box labeled **Task Name**. You may also type directly into this text box. Press **Save** to keep the new task description.

Editing or Deleting a Task Description: Warning: Changes to task descriptions affect ALL plants. Deleting a task deletes all records that used the task including but not limited to work orders, PM lists, completed PM records. It is recommended that you do not delete tasks once they have been put into use. To edit or delete a task description select  from the button bar. Select the tab labeled **Tasks**. To edit or delete a task you must have permission to **Add/Edit Records for Other Plants**. Check the menu items **Options>> Add/Edit Records for Other Plants**. This is required because task descriptions are global data items used by other top-level entities where applicable. In order to delete a task all records referencing this task must first be manually deleted. After all linked records have been deleted go to the **Program Configuration** screen and check the menu item labeled **Settings>>Allow Cascade Deletes**.

Click the appropriate row containing the task. Change the task text or move the task to a different task group. Press **Save** to keep the new task description or **Delete** to permanently remove the task and ALL records that used this task.

Right click the Task grid column header and type in a task to determine if this task or a similar one already exists in the database. Always avoid near duplicate task descriptions.



The screenshot shows the 'Tasks' window in the software. It includes a table of existing tasks, a form for adding a new task, and a menu for configuration options. Several callout boxes provide additional information:

- Task Grid:** A table with columns for task description and task group. The task group column is highlighted in blue.
- Task Form:** A form with a 'Task Group' dropdown menu (currently set to 'Bagger Tasks - ABC') and a 'Task Description (255 chars.)' text box (containing 'Check/Oil No-Bag Cylinders'). A 'Spell-check' button is located to the right of the text box.
- Options Menu:** A menu with several options, including 'Edit/Add Records to Other Plant', 'Batch Configure PMs', 'Use Current Technician', 'Convert Task Description To Proper Case On Save', 'OSHA Link...', 'Set Default Technician = Current Technician', and 'Set Current Technician = Default Technician'.
- Buttons:** 'New', 'Delete', 'Save', and 'Cancel' buttons are located at the bottom right of the window.

Callout Boxes:

- Top Left:** Select a task group to place the new task into from this drop-down box. By placing the tasks in groups it is much easier to find the task you need later.
- Top Right:** Either type the task description directly into this box OR drag and drop from a word processor OR copy/paste from a word processor or other program.
- Bottom Left:** Changes the **Default Technician** to whoever is currently assigned to the PM. Affects all records in this Plant.
- Bottom Center:** Sets whoever is currently assigned to the PM to be the **Default Technician**. Affects all records in this Plant.
- Bottom Right:** **Key Concept:** Setting the Default Technician provides a way to have a new technician temporarily perform PMs while default technician is on vacation.

Task Packages

Adding a New Task Package: To add a new task package select  from the button bar. Select the tab labeled **Tasks Packages**. To add a new task package you must have permission to Add/Edit Records for Other Plants. Press **New** then enter a descriptive task package name. Select a time interval from the drop-down box. Choose the tasks you want to include in this task package by selecting from the list box labeled **Select Task** and pressing to right arrow button below the list box. Tasks are added to the list box on the right. Press **Save** to keep this task package. Your new task package appears in the grid. This new task package can now be modified, added to a job list template and/or added to PM list.

Task packages, unlike job list templates, are shared by all plants. Adding a task package makes that task package available to all plants.

Note: All tasks use the same interval when creating a new task package. To use various intervals within the same task package see **Editing or Deleting a Task Package**.

Tip: Right mouse-click on the list box containing the task to select from. A menu appears containing all of the task groups. Click on the task group you want to work with and MaintSmart© fills the list box with tasks from that task group only. This really speeds up this process!

Editing or Deleting a Task Package: To edit or delete a task package select  from the button bar. Select the tab labeled **Tasks Packages**. To edit or delete a task package you must have permission to Add/Edit Records for Other Plants. Select the task package by left mouse clicking on one of the tasks in the task package in the grid. Highlight tasks in the list box labeled **Add a Task to Task PackX** press the right arrow button to add this task to the list box on the right. Conversely if you want to remove tasks from the task package you may highlight tasks in the list box on the right and press the left arrow button to remove this task. Press Save to keep the resulting task package.

To create a task package with the same tasks but with a different interval select a task in the grid from the task package you want to work with. Select a different interval from the drop down box. When you press **Save** you are asked if you want to create a new task package or add to this task package. If you choose **Yes** to create a new task package enter a descriptive name in the input box. If you want to add these tasks to the existing task package select **No**. These tasks are combined with the existing tasks in the task package.

Tip: Editing or deleting a Task Package has no effect on PM task lists where the task package has already been applied. This is because when a task package is applied to a PM list it simply copies the tasks and intervals to the PM list and does not create a link between the task package and the PM list.

Task Package	Task	Interval
AIRPUMP30	Check Blower Oil Level	30
BEARING14	Check Bearing Clearance	14
BEARING14	Clean Grease Zerks	14
BEARING14	Lube w/Food Grade Grease	14
BEARING14	Inspect Bearings	14
BURNER30	Adjust Flame	30

Use a task package name that describes the package. Include the interval at the end of the description. Example: BEARING14 (bearing tasks performed every 14 days)

You may delete a task package by clicking on any task in the grid contained by the task package and pressing **Delete**. The task package is permanently deleted.

Task packages are shared by all plants. Changing task packages changes them for all plants. Changing or deleting a task package does not affect the tasks applied to existing PM lists by *previously* using this task package. However other users accustomed to the characteristics of a particular task package may not realize it has been changed and incorrectly apply it. Always review the tasks in a task package prior to applying it to a PM List.

Tip: Right mouse-click on the list box containing the task to select from. A menu appears containing all of the task groups. Click on the task group you want to work with and MaintSmart© fills the list box with tasks from that task group only. This really speeds up this process!

Job List Templates

Adding a New Job List Template: To add a new job list template select  from the button bar. Select the tab labeled **Job List Templates**. Press **New** select an equipment item name and equipment index from the drop down box. To add a single task to this new job list template select a task and an interval from the drop down boxes. To apply a task package to this job list template select task package from the drop down box. Press **Save** to include this task in the new job list template.

Adding, Editing or Deleting Tasks From a Job List Template: Make sure you understand how task packages and job list templates work before attempting to edit or create them. To edit or delete a job list template select  from the button bar. Select the tab labeled **Job List Templates**. Job list templates like most everything else in MaintSmart© may be modified to suit your needs. Task packages or individual tasks may be added. Tasks may be replaced. Intervals may be changed on individual tasks. Individual tasks may be deleted.

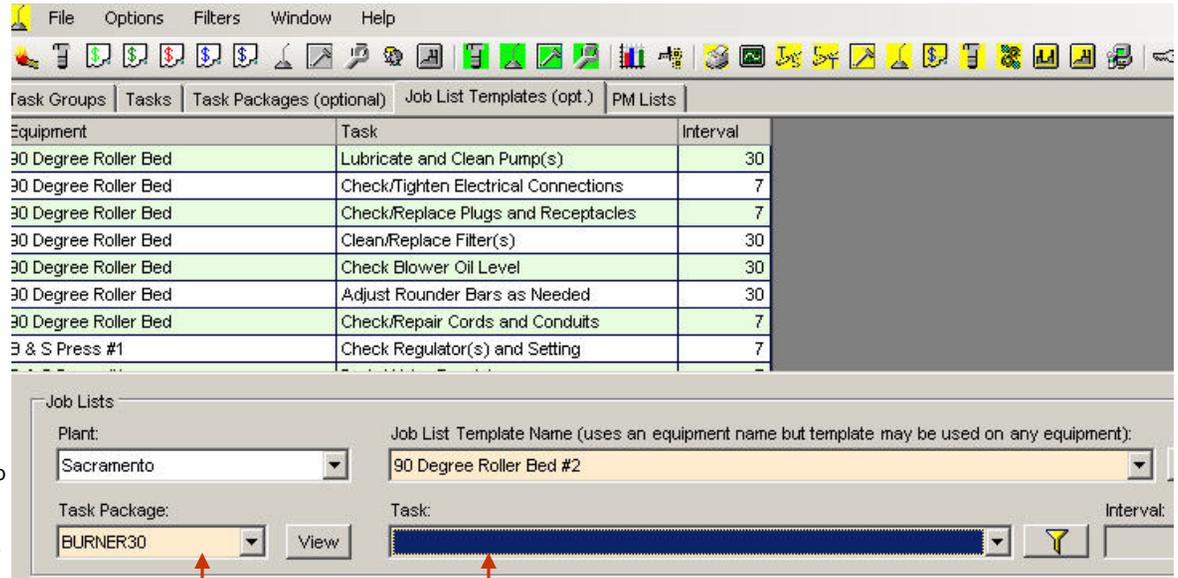
To add a task package or an individual task press the **New** button. Next select the job list template (equipment name) from the drop down box. Select the equipment index. Now select the task package or individual task to add to this job list template. If you select an individual task you also have to select an interval. Press **Save** to add these task(s) to the job list template.

To change or replace a task in a job list template select the task from the grid. Select a new interval if you want to keep the task but only change the interval. Otherwise select a new task and interval to replace the grid-selected task with the drop down box-selected task and interval. Press **Save**.

To delete a task simply click on the task in the grid and press **Delete**.

Changing or deleting a job list template does not affect the tasks applied to existing PM lists by *previously* using this job list template. However other users accustomed to the characteristics of a particular job list template may not realize it has been changed and incorrectly apply it. Always review the tasks in a job list template prior to applying it to a PM list.

Tip: Click the button labeled **Filter** next to the task drop-down box. A menu appears containing all of the task groups. Click on the task group you want to work with and MaintSmart© fills the drop-down box with tasks from that task group only. This really speeds up this process.



Equipment	Task	Interval
90 Degree Roller Bed	Lubricate and Clean Pump(s)	30
90 Degree Roller Bed	Check/Tighten Electrical Connections	7
90 Degree Roller Bed	Check/Replace Plugs and Receptacles	7
90 Degree Roller Bed	Clean/Replace Filter(s)	30
90 Degree Roller Bed	Check Blower Oil Level	30
90 Degree Roller Bed	Adjust Rounder Bars as Needed	30
90 Degree Roller Bed	Check/Repair Cords and Conduits	7
3 & S Press #1	Check Regulator(s) and Setting	7

Job Lists

Plant: Sacramento

Job List Template Name (uses an equipment name but template may be used on any equipment): 90 Degree Roller Bed #2

Task Package: BURNER30

Task: [Selected Task]

Interval: [Interval]

Apply task packages or individual tasks to a job list template.

You may delete a task package by clicking on any task in the grid contained by the task package and pressing **Delete**. The task package is permanently deleted.

Task packages or job list templates are shared by all plants. Changing task packages changes them for all plants. Changing or deleting a task package does not affect the tasks applied to existing PM lists by *previously* using this task package. However other users accustomed to the characteristics of a particular task package may not realize it has been changed and incorrectly apply it. Always review the tasks in a task package prior to applying it to a PM List.

Tip: Right mouse-click on the list box containing the task to select from. A menu appears containing all of the task groups. Click on the task group you want to work with and MaintSmart© fills the list box with tasks from that task group only. This really speeds up this process.

Tip: Editing or deleting a job list template has no effect on PM task lists where the job list template has already been applied. This is because when a job list template is applied to a PM list it simply copies the tasks and intervals to the PM list and does not create a link between the job list template and the PM list.

PM Lists - Configuration

Overview of Preventive Maintenance (PM) Task Lists: PM lists are created to provide schedules of tasks to be performed at defined intervals for the purpose of preventing equipment breakdown and to prolong the life of the equipment. Each equipment item in your plant should have a PM list. MaintSmart© makes creating PM lists simple and fast. Please read and understand Overview of Preventive Maintenance before creating PM lists.

PM lists are created by adding individual tasks, task packages, and job list templates to the target equipment. These task lists are then tweaked to specific requirements if necessary. A start date is assigned to each task or group of tasks when they are created. Once the PM list has been created PM lists are distributed to the maintenance technician coinciding with their work area. As tasks are completed the hours spent on each task are recorded by the technician in tenths of an hour (Example: 1.8). This task list is exchanged for a new updated task list preferably once a week. Now the plant technician updates and validates the status of the PM list(s) and creates new ones for distribution to the Technicians. Tasks that are due first are listed at the top of the task list. The technician should start at the top of the list and work down therefore completing late tasks or holdovers from the previous task list first.

Since maintenance technician wages are known and the times to complete PM tasks are also known MaintSmart© may now compute the actual cost of preventive maintenance for each equipment item. This information along with downtime costs, inventory cost, and work order cost aids the plant technician in determining the cost to own an equipment item. Decisions can now be thoughtfully made regarding the equipment item in question. *Data going into this program must be accurate and timely to be of use.*

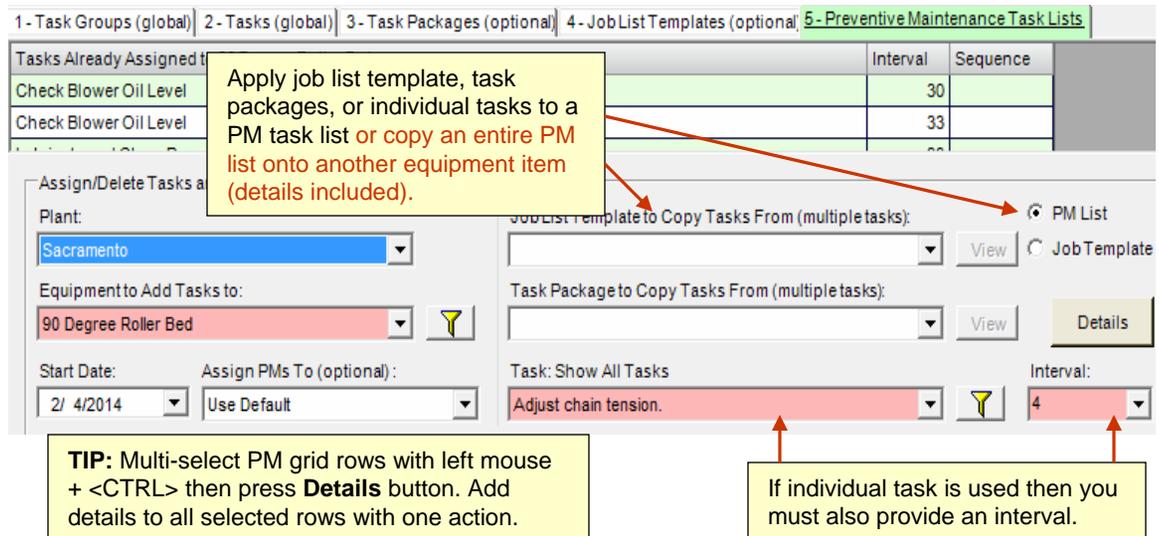
To create new or to edit existing PM lists select  from the button bar. To update completion status of existing PM lists select  from the button bar.

You may add tasks to a PM list at any time and are encouraged to do so. One of the primary goals of MaintSmart© is to aid the plant technician in maximizing efficiencies regarding which tasks are scheduled and how much time is allocated to those tasks. Adding and/or deleting tasks from the PM lists helps to accomplish this goal.

Adding Tasks to a PM Task List:

To create a new PM list or add tasks to an existing PM list select  from the button bar. Follow these steps:

1. Press **Edit (New)**.
2. Select an equipment item to add tasks to from the drop down box labeled **Equipment to Add Tasks To**.
3. Select the initial start date from the date selector box.
4. Select either a job list template, task package, or individual task. If you select an individual task you also have to select the interval.
5. Select the person to assign the PM list to.
6. **NEW: Copy a PM list onto another equipment. Choose PM List radio button to load available PM lists. Copies all Details too.**



The screenshot shows the 'Preventive Maintenance Task Lists' configuration window. At the top, there are tabs for '1- Task Groups (global)', '2- Tasks (global)', '3- Task Packages (optional)', '4- JobList Templates (optional)', and '5- Preventive Maintenance Task Lists'. Below the tabs is a table with columns for 'Tasks Already Assigned to', 'Interval', and 'Sequence'. The table contains two rows: 'Check Blower Oil Level' with an interval of 30 and sequence 30, and another 'Check Blower Oil Level' with an interval of 33 and sequence 33. Below the table is the 'Assign/Delete Tasks to' section, which includes a 'Plant' dropdown (Sacramento), an 'Equipment to Add Tasks to:' dropdown (90 Degree Roller Bed), a 'Start Date' selector (2/ 4/2014), and an 'Assign PMs To (optional):' dropdown (Use Default). There are also dropdowns for 'Job List Template to Copy Tasks From (multiple tasks):', 'Task Package to Copy Tasks From (multiple tasks):', and 'Task: Show All Tasks' (Adjust chain tension.). An 'Interval:' dropdown is set to 4. A 'Details' button is visible. Three callout boxes provide instructions: 1. 'Apply job list template, task packages, or individual tasks to a PM task list or copy an entire PM list onto another equipment item (details included).' with an arrow pointing to the 'Details' button. 2. 'TIP: Multi-select PM grid rows with left mouse + <CTRL> then press Details button. Add details to all selected rows with one action.' with an arrow pointing to the 'Details' button. 3. 'If individual task is used then you must also provide an interval.' with an arrow pointing to the 'Interval:' dropdown.

Tip: You may see what tasks are contained in the task package or job list template by pressing the button **View Tasks**.

5. Press **Save** to add these tasks to this PM list.

Editing or Deleting Tasks From a PM Task List:

You may add or delete tasks to a PM list at any time and are encouraged to do so. One of the primary goals of MaintSmart© is to aid the plant technician in maximizing efficiencies regarding which tasks are scheduled and how much time is allocated to those tasks. Adding and/or deleting tasks from the PM lists helps to accomplish this goal.

Note: Deleted tasks are removed from the current PM task list but are not removed from any historical PM records. Deleted tasks can be added back to the PM task list at a later date.

To edit or delete tasks from a PM list select  from the button bar. To delete tasks from an existing PM list follow these steps:

1. Press **Edit**.
2. Select the equipment item (PM list) you want to work with.
3. Left mouse click on the grid row containing the task you want to delete. To select more than one task hold down the **<Ctrl>** while you select the row in the grid.
4. Press **Delete**.

Changing the PM Interval

To change a PM interval select a grid row (s) then right click the grid and choose the pop-up menu item labeled **Change PM Interval**. Type or select the new PM interval into the resulting drop-down box.

PM Lists - More Options

Using Other PM Task Lists Options, Sequencing PMs, Editing the Start Date

PM lists may be sequenced in the order that you want the task to display on the printed PM task list.

To auto increment the sequence an existing PM list:

- 1.) Check the checkbox labeled **Sequence** and the checkbox labeled **Auto-Increment Sequence**. This places the grid click mode to sequence. NOTE: no other edits may be made to the data in the grid while in sequence mode.
- 2.) Left mouse-click the grid rows containing the PM tasks in the order that you want the task to appear in the list.
- 3.) Uncheck the **Sequence** checkbox and the clicked rows will update their sequence as designated.

You may also include the equipment sequence as part of the PM sequence by checking the Group By Equipment checkbox. Alternatively if you want to manually sequence each task you may leave Auto-Increment Sequence unchecked.

NOTE: two or more PM tasks may have the same sequence. This makes sense if you want to group PM tasks into a single task sequence.

Tip: PM task lists display tasks by sequence order in ascending order (in most task list formats) then by date due in descending order.

Check both checkboxes to sequence and auto-increment. This cause the sequence to count up in the order that you click the grid rows.

Assign/Delete Tasks and Job Lists to Equipment

Plant: Sacramento

Equipment to Add Tasks to: 90 Degree Roller Bed

Start Date: 6/ 1/2010 Assign PMs To (optional): Use Default

Job List Template to Copy Tasks From (

Task Package to Copy Tasks From (mul

Task: Show All Tasks

Adjust chain tension.

Add/Delete Tasks: 90 Degree Roller Bed

Sequence Auto-Increment Sequence Edit Start Date

Group By Equipment Sequence Position: 1

Edit

To reset the start date of a previously created PM task check this checkbox. Next select one or hold <CTRL> key and multi-select tasks from data grid. Change date in date selector then click **Save**.

PM Lists - Batch Configure

Configuring PM Task Lists With Batch Configure

PM lists may be batch updated. This causes all tasks, task package tasks or job list template tasks to be added to the PM list(s) of all equipment contained in the batch configure target equipment hierarchy.

For example: In the pictured on the right

- 1.) A task package REFRIG30 is selected. This task package contains 10 refrigeration tasks that have 30 day intervals.
- 2.) **Batch Configure PMs >> Filter Equipment By Work Area/Location** menu item is selected. This displays the pop-up screen listing all work area/locations for this plant.
- 3.) Choosing 'Bread Make Up' (then following prompts for batch configure) causes MaintSmart to copy all tasks contained by task package (REFRIG30) to all equipment contained by work area/location (Bread Make Up).

This is a really fast way to create PM task lists. Other uses may be for standard safety instructions, SOPs or other work that is generally done on all or most of the equipment in one of the equipment hierarchy levels.

Tip: It may be beneficial to use batch configure even if some of the tasks in a Task Package or Job List Template are not needed on some equipment related to a batch configure. Adding many tasks at once then deleting the unneeded tasks from the PM list manually may still be faster (and consistent) than adding these tasks without using batch configure.

The selected equipment item is ignored with batch configure.

Care must be taken when batch configuring PMs because while it is easy to add PMs to many equipment items at once removing unwanted PMs must be done without the aid of the batch configure function.

All batch configured PMs are assigned to the personnel selected

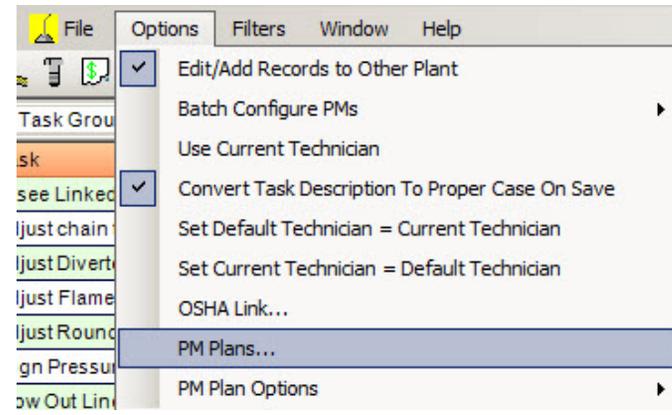
PM Lists – PM Plan Configuration

Configuring PM Plans

PM plans provide a way to create a pre-defined PM list of tasks that would normally not be associated with one another. This provides a completely customized and arbitrary way to group PM tasks for issuance. To create a new PM Plan begin by going to the PM Configuration screen and selecting the menu items: Options>>PM Plans... This will open a small dialog screen where a new PM plan name is entered.

Now that the PM Plan has a name begin adding PMs to the PM Plan as follows:

- 1.) Choose filters as needed from the drop-down boxes below the data grid (optional) to limit the data in the grid to the data set needed for the PM plan. As filters are chosen the data in the grid is changed.
- 2.) Left-click each row (highlight) to include the PM contained by the row in the PM plan. Holding the <CTRL> or <SHIFT> key on the keyboard while left-clicking provides a way to multi-select rows.
- 3.) Click the Link button to add these selected PMs to the PM plan selected in the drop-down box below the data grid.



The screenshot shows the PM Configuration dialog box with the following components and annotations:

- 1.) Choose one or more filters (optional) to load the grid with the PMs needed. Choosing blank from a dropdown defeats the filter and loads all PMs in the data grid.** - Points to the filter section at the bottom.
- 2.) Left-click the grid rows for PMs to include in the PM plan.** - Points to the data grid.
- 3.) Choose the PM plan to link these PMs to.** - Points to the 'PM Plan Name' dropdown.
- 4.) Press the Link button to link the selected PMs to this PM plan name..** - Points to the 'Link' button.

The data grid contains the following information:

Equipment	PM Plan	Task	Sequence	Technician	Technician Shift	Work Area/Location Desc.	Line
90 Degree Roller Bed #6		Check And Oil Chain		Charlie Huston		Bread Baggers/Wrappers	Bread Pro
90 Degree Roller Bed #6		Check And Oil Chain		Charlie Huston		Bread Baggers/Wrappers	Bread Pro
B & S Box Maker #1		Check And Oil Chain		Charlie Huston		Bun Wrapping	Roll Prod
B & S Press #2		Check And Oil Chain		Charlie Huston		Air Compressor Room	Bread Pac
Bulk Flour Bin #1		Check And Oil Chain		Charlie Huston		No Area Assignment - 327	Bulk Ingre
Bulk Flour Bin #2		Check And Oil Chain		Charlie Huston		No Area Assignment - 327	Bulk Ingre
Bulk Flour Bin #3		Check And Oil Chain		Charlie Huston			Bulk Ingre
Bulk Flour Bin #4		Check And Oil Chain		Charlie Huston			Bulk Ingre
Depanner #1		Check And Oil Chain		Charlie Huston			Bread Pro

Below the grid, the '26 PM Plan Records' section shows:

- Plant: Sacramento
- PM Plan Name: [Empty]
- Buttons: Link, De-Link, Cancel

The filter section at the bottom includes:

- Equipment Item: [Empty]
- PM Task: Check And Oil Chain
- Work Area/Location: [Empty]
- Task Group: [Empty]
- Department: [Empty]
- Equipment Group: [Empty]
- Engineer: [Empty]
- Min. Interval: [Empty]
- Max. Interval: [Empty]
- Clear Filters button

Map Tasks to Equipment Failure (downtime) Causes

Overview of Task to downtime Cause Mapping: When downtime is recorded the cause of the downtime is included in the record. In many cases downtime can be prevented if the cause can be identified and tasks applied to the PM list. **Task to Cause Mapping** provides a mechanism by which the plant technician, using his good judgment, can assign certain tasks to a PM list to help in the prevention of downtime from a specific cause. Perhaps the task is already assigned to the PM list. In this case the plant technician may want to adjust the time interval of the task in question. To verify and aid in these decisions MaintSmart® provide powerful reliability analysis tools and other analysis tools. [To use these tools select](#)  [for reliability analysis and other valuable decision making tools.](#)

Since tasks required to prevent downtime causes could be different between different equipment this program requires that causes of downtime be referenced to a specific equipment item. After completing a task to cause mapping for one equipment item MaintSmart® provides a way for you to copy these mappings to other equipment with a couple of mouse clicks. This saves much time and also provides for accurate task to cause mapping. After copying to other equipment you may tweak the task to cause mapping list by deleting and/or adding mappings as needed.

Mapping a Task to a downtime Cause:

To work with task to downtime cause mapping select  from the button bar. MaintSmart® provides a quick and easy way to map all of your downtime causes to tasks. Follow these steps to map a task to a cause:

1. Press **New**.
 2. Select the equipment whose causes you want to map tasks to.
 3. Select the cause. To restrict the causes in the drop down box select the option button **Recent Causes**.
 4. Select tasks from the list box labeled **Select From These Tasks** press the right arrow button to use them.
 5. Press **Save** to map these tasks to the selected cause and equipment.
- Warning:** Deleted task to cause mappings are permanently deleted. To restore them you must recreate them.

Editing or Deleting a Task to downtime Cause Mapping:

To work with task to downtime cause mapping select  from the button bar. MaintSmart® provides a quick and easy way to map all of your downtime causes to tasks. Follow these steps to edit a task to a cause mapping:

1. Select the grid row containing the mapping you want to work with.
2. The tasks mapped to the selected cause appear in the list box on the right. All available tasks appear in the list box on the left.

Equipment	Cause	Preventive Task	MachineCode	PlantCode
Yeast Refrigeration Compressor #1	Sprocket Worn	Check and Lubricate Bearings	327001001	327
Yeast Refrigeration Compressor #1	Sprocket Worn	Check Oil Level In Gearbox(es)	327001001	327
Yeast Refrigeration Compressor #1	Sprocket Worn	Lubricate Carrier Chain	327001001	327
Yeast Refrigeration Compressor #1	Sprocket Worn	Lubricate Fan Shaft	327001001	327
Yeast Refrigeration Compressor #1	Sprocket Worn	Oil Valve Stem at Packing Gland	327001001	327
Yeast Refrigeration Compressor #1	Shaft Bearing Failed	Check and Oil Chains	327001001	327
Yeast Refrigeration Compressor #1	Shaft Bearing Failed	Check and Lubricate Bearings	327001001	327
Yeast Refrigeration Compressor #1	Shaft Bearing Failed	Check Oil Level In Gearbox(es)	327001001	327

Map Tasks to Down Time Causes

Plant: AnyTown

Equipment: Dough Mixer #6

Down Time Cause: Electrical
Broken/Damaged Wire

Select From These Tasks: Electrical Group

- Check Motor Starter(s)
- Check Pressure Switch(es)
- Check Proximity Switch(es)
- Check Start/Stop Switches
- Check Static Wire
- Check Tank Heater/Thermostat
- Check/Repair Cords and Conduits

Do These Tasks to Prevent: Broken Wire

- Check For Excessive Amp Draw
- Check Ignition, Electrode, Wires
- Check Motor Starter(s)

Recent Causes All Causes

Associate this downtime cause for the Dough Mixer #6 with these tasks(that prevent this downtime cause).

3. Add or remove tasks by using the arrow buttons.
4. Press **Save**. The remaining tasks in the list box on the right are mapped.

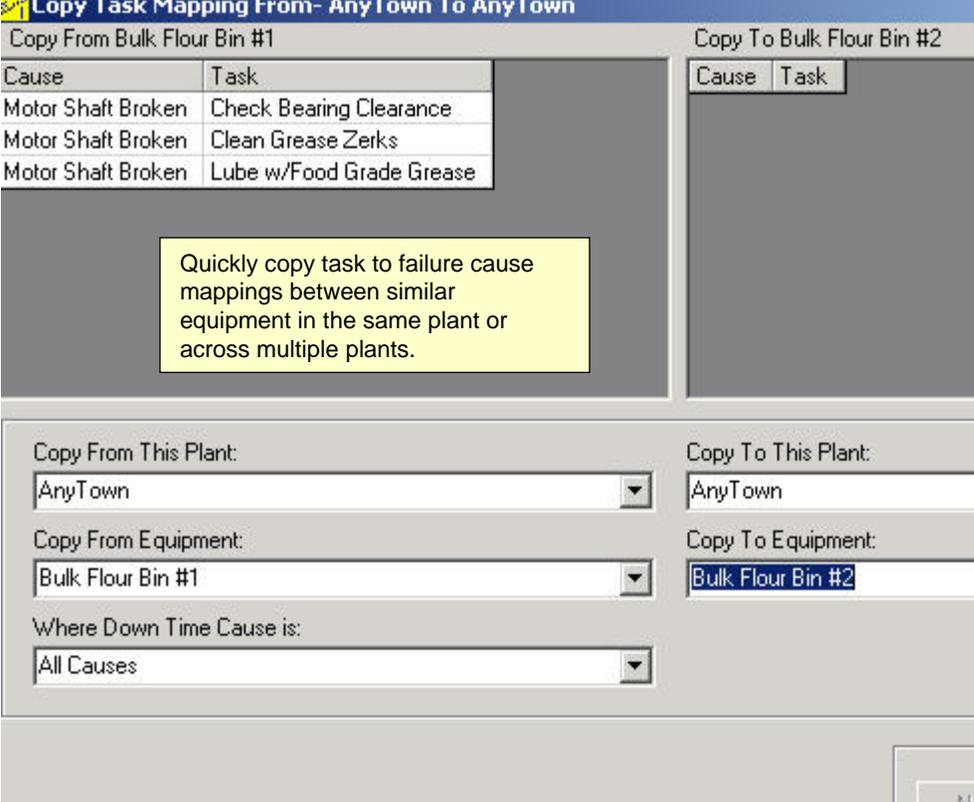
Follow these steps to delete a task to a cause mapping:

1. Select the grid row containing the mapping you want to work with.
2. Press the **Delete** button.
3. A message box appears. Press **No** to delete just the selected task. Press **Yes** to delete all tasks associated with the selected cause for this equipment.

Copy Task to Downtime Cause Mappings

Copy Task to downtime Cause Mappings: MaintSmart© provides a quick and easy way to copy task to cause mappings between equipment. To work with task to downtime cause mapping select  from the button bar. Next select the menu items **Options>>Copy Task Mapping**. Follow these steps to copy a mapping:

1. Press **New**.
2. Select the equipment whose task to cause mappings you want to copy from.
3. Select the cause to copy or select **All Causes** to copy them all.
4. Select the equipment to copy the mappings to. Duplicate mappings, if any, are ignored.
5. Press **Save** to assign these mappings to the selected and equipment.



Copy From Bulk Flour Bin #1		Copy To Bulk Flour Bin #2	
Cause	Task	Cause	Task
Motor Shaft Broken	Check Bearing Clearance		
Motor Shaft Broken	Clean Grease Zerks		
Motor Shaft Broken	Lube w/Food Grade Grease		

Quickly copy task to failure cause mappings between similar equipment in the same plant or across multiple plants.

Copy From This Plant: AnyTown

Copy To This Plant: AnyTown

Copy From Equipment: Bulk Flour Bin #1

Copy To Equipment: Bulk Flour Bin #2

Where Down Time Cause is: All Causes

Skill to Task Mapping

Overview of Skill to Task Mapping: The purpose of skill to task mapping is to provide a way for MaintSmart© to match needed personnel skills with required tasks for an equipment item or work area. This helps the plant technician make informed decisions regarding area and work assignments. Skill are assigned to the maintenance technician when their record is created. To work with skill to task mapping select  from the button bar. Skill to task mapping is used by the analysis part of this program to determine how well matched an technician is to his work area. This function can pin point what training may be necessary to improve performance in that area or perhaps several areas at once.

Note: Determining what skill an individual has is somewhat subjective and left to the expert opinion or the plant technician. Care must be taken during the data entry phase to ensure good results from the analysis phase.

Mapping a Skill to a Task: To work with skill to task mapping select  from the button bar.

Follow these steps to create a new skill to task mapping:

1. Press **New** .
2. Select a task or task group from the drop down box.
3. Select the skill(s) that you want to map to the task by clicking them with the mouse.
4. Press the right arrow button to use the selected tasks.
5. Press **Save**.

Edit or Delete a Skill to Task Mapping: **Warning:** Deleted skill to task mappings are permanently deleted. To restore them you must recreate them.

To work with skill to task mapping select  from the button bar.

Follow these steps to edit an existing skill to task mapping:

1. Select the grid row containing the mapping by clicking the row with the mouse.
2. Add skills to the task by selecting them in the list box on the left then pressing the right arrow button.
3. Delete skills from this task by selecting them from the right list box and pressing the left arrow button.
4. Press **Save**.

Follow these steps to delete a skill to task mapping:

1. Select the grid row containing the mapping you want to work with.
2. Press the **Delete** button.
3. A message box appears. Press **No** to delete just the selected skill. Press **Yes** to delete all skills associated with the selected task.

Map Skills to Tasks

Plant: AnyTown

Map All Tasks In a Task Group to Skill(s): Electrical Group

Map Individual Tasks to Skill(s):

Select From These Skills:

- Computer
- Electrical 2
- Fabricator
- Hydraulic
- Leader
- Machinist 1
- Machinist 2
- Millwright

These Skills Are Needed To Perform Any Task In This Task Group: Electrical Group

- Wiring
- PLC 1

Important Note: Tasks mapped to maintenance personnel skills may be later used in the PM section to suggest maintenance assignments.

Add a New Record

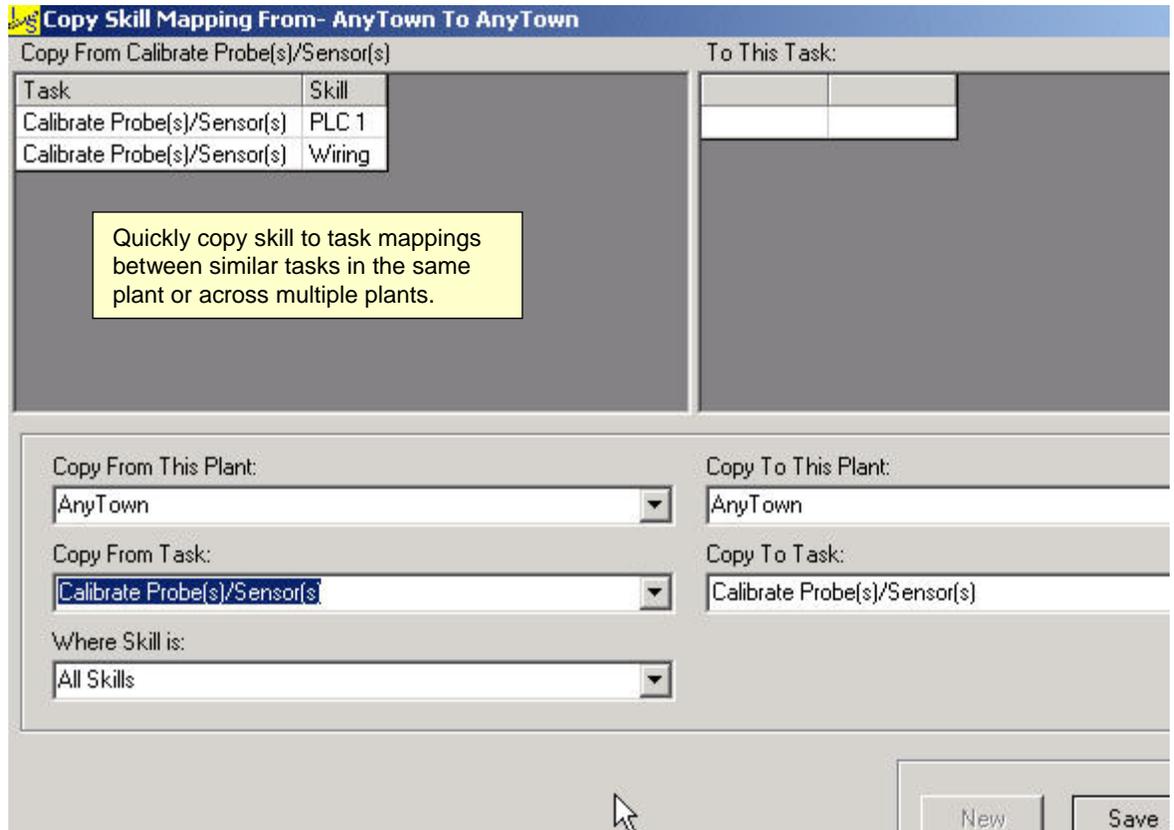
New Delete Save Cancel

Copy Skill to Task Mappings

Copying Skill to Task Mappings: MaintSmart© provides a quick and easy way to copy skill to task mappings between plants. To work with skill to task mapping select  from the button bar. Next select the menu items **Options>>Copy Skill Mapping**. Follow these steps to copy a mapping:

1. Select menu items **Options>>Edit/Add Records to Other Plants**. You must have permission to access this menu item.
2. Select the menu item **Copy Skill Mapping**.
3. Choose the plant to copy skills from.
4. Choose the task. When you do this the drop down box labeled **Where Skill is** is loaded with the skills already mapped to the selected task.
5. Choose one skill or 'All Skills' from the drop down box labeled **Where Skill is**.
6. Choose the plant you want to copy the skills to.
7. Choose the task you want to copy the skills to.
8. Press **Save**.

The skills mapped to one task can be mapped to many other tasks within your plant or in other plants by using this **Skill Copying**. This saves a lot of time



Copy Skill Mapping From- AnyTown To AnyTown

Copy From Calibrate Probe(s)/Sensor(s)

Task	Skill
Calibrate Probe(s)/Sensor(s)	PLC 1
Calibrate Probe(s)/Sensor(s)	Wiring

To This Task:

Quickly copy skill to task mappings between similar tasks in the same plant or across multiple plants.

Copy From This Plant: AnyTown

Copy To This Plant: AnyTown

Copy From Task: Calibrate Probe(s)/Sensor(s)

Copy To Task: Calibrate Probe(s)/Sensor(s)

Where Skill is: All Skills

New Save

Downtime Cause Groups

Overview of downtime Causes: Causes are grouped to help organize them and to speed data entry through filtering. **Cause groups** make it easier for the user to locate causes by associating them with a group of similar causes. Cause groups should be kept relatively small. Between 10 and 50 causes in a group is ideal though they can contain many more than 50. Naming conventions for cause groups should be logical and consistent.

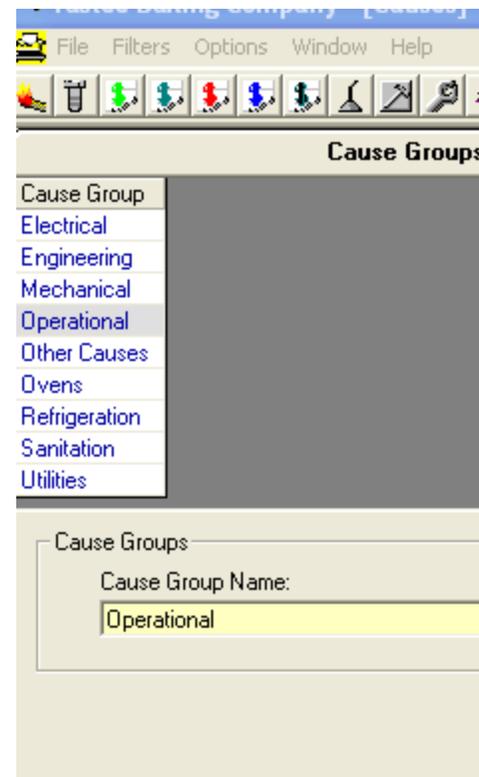
There are basically two different ways you can name your cause groups.

1. Name them for the type of equipment or component, i.e.. Conveyor Group, Bearing Group, etc
2. Name the cause group to describe the type of failure, i.e.. Mechanical Breakage Group, Electrical Group, etc.
3. Name the cause group to *generally* describe the type of failure, i.e.. Mechanical Group, Electrical Group, Operational, Technician, Utility, Sanitation, etc.

Note: Naming cause groups based on #2. (describe type of failure) may be more efficient as equipment or components experience the same types of failures. For example gearboxes have bearings fail as do conveyors and electric motors..

downtime **causes** should be kept short and to the point. They should only cover one topic. For example a dry chain breaks. The cause definition for this situation is twofold. The chain was dry *and* the chain broke. The cause for this downtime incident might be 'Chain Dry' if the chain being dry contributed to its breakage. Create up to 2.1 billion failure cause descriptions. Otherwise the cause might be Chain Broke'. In any event two causes need to be defined rather than 'Chain Dry and Chain Broke'. It's easier for MaintSmart© to pinpoint problems when they are clearly defined. To edit or delete a cause select the menu item **View>>Configuration>>downtime Causes** from the home screen.

Adding a New Cause Group: Select the tab labeled **Cause Groups**. While working with cause groups is fairly simple it does require some forethought to prevent problems in the future. Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Press **New** then enter a logical cause group name. Press **Save**.



Editing or Deleting a Cause Group: Warning: Changes to cause groups affects ALL plants. Deleting a cause group deletes all causes in that group and all records that used any of the causes in that group including but not limited to downtime records.

Select the menu items **Options>Edit/Add Records to Other Plants**. If you are unable to access this menu item see your system administrator for access permission to this menu item. Left mouse click the grid row containing the record you want to work with.

In order to delete a cause group all records referencing this cause group must first be manually deleted. After all linked records have been deleted go to the **Program Configuration** screen and check the menu item labeled **Settings>>Allow Cascade Deletes**. Press **Save** or **Delete**.

Downtime Cause Definitions

Adding a New downtime Cause Definition: Cause descriptions are used in downtime records to specify the reason for the failure. Once again MaintSmart© is extremely flexible and allows complete customization to your specific situation. Causes are created from word lists or you may directly type them.

To edit or delete a cause select the menu item **View>>Configuration>>downtime Causes** from the home screen. Select the tab labeled **Causes**. To add a new cause you must have permission to Add/Edit Records for Other Plants. Press **New**. Select the cause group that you want to add the cause to from the drop-down box. Type, drag and drop, copy/paste failure cause description into the textbox. Press **Save** to keep the new cause description.

Note: downtime causes should be kept short and to the point. They should only cover one topic. For example: a dry chain breaks. The cause definition for this situation is twofold. The chain was dry *and* the chain broke. The cause for this downtime incident might be 'Chain Dry' if the chain being dry contributed to its breakage, Otherwise the cause might be 'Chain Broke'. In any event two causes need to be defined rather than 'Chain Dry and Chain Broke'. It's easier for MaintSmart© to pinpoint problems when they are clearly defined.

Editing or Deleting a downtime Cause Definition: Warning: Changes to cause descriptions affect ALL plants. Deleting a cause deletes all downtime records that used the cause. It is recommended that you do not delete causes once they have been put into use.

To edit or delete a cause select the menu item **View>>Configuration>>downtime Causes** from the home screen. Select the tab labeled **Causes**. To edit or delete a cause you must have permission to Add/Edit Records for Other Plants.

In order to delete a cause all records referencing this cause must first be manually deleted. After all linked records have been deleted go to the **Program Configuration** screen and check the menu item labeled **Settings>>Allow Cascade Deletes**. Press **Save** or **Delete**.

Click the appropriate row containing the cause. You may not change the cause group. The only way to move a cause to another cause group is to first delete the cause then recreate it in another cause group. This is not recommended as ALL records in ALL plants containing the deleted cause are also deleted. Press **Save** to keep the new cause description or **Delete** to permanently remove the cause and ALL records that used this cause.

Cause	Cause Group
AC/DC Drive Fail/Malfunction	Electrical
Actuator Failed/Broken	Mechanical
Adjust Timing	Mechanical
Adjustment Screw Stripped/Broken	Mechanical
Agitator Loose/Failed	Mechanical
Air Compressor Failure	Utilities
Air Cylinder Failed	Mechanical
Air Cylinder/Clevis Broken	Mechanical
Air Hose Broken	Mechanical
Air Hose Restricted	Mechanical
Air Leak	Mechanical
Runners Failed	Mechanical

Causes (drag/drop words into 'Cause Description' box below. Copy/paste or drag drop from other doc

Cause Group:

Cause Description (255 chars):

Failure cause descriptions may be up to 255 characters each..

Meters

Meters – An Overview

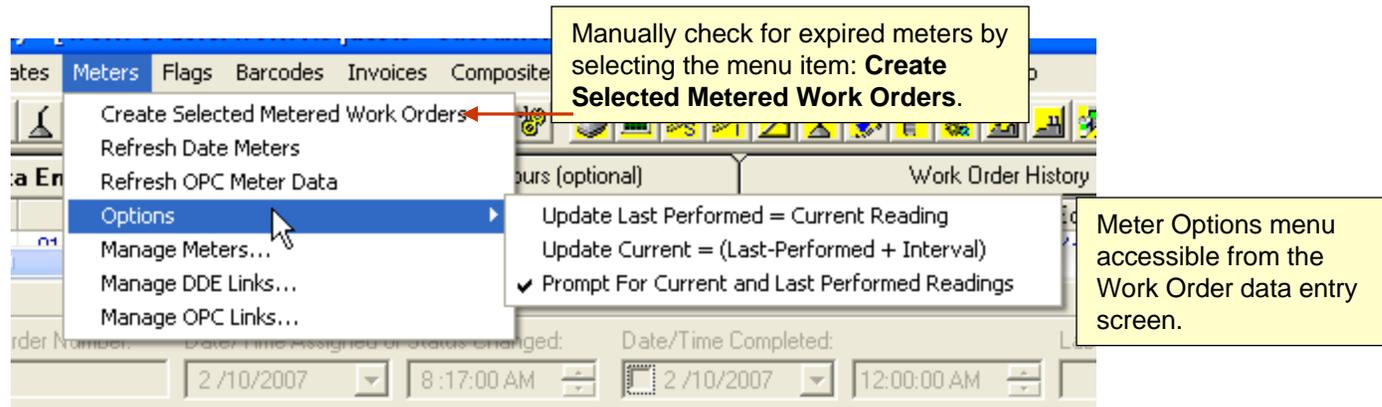
Meters provide a way for you to trigger work order creation based upon a meter reading. Examples of meter units might be hours (from an equipment hour meter), cycles, miles (odometer reading), cuts (a sawmill), cans (in a cannery operation), days (a calendar based meter), etc.

MaintSmart uses meters as follows:

1. You create a user-friendly meter name. This meter name can refer to between 1 and 6 separate metered values (units). **Example:** Meter Name: **Semi-Annual Service**. Meter Units: **miles, months**.
2. After naming this meter and selecting the units you would assign trigger intervals to each of the units. **Example:** **6000 miles, 6 months**.
3. Now that the meter **Semi-Annual Service** has been created you may assign this meter to one or more **Work Order Templates**. One of the work order templates might be concerned with changing the oil on the template equipment. Another work order template may be concerned with tightening fasteners on this equipment item.
4. Now that the meter has been linked to a work order template you need to enter a meter reading record for the equipment described in the work order template. Thereafter you'll enter meter readings in the Current Reading text box on the meter screen as needed.
5. When the **Last Performed Reading** (meaning the last time this meter was satisfied by completion of the linked work order) + the **meter Interval** (as defined when you created the meter) **is less than the Current Reading** then the metered work order template is considered expired. This condition will generate a work order to satisfy the required tasks.
6. When the meter generated work order is completed MaintSmart either automatically update the Last Performed and Current Readings (by guess what they should be) or prompts the user for their new values from the work order screen. Of course you may always go into the meters screen and manually adjust both of these values as well.

This is the entire metered work order template process from start to finish. Although it may seem lengthy at first once the meter and template have been set up all you'll need to do after that is adjust the current Reading and possibly the Last Performed reading. The benefit is great time-saving accurate and consistent work orders hopefully resulting in a better equipment maintenance operation.

Note: Work order templates linked to inventory parts will use these parts automatically when created just as they would if the work order was created manually from a template.



Meters - Configuring Meter Definitions

Adding a New Meter Definition

To work with meters begin by opening the Meters screen. This screen is accessible from the button bar or from the Work Orders data entry screen under the menu items **Meters>>Manage Meters...** Once the Meters screen is open follow these steps to create a new meter name/definition:

1. Select the tab labeled **Configure Meter Definitions**. Press the **New** button.

2. Enter a unique meter name (description) in the box labeled **Meter Name**. This will be the user-friendly name you'll use to identify this meter.

Note: a meter name could refer to the triggering event or even the task that the meter triggers. The point is to create a descriptive name that will make to others that may encounter it.

3. Select the meter unit and the interval for this unit. This interval represents the triggering value for this meter unit. You may assign up to 6 units/interval combinations for each meter.

Example: perhaps you have a fleet maintenance operation and need to change oil every 6 months or 6000 miles. In this case you may use the interval 6 and the unit: **months** and the interval 6000 with the unit: **miles**.

Important Note: You may define additional meter units from the menu items **Options>>Meter Units...**

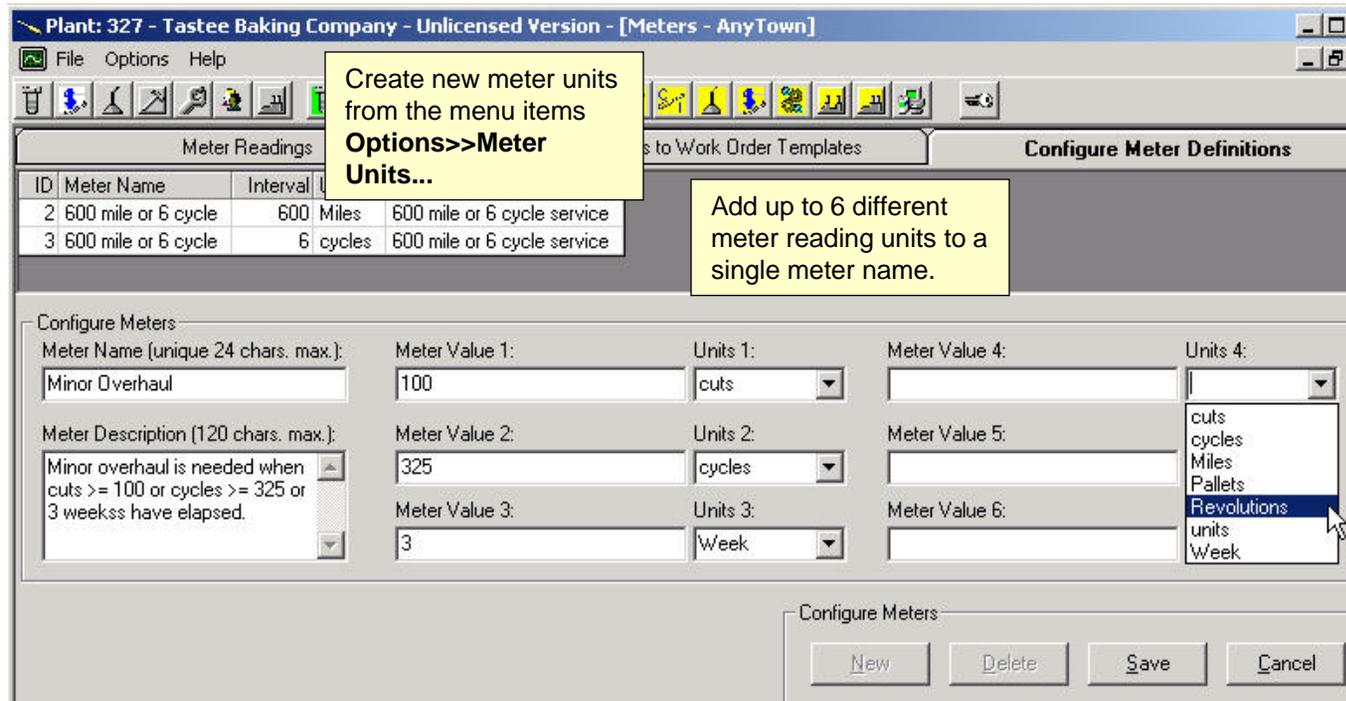
4. Enter a meter description if needed.

5. Press the **Save** button to save this meter. This meter now becomes available for use.

Editing or Deleting a Meter Definition

To edit or delete a meter definition (name) left mouse-click the grid row containing the meter you want to work with. Press the **Delete** button to permanently delete this meter. All meter/work order template records containing this meter are also permanently deleted. Work orders and work order templates are not deleted though.

To edit a meter definition select the grid row as described above then change the appropriate values in the boxes below the grid. Press **Save** to keep the changes.



Meters - Applying Meters to Work Order Templates

Applying Meters to Work Order Templates

Once you have created one or more meter definitions (or names) you'll need to apply (or link) these meters to work order templates. When the meter or meters expire a work order is created from the linked work order template. From the Meters screen select the tab labeled **Apply Meters to Work Order Templates**.

Follow these steps to apply one or more meters to a work order template:

1. Select a work order template name from the drop-down box labeled: **Work Order Template Name**.
2. Select a meter name from the drop-down labeled **Meter Name**. If no meters appear in this drop-down you'll need to create one or more meter definitions. This is done from the last tab on this screen.
3. Make sure the **Activate Meter** checkbox is checked then press **Apply**.

To delete a work order/meter combination left mouse-click the grid row containing the record you want to delete. Next press the **Delete** button. This action will delete all meter/unit combinations associated with this meter name.

Note: these records may not be edited once they are created. If you need to change one of these records simply delete the record and recreate it with the desired parameters.

Template ID	Description	Meter Name	Meter Interval	Unit	Active	Meter ID
3	New Template	600 mile or 6 cycle	600	Miles	<input checked="" type="checkbox"/>	2
3	New Template	600 mile or 6 cycle	6	cycles	<input checked="" type="checkbox"/>	3
8	272 Fryer #1-00503 Check Cylinder Clevis and Pin(s)	Minor Overhaul	100	cuts	<input checked="" type="checkbox"/>	5
8	272 Fryer #1-00503 Check Cylinder Clevis and Pin(s)	Minor Overhaul	325	cycles	<input checked="" type="checkbox"/>	6
8	272 Fryer #1-00503 Check Cylinder Clevis and Pin(s)	Minor Overhaul	3	Week	<input checked="" type="checkbox"/>	7

Apply Work Order Meters - 272 Fryer #1
Plant: AnyTown
Work Order Template Name: 272 Fryer #1-00503 Check Cylinder Clevis and Pin(s)
Work orders are automatically created from the selected work order template when any associated meter interval expires. All meters associated with this work order are updated when the work order is completed.

Important Note: Go to the data entry area of this manual for instructions on how to update current meter readings.

Meter Name: Minor Overhaul
Meter(s) Information:
100 cuts
3 Week
325 cycles

Select a work order template name and meter name to cause the data entry buttons to become enabled..

Apply Work Order Meters
 Activate Meter

List displays meter interval/units associated with the selected meter name.

Data Entry

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Preventive Maintenance (PMs) - Validating PM Tasks

To work with PM task list validation select  from the button bar.

Be sure you understand how PM lists are constructed and used before reading this section. PM task validation is the process of updating completed PM tasks. Typically this validation process takes place weekly. PM task lists for each work area are generated by selecting the menu items **File>>Print>>Assign PM Lists>>PM List**. The tasks are ordered with the ones due first at the top of the list. As the PM list is completed by the maintenance technician the hours required to complete a given task are recorded in the box at the far right of the PM list. The PM lists are typically returned to the maintenance manager when all tasks have been completed or at the end of the week. The maintenance manager records the tasks if complete. Uncompleted tasks are carried over automatically to the next PM list. Tasks that are not completed during their allotted time are marked 'Late' by the program and are moved to the top of the next PM list or marked with an asterisk ("**") on the printed PM task list.

This program has two features that can speed up the PM list validation process. The Completed on Due Date check box automatically updates the selected PM(s) as completed on time. This feature should only be used if the PMs actually were completed on time. Otherwise erroneous data entered may result in erroneous analysis later. For tasks that normally take the same amount of time this program has a feature that averages the time from previous PM task list updates for a given task. This averaged time value is used for the completion time saving you the effort of manually entering the hours to complete each time an update is made. To use this feature simply check the box labeled **Use Default Hours**.

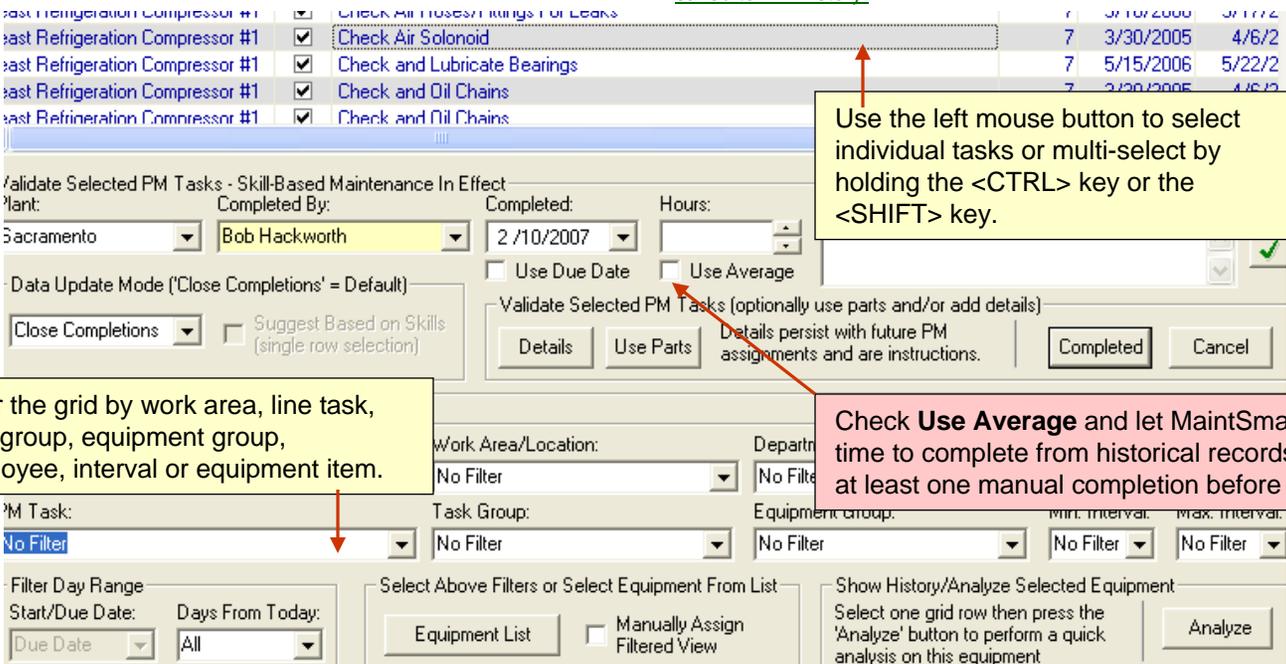
If the task has not been previously updated an input box appears asking you to enter the hours. This only needs to be done once for each task – equipment – interval combination.

The text box labeled **Task Completion Comments** is simply a short comment entered at the time the PM is completed. Perhaps this comment could refer to an existing condition noticed by the maintenance technician while working on this equipment item.

Detailed instructions may be attached to any or all PM task assignments. Select a record from the grid by left mouse-clicking it. Next press the button labeled Detailed Instructions. When the detail screen appears enter the instructions into the white area of the screen. Press the **Save** button on the Detailed Instructions screen to permanently save the text and write it to the database. **Note:** The following provides the distinction between **Detailed Instructions** and **Comments**.

Detailed Instructions are specific instructions to aid in the completion of a task. Detailed instructions are persistent and do carry over to subsequent PM task lists until manually removed or altered. Normally these detailed instructions would be entered from the **PM Configuration** section of MaintSmart. However to provide quick access to instructions that may change from week to week MaintSmart provided a way for you to access these detailed instructions right from the PM Validation screen as well.

Note: Comments are different from **Detailed Instructions** when used with PM task lists. **Comments** are NOT instructions. **Comments** do NOT persist with the PM task list and do not carry over to subsequent weeks as do **Detailed Instructions**. **Comments** are comments entered by the maintenance technician performing the task. These may be comments or observations by the maintenance technician related to the specified task. Comments are saved to PM history.



The screenshot shows the PM Validation interface. At the top, a grid lists tasks for 'Refrigeration Compressor #1'. Below the grid are controls for validation, including 'Validate Selected PM Tasks - Skill-Based Maintenance In Effect', 'Plant' (Sacramento), 'Completed By' (Bob Hackworth), 'Completed' (2/10/2007), and 'Hours'. There are checkboxes for 'Use Due Date' and 'Use Average'. A 'Details' button is highlighted with a callout box. Below these are filter controls for 'Work Area/Location', 'Department', 'PM Task', 'Task Group', and 'Equipment Group'. At the bottom, there are 'Filter Day Range' controls and an 'Analyze' button.

Callout 1 (Yellow): Use the left mouse button to select individual tasks or multi-select by holding the <CTRL> key or the <SHIFT> key.

Callout 2 (Yellow): Filter the grid by work area, line task, task group, equipment group, employee, interval or equipment item.

Callout 3 (Pink): Check **Use Average** and let MaintSmart calculate the time to complete from historical records. You must have at least one manual completion before using this.

Preventive Maintenance (PMs) - Completion/Assign Mode

To work with PM task list validation select  from the button bar.

PM Lists – Completion Mode (available with skill-based PMs only)

In most cases you'll use the completion mode when working with PMs. Select Close Completions from the drop-down labeled Data Update Mode. From the Completed By drop-down select the person that completed the PM. Enter the date completed, hours or minutes to complete (depending upon if you are using hour or minute format from the Options menu) and enter completion comments if needed. Press the button labeled Completed.

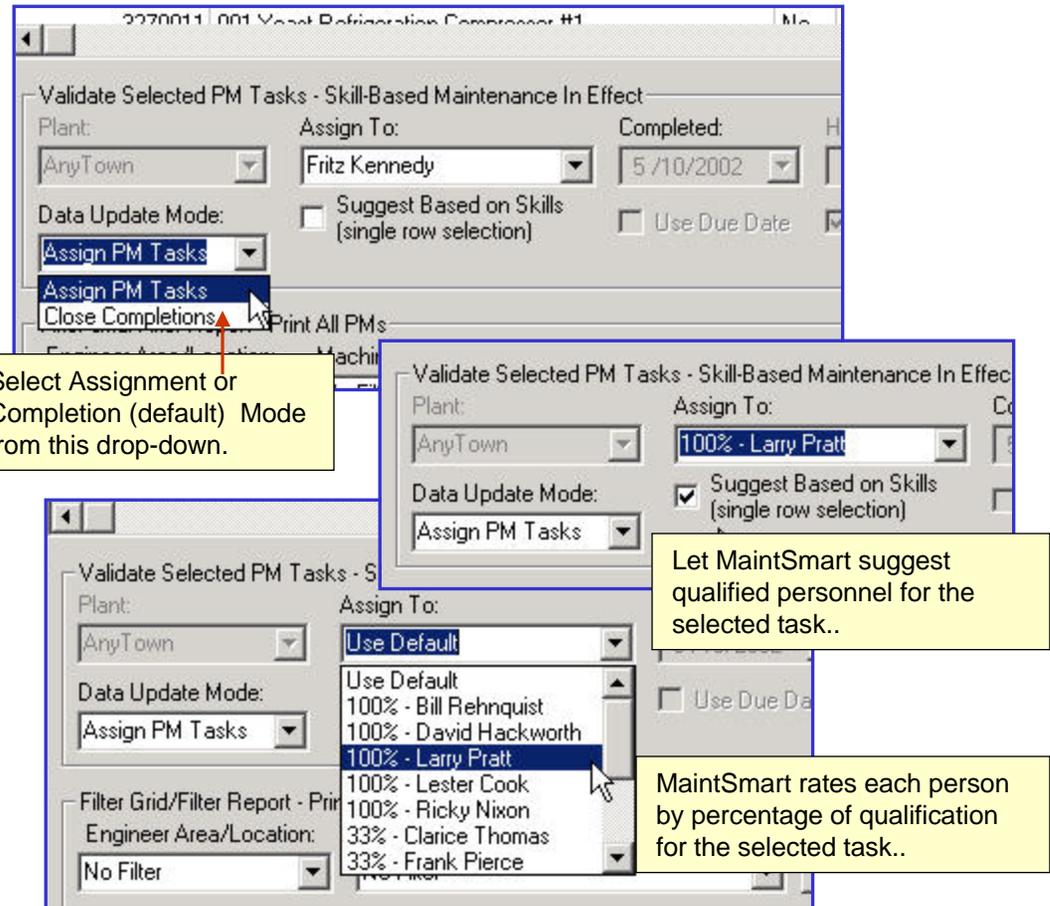
PM Lists – Assign Mode (available with skill-based PMs only)

Select Assign PM Tasks from the drop-down labeled Data Update Mode. MaintSmart provides Assign mode for the sole purpose of assigning PMs to maintenance personnel. Assign mode is only available when using skill-based PMs with MaintSmart. The reason for this is that with zone-based PMs there is no reason to assign PMs as they are automatically assigned to the person that has been assigned to the work area/technician area where the subject equipment resides.

Note: PMs may be assigned to maintenance personnel from the PM Configuration screen when PM lists are originally created too.

To assign PMs to personnel select or multi-select the grid row(s) in the grid by left mouse-clicking a single row or left mouse-clicking a row then holding the <SHIFT> or <CTRL> key and multi-selecting rows. Next select the person you want to assign the selected PMs to from the drop-down box labeled Assign To:. Selecting the Use Default drop-down selection tells MaintSmart to use the same person that has the work area assignment that containing the equipment.

Press the button labeled Assign to assign these PMs to this person. These PMs are now assigned to this person and show up on the next PM list print from the menu items File>>Print>>Assign PM Lists>>PM Lists – by Currently Assigned Personnel. PM completions do not have to necessarily be the same person as they were originally assigned to.



The image shows three screenshots of the 'Validate Selected PM Tasks - Skill-Based Maintenance In Effect' window. The first screenshot shows the 'Data Update Mode' dropdown menu with 'Assign PM Tasks' selected. The second screenshot shows the 'Assign To' dropdown menu with '100% - Larry Pratt' selected. The third screenshot shows the 'Assign To' dropdown menu with 'Use Default' selected. Callouts provide instructions: 'Select Assignment or Completion (default) Mode from this drop-down.', 'Let MaintSmart suggest qualified personnel for the selected task..', and 'MaintSmart rates each person by percentage of qualification for the selected task..'

Suggesting PM task assignments based upon skill to task association (skill to task mapping)

MaintSmart provides a way to limit the choices of possible personnel when assigning PM tasks. MaintSmart even rates each person based upon the degree of qualification.

To use this powerful feature follow these steps:

1. From the PMs Validation screen make certain that the menu item Options>>Use Zone-Maintenance is unchecked. By doing so the MaintSmart PMs Validation screen is placed in skill-based PM task mode.
2. Select the option Assign PM Tasks from the drop-down labeled Data Update Mode.
3. Check the checkbox labeled Assign Based On Skills.
4. Left mouse-click the grid row containing the record you want to work with. MaintSmart evaluates the task for that record then loads qualified personnel into the drop-down along with the persons degree of qualification for this particular task. Example: "100% - John Doe" John Doe has 100% of the skills required for this task. Note: Skills are related to Tasks in the Task to Skill mapping section of MaintSmart.

Preventive Maintenance Parts Usage Links

Inventory Part Linking – An Overview

MaintSmart provides a simple way to link needed inventory parts to work order templates and PM task/equipment combinations. With part linking you set the parts needed and the quantities of each. When the linked work order template is *created* the linked parts are used from inventory. Linked PM task/equipment combinations work slightly differently in that the parts are actually used from inventory when the PM is *marked completed*.

When part linking is activated either (through work order creation or PM task completion) a small grid appears displaying the linked parts. In the case where needed parts were not available the grid row containing the shortage appears with a red background. Several options are available for printing this linked parts grid.

Three part linking options are available for linked PMs as follows:

1. **Deactivate Parts Usage Linking.**
2. **Manage Parts Usage Links...**

Linking Parts To PMs

To link parts to PMs select from the PMs update screen the menu items **Options>>Parts Usage>>Manage Parts Usage Links...** When the **Associate Parts Usage With Work Order Templates and PMs** screen appears follow these steps:

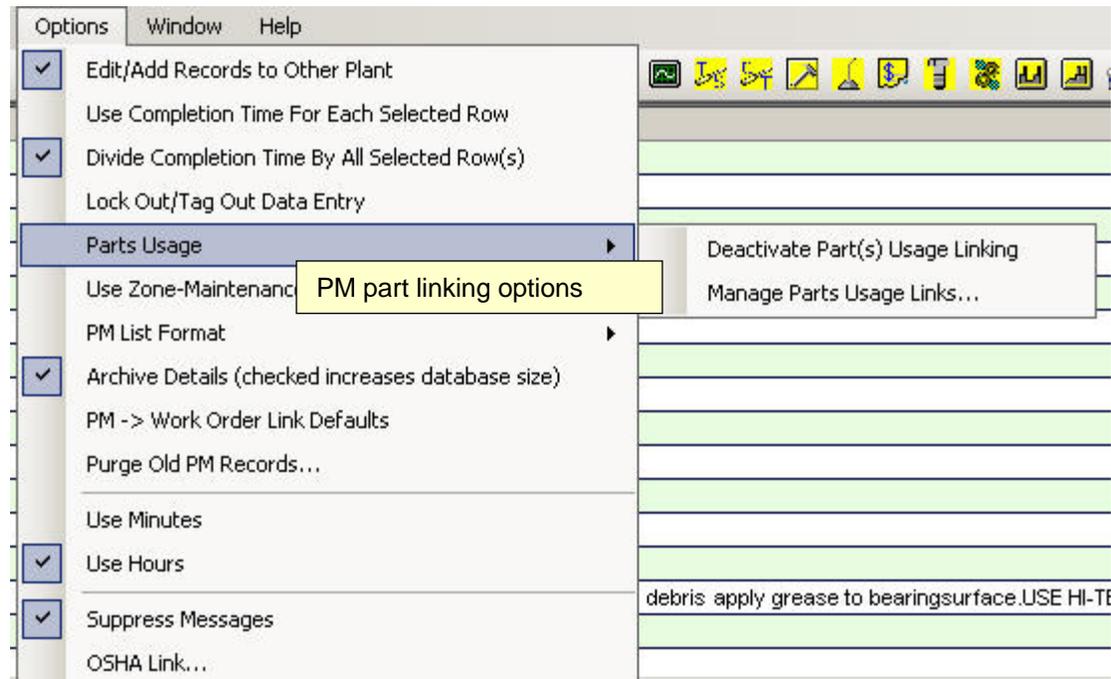
1. Press the **New** button.
2. Select the **Cost Center** and the **Account** from the appropriate drop-down boxes.
3. Select the equipment item from the **Equipment** drop-down. This is the equipment that the PM will be performed on.

Note: When you select the equipment name MaintSmart automatically fills the **Task** drop-down with actual PM tasks associated with this equipment item. If the task drop-down is empty after selecting an equipment item this indicates that no PM tasks have been applied to this equipment item yet. In this case you'll need to go back to the PM Configuration screen first and apply PM tasks to this particular equipment item.

4. From the **Filter Parts:** drop-down select the **Part Group** containing the part you want to link.
5. From the **Part Used** drop-down select the part you want to link to this PM.
6. Select the **Item Type**. Only valid choices are presented in this drop-down.
7. Enter the **Quantity** of this part that will be used each time this PM is *completed*.
8. Make sure the check box labeled **Auto-Use** is checked (this activates this record) then press **Save**.

This part(s) is now linked to the selected PM (equipment/task/interval combination). Anytime this PM is completed MaintSmart will automatically use these parts. Used parts records created by this means contain all of the same information contained in used inventory records that are created manually.

Also see the section regarding **Managing Part Links** found in the Inventory section of this user guide.



Preventive Maintenance (PMs) - Filter Options and More

To work with PM task list validation select  from the button bar.

Filtering PM Task Lists (Validate PM Tasks Grid View)

Filtering by Work Area

To filter the **PM Tasks** grid by work area select the work area from the drop-down box labeled **Work Area/Location** located near the bottom of the screen. Once a work area has been selected from the drop-down the grid view automatically changes to display the selected item. To print this grid view select the menu items **File>>Print>>Assign PM Lists>>PM List for [work area]**.

Filtering by Equipment Item

To filter the **PM Tasks** grid by equipment select the equipment item from the drop-down box labeled **/Equipment** Items located near the bottom of the screen. Once an equipment has been selected from the drop-down the grid view automatically changes to display the selected item. To print this grid view select the menu items **File>>Print>>Assign PM Lists>>PM List for [equipment]**

Using 'Filter Grid' Pop-Up Window

To filter any data entry screen (and most configuration screen grid) views right mouse-click anywhere on the grid to display the pop-up menu. Select the menu item labeled **Filter Grid....** When the filter grid pop-up window appears select the data field or category on which you want to apply a filter. Once the data category has been selected MaintSmart loads the drop-down labeled **Is [operator] to This Value** with possible choices. You may also type into this drop-down in some cases. Next select the Operator (>, <, =, etc). Select the filter criteria from the drop-down labeled **Is [operator] to This Value**. Press OK to apply the filter.

To save a filter as a menu item select, from the filter grid pop-up screen the tab labeled **Save Filters**. Press the New button. Enter the name of the filter. This name can be anything and is used as the displayed menu text after the filter has been actually saved. Enter a filter **description (optional)**. The **description is not displayed anywhere except in the Filter Grid** screen. Saved filters may be edited (description and filter name) or deleted. Simply select the grid row containing the filter from the Filter pop-up screen under tab **Save Filters**. Press **Delete** or make changes in the boxes below the grid then press the **Save** button.

Saved filters may be reused from the data entry or configuration screen that the filter was created from by selecting the menu items **Filters>>[saved filter]**.

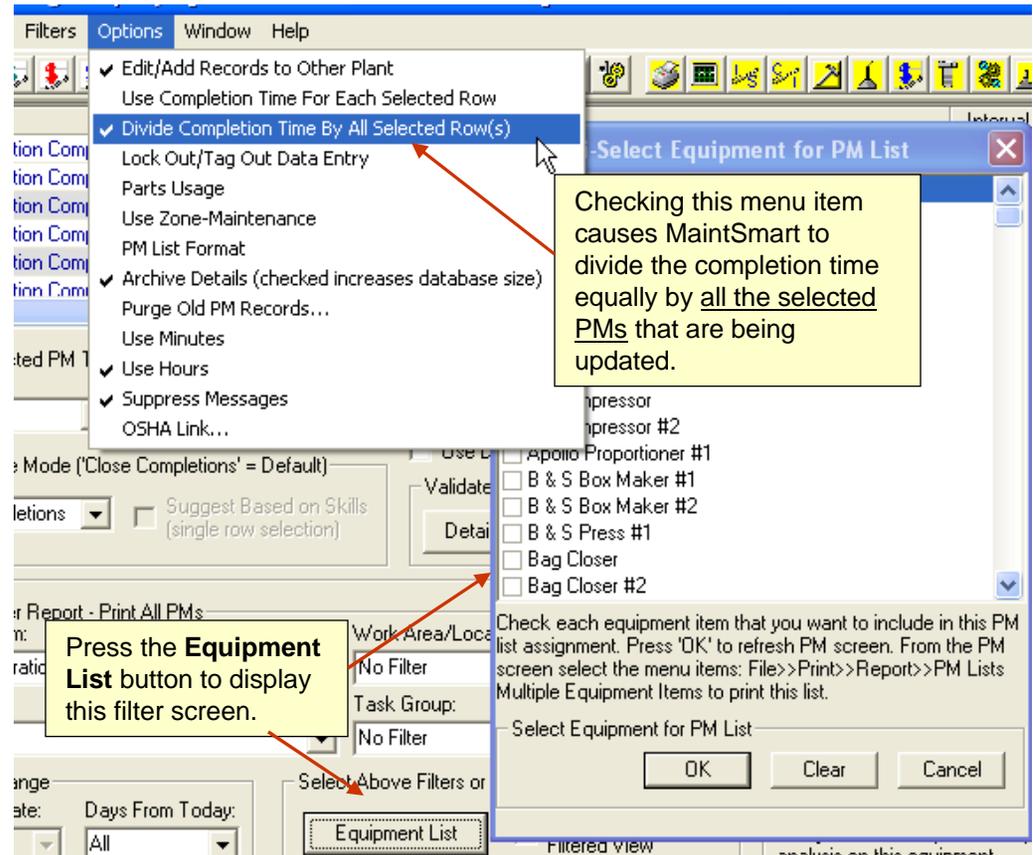
To print a filtered grid select the menu items **File>>Print>>Grid**.

Completion Time Options (with multi-selected PM updating)

The completion time attributed to multi-selected PMs may be updated based on either of the following:

Each PM task is updated with the time (hours/minutes) entered.

OR each PM is updated by the: (time entered in hours/minutes) divided by (number of selected PMs). See picture at upper right for appropriate menu selection.



Using Relative Dates With Grid Filters

MaintSmart provides a way to use relative dates instead of literal dates when saving a grid filter. Here's an example of how relative dates work:

Example: suppose "today" is 7/15/2003. This filter shows PMs for the dates included between today-17 days (6/26/2003) to today+13 days (7/28/2003) You save this filter and check **Use Relative Date**. You come back to use this saved filter on 8/1/2003. The date now used by MaintSmart is between 7/14/2003 (today-17 days) and 8/14/2003 (today+14 days). See **Filtering and Printing PMs** for more on this topic.

Filtering by Multi-Selecting Equipment Items

You may optionally click the button labeled **Multi-Select**. Clicking this button causes a list of all equipment to be displayed. Check the checkboxes next to each equipment item you wish to display in the grid. Press the **OK** button to create the PM equipment view. To discontinue this view click the **Multi-Select** button again (now it's labeled **Cancel**) button labeled **File>>Print>>Assign PM Lists>>PM Lists For Multiple Equipment Items**.

Restoring the Original PM Grid View (unfiltered)

You may restore the default PM grid view to display all records by right mouse-clicking the grid then selecting the menu item **Display All PMs**.

Refreshing the Current data Set in the PM Grid View

You may refresh the current data set in the PM grid view by right mouse-clicking the grid then selecting the menu item **Refresh Current Data Set**. This feature is useful if other users are currently updating record in the PM data table. MaintSmart does not refresh changes to the data table by other users until you either manually refresh the grid, save a record, delete a record or open the screen.

Preventive Maintenance (PMs) - More Options

The PM validation screen provides several useful options available from the **Options** menu item.

PM List Formats (check one only)

Three PM task list formats are available as follows:

1. **Normal** prints the PM Task List with the tasks grouped by their prospective equipment item. Detailed instructions are omitted.
2. **Compact** prints the PM task list without any grouping of the tasks by equipment item.
3. **Details** is the same format as Normal with the addition of the detailed instructions.

Archive Details (checked or unchecked)

When this menu item is checked detailed instructions are saved every time you validate PM task lists. This may cause the database file to grow large rather quickly. A large database file may slow down the program and take up unnecessary disk space on your computer. Uncheck this menu item unless you need to store detailed instructions with every validated task list.

Purge Old PM Records

Depending upon the size of your maintenance operation PM task list validation records may accumulate to the point where you need to get rid of some of the oldest ones. Before you take this action consider saving a copy of the database in case you ever need to restore these old records.

Removing old records through this method permanently deletes these records. There is no way to retrieve them once they're deleted.

To purge old PM records follow these steps:

1. Select the menu items **Options>>Purge Old PM Records...**
2. When the box appears select the date period of the records you wish to delete.

Note: the next step permanently deletes the selected records. Think carefully about this before you do it.

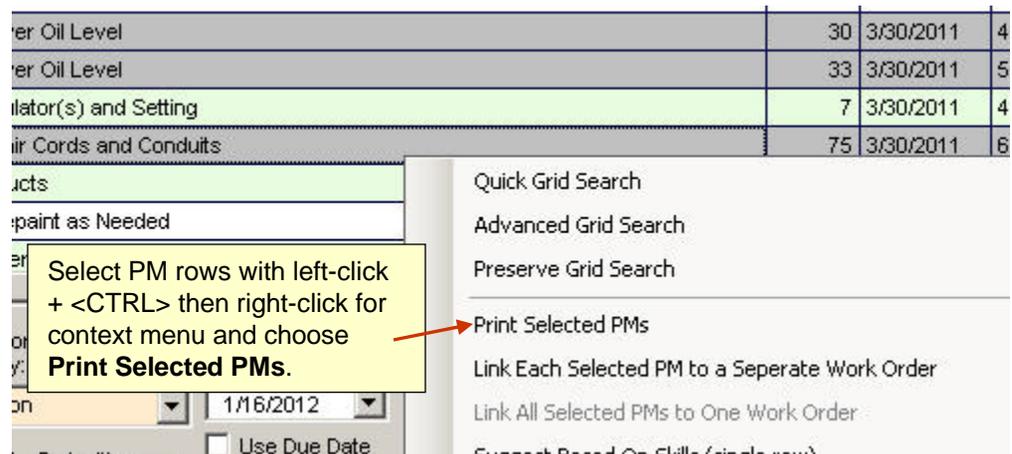
3. Press the Delete Records button.
4. Press the Compact Database button to compress the database.

Use Minutes/Use Hours (check one only)

Some users prefer to enter the PM task completion time in hours. Others prefer minutes. MaintSmart doesn't care it stores everything in the hours format and automatically converts minutes to hours behind the scenes.

Suppress Messages (checked or unchecked)

Checking this item prevents message boxes related to the Default Hours and Completed on Due Date checkboxes (if they are checked also) from appearing. This may speed up data entry.



Preventive Maintenance (PMs) - More Options

The PM validation screen provides several useful options available from the **Options** menu item.

Restore Default Technician

In some cases you may want to temporarily assign PMs to a technician other than the default person that normally performs these PMs (such as when a technician goes on vacation). This is easy to do using the Assign PM Tasks option under the Data Update Mode setting below the grid.

Fortunately beginning in MaintSmart 5.0 you may now easily also restore the original assigned technician by simply choosing the Restore Default Technician menu item. When the small dialog screen appears choose the technician that you want to restore (i.e. the original default technician). Click the OK button to copy the original default technician back as the currently assigned technician.

Go Back ___ Days To Calculate Average Task Hours

Click this menu item under Options to tell MaintSmart how many days back to go when calculating the average amount of time it takes to complete a PM. MaintSmart queries for completed PM data then calculates the average time to complete each equipment/task/interval combination. Going back too far may provide inaccurate results if the technicians completing the work are gradually spending less time to complete the PM (possibly due to increased experience). Not going back far enough could cause inaccurate results because fewer records are being queried.

Go Back ___ Days for Late PMs

Click this menu limit the Late PMs to only PMs that have a due date this many days back from today.

Data Update Mode ('Close Completions' = Default)

Assign PM Tasks Suggest Based on Skills (single row selection)

Temporarily assign PMs to a different technician (other than the default technician).

Go Back ___ Days for Late PMs

Under the **Options** menu: Enter how many days to go back when retrieving late PMs.

Preventive Maintenance (PMs) - Linking PMs to Work Order(s)

Starting with MaintSmart 5.0 you may now embed PM tasks into a work order's detail section. Closing all the linked PMs is as simple as closing the linked work order. Several defaults may be added to accommodate setting that may be in common between the PMs and the work order. Alternatively you may link each PM task to a separate work order instead of embedding multiple PMs into one work order.

Embedding PM Tasks Into One Work Order's Details Section

Follow the below steps to embed multiple PMs into one work order:

1. From the PM screen select an Equipment filter from the drop-down box labeled: 'Equipment Item' at the bottom of the screen. **NOTE:** when embedding multiple PMs into one work order all PMs must be for the same equipment item. This is necessary because each work order must reference only one equipment item.
2. Left-click the rows containing the PM tasks that you want to link. Multi-select by holding the <CTRL> key while left-clicking.
3. After the selected equipment filter has populated the data grid right mouse click on the data grid to display the pop-up menu. Select the menu item **Link All Selected PMs to One Work Order**. The new work order number will be displayed as depicted on the right.
4. Proceed to the work order screen to print and otherwise modify this work order. You may also auto-print this work order by checking the menu item: **File>>Print>>Print Options>>Auto-Print Work Order**.

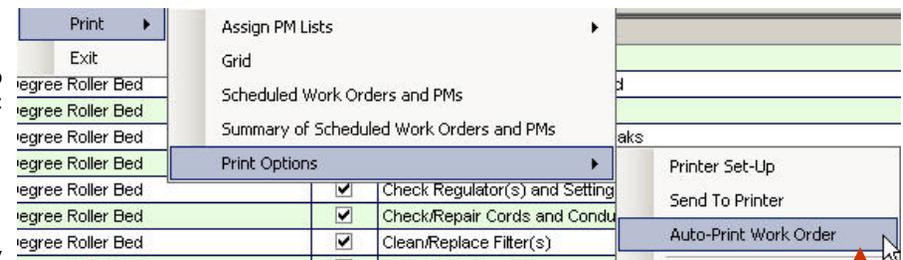
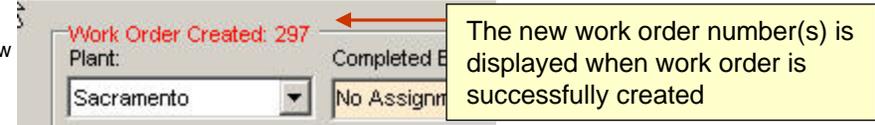
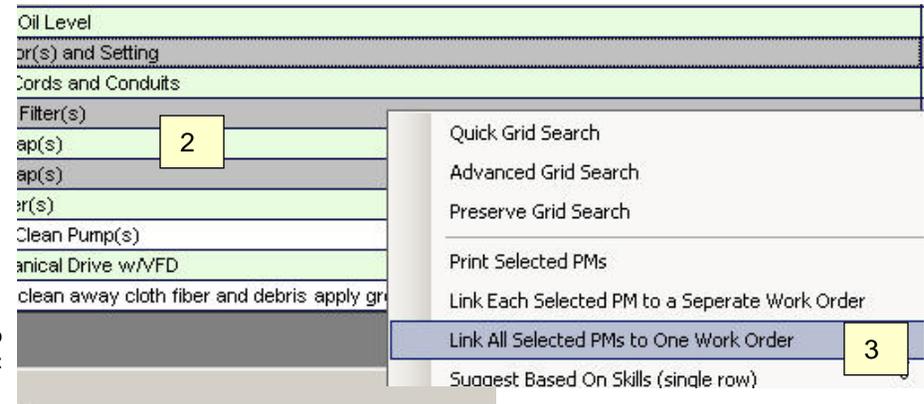
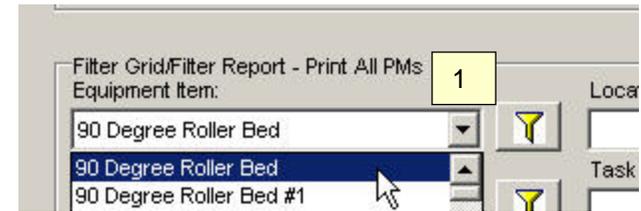
Embedding PM Tasks Into Multiple Work Order's Details

This method of linking creates a separate work order for each PM row selected. Follow the below steps to embed multiple PMs into one work order:

1. From the PM screen select an Equipment filter from the drop-down box labeled: 'Equipment Item' at the bottom of the screen. **NOTE:** when
2. Left-click the rows containing the PM tasks that you want to link. Multi-select by holding the <CTRL> key while left-clicking.
3. After the selected equipment filter has populated the data grid right mouse click on the data grid to display the pop-up menu. Select the menu item **Link Each Selected PM to a Separate Work Order**. The new work order number(s) will be displayed as depicted on the right.
4. Proceed to the work order screen to print and otherwise modify this work order. You may also auto-print this work order by checking the menu item: **File>>Print>>Print Options>>Auto-Print Work Order**.

Closing Linked PMs

To close PMs linked to a work order either close them individually from the PM screen or close the work order and all linked PMs will be closed automatically. Automatically closing PMs does not give you the same abilities as closing PMs from the PM screen however certain options may be set to facilitate various auto-closure parameters as explained on the next page.



To auto-print work orders check this menu item.

Preventive Maintenance (PMs) - PM Linked Work Order Defaults

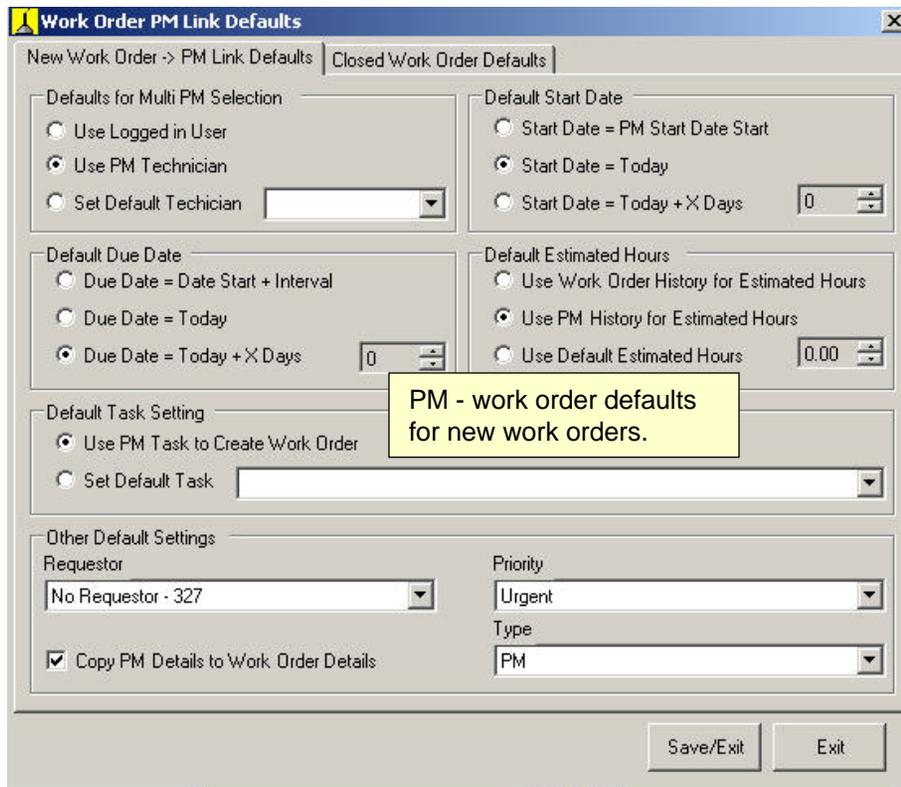
Several default settings may be set by each user for the purpose of populating various fields when linking PMs to work orders. These defaults are available from the PM screen  menu items **Options>>PM->Work Order Link Defaults**. When a new work order is created from linked PMs these defaults are used to create the work order. Similarly when closing a work order that contains linked PM other defaults may be set to record the PM closure.

PM Work Order Link Defaults for New Work Orders

Select the leftmost screen tab from the Work Order PM Defaults screen to set defaults that will be used to create new work orders containing linked PMs. The labels above each possible default setting describes its function.

PM Work Order Link Defaults for Closed Work Orders

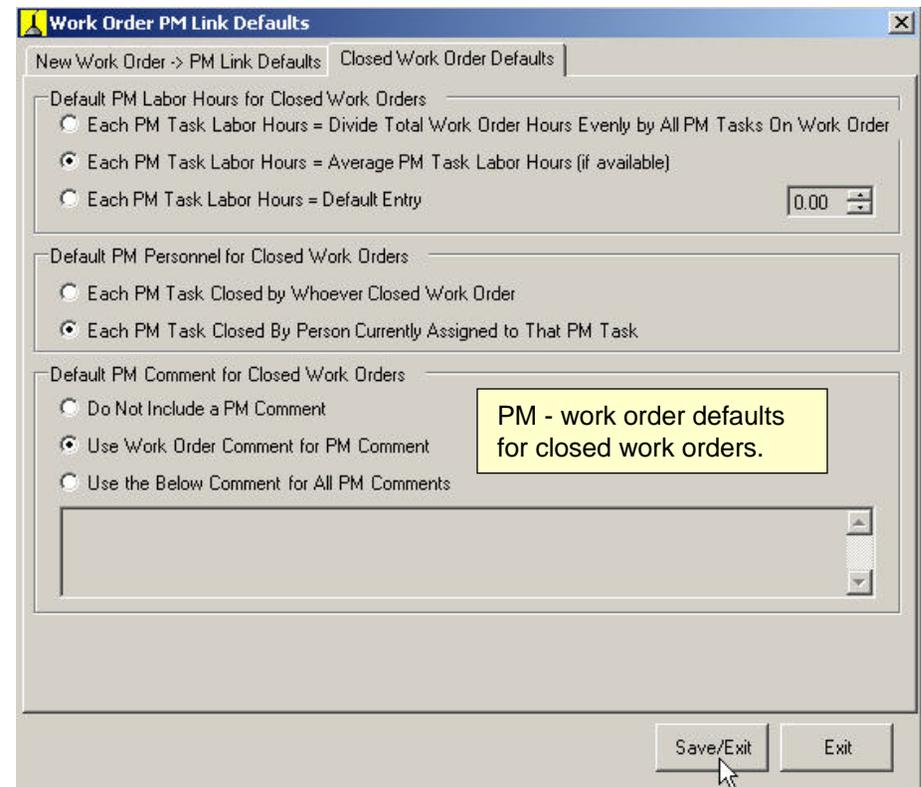
Select the screen tab labeled Closed Work Order Defaults to set defaults for when a PM linked work order is closed from the work order screen. These are defaults that are entered into PM history for closed PMs. These defaults affect PM labor hours, technician that closed PM and any comment that may be included in PM history.



The screenshot shows the 'Work Order PM Link Defaults' dialog box with the 'New Work Order -> PM Link Defaults' tab selected. The dialog is divided into several sections:

- Defaults for Multi PM Selection:** Radio buttons for 'Use Logged in User', 'Use PM Technician' (selected), and 'Set Default Technician' (with a dropdown menu).
- Default Start Date:** Radio buttons for 'Start Date = PM Start Date Start', 'Start Date = Today' (selected), and 'Start Date = Today + X Days' (with a numeric input field set to 0).
- Default Due Date:** Radio buttons for 'Due Date = Date Start + Interval', 'Due Date = Today', and 'Due Date = Today + X Days' (with a numeric input field set to 0).
- Default Estimated Hours:** Radio buttons for 'Use Work Order History for Estimated Hours', 'Use PM History for Estimated Hours' (selected), and 'Use Default Estimated Hours' (with a numeric input field set to 0.00).
- Default Task Setting:** Radio buttons for 'Use PM Task to Create Work Order' (selected) and 'Set Default Task' (with a dropdown menu).
- Other Default Settings:** 'Requestor' dropdown set to 'No Requestor - 327', 'Priority' dropdown set to 'Urgent', 'Type' dropdown set to 'PM', and a checked checkbox for 'Copy PM Details to Work Order Details'.

Buttons at the bottom are 'Save/Exit' and 'Exit'. A yellow callout box points to the 'Use PM Technician' option with the text: "PM - work order defaults for new work orders."



The screenshot shows the 'Work Order PM Link Defaults' dialog box with the 'Closed Work Order Defaults' tab selected. The dialog is divided into several sections:

- Default PM Labor Hours for Closed Work Orders:** Radio buttons for 'Each PM Task Labor Hours = Divide Total Work Order Hours Evenly by All PM Tasks On Work Order', 'Each PM Task Labor Hours = Average PM Task Labor Hours (if available)' (selected), and 'Each PM Task Labor Hours = Default Entry' (with a numeric input field set to 0.00).
- Default PM Personnel for Closed Work Orders:** Radio buttons for 'Each PM Task Closed by Whoever Closed Work Order' and 'Each PM Task Closed By Person Currently Assigned to That PM Task' (selected).
- Default PM Comment for Closed Work Orders:** Radio buttons for 'Do Not Include a PM Comment', 'Use Work Order Comment for PM Comment' (selected), and 'Use the Below Comment for All PM Comments' (with a text area below).

Buttons at the bottom are 'Save/Exit' and 'Exit'. A yellow callout box points to the 'Use Work Order Comment for PM Comment' option with the text: "PM - work order defaults for closed work orders."

Preventive Maintenance (PMs) - Editing Closed PMs

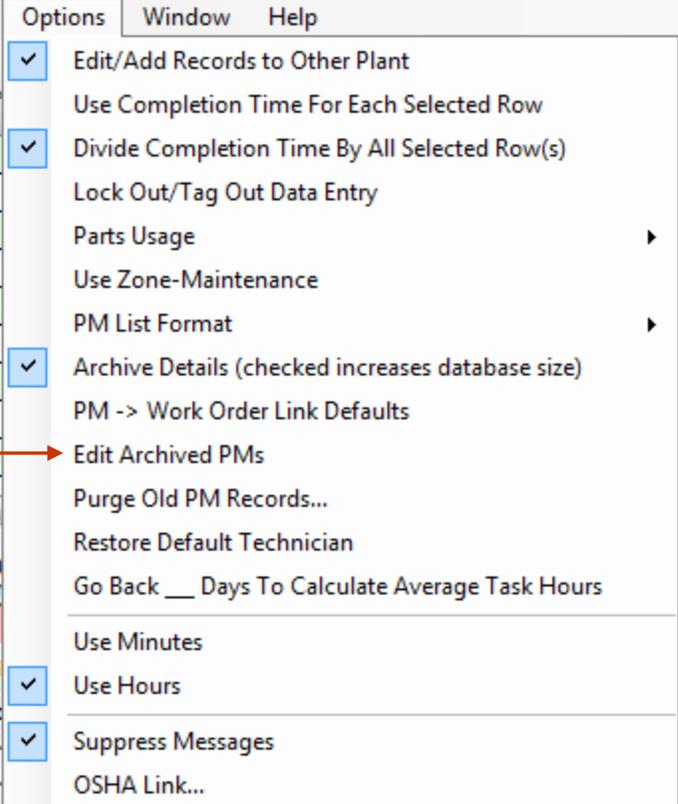
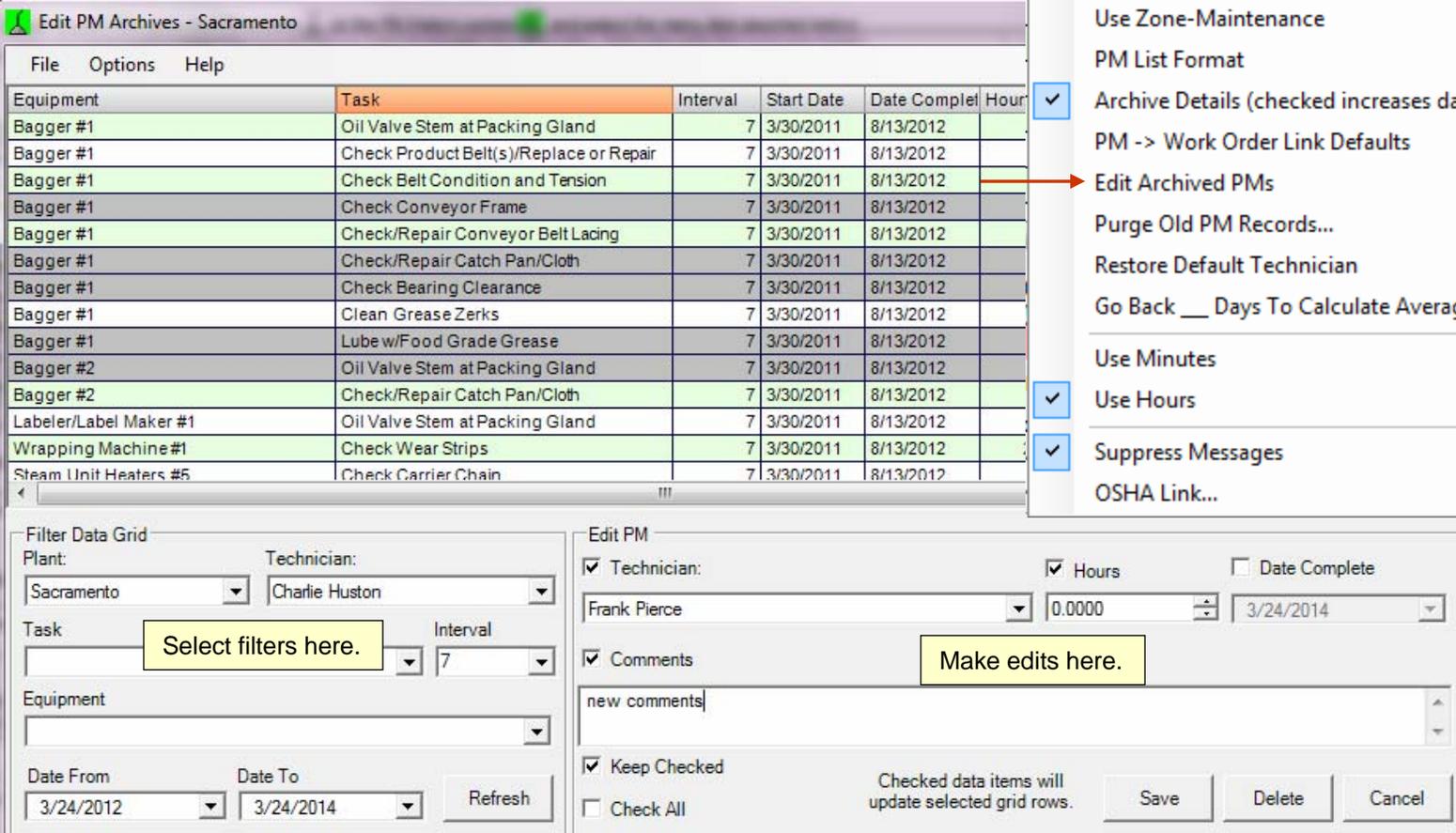
To edit closed PMs go to the PM screen  or the PM History screen  and select the menu item depicted below. Users will need to have Edit PMs permissions in order to access this menu item. When the Edit PM Archives screen opens depending upon user permissions you will either be limited to just PMs for the logged in user or have the ability to select a technician from the **Technician** filter drop-down.

Edit a PM Archive Record

To edit a PM archive record (PM history) follow these steps:

1. Select the desired filter items by checking the corresponding checkbox then selecting a filter(s) from the drop-down(s) (Technician and/or date range) then click the **Refresh Grid** button.
2. Left click the row you want to edit to select that row. Multi-select by holding down the CTRL key and left-clicking the row
3. Make changes in **Technician**, **Date Completed**, **Comments** or **Labor Hours** fields then press **Save**.

NOTE: Care should be taken to avoid editing and creating duplicate PM closure records.

Equipment	Task	Interval	Start Date	Date Complete	Hours
Bagger #1	Oil Valve Stem at Packing Gland	7	3/30/2011	8/13/2012	
Bagger #1	Check Product Belt(s)/Replace or Repair	7	3/30/2011	8/13/2012	
Bagger #1	Check Belt Condition and Tension	7	3/30/2011	8/13/2012	
Bagger #1	Check Conveyor Frame	7	3/30/2011	8/13/2012	
Bagger #1	Check/Repair Conveyor Belt Lacing	7	3/30/2011	8/13/2012	
Bagger #1	Check/Repair Catch Pan/Cloth	7	3/30/2011	8/13/2012	
Bagger #1	Check Bearing Clearance	7	3/30/2011	8/13/2012	
Bagger #1	Clean Grease Zerks	7	3/30/2011	8/13/2012	
Bagger #1	Lubew/Food Grade Grease	7	3/30/2011	8/13/2012	
Bagger #2	Oil Valve Stem at Packing Gland	7	3/30/2011	8/13/2012	
Bagger #2	Check/Repair Catch Pan/Cloth	7	3/30/2011	8/13/2012	
Labeler/Label Maker #1	Oil Valve Stem at Packing Gland	7	3/30/2011	8/13/2012	
Wrapping Machine #1	Check Wear Strips	7	3/30/2011	8/13/2012	
Steam Unit Heaters #5	Check Carrier Chain	7	3/30/2011	8/13/2012	

Preventive Maintenance (PMs) - Printing PM Task Lists

PM List Reports

To work with PM task list validation select from the button bar. You have the option of either a simple grid print report or PM list detail reports. A grid report prints the entire contents of the grid. To print a grid report select **File>>Print>>Grid**. To print PM lists select the menu items **File>>Print>>Assign PM Lists>>[PM list format]**.

Below is a listing of what each PM list report provides.:

PM Lists – by Currently Assigned Personnel

Prints PMs based upon the currently assigned person for each task/equipment designation without regard to work area/technician area.

PM Lists – by Currently Assigned Personnel w/Average Hours

Prints PMs based upon the currently assigned person for each task/equipment designation without regard to work area/technician area. Includes grouping by maintenance technician and equipment item displaying sum of average PM hours for equipment and work area.

PM Lists – Manual Assignment

Selection of equipment items is assigned to whomever is currently displayed in the Completed By: drop-down box regardless of previous assignment or work area assignment. Although the technician name is displayed on the PM task list this technician may not be listed as the assigned maintenance technician in the data records for the PM task list. When the time comes to validate (close) the completed PM task list you may assign the completion to this maintenance technician.

Late PM Lists – Manual Assignment

Same as previous description except only prints PM tasks that are overdue.

PM List By Area

Enter the numeric work area code to print this work area only. No reference is given to the maintenance technician that performs the PMs or is assigned the PMs. The work area description is displayed at the top of the PM list.

Late PM List By Area

Same as previous description except only prints PM tasks that are overdue.

PM List For [work area] (as selected from the Filter Grid/Filter Report Work Area/Location drop-down box)

Prints the grid display without reference to the maintenance technician actually receiving this assignment but rather displays the work area (zone-based maintenance).

PM List For [equipment item] (as selected from the Filter Grid/Filter Report Equipment Item-down box)

Prints the grid view displaying the selected equipment item. Displays the maintenance technician that is listed in the Completed By: drop-down. **Note:** Using the text: "Use Default" or leaving the **Completed By:** box blank results in the generic text: **Assign To:** _____ being printed instead of the maintenance technician's name. This allows you to hand print the maintenance technicians name on the PM task assignment then later validate the completed PMs using this maintenance technician.

PM List for Multiple Equipment Items

Access to this feature is through the button labeled **Multi-Select** near the bottom of the PMs Update screen. Select the equipment from the Multi-Select pop-up screen then press **OK**.

Prints the grid view displaying the selected equipment item. Displays the maintenance technician that is listed in the **Completed By:** drop-down. **Note:** Using the text: "Use Default" or leaving the **Completed By:** box blank results in the generic text: **Assign To:** _____ being printed instead of the maintenance technician's name. This allows you to hand print the maintenance technicians name on the PM task assignment then later validate the completed PMs using this maintenance technician.

Note: **Filter Grid** (pop-up screen) data sets may only be printed as a grid report.

Task	Internal	Start	Due	Aug. Hr.	Hours	Parts Used/Comments																						
David Hackworth						5306																						
001 Yeast Refrigeration Compressor #1		S/N: 657490		Asset: 225																								
Location: Warehouse H		Building: H																										
* 00001 Check and Oil Changes	7	6/13/2013	6/20/2013	0.12	<input type="text"/>																							
Notes:																												
<table border="1"> <thead> <tr> <th>Part Description</th> <th>Part Number</th> <th>Quantity Needed</th> <th>Available</th> <th>Part Locat</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Drive Belt</td> <td>V99</td> <td>3ea</td> <td>2 Low Stock</td> <td>Belt Rack</td> </tr> <tr> <td><input type="checkbox"/> Connecting Rod</td> <td>YY44a</td> <td>3ea</td> <td>5</td> <td>Y64</td> </tr> <tr> <td colspan="2">Total Hours This Equipment Item:</td> <td colspan="5">0.24</td> </tr> </tbody> </table>							Part Description	Part Number	Quantity Needed	Available	Part Locat	<input type="checkbox"/> Drive Belt	V99	3ea	2 Low Stock	Belt Rack	<input type="checkbox"/> Connecting Rod	YY44a	3ea	5	Y64	Total Hours This Equipment Item:		0.24				
Part Description	Part Number	Quantity Needed	Available	Part Locat																								
<input type="checkbox"/> Drive Belt	V99	3ea	2 Low Stock	Belt Rack																								
<input type="checkbox"/> Connecting Rod	YY44a	3ea	5	Y64																								
Total Hours This Equipment Item:		0.24																										
002 Bulk Flour Bin #1		S/N:		Asset:																								
Location:		Building:																										
* 00206 Check Drive Chain Alignment	7	10/7/2012	10/14/2012	<input type="text"/>	<input type="text"/>																							
Notes:																												

Parts listing, stock level and reorder information is also provided with this PM list format.

More Printing and Filtering on Next Page->

Preventive Maintenance (PMs) - Filtering and Printing

- * Contains (text)
- !* NOT Contains (Text)
- ?* Begins With (text)
- *? Ends With (text)
- = Equals (any data type)
- <> NOT Equals (any data type)
- > Greater Than (any data type)
- < Less Than (any data type)
- >= Greater Than or Equal to (any data type)
- <= Less Than or Equal to (any data type)
- (v1,v2,v3... (data IN (any data type)
- (!v1,v2,v3... (data NOT IN (any data type)

Useful Feature (1):
The above filter displays PMs where the equipment is located in the Bulk Ingredients line and the due date (start date + interval) is between 6/28/2003 and 7/28/2003. See caption to right->

Useful Feature (2):
This is the same filter from the left being saved as a menu item. To make this filter more useful **save it with a relative date** instead of a literal date.
Example: suppose "today" is 7/15/2003. This filter shows PMs for the dates included between today-17 days (6/26/2003) to today+13 days (7/28/2003)
You save this filter and check **Use Relative Date**. You come back to use this saved filter on 8/1/2003. The date used by MaintSmart is between 7/14/2003 (today-17 days) and 8/14/2003 (today+14 days).

Saved filter now available for use.

PM assignment menu. These items may change depending on the filters being used for the data grid.

See page 62 for how to print selected PMs.

Preventive Maintenance (PMs) - Filtering and Printing

Printing PM Plan Task List Reports

PM plans are new to MaintSmart 5.0. These PM task groupings provide a way to arbitrarily group PM tasks then quickly print them as needed. To print a PM plan choose the PM plan from the drop-down box at the lower right part of the PMs Update screen. When a PM plan is chosen the data grid immediately displays the PMs in this PM plan. To print these PMs

Technician: [] []

PM Plan: [Tuesday PMs]

Filter by PM Plan.

Equipment List Manually Assign Filtered View

Equipment	Late	Task
B & S Box Maker #1	<input checked="" type="checkbox"/>	Check And Oil Chain
B & S Press #2	<input checked="" type="checkbox"/>	Check And Oil Chain
Bulk Flour Bin #2	<input checked="" type="checkbox"/>	Check And Oil Chain
Bulk Flour Bin #3	<input checked="" type="checkbox"/>	Check And Oil Chain

Validate Selected PM Tasks ~ (4) Records Loaded in (seconds): 0.02

Plant: [Sacramento] Completed By: [Larry Pratts] Completed: [1/12/2017] Hours: [0.00]

File View Filters Options Window Help

Save

Print ▶

Exit

Assign PM Lists ▶

- PM Lists - by Current
- PM Lists - by Current
- PM Lists - Manual As
- Late PM Lists - Manu
- Tuesday PMs

Print the displayed PM plan task list.

Work Orders - Adding New and Editing

Overview of Work Orders

To access the work order data entry screen select  from the button bar. Work orders consist of planned work performed on equipment outside of normal preventive maintenance (PMs). Work orders should not be confused with normal preventive maintenance. Work orders could be large or small projects. They could be a minor or major modification to equipment. A work order could be issued for something as simple as lubricating a drive chain that, for some reason, is not included on a PM list (Basic equipment servicing however should normally be included in a PM list). In short work orders should be issued for any planned work performed on equipment that is not already on a PM list.

Work needed to immediately repair an equipment item failure (downtime instance) for the purpose of restoring the equipment to online condition is not normally a cause to issue a work order. In this case the work description is included in the comments section of the downtime record. The time allotted for repairs in this case is recorded in the 'Time To Repair' box when the downtime instance is recorded. Follow up repairs to a downtime instance may be cause for a work order to be issued.

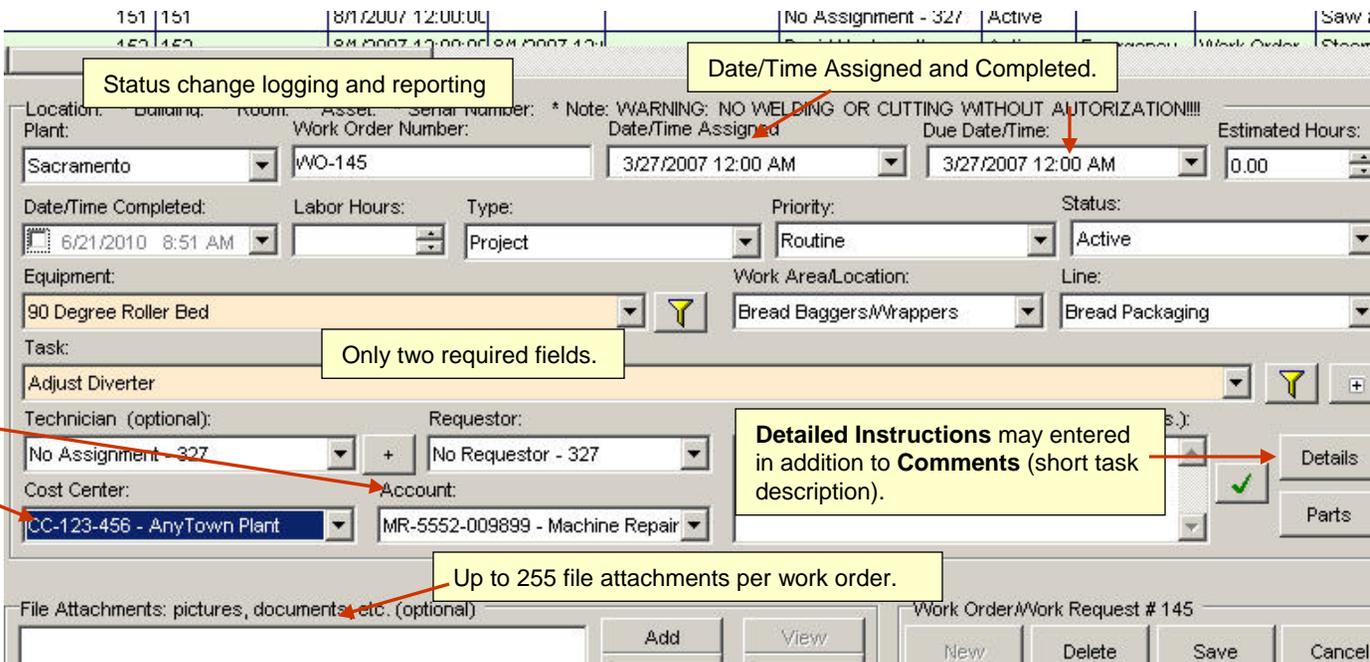
Adding a New Work Order

To access the work order data entry screen select  from the button bar. Follow these steps to create a new work order:

1. Press **New** then enter the work order number (or use auto-increment) date assigned, the technician assigned to, the line where the equipment is located, the technician work area, and the equipment that the work is being performed on.
2. For brief instructions describe the work to be performed in the **Comments** box.
3. To enter detailed instructions for this work order press the button labeled **Detailed Instructions** . Type or copy/paste the instructions into the text box that appears. Press **OK** to keep this text (this does not save the text to work order).
4. Select the work order status (normally 'Active' when first assigned).
5. Select a general task description from the drop-down box labeled **Task**.
6. Press the **Save** button to save the detailed instructions as well as all of the other data you have entered into the work order screen.

Note: unlimited helper technicians may be added to a single work order. MaintSmart tracks all of their hours for you.

Tip: Click the button labeled **Filter** next to the task drop-down box. A menu appears containing all of the task groups. Click on the task group you want to work with and MaintSmart© fills the drop-down box with tasks from that task group only. This really speeds up this process!



The screenshot shows the Work Order data entry screen with several callouts:

- Status change logging and reporting**: Points to the 'Status' dropdown menu.
- Date/Time Assigned and Completed.**: Points to the 'Date/Time Assigned' and 'Date/Time Completed' dropdown menus.
- Link work order to Cost Center and/or account. Force either field and lock if needed.**: Points to the 'Cost Center' and 'Account' dropdown menus.
- Only two required fields.**: Points to the 'Equipment' and 'Task' dropdown menus.
- Detailed Instructions may entered in addition to Comments (short task description).**: Points to the 'Detailed Instructions' button.
- Up to 255 file attachments per work order.**: Points to the 'File Attachments' section.

The form fields include:

- Location: Sacramento
- Work Order Number: WWO-145
- Date/Time Assigned: 3/27/2007 12:00 AM
- Due Date/Time: 3/27/2007 12:00 AM
- Estimated Hours: 0.00
- Date/Time Completed: 6/21/2010 8:51 AM
- Labor Hours: [empty]
- Type: Project
- Priority: Routine
- Status: Active
- Equipment: 90 Degree Roller Bed
- Work Area/Location: Bread Baggers/Wrappers
- Line: Bread Packaging
- Task: Adjust Diverter
- Technician (optional): No Assignment - 327
- Requestor: No Requestor - 327
- Cost Center: CC-123-456 - AnyTown Plant
- Account: MR-5552-009899 - Machine Repair

Work Orders - Adding New and Editing

Editing or Deleting a Work Order

To access the work order data entry screen select  from the button bar. To edit a work order select the work order by left mouse-clicking the grid row that contains the record. Make changes to the record in the boxes below the grid. When finished press **Save** to keep the changes.

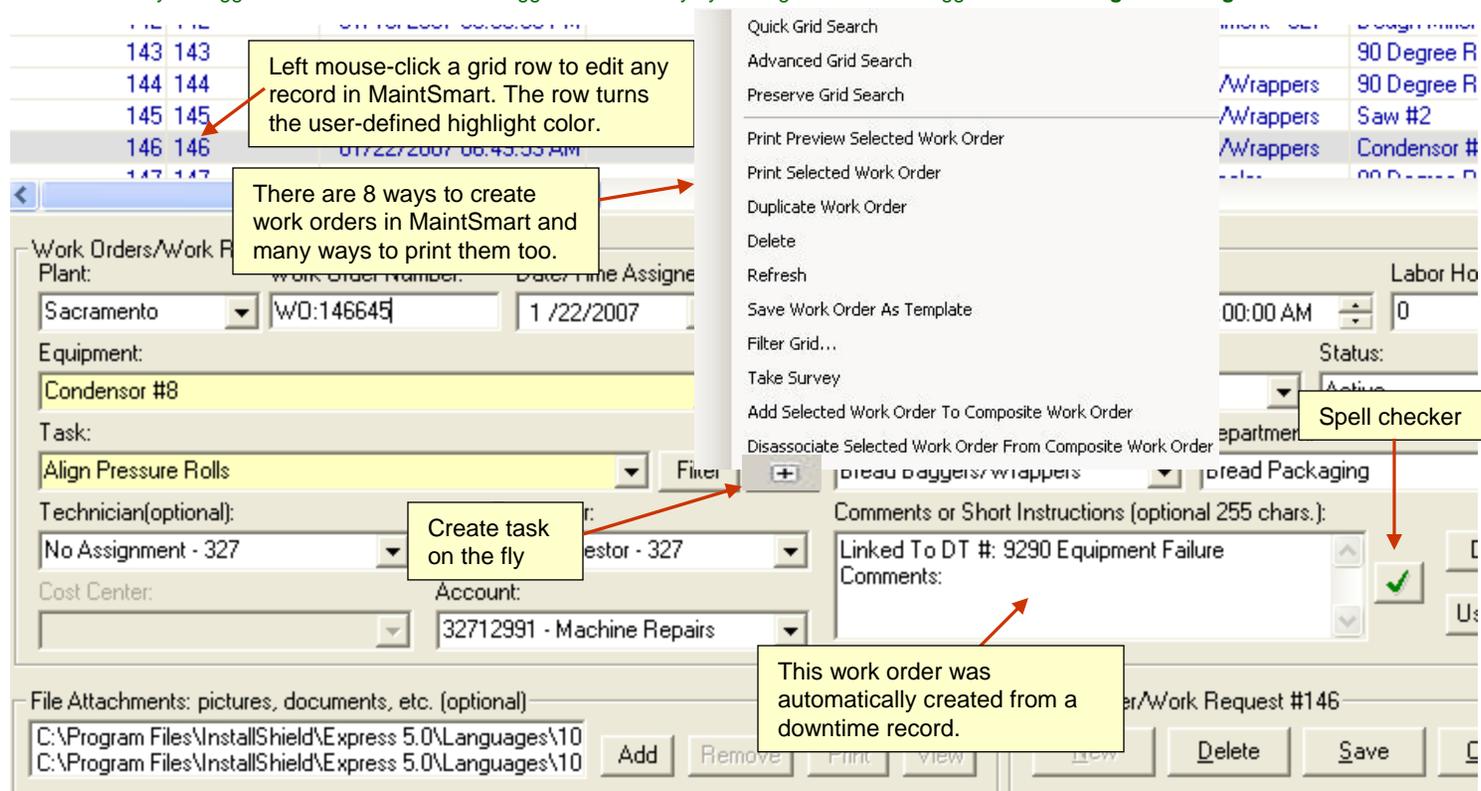
To permanently delete a work order select the work order by left mouse-clicking the grid row that contains the record. Press **Delete**.

Tip: Click the button labeled **Filter** next to the task drop-down box. A menu appears containing all of the task groups. Click on the task group you want to work with and MaintSmart® fills the drop-down box with tasks from that task group only. This really speeds up this process!

Updating the Completion Status of a Work Order

To change the completion status of a work order select the work order by left mouse-clicking the grid row that contains the record. Select the completion status from the drop-down box in the frame labeled Work Order Status. If the status is Done be sure to enter the hours it took to complete the work. When finished press **Save** to keep the changes. To batch update two or more selected work order left-click (while holding down the <CTRL> button) multiple work orders from the grid. In this case only the **Date/Time Completed**, **Hours** and **Status** boxes are available for edits. After making needed selections and entering hours to complete press the **Save** button and all selected work orders are batch updated.

Changes to the work order status may be logged in the work order status logger automatically by turning on the status logger from the **Program Configuration** screen.



The screenshot displays the 'Work Orders/Work Request' form in the MaintSmart software. A grid at the top shows several work order records. A context menu is open over the grid, listing actions such as 'Quick Grid Search', 'Advanced Grid Search', 'Print Selected Work Order', and 'Delete'. A callout box points to a grid row, stating: 'Left mouse-click a grid row to edit any record in MaintSmart. The row turns the user-defined highlight color.' Another callout points to the 'Filter' button next to the task dropdown, stating: 'There are 8 ways to create work orders in MaintSmart and many ways to print them too.' A third callout points to the 'Filter' button, stating: 'Create task on the fly'. A fourth callout points to the 'Comments' field, stating: 'This work order was automatically created from a downtime record.' A fifth callout points to a green checkmark icon in the 'Status' dropdown area, stating: 'Spell checker'. The form fields include: Plant: Sacramento; Work Order Number: WD:146645; Date/Time Assigned: 1/22/2007; Equipment: Condensor #8; Task: Align Pressure Rolls; Technician: No Assignment - 327; Cost Center: 32712991 - Machine Repairs; and Comments: Linked To DT #: 9290 Equipment Failure. The bottom of the screen shows buttons for 'Add', 'Remove', 'Print', 'View', 'Delete', and 'Save'.

Work Orders - Adding New and Editing Comments

Editing or Deleting a Work Order

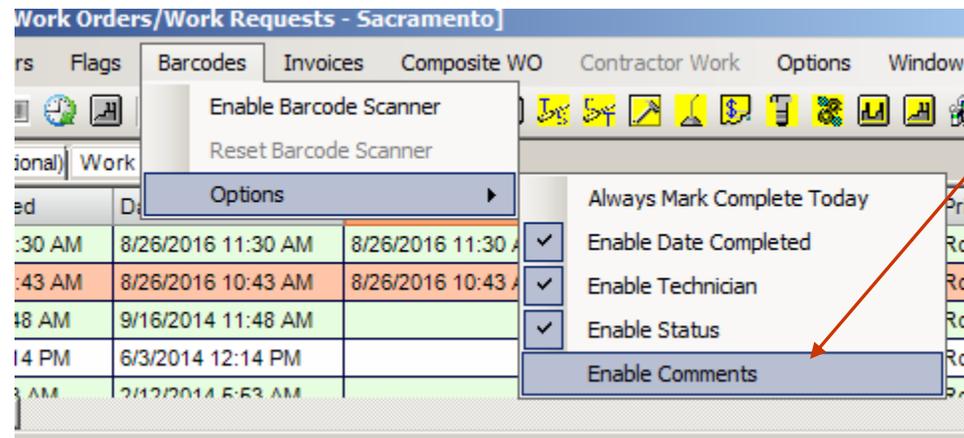
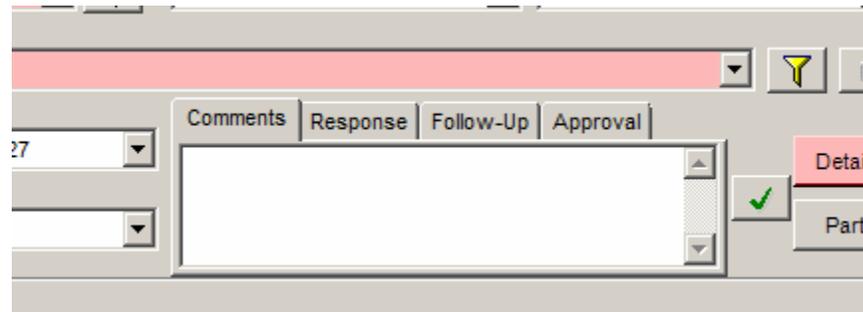
There are four (4) comment fields available for each work order as follows:

Comments: this is typically used for comments on the task assignment and how to perform the task. If more than 255 characters are needed then use the Details button for up to 2 GB of text.

Response: this is typically used for a response on how the job progressed or completion comments.

Follow-Up: this is field could be used for follow-up comments by either the technician or the requestor or both. Alternatively the requester can use the Customer Satisfaction Survey to post satisfaction level. This module requires a small amount of configuration by the Administrator.

Approval: approval comments are used if work order approval is required. This is set-up by the Administrator under **Program Configuration**, menus: **View>>Approval Level Configuration...**



Enable Comments editing when scanning work order barcodes by checking this menu item. This is a user setting.

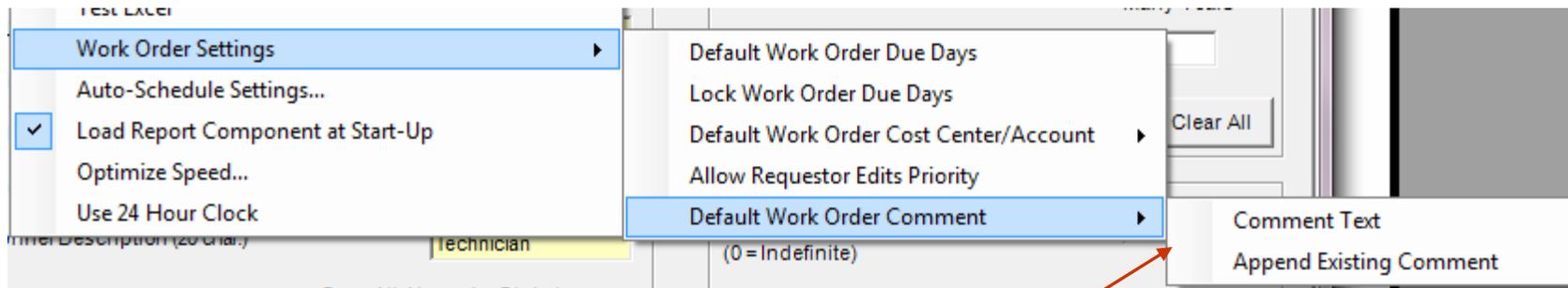
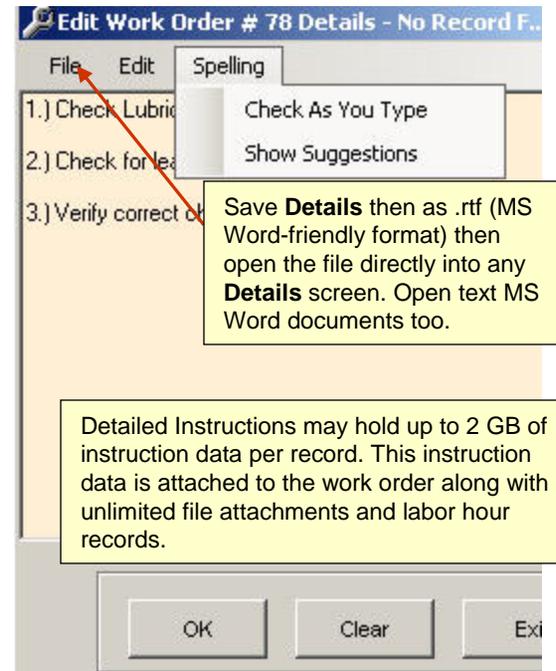
Work Orders - Detailed Instructions and Default Comments

Detailed Instructions

Select a record from the grid by left mouse-clicking it. Next press the **Detailed Instructions** button. When the detail screen appears enter the instructions (type or cut/paste) into the white area of the screen. Press **OK** to temporarily store the text. Be certain to press the **Save** button on the Work Order screen to save the detail text to the database. This saves the instructions with this work order and writes them to the database. Include hyperlinks to web pages if needed too.

To edit or delete detailed instructions:

1. Select the record from the PM list or work order grid by left mouse-clicking the grid row containing the record in question.
2. Press the button labeled **Detailed Instructions** to display the details screen.
3. Select all of the text in the details screen by holding the left mouse button down and dragging the mouse from top to bottom.
4. Press the **<Delete>** key to delete all of the text or type over text, add text, delete only a portion of the text as needed to edit the details.
5. Spell checker is also available.



Work Orders – Simple Input View

What is Simple Input View for Work Orders and Work Requests?

Beginning in MaintSmart 5.0 a simple input view for work orders and work requests is available. This screen display uses the same work order data table but only displays fields necessary to input the simplest of work orders or work requests (repair tickets). This view may be toggled on and off from either the Program Configuration or from the work order screen itself and is a user setting. As such the program knows the preference of the logged in user and displays the proper work order view accordingly. This module was added so that inexperienced users could enter a repair ticket or work order very little or no training on the software. Defaults may be set/user so that opening this screen populates all fields except the comments field. By doing so the inexperienced user can simply type in the comments for the needed work, leaving the details of task and equipment selection to the maintenance manager.

Configuring Simple Input View

Simple Input View for work orders may be toggled on or off by each user from the work order screen by right-clicking the grid area to display the context menu then checking the menu item: **Simple Input View**. Alternatively the Administrator may set Simple Input View for users from the **Program Configuration screen >> Passwords** (screen tab). Select the grid row containing the user then check the checkbox at the bottom of the screen that is labeled **Simple Work Order Input**. Click the Save button.

Using Simple Input View

To use simple input work order click the **New** button (if it is enabled) then select the needed data from the drop-down boxes on the screen. The **New** button is automatically clicked for the user when the screen is opened making it even simpler to create a work order or repair ticket. Additionally defaults may be saved by each user so that the required fields (**Equipment** and **Task**) may auto-populate. The **Priority** field may also be set for a default. To set defaults for these fields select the data item needed for the default then click the button adjacent to that field that is labeled **My Default**. After the New button is clicked then select an Equipment and a Task. In most cases the Priority and the Comments fields would also be populated, however both of these fields are optional. Click the Save button to save this new work order or repair ticket.

TIP: For requesters or others that may not know which specific **Equipment** or **Task** to select the following example may be useful:

Create a dummy **Equipment** item called ****See Comments**** and a dummy **Task** called ****See Comments****. Set these data items as the defaults for the corresponding **Equipment** and **Task** drop-downs by selecting the items from the drop-down then clicking the **My Default** button. Thereafter any time a user opens the work order screen in simple input mode or clicks the **New** button in simple input mode these items will auto-populate these drop-down boxes. Please note that these defaults are not the same as the same field defaults that may be set from the full work order screen view **Defaults** screen.

Work Order ID	Work Order #	Date Assigned	Date Due	Date Completed	Technician	Status	Priority
309	309	1/13/2017 3:25 PM	1/20/2017 3:25 PM		Charlie Huston	Request	Routine
308	308	8/26/2016 11:30 AM	8/26/2016 11:30 AM	8/26/2016 11:30 AM	Charlie Huston	Done	Routine
307	307	8/26/2016 10:43 AM	8/26/2016 10:43 AM	8/26/2016 10:43 AM	Larry Pratts	Done	Routine

Submit a Repair Ticket or Work Order

Select Equipment

**** See Comments ****

Select Task

**** See Comments ****

Select Priority

Routine

Needed By

01/16/2017 09:01:16 Need Now

Description of Problem

Set User Defaults.

By setting defaults the user can log into this screen and simply type their own description of the needed work.

Sets Date Due Field to Now.

Work Orders - Contractor Work

Contractor Work Orders

Contractor work orders are used for work performed by outside help. Create contractor (outside labor) work orders from the MaintSmart work orders screen then add these work orders to a P.O. with or without other purchased items.

To add a new a contractor work order follow these steps:

1. Open the work order data entry screen.
2. Check the menu items: Contractor Work>>Create Contractor Work Orders.
3. Create the work order as you would any other work order except that now the Technician drop-down becomes the Contractor drop-down and the Hours box becomes the Estimated Cost box.
4. Complete a contractor work order as you would any other work order.

To edit or delete a contractor work order follow these steps:

1. Select the contractor work order from the work order grid with a left mouse-click.
2. Press Delete button or edit the work order as needed in the boxes below the grid.

Note: MaintSmart detects what type of work order you clicked in the grid so there is no need to check the contractor work order menu item.



Creating a contractor work is the same as a normal in-house work order except that a vendor replaces the technician and the estimated cost of the job replaced the labor hours..

A screenshot of the Contractor Work Order data entry screen. The form contains the following fields:

- Plant: Sacramento
- Work Order Number: 211
- Date/Time Assigned: 6/24/2010 11:59 AM
- Due Date/Time: 6/25/2010 11:59
- Date/Time Completed: 6/24/2010 11:58 AM
- Estimated Cost: (empty)
- Type: (empty)
- Priority: (empty)
- Equipment: 90 Degree Roller Bed #10
- Work Area/Location: Air Compressor Room
- Task: Calibrate T/C
- Contractor/Vendor: Bolts Unlimited, Ltd. (selected from a list including Delta Rubber, Freddie Vendor, Graingers Supply, and McMaster Carr)
- Requestor: No Requestor - 327
- Account: (empty)
- Comments or Short Instructions (optional): (empty)

Red arrows point to the Estimated Cost field, the Contractor/Vendor dropdown, and the Task field.

Work Orders - Adding Extra Labor (helpers)

Work Order Labor Hours- An Overview

MaintSmart provides a way for you to add multiple technicians to one work order with or without one “**lead technician**”. When a work order is created adding an technician to the work order from the work order screen is optional. If an technician is added to the work order from the main work order screen (1st tab) this technician is considered the “lead technician”.

Other technicians may be added to the work order in one of two different ways. These additional technicians are termed “**helper technicians**”. Enter these helper technicians from the 2nd tab on the work order screen labeled: Work Order Labor Hours. Their time is tracked (start time-end time) each time they work on this work order. Their hours for each job instance is either calculated by MaintSmart from the start/end time/date or you may enter the hours manually and MaintSmart will guess at the actual start and/or end time/date.

Alternatively create a work order from the 1st tab, save this new work order then left mouse-click the work order in the grid to select it. Press the “+” button next to the **Technician Name** drop-down to add (whoever is displayed in the drop-down) this technician to the work order as a helper. MaintSmart creates a record on the 2nd tab using the current time as the start time.

Helper technicians may be added at any time to an existing work order. There is no limit to the amount of helpers that may be added to a work order. The same technician may be added countless times for each time they work on this work order. MaintSmart continues to track and accumulate their time indefinitely. MaintSmart reports on this job time with a detail report.

Adding A Work Order Labor Hours Record

Note: the work order labor hours grid is unique in MaintSmart in that it is edited directly. Records are added or edited then the entire grid is saved all at once by pressing the **Save** button. Other grids in MaintSmart are not editable and generally save only one record each time the **Save** button is pressed.

There are three ways to add a new work order labors hours record as described below:

Option 1:

1. Create a work order from the 1st tab on the work order screen.
2. Save the work order.
3. Select the new work order by left mouse-clicking the grid row containing the work order.
4. Select an technician from the **Technician** name dropdown below the grid on the 1st work order screen tab.
5. After selecting a technician press the button labeled: +.

6. The technician displayed in the drop-down is added to the selected work order with a start time equal to the current time/date.

Option 2:

1. Select the 2nd tab on the work orders screen (**Labor Hours**).
2. Press the **New** button.
3. Select a work order from the labor hours grid’s 1st column by left-mouse clicking the grid cell of the colored row and selecting the work order number from the drop-down that appears from the grid cell.
4. Select an technician from the labor hours grid’s 2nd column by left-mouse clicking the grid cell of the colored row and selecting an technician name from the drop-down that appears from the grid cell.
5. Check the checkbox in the grid’s 3rd column (start timing). The current date/time should automatically appear in column 4. If it doesn’t you may manually enter the current date/time or better yet select the proper date/time from the date/time selectors below the grid labeled **Work Order Start Date/Time** then press the **Apply** button. If you are just beginning work on this work order you should save this work order at this time by pressing the Save button. Later when you finish working on this work order for the day you can select this work order’s job history from this same grid by checking the checkbox labeled with this work order number from the list box below the grid. Next simply enter the end date/time or enter the length of time in hours or fractions of hours (in decimal) and MaintSmart calculates the correct end date/time.

Option 3:

By selecting (checking) the menu items **Options Defaults-Labor Hours>>Insert New Labor Hours Record When New Work Order Is Created** MaintSmart creates a labor hours record for you that contains the lead technician and the current time as the start time.

Important Note: Always remember to press the **Save** button after creating new (or editing existing) work order labor hour records. MaintSmart save the entire labor hours grid each time it saves.

Work Order Number	Engineer	Start Timing	Start Date/Time	Stop Timing	Stop Date/Time	Duration (hours)	Comm
280	David Hackworth	<input checked="" type="checkbox"/>	1/13/2012 09:19:37	<input checked="" type="checkbox"/>	1/13/2012 09:21:11	0.0333333351	
280	David Hackworth	<input checked="" type="checkbox"/>	1/13/2012 09:20:39	<input checked="" type="checkbox"/>	1/13/2012 09:22:25	0.0333333351	
280	David Hackworth	<input checked="" type="checkbox"/>	1/13/2012 09:20:41				351

Work Order Details
 Work Order Start: 1/13/2012 09:20:41 [Apply]
 Work Order Stop Date/Time (check when done): 01/13/2012 09:22 AM [Apply]
 Data From () Days Back: 365

Warranty: WOV# 280 - Air Compressor #10 - Check And Oil Chain

Work Orders - Adding Extra Labor (helpers)

6/24/2010 12:55 PM

Insert Start Time As Current Time For New Records
 Insert New Labor Hours Record When New Work Order Is Created
 Auto-Load Work Order List On Tab-Click

- Parts Usage ▶
- Defaults ▶
- Defaults-Labor Hours ▶**
- Work Order Numbering ▶
- Work Order Format ▶

Some useful work order labor hours defaults..

Work Order Number	Engineer	Start Timing	Start Date/Time	Stop Timing	S
23	Nick Dixon	<input checked="" type="checkbox"/>	6/24/2010 3:00 AM	<input type="checkbox"/>	
23	Ken Wrigl	<input checked="" type="checkbox"/>	6/24/2010 12:55 PM	<input type="checkbox"/>	

Ken Wright
 Larry Pratts
 Nick Dixon
No Assignment - 327

Check "Start Timing".

Select technician from grid cell drop-down..

Typing the hours directly into the Duration cell causes the date/time to adjust automatically..

Work Order Number	Engineer	Start Timing	Start Date/Time	Stop Timing	Stop Date/Time	Duration (hours)	Comments	Refer
23	Nick Dixon	<input checked="" type="checkbox"/>	6/24/2010 3:00 AM	<input type="checkbox"/>				
23	Ken Wright	<input checked="" type="checkbox"/>	6/24/2010 12:55 PM	<input checked="" type="checkbox"/>	6/24/2010 7:13 PM	6.3		

Click **Apply** (if associated selector is available) to set to current date/time.

Work Order Details (editable grid)

Work Order Start Date/Time: 6/24/2010 12:55 PM

Work Order Stop Date/Time (check when done): 06/24/2010 07:13 PM

Notice both sets of date/time selectors are enabled because **Start Timing** and **Stop Timing** checkboxes are checked in the grid..

Work Orders - Adding Extra Labor (helpers)

Editing A Work Order Labor Hours Record

In many cases you'll need to enter the **stop date/time** into an existing work order labor hours record. To edit a record follow these steps:

1. Check the appropriate checkbox in the list box below the grid to load the job associated with this work order into the grid.
2. Once the jobs have been loaded into the grid left mouse-click the one you want to edit to highlight/select it. If you are simply updating the end date/time you may check the checkbox in the **Stop Timing** column. The current date/time is entered for you. To change this to a different date keep the checkbox checked to enable the date/time selectors below the grid. Select the date and time then press **Apply**. Change other grid fields (columns) as needed. Press the **Save** button to save all grid changes at once.

Note: The first two columns of the grid contain drop-downs with valid data. If a work order is just created it may not appear automatically in the drop-down. In this case you can reload the grid drop-down by pressing the button below the grid labeled: **Refresh WO List**. Another way of accomplishing this is to check the menu item **Options Defaults-Labor Hours>>Insert New Labor Hours Record When New Work Order Is Created**.

Note: grid cells that turn green when selected are editable grid cells. To delete labor hour comments select the grid row then right mouse-click and select **Delete Comments**.

Note: green cells are editable by typing directly into the selected cell. Typing in the date/time will not reflect the actual duration (hours) until the **Save** button has been pressed.

Deleting A Work Order Labor Hours Record

To delete a work order labor hours record follow these steps:

1. Check the appropriate checkbox in the list box below the grid to load the job associated with this work order into the grid. Once the jobs have been loaded into the grid left mouse-click the one you want to delete to highlight it.
2. Press the **Delete** button. The record is immediately and permanently deleted.

Note: if you add a labor hours record by pressing the Add button and then decide to cancel by pressing the **Cancel** button before saving this record maintSmart prompts you to remove the new row .

6. The technician displayed in the drop-down is added to the selected work order with a start time equal to the current time/date.

Option 2:

1. Select the 2nd tab on the work orders screen (**Labor Hours**).

2. Press the **New** button.

3. Select a work order from the labor hours grid's 1st column by left-mouse clicking the grid cell of the colored row and selecting the work order number from the drop-down that appears from the grid cell.

4. Select an technician from the labor hours grid's 2nd column by left-mouse clicking the grid cell of the colored row and selecting a technician name from the drop-down that appears from the grid cell.

5. Check the checkbox in the grid's 3rd column (start timing). The current date/time should automatically appear in column 4. If it doesn't you may manually enter the current date/time or better yet select the proper date/time from the date/time selectors below the grid labeled **Work Order Start Date/Time** then press the **Apply** button. If you are just beginning work on this work order you should save this work order at this time by pressing the Save button. Later when you finish working on this work order for the day you can select this work order's job history from this same grid by checking the checkbox labeled with this work order number from the list box below the grid. Next simply enter the end date/time or enter the length of time in hours or fractions of hours (in decimal) and MaintSmart calculates the correct end date/time.

Option 3:

By selecting (checking) the menu items **Options Defaults-Labor Hours>>Insert New Labor Hours Record When New Work Order Is Created** MaintSmart creates a labor hours record for you that contains the lead technician and the current time as the start time.

Important Note: Always remember to press the **Save** button after creating new (or editing existing) work order labor hour records. MaintSmart save the entire labor hours grid each time it saves.

Work Order Number	Engineer	Start Timing	Start Date/Time	Stop Timing	Stop Date
23	Nick Dixon	<input checked="" type="checkbox"/>	6/24/2010 3:00 AM	<input type="checkbox"/>	
23	Ken Wright	<input checked="" type="checkbox"/>	6/24/2010 12:55 PM	<input checked="" type="checkbox"/>	6/24/2010

Work Order Start Date/Time: 6/24/2010 12:55 PM [Apply]

- WO#:WO-109929 - Yeast Refrigeration Compressor #1 - Set Knife Clearance
- WO#:WO-109934 - 90 Degree Roller Bed #1 - Check and Lubricate Bearings
- WO#:72 - Oven Burner Control/Oven Extension #2 - Check Drive Chain Alignment
- WO#:73 - Dough Mixer #1 - Check Dump Mechanism

[Refresh WO List] [Load/Refresh]

Continued Next On Page ->

Work Orders - Approving Work

Overview of Approving Work

Work may be approved by one or more approvers. These approvers are configured in the Program Configuration screen. Requirements for work final approval are also set in the Program Configuration screen. Once a work order has met the approval requirements and approved by the designated count and levels of qualified approvers the work order will be considered Approved.

Individual approvers may at anytime withdraw their own approval but not the approval of another user.

Adding an Approval's to Work

To approve a work order perform the following steps:

- 1.) Left-click the grid row containing the work order to be approved. You may also hold the CTRL key and left-click multiple rows to approve multiple work orders at the same time.
- 2.) Click the  button (for one work order) or the  button to approve multiple work orders at the same time. Please note that although you can approve many work orders at the same time you must unapprove work order one at a time.

Un-Approval's Previously Approved Work

To un-approve a work order perform the following steps:

- 1.) Left-click the grid row containing the work order to be approved. You may also hold the CTRL key and left-click multiple rows to approve multiple work orders at the same time.
- 2.) Click the  button. Remember you can only un-approve work that you previously approved.

Printing Approval Reports

To print an approval report select the following menu items from the Work Order screen: **File>>Print>>Report>>Work Order Approvals>>????**

Date Due	Date Completed	Technician	Status	Priority	Type
2/5/2013 11:10 AM	1/29/2013 11:11 AM	David Hackworth	Done	Emergency	Work Order
2/5/2013 8:56 AM	1/29/2013 11:49 AM	No Assignment - 327	Done	Routine	Follow Up
2/5/2013 8:55 AM		Red Crew	Active		
8/5/2010 8:30 AM		No Assignment - 327	Active		

Order Number: Date/Time Assigned: 1/29/2013 8:56 AM Due Date/Time: 2/ 5/2013 8:56 AM Estimated Hours: 0.00

Hours: Type: Follow Up Priority: Routine Status: Done

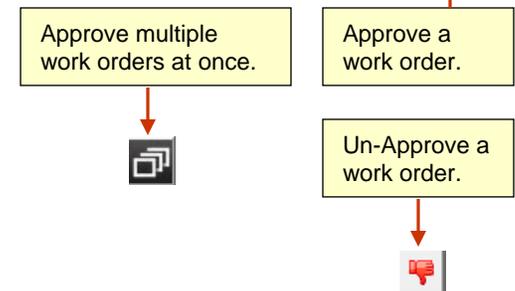
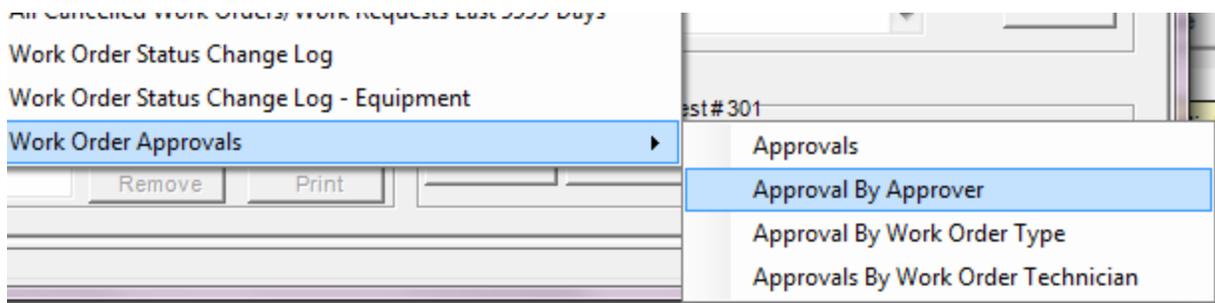
Work Area/Location: No Area Assignment - 327 Line: Bread Prod.

Requestor: No Requestor - 327 Account:

Comments Response Follow-Up Approval

Buttons: +, -, Details, Parts

etc. (optional) pdf d2.jp Add Remove View Print New Delete Save Cancel  



Continued Next On Page ->

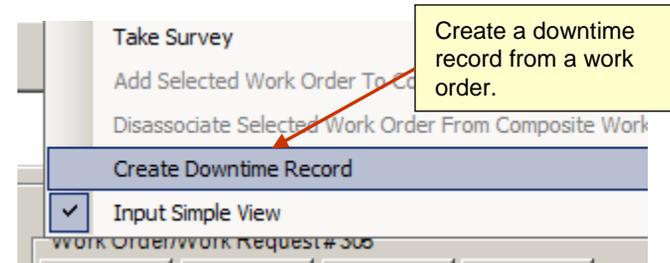
Work Orders – Create a Downtime Record from an Existing Work Order

Creating A Downtime Record from a Work Order

A work order may be used to create a new downtime record. Follow these steps to create a new downtime record from an existing work order:

1. Open the work order screen then select the work order from the data grid.
2. Right-click to display the context menu.
3. Choose: **Create Downtime Record** from the context menu.
4. Populate the required fields on the resulting dialog screen that appears.
5. Click the **Save** button on the dialog screen to save the new downtime record.

This new downtime record is available from the **Downtime** screen for additional editing as needed.



A screenshot of the 'Create Downtime Record' dialog box. The dialog has a 'File' menu and an 'Options' tab. A yellow callout box with an arrow pointing to the 'Save As Defaults' button in the 'Options' tab contains the text: 'Save the current selections as defaults if needed.' The main form contains the following fields:

- Cause of Break Down:** A dropdown menu with 'Ac/dc Drive Fail/malfunction' selected.
- Operator Shift:** A dropdown menu with '2' selected.
- Engineer Shift:** A dropdown menu with 'Graveyard' selected.
- # of Engineers:** A spinner box with '1' selected.
- Down Time Type:** A dropdown menu with 'Break Down' selected.
- Down Time Severity:** A dropdown menu with '2' selected.
- Comments (255 characters max., optional):** A text area containing 'Drive control needs calibration.'
- Enter Minutes of Down Time (optional, recommended):** A sub-section with three spinner boxes: 'Time Down' (20), 'Repair Time' (5), and 'Impact' (0).

At the bottom right, there are three buttons: 'Save', 'Cancel', and 'Use Defaults' (with an unchecked checkbox).

Work Order Templates

Overview of Work Order Templates

Work order templates provide a way to create work orders with very little effort. Work order templates may be linked to inventory spare parts too. Part-linked work order templates use appropriate parts (if available) when they are created. Work order templates may also be linked to meters. When the meter expires the appropriate work order is created from the work order template.

Creating Work Order Templates

To create a work order template follow these steps:

1. Create a work order.
2. Select the work order you just created in the grid by left mouse-clicking.
3. Select the menu items **Templates>>Save Work Order As Template**.
4. When the **New Work Order Template** screen appears enter a user-friendly name in the box.
5. Press the **OK** button to save the template.

Creating a Work Order From a Work Order Template

To manually create a work order from a template follow these steps:

1. Select the menu items **Templates>>Create Work Order From Template**.
2. When the Work Order Templates screen appears check the templates you want to use.
3. Press the **Create WO** button.

Note: Work order templates that are linked to parts will immediately use the linked parts from inventory. You may temporarily disable part links by checking the menu items **Options>>Temporarily Disable Part Linking**.

Managing Work Order Templates

From the work order data entry screen select the menu items **Templates>>Manage Work Order Templates....** When the work order template screen appears you may edit existing templates by selecting the grid row containing the template you wish to edit or delete. Once selected the boxes and buttons below the grid becomes enabled. Make the needed changes in the boxes then press **Save** or **Delete** to permanently delete the template. You may add/edit/delete file attachments and Details to an existing work order template from this screen

Note: deleting a work order template also deletes and part links or meters associated with the template but has no effect on work orders created from this template.

You may change some of the Work Order Template field data items from the **Manage Work Order Templates...** menu item.

MaintSmart provides a default work order template name (when the template is first created from an existing work order) that consists of the equipment item and task description. You may enter any text that makes it easy for you to identify the template.

Part #	Part Desc.	Unit Cost	Quantity Needed	Quantity Used	Quantity Shk
WW-004	Filter Element	\$20.00	3	0	
WW-004	Filter Element	\$20.10	0	0	
WW-004	Filter Element	\$20.05	0	0	
88-UU	Bearing	\$78.45	5	1	

Partial view of **Parts Usage** List generated when a part-linked work order template was created. MaintSmart looked for Filter Elements at all the various acquisition prices and found none (hence the red highlighted rows). The bearing 88-UU was available though and was automatically used from stock. This list may be printed or save as a file from the **File** menu.

Metered Work Order Templates

Metered Work Orders

There are a couple of ways to create metered work orders. From the **Program Configuration** screen check the checkbox labeled **Check For Expired Meters...** (depicted on the right). With the meter scanner running MaintSmart automatically checks for expired meters based upon the **Meter Scan Rate** setting. If it finds one or more expired work orders MaintSmart automatically generates new work orders from these expired meters/work order templates.

The other way to create metered work orders is to select the menu items **Meters>>Create Selected Metered Work Orders**. This provides a way for you to manually check for, then create metered work orders. Press the button labeled **Create WOs** to create all expired metered work orders in one step. **Note:** the metered work order pop-up screen displays all work order template/meter combinations that are linked to expired meters. In the case where more than one meter has expired on the same work order MaintSmart un-check the checkbox for all instances in which a duplicate work order may be created. It's recommended that you accept the default checked work order templates and simply press the button labeled **Create WOs**.

Other settings that may be useful if creating metered work orders are as follows:

1. **Options>>Parts Usage>>?** Depending upon your selection you may instruct MaintSmart to automatically use linked parts (if any) from inventory when the work order is created.
2. From the **Program Configuration** screen check the checkbox labeled **Auto-Print Work Orders Created From Expired Meters** (depicted on the right). All expired meters linked to work order templates will generate a new work order then either print preview or send the new work order directly to the printer.

Meter options available from the Meters screen

1. Create meter units from the **Options>>Meter Units** menu items. Press the **New** button, enter the unit description then press **Save**. To edit a unit description left mouse-click the grid row containing the record you want to edit. Next change the unit description in the box labeled **Meter Unit Description**. Press **Save**.
2. Edit work order templates by selecting the menu items **Options>>Manage Work Order Templates...**

Expired Meter Scan Settings Are Set From the Program Configuration Screen Appendix D -

Expired Meter Scan Settings (pages 196-198)

Configuration Configuration - More Us

Work Order, Auto-Print Scanner and Report Properties

Always Print Scheduled Print Jobs Regardless Of Logged On User

Only Print Scheduled Print Jobs Linked To Logged On User

Disable All Scheduled Print Jobs

Check For Expired Meters. Automatically Create Work Orders From Expired Meters

Auto-Print Work Orders Created From Expired Meters Help

Automatically Refresh Date Meters

Automatically Refresh OPC Meter Links Ignore Value If = 0

Meter Scan Rate (min.): Schedule Scan Rate (min.):

How To Use Parts For Metered Work Orders:

Report Format For Metered Work Orders:

Print Attachments

Cost Center/Account Assignment Settings for All Work Orders:

Log Work Order Status Changes

Show Currency Value(s) for Work Order and PM Part Lists

Work Order Part(s) Usage Links

Inventory Part Linking – An Overview

MaintSmart provides a simple way to link needed inventory parts to work order templates and PM task/equipment combinations. With part linking you set the parts needed and the quantities of each. When the linked work order template is *created* the linked parts are used from inventory. Linked PM task/equipment combinations work slightly differently in that the parts are actually used from inventory when the PM is *marked completed*.

When part linking is activated either (through work order creation or PM task completion) a small grid appears displaying the linked parts. In the case where needed parts were not available the grid row containing the shortage appears with a red background. Several options are available for printing this linked parts grid.

Three part linking options are available for linked work orders and PMs as follows:

1. **Always Create Work Order** (regardless of part availability)
2. **Create Work Order If All Parts Are Available**.
3. **Deactivate Parts Usage Linking**.

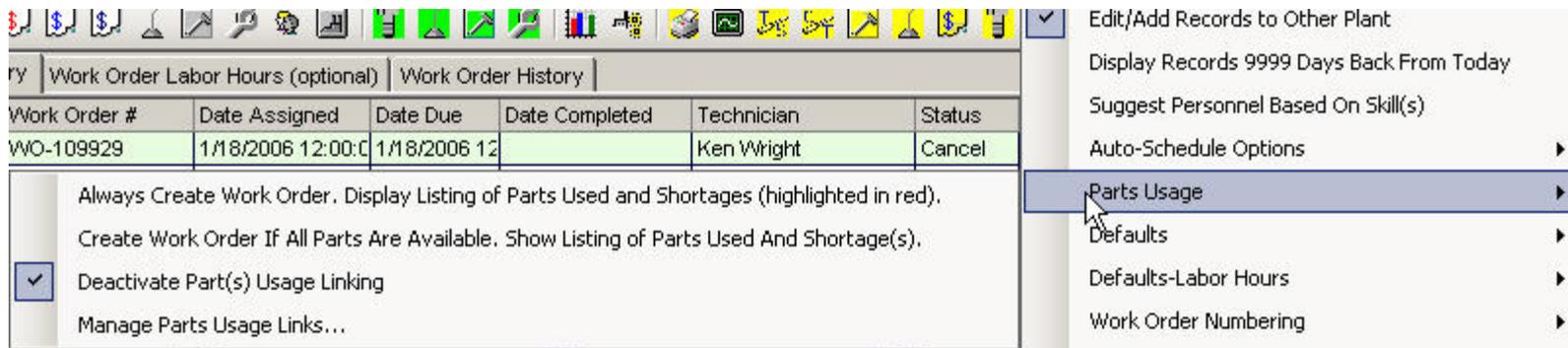
Linking Parts To Work Orders

To link parts to a work order template select from the work orders data entry screen the menu items **Options>>Parts Usage>>Manage Parts Usage Links...** When the **Associate Parts Usage With Work Order Templates and PMs** screen appears follow these steps:

1. Press the **New** button.
2. Select the **Cost Center** and the **Account** from the appropriate drop-down boxes.
3. Select the work order template that you want to link the parts to from the drop-down box labeled: **Work Order Template**. **Note:** parts will be used and linked to the actual work order created from this work order template
4. From the **Filter Parts:** drop-down select the **Part Group** containing the part you want to link.
5. From the **Part Used** drop-down select the part you want to link to this work order template.
6. Select the **Item Type**. Only valid choices are presented in this drop-down.
7. Enter the **Quantity** of this part that will be used each time a work order is created from this template.
8. Make sure the check box labeled **Auto-Use** is checked (this activates this record) then press **Save**.

This part(s) is now linked to the selected work order template. Anytime a work order is created (either manually or by means of an expired meter) from this template MaintSmart will automatically use these parts. Used parts records created by this means contain all of the same information contained in used inventory records that are created manually.

Also see the section regarding **Managing Part Links** found in the **Inventory** section of this user guide.



Work order part linking options

Work Orders - Setting Default Data

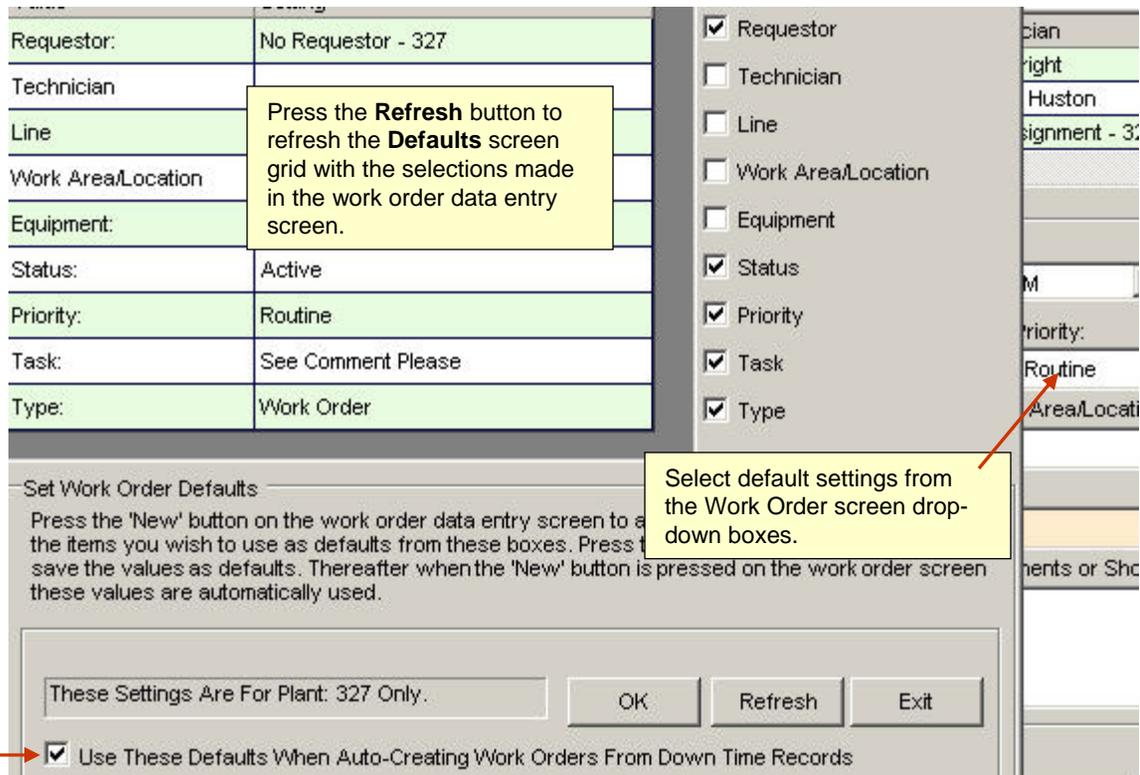
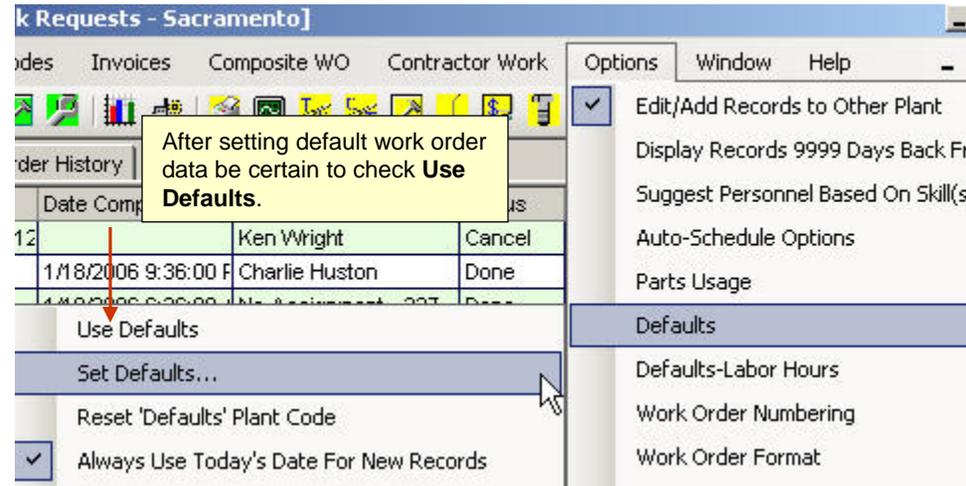
Work Order Defaults (For Full Work Order Screen Not Simple View)

You may select default data for up to 8 of the 12 needed data entry fields for work orders as follows:

1. From the work order data entry screen select the menu items **Options>>Defaults>>Set Defaults**.
2. When the **Set Work Order Defaults** screen appears press the New button on the **Work Order** data entry screen to activate the drop-down boxes on the **Work Order** data entry screen.
3. Make the defaults selections from the **Work Order** data entry screen drop-down boxes.
4. When you have the defaults selected from the **Work Order** data entry screen press the button labeled **Refresh** from the **Set Work Order Defaults** screen.
5. Press **OK** to save these values as default values for all new work orders.

After setting defaults and checking the menu item **Use Defaults** MaintSmart automatically enters these values for you whenever you create a new work order.

Note: These values are only useable when working within the same top-level entity as they were created from. In some cases default data values may be deleted from the database with the default setting(s) still in effect. If this occurs you may simply open the **Set Work Order Defaults** screen again then uncheck the data value pressing **OK** when finished. MaintSmart also provides a utility for this purpose. This utility is available from the **Set Work Order Defaults** menu items **Options>Check Validity**. MaintSmart checks the validity of your default settings then deletes them if they are invalid.



Check this checkbox before saving defaults to use these same defaults for auto-create work order from downtime..

Select default settings from the Work Order screen drop-down boxes.

Work Orders - Report Formats

Work Order Formats

You may select the desired work order format by selecting the following menu items from the work order data entry screen **Options>>Work Order Format**. There are two different work order formats to choose from as follows:

- 1. Work Order w/Detailed Instructions:** This format does not provide detailed instructions however if the instructions are less than 255 characters (**Short Instructions**) in length this would be the best format to choose. Recent downtime records associated with this equipment item are displayed for informational purposes along with the work order.
- 2. Work Order w/Recent downtime:** This work order format displays the detailed instructions (unlimited length) but does not display recent downtime records.

This text may be edited in the **Program Configuration** screen.

Tastee Baking Company

Work Order: WO-109929(23)



Printed By:	Christian Thomas	Print Date:	6/24/2010
Priority:	Emergency		
Type:	Work Order		
Status:	Cancel		

Requested By:	Tom Jardine	Requestor Phone:	555-1213 ext 3398
Requestor Office:	Wrapping		

Date Assigned:	1/18/2006 12:00:00AM	Estimated Hours:	0.00
Date Due:	1/18/2006 12:00:00AM		
Technician:	Ken Wright		

Equipment: Yeast Refrigeration Compressor #1



Plant	Sacramento (327)		
Line:	Bulk Ingredients		
Work Area/Location :	No Area Assignment - 327		
Location:	Roof	Asset Number:	21347
Building:	A	Serial Number:	6734569379
Equipment Info:			

Task: Set Knife Clearance

Instructions:
Set knife clearance to manufacturer's specification.

*Use Safety Equipment
Do Not Bypass Safeties
Do Not Operate Equipment Without Guards in Place
Use Proper Lock-Out/Tag-Out*

Set Knife Clearance:

- Set to D025
- Tighten lock nuts.
- Spray with silicone mold release.

SAFETY FIRST:
One key to successful ergonomic efforts is management support to lead the efforts.

Work Order with Detailed Instructions.

Work Order Number:	Date/Time Assigned	Due Date/Time	Work Order Numbering
Work Order w/Parts Used			Work Order Format
<input checked="" type="checkbox"/> Work Order w/Details and Parts			OSHA Link...
Classic Formats			Lock Out/Tag Out Data Entry...
Use Multi- Technician Assignment Format When Applicable (detail formats only)			Requestors...
Print Separate Parts List When Applicable			Priority States...

Work Orders - Assigning Work Orders

Assigning Work Orders

To access the work order data entry screen select  from the button bar. There are three ways to assign work orders:

1. Select the work order by left mouse-clicking the grid row that contains the record. Select the menu items **File>>Print>>Report>>Assign Current Work Order**. This method assigns the selected work order only.
2. You may assign all active work orders at once by selecting the menu items **File>>Print>>Report>>Assign All Active Work Orders**.
3. You may assign multiple work orders by left mouse-clicking the grid row that contains the work order while holding down the **<Ctrl>** key. This method does not function with the detailed instructions work order format selected.

When the print preview screen appears use the arrow buttons at the top of the screen to navigate from page to page.

The print preview screen for work orders is split into two sections. The section on the left shows a summary of the available work orders. By clicking any of these work orders the screen focus jumps to that work order. This provides a simple and fast way to get to the work order that interest you without manually searching page by page (applies only in case of multiple work orders being assigned at one time). Another useful search lets you type in a word or phrase to locate the word or phrase. To access this feature type in the word or phrase in the text box at the top of the print preview screen. Press **F3** to start the search. Each time you press the search button the screen focus jumps to the next instance of the search word or phrase. The work order may be changed by another user while you are viewing it. To see the most recent changes in the data press **F5**. This refreshes the work order(s) with the most up to date information. The contents of the print preview screen may be sent to a printer or saved in numerous data formats. The contents may also be emailed from the print preview screen.

Convert all work requests to active work orders with one mouse-click. (except with Detail formats).

Export work order to: email, file or printer(s).

Select a specific work order by clicking the work order number on the left side of the screen.

Tastee Baking Company
Work Order: 72 (72)

Printed By: Christian Thomas Print Date:

Priority:

Type:

Status: Done

Requested By: No Requestor- 327 Requestor Ph

Date Assigned: 1/18/2006 12:00:00AM Estimated Ho

Date Due:

Technician: No Assignment- 327

Equipment: Oven Burner Control/Oven Extension #2

Plant: Sacramento (327)

Line: Roll Print

Work Orders - Updating the Completion Status and More

Updating the Completion Status of Work Orders

To access the work order data entry screen select  from the button bar. To change the completion status of a work order select the work order by left mouse-clicking the grid row that contains the record. Select the completion status from the drop-down box in the frame labeled **Work Order Status**. If the status is **Done** be sure to enter the hours it took to complete the work. When finished press **Save** to keep the changes.

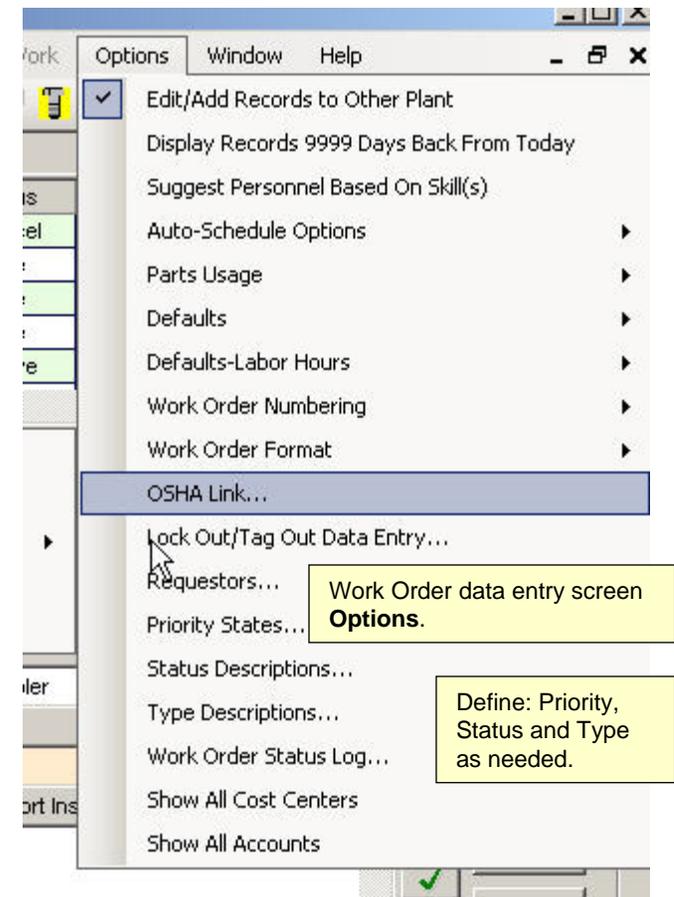
More Options

You may enter work order completion duration (**Minutes to Complete**) as either minutes or hours. Place a checkmark next to the menu option you prefer as illustrated below. You may even change the time format in the middle of entering a record. MaintSmart stores all time data as hours or fractions thereof.

Check the menu item **Print Work Order After Save** to automatically display the print preview screen whenever the Save button is clicked.

Batch Updating Work Order Completion Status

To batch update two or more selected work order left-click (while holding down the <CTRL> button) multiple work orders from the grid. In this case only the **Date Completed**, **Hours** and **Status** boxes are available for edits. After making needed selections and entering hours to complete press the **Save** button and all selected work orders are batch updated.



Work Orders - Flags

Work Order Flags

Work order flags provide a way for you to quickly identify aged work orders in the work order data grid. To use this feature select from the work order data entry screen the menu items **Flags>>Flag Text Color**. When the color dialog box appears select the font color you want to use for aged work orders. Default is red. Be certain to use a color that contrasts well with grid back-color, row selection color and font color settings. This setting determines what the **Due Date** of the work order is by default. The **Due Date** may be changed manually though at any time.

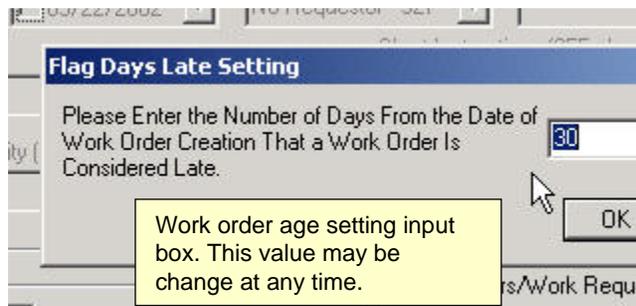
Next select the menu items **Flags>>Flag Days Late**. Enter a number between 1-1800. This number represents the amount of days from the date of work order creation that flagging will occur.

Example: if today is 12/20/2002 and the **Flag Days Late** setting is set to 7 any *uncompleted* work orders created on or before 12/13/2002 will display with flagged text color.

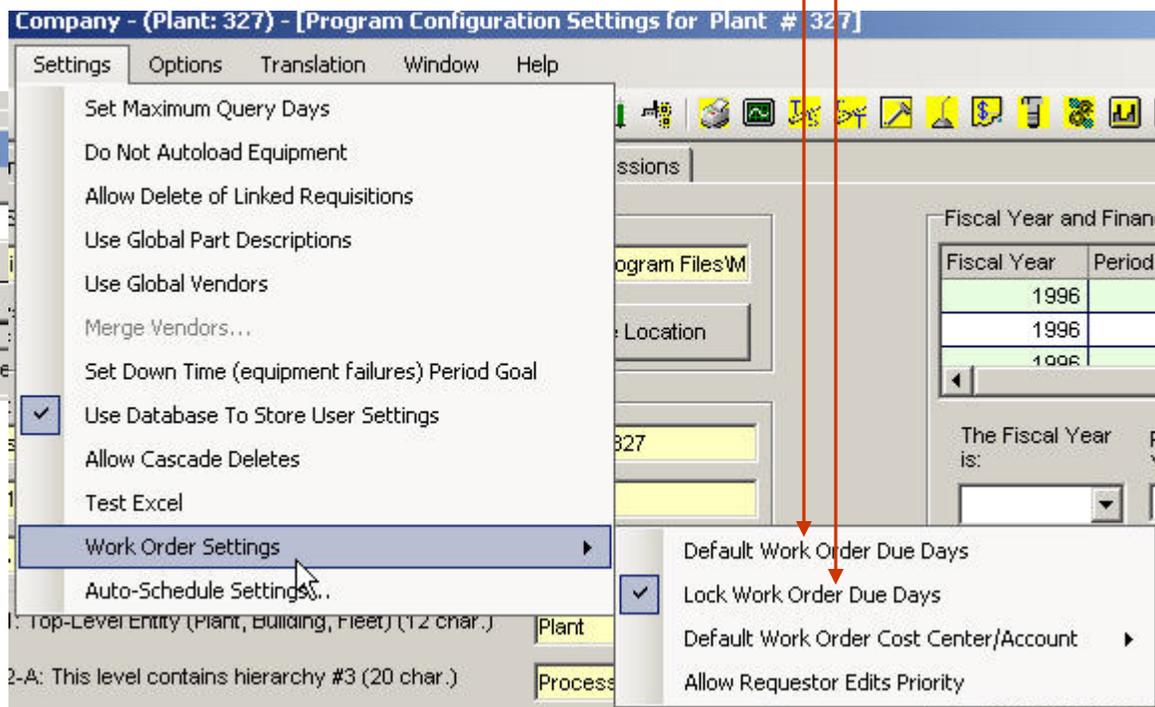


After setting work order flag settings be sure to check **Activate Flags**.

Work order due days may be set from the **Program Configuration** screen and locked.



Work order age setting input box. This value may be change at any time.



Work Orders - Working With Requestors



Overview of Requestors

A requestor is the person that requests work to be performed. Typically the requestor would be an individual that is not a member of the maintenance staff. **Requestors should be created from the Program Configuration screen whenever possible.** The best way to accomplish this is to create the requestor while you are creating a user name/password combination for a **Request Only** user. By doing so you create a user name/password linkage to the **Requestor** automatically. This is useful because typically you'd want a **Requestor** to only have **Request Only** permissions anyway. Follow these steps to create a **Request Only** user and a **Requestor**. The important distinction to make here is that a **Requestor** is a data item that may be linked to a work request (work order with a request status) and a **Request Only** user is a log in type. These two data items are NOT one in the same but should be linked together in almost all instances. When using a requestor for the purpose this requestor may use the customer satisfaction survey.

Requestors may be added, edited or deleted. Changes to existing requestors automatically affect all work requests/orders that reference the requestor.

Adding, Editing or Deleting Requestors

To use a requestor on a work request/order select from the button bar to enter the work order data entry screen. While entering work order/request data in the boxes below the grid select **New Requestor...** from the drop-down box or select the menu items **Options>>Requestors**. This selection brings up another screen that allows you to add, edit or delete requestors. To work with an existing requestor name left mouse-click the requestor in the grid. Edit this requestor information in the boxes below the grid then click the **Save** button. Click the **Delete** button to permanently delete this requestor.

Editing a requestor causes the requestor changes to be updated in all work orders or requests containing this requestor. Deleting a requestor changes the requestor to the default "No Requestor" text for this top-level entity.

Requestors may be simply deactivated instead of deleted by unchecking the **Active** checkbox.

Note: When using a requestor for the purpose of using the customer satisfaction survey you must first link the requestor name to a user ID from the Requestors configuration screen.

1 : create new user name with Request Only permissions

Work Order Requestors

File Help

Requestor	Office	Phone	Plant ID	Email
Ben Sanderson	765	888-9997	Sacramento	feedback@mair
Barney Dobson				
Daniel Cook				
Ben Sanderson				

3 : Create actual requestor. Note User ID drop-down box contains the log in for the Request Only user being created. This links the user log in to the actual requestor.

Request Only user name is derived from Display Name used during User Name/Password creation.

2 : Accept option (Yes) to create actual requestor and link new requestor to the new Request Only log in being created at the same time.

Work Orders - File Attachments and Working With Priority States

Adding, Editing or Deleting Work Order Priority States

MaintSmart lets you define work order priority states that best suit your maintenance operation. Examples might be Normal, Urgent, Emergency, Safety or Routine. To add, edit or delete a work order priority state select from the button bar to enter the work order data entry screen. Select the menu items **Options>>Priority States**. This selection brings up another screen that allows you to add, edit or delete priority states. To work with an existing priority state left mouse-click the priority state in the grid. You may also choose a priority color and link work order priorities to email priority. Edit this priority state in the boxes below the grid then click the **Save** button. Click the **Delete** button to permanently delete this priority state.

Note: Editing a priority state causes the priority state changes to be updated in all work orders or requests containing this priority state. Deleting a priority state permanently deletes the priority state from all referenced work order/requests. Priority is an optional work order field.

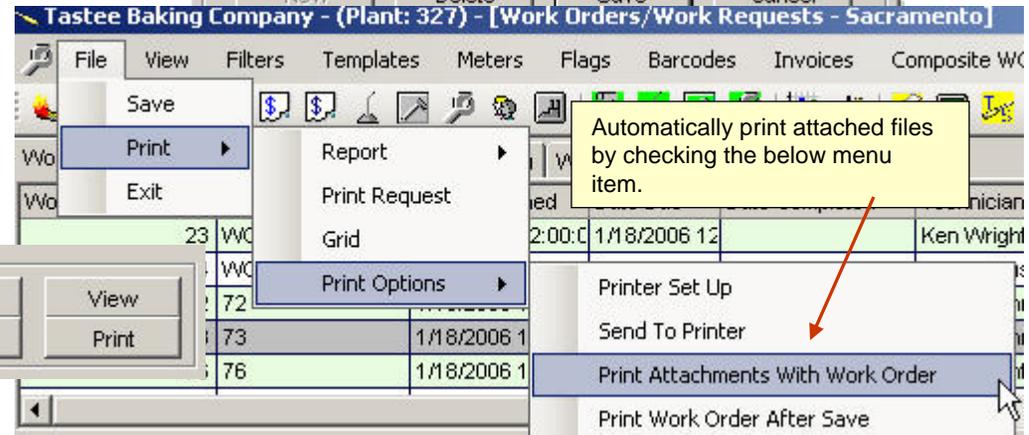
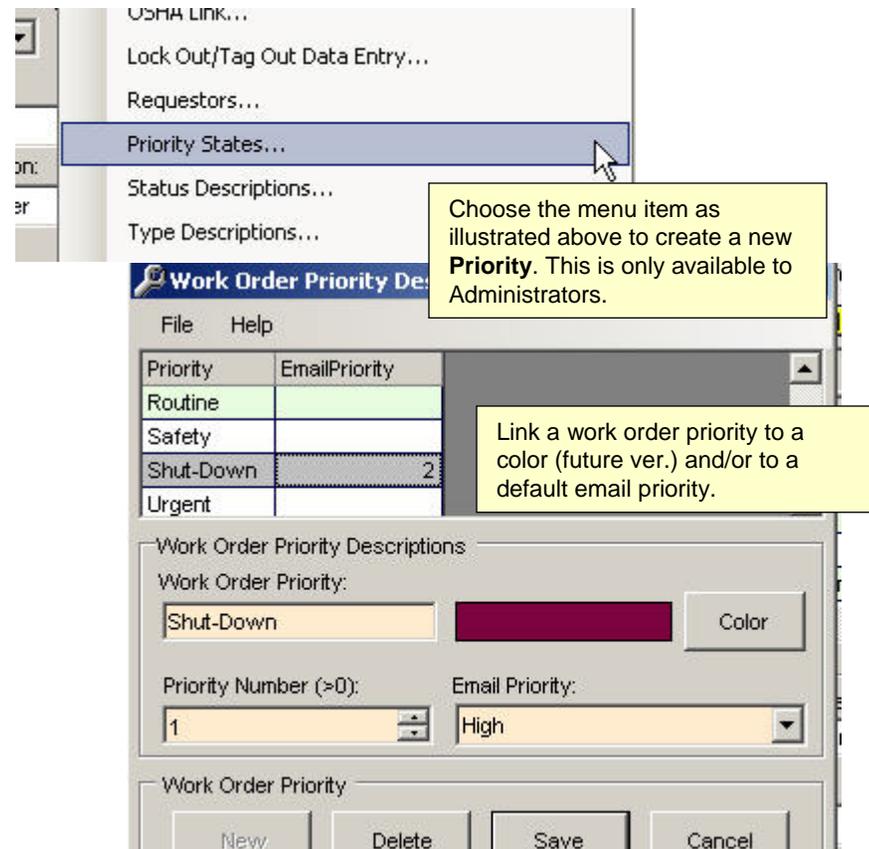
Work Orders - File Attachments

Attaching Files to a Work Order

MaintSmart lets you attach files to a work order. This feature is useful when you want to reference a CAD drawing, Word document, HTML file or any other file to a work order. Begin by an existing work order from a grid row. The **Add** button becomes enabled. Click the **Add** button to locate files to attach. Attach as many files as you want. The only limitation is the file path must be 255 characters or less each.

To remove an attached file select the grid row containing the work order you want to work with. If there are attachments they'll appear in the **File Attachments** box. Select the attachment you want to remove by left mouse-clicking it. Press the **Remove** button. Press the **Save** button (work order). Attachments may be manually or automatically printed with the attached work order.

NOTE: A program that can open the file type of the attached work order must exist on the computer running MaintSmart. Example: ".doc" extension would require MS Word.



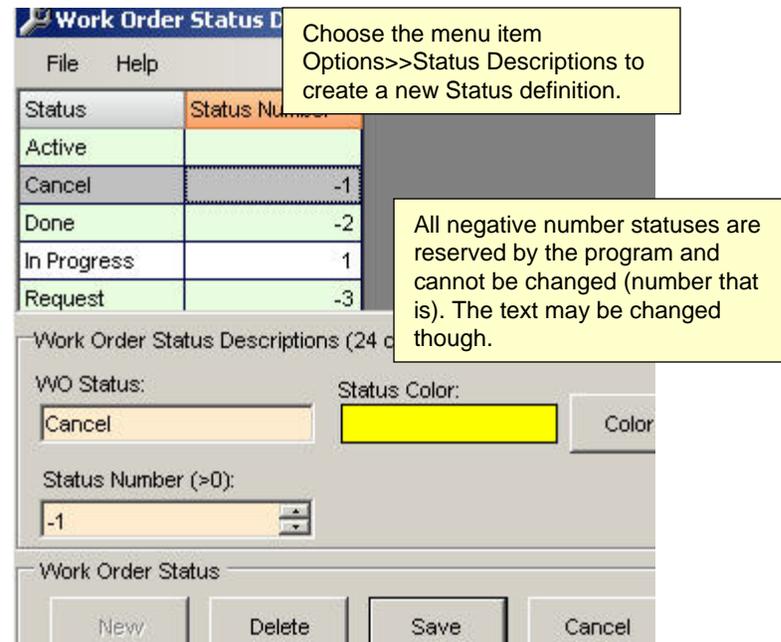
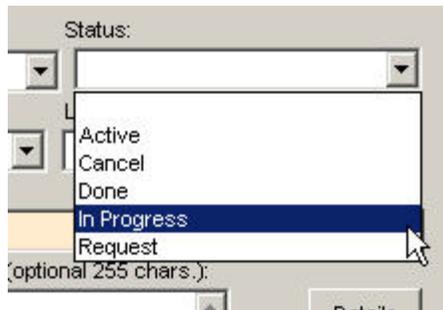
Work Orders - Working With Status Descriptions

Adding, Editing or Deleting Work Order Status Descriptions

MaintSmart lets you define work order status descriptions that best suit your maintenance operation. Examples might be Parts Ordered, Approval Pending. Etc. To add, edit or delete a work order status description select  from the button bar to enter the work order data entry screen. Select the menu items **Options>>Status Descriptions**. This selection brings up another screen that allows you to add, edit or delete status descriptions. To work with an existing status description left mouse-click the status description in the grid. Edit this status description in the boxes below the grid then click the **Save** button. Click the **Delete** button to permanently delete this status description.

Link a color to a status (future version use) and a status number. Please note that the numbers 0 and below are reserved and cannot be changed. However the linked text to these reserved status numbers can be changed (example: 'Done' -> 'Completed').

Note: Editing a status description causes the status description changes to be updated in all work orders or requests containing this status description. Deleting a status description permanently deletes the status description from all referenced work order/requests. **Status** is an optional work order field.



Work Orders - Customer Satisfaction Survey Configuration

Customer Satisfaction Survey Overview

Customer satisfaction surveys provide a way for work requestors to give feedback to the maintenance line regarding work completed that was originally requested by the logged in requestor. You may configure unlimited questions and ratings for this survey.

The sequence of events that lead to the taking of a survey are as follows:

1. Requestor enters a work request.
2. Maintenance manager converts request to actual work order.
3. Work order is completed and updated in maintSmart.
4. Requestor logs into MaintSmart and sees his work order completed.
5. Requestor selects the grid row containing the work order (left-click).
6. Requestor right-clicks selected row the clicks Take Survey menu item for pop-up menu.
7. Requestor takes survey. Results are available to authorized users.

Configuring the Customer Satisfaction Survey

Configuration of the customer satisfaction survey consists of two parts: Questions and Ratings. To configure the survey go to the Program Configuration  screen and select the menu items **View>>Configure Customer Satisfaction Survey**.

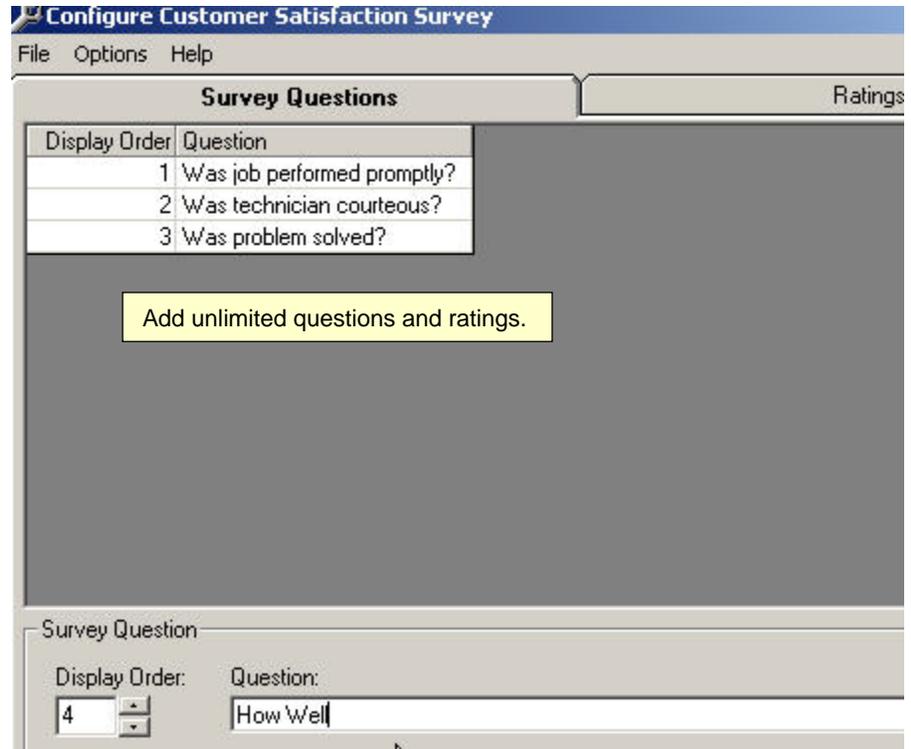
Follow these steps to create a new survey question:

1. Select the first tab labeled **Survey Questions**.
2. Press the **New** button on this screen then enter the desired text of the question (Example: Was job performed promptly?).
3. Enter the order of the question (the order it appear in the survey).
4. Press **Save**.

Follow these steps to create a new survey rating:

1. Select the first tab labeled **Ratings**.
2. Press the **New** button on this screen then enter the desired text of the rating (Example: Excellent, Very Good, Good, Average, etc.).
3. Enter the rating score (Example: 1,2,3,4...).
4. Press **Save**.

Edit or delete a survey question or rating by selecting the grid containing the question then changing the text of the question or deleting it.



Display Order	Question
1	Was job performed promptly?
2	Was technician courteous?
3	Was problem solved?

Add unlimited questions and ratings.

Survey Question

Display Order:

Question:

Work Orders - Using Customer Satisfaction Survey

Using the Customer Satisfaction Survey (step-by-step)

See the manual topic 'Work Orders - Working With Requestors' for a detailed explanation of how to link requestors to Request Only user log- ins. (Skip Steps 1-2 below if applicable)

Step 1: Create User ID

To use the customer satisfaction survey begin by creating Requestor Only login(s) from the passwords screen. Give these requestors permissions as depicted on the right and below.

Step 2: Link User ID to Requestor Name

Open the work orders data entry screen then select the menu items **Options>>Requestors...** When the **Requestors** pop-up screen appears either select an existing requestor from the grid with a left mouse-click or create a new requestor. Next select the user ID to link this requestor to from the drop-down box near the bottom of the requestor screen. Press **Save**.

This completes the linking of a **User ID** to a **Requestor** name. Now whenever this requestor creates a request that is eventually converted to an actual work order, then completed this work order becomes available to this requestor for the survey.

Step 3: Create a Work Request. Take Survey After Work Is Completed

Open the work order screen then create a new work request (while logged in as a User ID linked Requestor). After this request has been converted to an actual work order and completed log back into the work order screen. Locate the work order in the grid. Left-click to select this work order. Right-click to display pop-up menu. Menu item: **Take Survey** should be enabled. Click this menu item then take the survey from the Survey screen. Taking the survey consists of simply checking the appropriate checkboxes in the grid then pressing the **Save** button.

Later survey results may be viewed and printed.

Work Request Survey			
Question	Excellent	Good	Average
Was job performed promptly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Was technician courteous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was problem solved?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Take the survey by checking the appropriate checkboxes in the grid.

Available User Groups: Requestor

User Name(Up to 12 chars.): John

Re-Type Password: Common Name (optional, display

Requestor	Presentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Requestor	WorkOrders	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Editing User Group: Requestor

General Permissions 1 | General Permissions 2 | Inventory/

Access Area: WorkOrders

View

Print

Edit/Add Records to Other Plant

Submit Service Requests

Configure Auto-Print Scheduler

Be sure to apply **Submit Requests** permissions.

Take Survey menu item becomes available if the logged in Requestor created the original request for this completed work order AND if this Requestor has been linked to a **User ID**.

00:0	1/18/2006 6:26:00	No Assignment - 327	Done
00:0	1/18/2006 5:30		

Number: Date/Time: 1/18/2006

Type:

Requestor: No Requestor - 327

- Quick Grid Search
- Advanced Grid Search
- Preserve Grid Search
- Print Preview Selected Work Order
- Print Selected Work Order
- Duplicate Work Order
- Delete
- Refresh
- Save Work Order As Template
- Filter Grid...
- Take Survey**
- Add Selected Work Order To Campaign

Overview of Composite Work Orders

Overview of Composite Work Orders

Blanket work orders provide a way to add more than one job to a work order. With composite work orders you simply create a new composite work order then add work orders to the composite work order. Unlike individual work orders (these are automatically numbered by MaintSmart) with composite work orders you give each composite work order the number you want (24 chars. maximum).

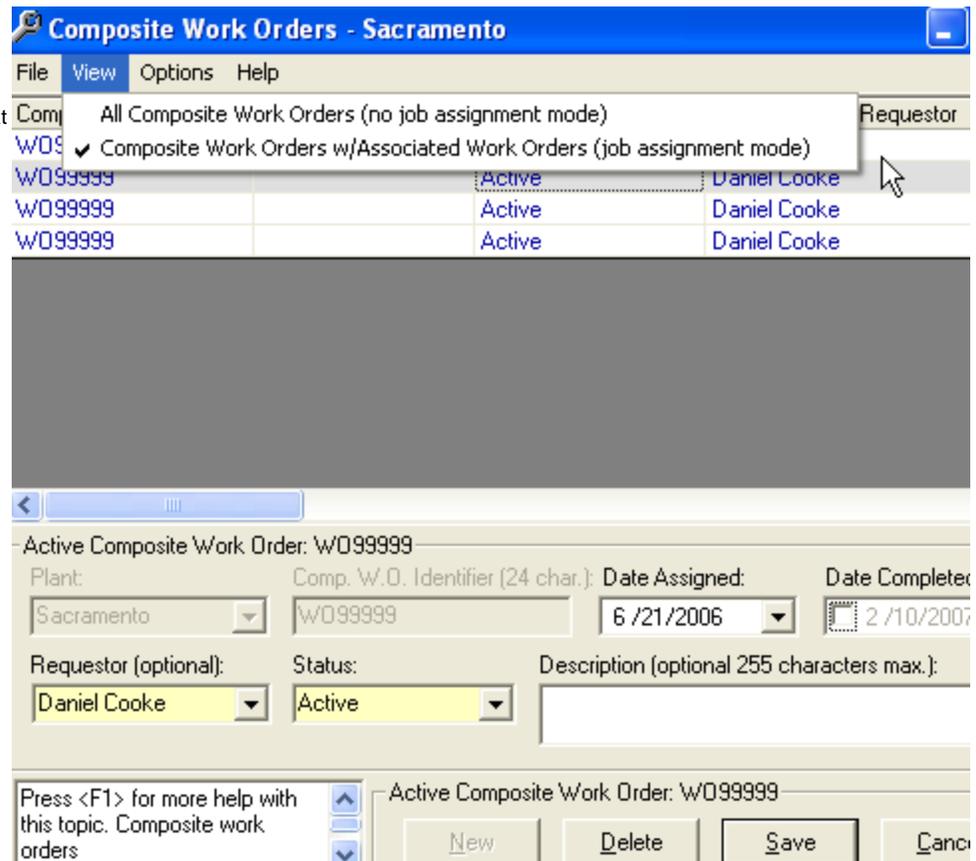
Stated another way: Blanket work orders are essentially containers for work orders. With composite work orders the contained work orders that actually make up the work involved with this composite work order are referred to as **Job Ref.** (job reference numbers). A job ref. is simply a work order number (not to be confused with a composite work order number).

There are two print formats. One format puts each job reference (actually a work order) on a separate sheet of paper as with regular work orders. The second format puts all jobs (work orders) on the same sheet(s). This second formatting method normally uses less paper than the first.

Notice the two menu items under the **View** menu item. The first view displays all created composite work orders. These composite work orders may not have any work orders associated with them yet. The other view (job assignment mode) shows contained work orders or "Job Refs."

Important: When creating a new composite work order you'll need to check the first menu item **All Composite Work Orders** under **View** to make the composite work order visible in the grid. Once you have added a job (work order) to this new composite work order you may switch back to the second grid view i.e.: **Composite Work Orders w/Associated Work Orders**.

Important Note: Composite work order are essentially containers for work orders. With composite work orders the contained work orders that actually make up the work involved with this composite work order are referred to as Job Refs. (job reference numbers). A job ref. is simply a work order number (not to be confused with a composite work order number).



Adding, Editing or Deleting Composite Work Orders

Adding, Editing or Deleting Composite Work Orders

Blanket work orders are essentially containers for work orders. With composite work orders the contained work orders that actually make up the work involved with this composite work order are referred to as **Job Ref.** (job reference numbers). A job ref. is simply a work order number (not to be confused with a composite work order number).

To add a new composite work order open the work order screen by clicking the work order data entry button  Next select the menu item **Blanket WO>> Manage Composite Work Orders...** When the Composite Work Order pop-up screen appears follow these steps:

1. Press the **New** button.
2. Enter an alphanumeric composite work order number of your choosing (up to 24 characters long).
3. Select the assignment date, requestor (optional) and the status (Active). Enter a short general description of this composite work order.

Note: there is no need to enter the job instructions in the **Description** field because you'll be adding jobs to this composite work order in the form of actual work orders.

4. Press the **Save** button. You now have a composite work order that you may add an unlimited amount of work to. This work is added in the form of individual work orders. See the topic:

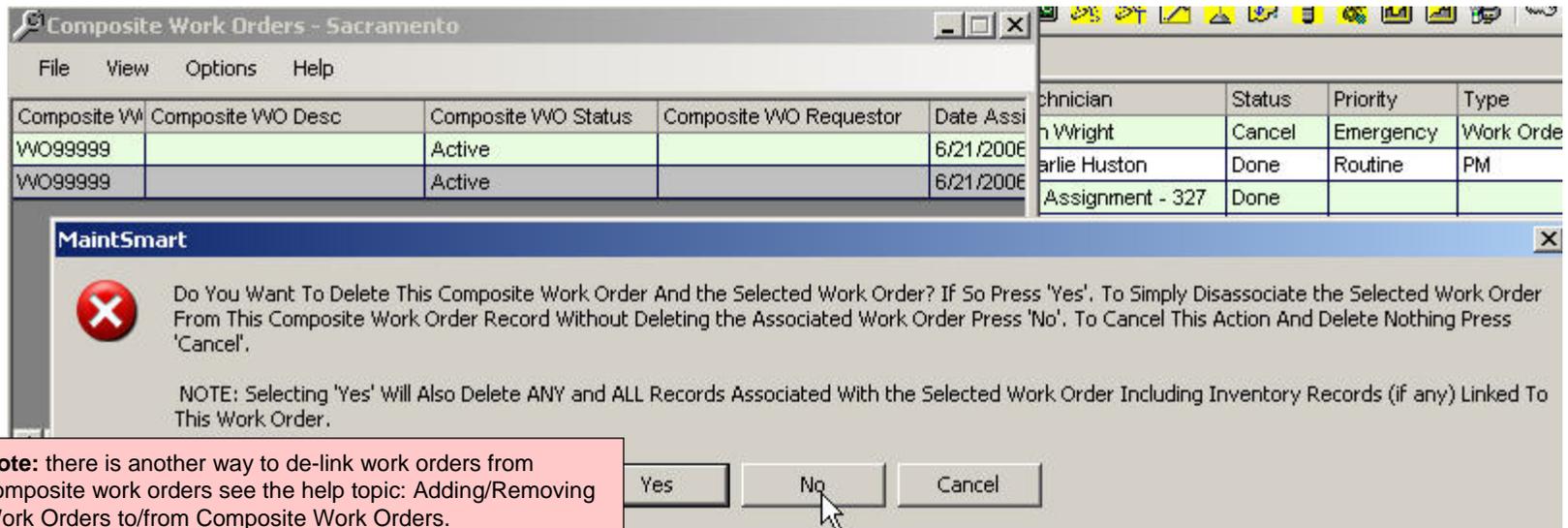
Adding Work Orders to Composite Work Orders

To edit a composite work order open the work order screen by clicking the work order data entry button  Next select the menu item **Blanket WO>> Manage Composite Work Orders...** When the Composite Work Order pop-up screen appears follow these steps:

1. Left mouse-click the grid row containing the existing composite work order you want to edit.
2. Make the needed changes in the boxes below the grid then press **Save**.

To delete a composite work order open the work order screen by clicking the work order data entry button  Next select the menu item **Blanket WO>> Manage Composite Work Orders...** When the Composite Work Order pop-up screen appears follow these steps:

1. Left mouse-click the grid row containing the existing composite work order you want to delete.
2. Press the **Delete** button
3. You'll now be presented with the option of deleting the entire composite work order and therefore disassociating (or de-linking) all linked jobs (work orders) from this composite work order (**Yes** selection) or simply removing one work order linked to the composite work order (**No** selection). Selecting either **Yes** or **No** does not delete the actual work order (job reference) but merely de-links work orders from this composite work order or in the case of the Yes selection de-links all linked work orders (job refs.) from this composite work order.



Note: there is another way to de-link work orders from composite work orders see the help topic: Adding/Removing Work Orders to/from Composite Work Orders.

Adding/Removing Work To/From Composite Work Orders

To add jobs (work orders) to composite work order open the work order screen by clicking the work order data entry button  Next check the menu item **Blanket WO>>Composite Work Order Mode...** When the Composite Work Order pop-up screen appears follow these steps:

1. Left mouse-click an existing composite work order row in the composite work order grid. If there are no records in the grid you'll need to follow the steps required to create a new composite work order first.
2. You should now have one colored row in the composite work order pop-up screen. This is the active composite work order that you'll add jobs to in a moment.

From the **work order data entry screen** (not the composite work order pop-up). Select the work order from the work order data entry grid by left mouse-clicking the row containing the work order you want to link to the selected composite work order. (Once linked the work order is referred to as a **Job Reference** number within the composite work order.

Note: The work order itself is in no way changed by linking it to the composite work order and still exists as a singular entity as well. Changes to the linked work order such as field edits are reflected immediately in the composite work order too.

3. Right mouse-click the work order data entry grid (containing the now selected, and colored, grid row). From the pop-up menu select the menu item: **Add Selected Work Order to Composite Work Order** Alternatively you may select the menu items **Blanket WO>>Add Selected Work Order to Composite Work Order**. The work order is immediately linked to the active composite work order.

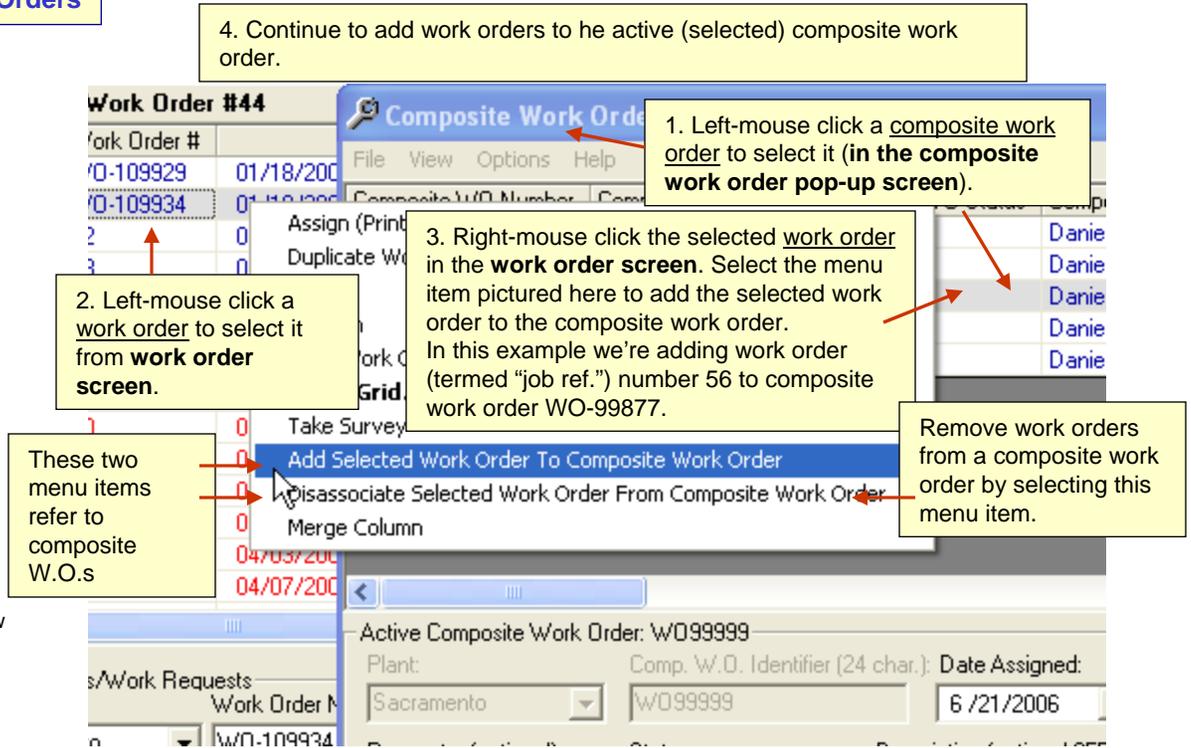
4. Continue to add work to this composite work order by first left mouse-clicking the grid row needed then selecting the menu item: **Add Selected Work Order to Composite Work Order** from the pop-up.

To remove jobs (work orders) composite work order open the work order screen by clicking the work order data entry button  Next check the menu item **Blanket WO>>Composite Work Order Mode...** When the Composite Work Order pop-up screen appears follow these steps:

1. Left mouse-click an existing composite work order row in the composite work order grid.
2. You should now have one colored row in the composite work order pop-up screen. This is the active composite work order that you'll remove jobs from in a moment.

From the **work order data entry screen** (not the composite work order pop-up). Select the work order from the work order data entry grid by left mouse-clicking the row containing the work order you want to de-link from the selected composite work order.

4. Continue to add work orders to the active (selected) composite work order.



1. Left mouse-click a composite work order to select it (in the composite work order pop-up screen).

2. Left mouse click a work order to select it from work order screen.

3. Right mouse click the selected work order in the work order screen. Select the menu item pictured here to add the selected work order to the composite work order. In this example we're adding work order (termed "job ref.") number 56 to composite work order WO-99877.

Remove work orders from a composite work order by selecting this menu item.

These two menu items refer to composite W.O.s

4. Continue to add work orders to the active (selected) composite work order.

Note: The work order itself is in no way changed by de-linking it from the composite work order and still exists as a singular entity as well. Changes to the linked work order such as field edits are reflected immediately in the composite work order too.

3. Right mouse-click the work order data entry grid (containing the now selected, and colored, grid row). From the pop-up menu select the menu item: **Remove Selected Work Order From Composite Work Order** Alternatively you may select the menu items **Blanket WO>>Remove Selected Work Order From Composite Work Order**

. The work order is immediately de-linked from the active composite work order.

4. Continue to remove work from this composite work order as needed by first left mouse-clicking the grid row needed then selecting the menu item: **Remove Selected Work Order From Composite Work Order** from the pop-up.

Note: After adding or removing a work order from a composite work order you'll need to refresh the composite work order screen to show the changes. Select **Options>>Refresh Grid** from or right mouse-click select **Refresh**.

Options and Printing Composite Work Orders

There are two formats for printing composite work orders. Select from the **Options>>Work Order Format** menu item which format you prefer.

To print a composite work order select the menu items **File>>Print>>Report>>?** Either of the first two menu items. You may also print a composite work order expense summary from this menu selection.

The view menu item is of special importance. When adding a new composite work order the grid will not display the composite work order unless you have selected the grid view **View>>All Composite Work Orders**. The reason for this is that no work orders have been added to this composite work order (work order container) yet. After you add one or more work orders (job refs.) to this composite work order you may switch to the other **View>>Composite Work Orders w/Associated Work Orders**.

Work Order #: WO-99876

Date Assigned: 4/1/03 **Requested By:** Elmo Puddy

Description: Install new conveyor system

Use Safety Equipment Do Not Bypass Safeties Do Not Operate Machinery Without Gu

Job Ref. 19 Printed By:

Plant: 327

Priority: Routine

Requested By: Daniel Cooke

Area/Location: Mixing Area

Type:

Location: Administration

Requestor Ph:

2/19/01
Done
Larry Pratt
104 Dough Mixer #1
00268 Repair Leak(s)
Repair leak under #2 mixer.

Instructions:

Parts Used for Job Ref. 19

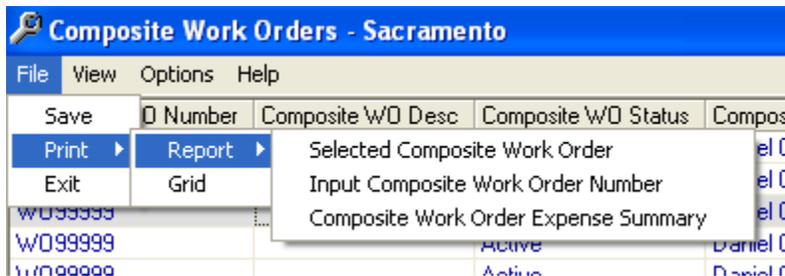
Quantity	Part Number	Description
3	RBB-10	1 inch rubber balls

Hours Labor(1/10's): _____ Signature: _____

Job Ref. 29 Printed By:

Plant: 327

Area/Location: Donut Cooler/Make Up



Adding Work Order Invoices

Work Order Invoice Overview

Work order invoices are used for billing customers for labor and materials. A typical use for work order invoices may be a shop that performs service work for outside customers. Inside customers could be invoiced as well.

Create a work order invoice then add one or more existing work orders to the invoice. Any parts usage associated with the linked work orders are automatically linked to the invoice too. Invoice fields include; Customer, Invoice Status, Invoice Priority, Request Date, Start Date, Completion Date, two different tax rates (tax on labor charges and tax on material charge), Customer Comments and Invoice Description. When an invoice has been paid simply check Invoice **Paid In Full**.

Adding A New Work Order Invoice

To add a new work order invoice go to the Work Order  screen. Select the menu items **Invoices>>Manage**

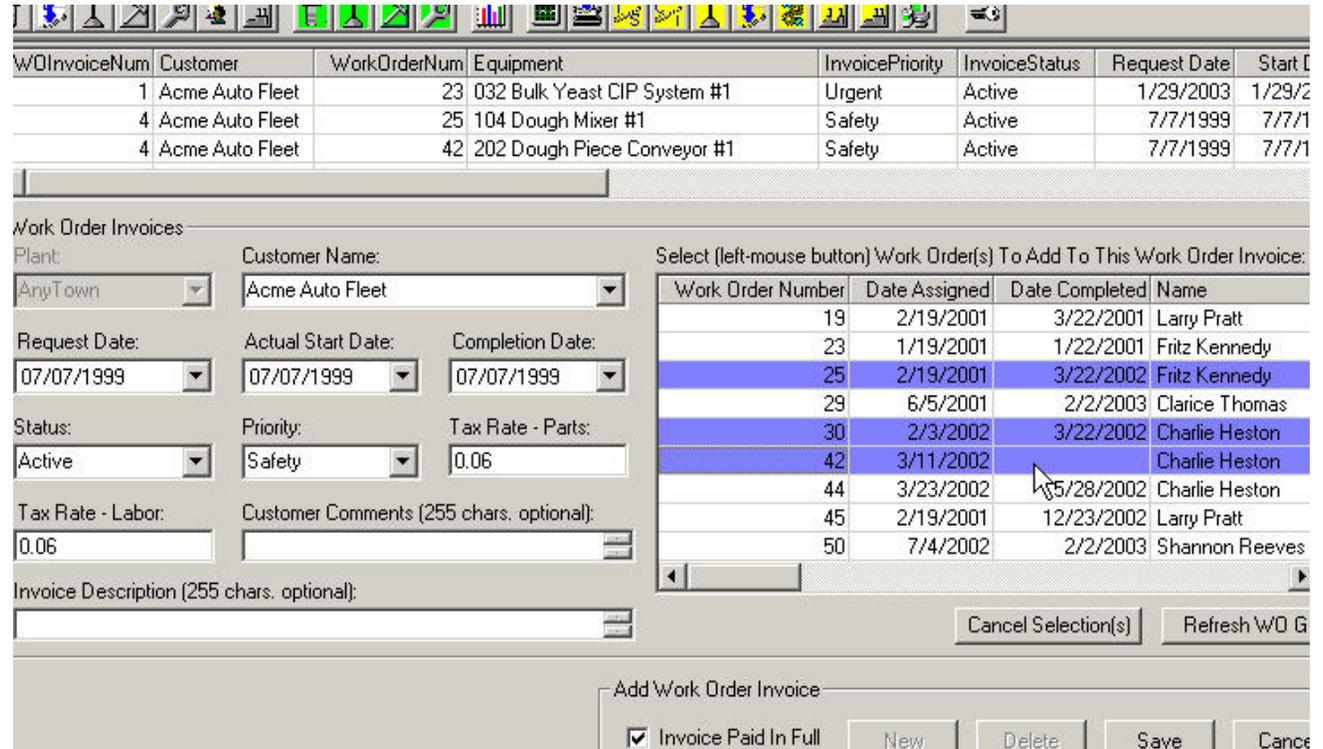
Work Order Invoices. When the Work Order Invoice screen appears follow these steps to add a new invoice:

1. Press the **New** button.
2. Select a **Customer** from the drop-down.
3. Select the **Request Date, Start Date and estimated Completion Date** (optional).
4. Select a **Status** and a **Priority** for this invoice.
5. Enter appropriate tax rates if needed.
6. Enter **Customer Comments**. This field may be used for general comments regarding the customer.
7. Enter the **Invoice Description**. This field may be used for general comments regarding the invoice.
8. Select one or more work orders to bill with this invoice by left mouse-clicking the appropriate grid row(s) in the grid at the lower right. You may clear selected work order rows one at a time by clicking them again or clear all selected work order rows by pressing the **Cancel Selection** button. The **Refresh WO Grid** button also clears the selected rows and refreshes the grid with the current state of the work order table.
9. If the invoice has been paid check the checkbox labeled **Invoice Paid In Full**.

To print the new invoice select the menu items **File>>Print>>Invoice**. Enter the invoice number then press **OK**. Alternatively you may left mouse-click the grid row containing the invoice you want to print then select the menu items **File>>Print>>Selected Invoice**.

Note: MaintSmart Provides a Way to Mark-Up or Discount Parts For Invoices:

See the page 92 for information on how to use this powerful feature.



WOInvoiceNum	Customer	WorkOrderNum	Equipment	InvoicePriority	InvoiceStatus	Request Date	Start [
1	Acme Auto Fleet	23	032 Bulk Yeast CIP System #1	Urgent	Active	1/29/2003	1/29/2
4	Acme Auto Fleet	25	104 Dough Mixer #1	Safety	Active	7/7/1999	7/7/1
4	Acme Auto Fleet	42	202 Dough Piece Conveyor #1	Safety	Active	7/7/1999	7/7/1

Work Order Invoices

Plant: AnyTown

Customer Name: Acme Auto Fleet

Request Date: 07/07/1999

Actual Start Date: 07/07/1999

Completion Date: 07/07/1999

Status: Active

Priority: Safety

Tax Rate - Parts: 0.06

Tax Rate - Labor: 0.06

Customer Comments (255 chars. optional):

Invoice Description (255 chars. optional):

Work Order Number	Date Assigned	Date Completed	Name
19	2/19/2001	3/22/2001	Larry Pratt
23	1/19/2001	1/22/2001	Fritz Kennedy
25	2/19/2001	3/22/2002	Fritz Kennedy
29	6/5/2001	2/2/2003	Clarice Thomas
30	2/3/2002	3/22/2002	Charlie Heston
42	3/11/2002		Charlie Heston
44	3/23/2002	5/28/2002	Charlie Heston
45	2/19/2001	12/23/2002	Larry Pratt
50	7/4/2002	2/2/2003	Shannon Reeves

Cancel Selection(s) Refresh WO G

Add Work Order Invoice
 Invoice Paid In Full New Delete Save Cancel

Editing/Deleting and Printing Work Order Invoices

Editing or Deleting A Work Order Invoice

To edit or delete a work order invoice go to the Work Order  screen. Select the menu items **Invoices>>Manage Work Order Invoices**.

When the Work Order Invoice screen appears follow these steps to edit an invoice:

1. Left mouse-click the row containing the invoice in the upper (large grid). The boxes below the invoice grid become enabled. Also notice that the appropriate work order grid (small grid) also highlights.
2. Change the selections in the boxes below the grid as needed
3. **Changing the linked work order for an existing invoice:** You may change the work order associated with this invoice by simply left mouse-clicking a different row (the row containing the work order you want to link).
4. **Adding additional work orders to an existing invoice:** You add work orders associated with this invoice by simply left mouse-clicking the appropriate rows while holding down the **<CTRL>**.
5. When all changes have been completed press the **Save** button.

To delete a work order invoice follow these steps:

1. Left mouse-click the row containing the invoice in the upper (large grid).
2. Press the **Delete** button.

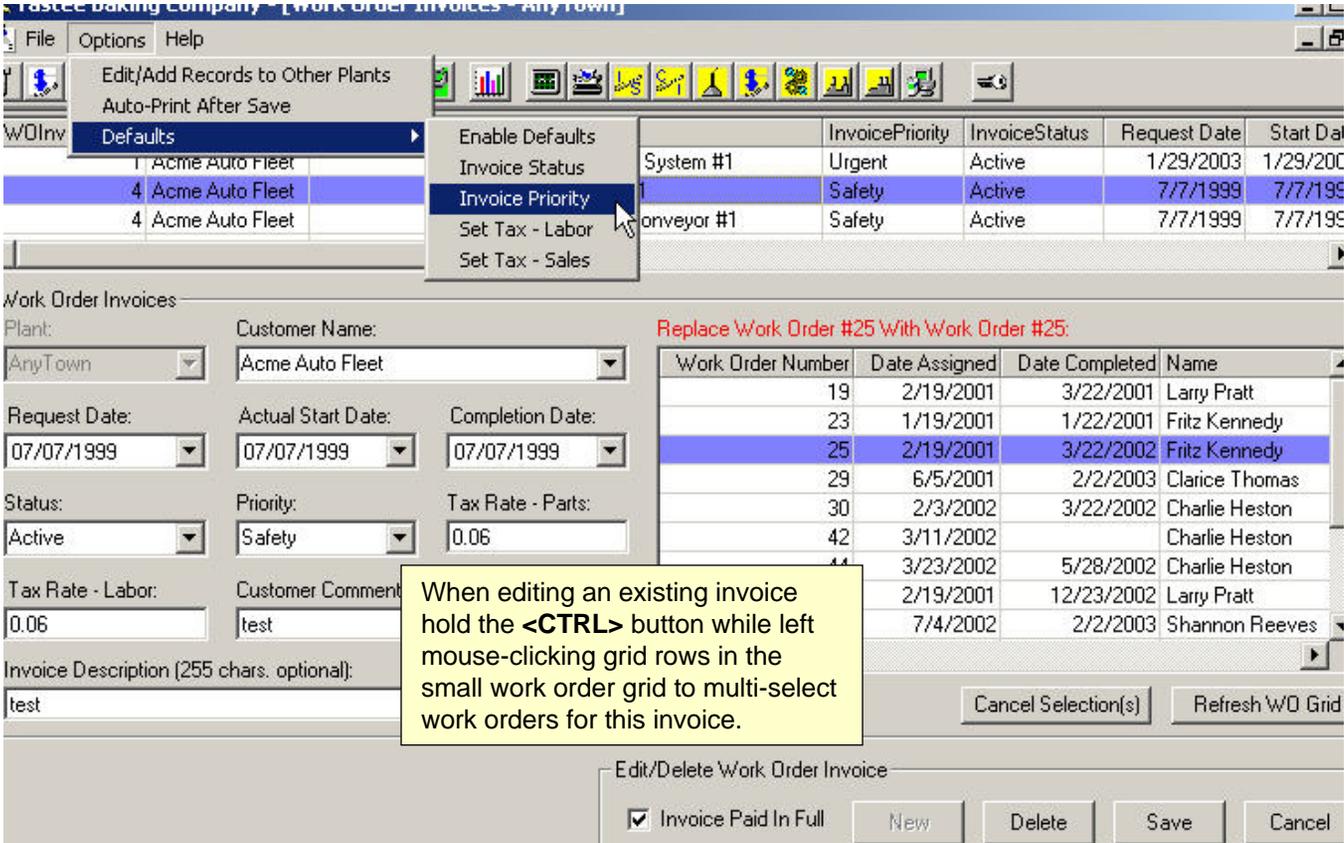
Work Order Invoice Options

To set work order invoice defaults go to the Work Order  screen. Select the menu items **Options>>Defaults**. Set default values for status, priority and tax rate. To use the default value check the menu item **Options>>Defaults>>Use Defaults**. Each time the New button is pressed the default values are automatically entered.

By checking the menu items **Options>>Auto-Print After Save** MaintSmart automatically prints the selected invoice when the **Save** button is pressed.

Printing Work Order Invoices

To print an invoice select the menu items **File>>Print>>Invoice**. Enter the invoice number when prompted. Alternatively you may left mouse-click the grid row containing the invoice record then select the menu items **File>>Print>>Selected Invoice**.



Work Order Invoices

Plant: AnyTown Customer Name: Acme Auto Fleet

Request Date: 07/07/1999 Actual Start Date: 07/07/1999 Completion Date: 07/07/1999

Status: Active Priority: Safety Tax Rate - Parts: 0.06 Tax Rate - Labor: 0.06 Customer Comment: test

Invoice Description (255 chars. optional): test

Replace Work Order #25 With Work Order #25:

Work Order Number	Date Assigned	Date Completed	Name
19	2/19/2001	3/22/2001	Larry Pratt
23	1/19/2001	1/22/2001	Fritz Kennedy
25	2/19/2001	3/22/2002	Fritz Kennedy
29	6/5/2001	2/2/2003	Clarice Thomas
30	2/3/2002	3/22/2002	Charlie Heston
42	3/11/2002		Charlie Heston
44	3/23/2002	5/28/2002	Charlie Heston
	2/19/2001	12/23/2002	Larry Pratt
	7/4/2002	2/2/2003	Shannon Reeves

When editing an existing invoice hold the **<CTRL>** button while left mouse-clicking grid rows in the small work order grid to multi-select work orders for this invoice.

Buttons: Invoice Paid In Full, New, Delete, Save, Cancel

Managing Customers

Adding a New Customer

To add a new work order invoice go to the Work Order  screen. Select the menu items **Invoices>>Manage Work Order Invoices**. When the Work Order Invoice screen appears follow these steps to add a new invoice:

1. Press the **New** button.
2. Select a **Customer** from the drop-down.
3. Select the **Request Date, Start Date and estimated Completion Date** (optional).
4. Select a **Status** and a **Priority** for this invoice.
5. Enter appropriate tax rates if needed.
6. Enter **Customer Comments**. This field may be used for general comments regarding the customer.
7. Enter the **Invoice Description**. This field may be used for general comments regarding the invoice.
8. Select one or more work orders to bill with this invoice by left mouse-clicking the appropriate grid row(s) in the grid at the lower right. You may clear selected work order rows one at a time by clicking them again or clear all selected work order rows by pressing the **Cancel Selection** button. The **Refresh WO Grid** button also clears the selected rows and refreshes the grid with the current state of the work order table.
9. If the invoice has been paid check the checkbox labeled **Invoice Paid In Full**.

To print the new invoice select the menu items **File>>Print>>Invoice**. Enter the invoice number then press **OK**. Alternatively you may left mouse-click the grid row containing the invoice you want to print then select the menu items **File>>Print>>Selected Work Order Invoice**.

Editing or Deleting An Existing Customer

To edit or delete a work order invoice go to the Work Order  screen. Select the menu items **Invoices>>Manage Work Order Invoices**.

When the Work Order Invoice screen appears follow these steps to edit an invoice:

1. Left mouse-click the row containing the invoice in the upper (large grid). The boxes below the invoice grid become enabled. Also notice that the appropriate work order grid (small grid) also highlights.
2. Change the selections in the boxes below the grid as needed
3. **Changing the linked work order for an existing invoice:** You may change the work order associated with this invoice by simply left mouse-clicking a different row (the row containing the work order you want to link).
4. **Adding additional work orders to an existing invoice:** You add work orders associated with this invoice by simply left mouse-clicking the appropriate rows while holding down the **<CTRL>**.
5. When all changes have been completed press the **Save** button.

To delete a work order invoice follow these steps:

1. Left mouse-click the row containing the invoice in the upper (large grid).
2. Press the **Delete** button.

Note: MaintSmart Provides a Way to Mark-Up or Discount Parts For Invoices:

See the next page for information on how to use this powerful feature.



The screenshot shows a software window with a menu bar (File, Options, Help) and a toolbar. Below the toolbar is a table with columns: Plant City, Customer ID, Name, Phone, Contact, Address, City, State, Zip, Country, and Comments. The first row is selected and highlighted in blue, showing: AnyTown, 1, Acme Auto Fleet, 916-998-0762, Randell Philips, 5342 Sheridan Ct., Placerville, CA, 98776, USA, A good custo. Below the table is a form titled "Customers" with fields for: Plant (AnyTown), Customer Name (Acme Auto Fleet), Customer ID Number (1), Contact (Randell Philips), Phone (916-998-0762), FAX (916-777-0953), Email (rphilips@yahoo.com), Address (5342 Sheridan Ct.), and City (Placerville).

Plant City	Customer ID	Name	Phone	Contact	Address	City	State	Zip	Country	Comments
AnyTown	1	Acme Auto Fleet	916-998-0762	Randell Philips	5342 Sheridan Ct.	Placerville	CA	98776	USA	A good custo

Customers

Plant: AnyTown
Customer Name: Acme Auto Fleet
Customer ID Number: 1
Contact: Randell Philips
Phone: 916-998-0762
FAX: 916-777-0953
Email: rphilips@yahoo.com
Address: 5342 Sheridan Ct.
City: Placerville

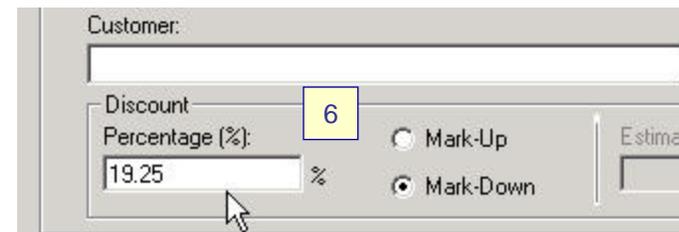
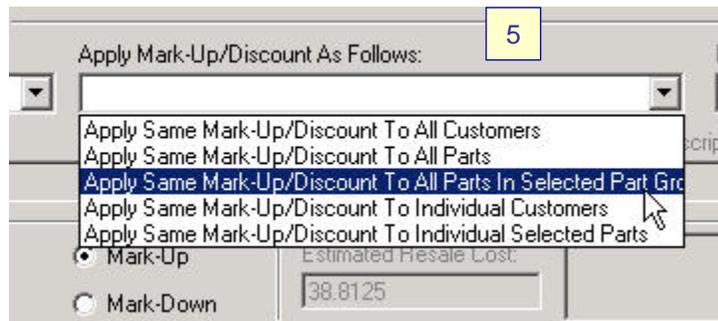
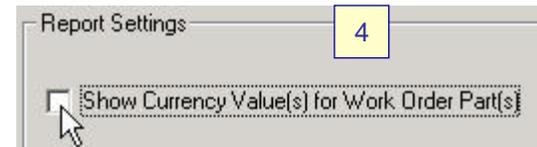
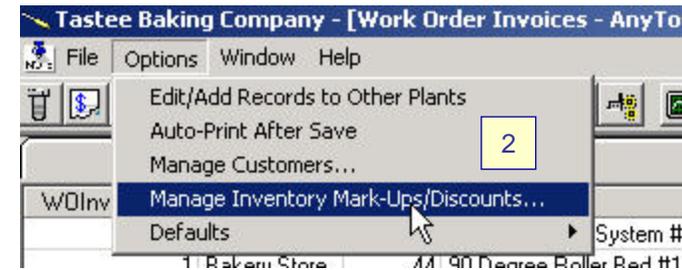
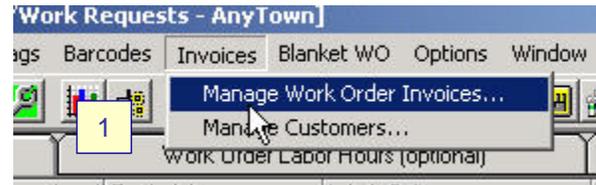
Inventory Mark-Up/Discount For Work Order Invoicing

Overview of Inventory Mark-Up/Discount

Inventory Mark-ups/Discounts provide a way for a service company to mark-up parts sold to customers. These mark-ups are visible to the customer on the invoice itself. **Inventory Mark-ups/Discounts** may be configured for groups of parts, individual parts, individual customers, all customers or all parts. In the case where a discount occurs for a specific part *and* a given customer MaintSmart applies one discount or the other first depending upon the setting you have selected in the **Program Configuration** screen of MaintSmart (see picture 3). This setting is available from the second tab or the **Program Configuration** screen near the lower right part of the screen. Additionally you may hide prices (unit cost) of parts listed on the actual work orders. This would be needed in the case where you are providing the actual work orders (job ref.) with the work order invoice. To hide the actual unit costs of parts on work orders uncheck (default) the check box at the lower left part of the second tab on the **Program Configuration** screen (picture #4).

To add a new part mark-up/discount record go to the **Work Order** screen. Select the menu items **Invoices>>Manage Work Order Invoices**. When the Work Order Invoice screen appears select the following menu items: **Options>>Manage Inventory Mark-Ups/Discounts...** When the **Inventory Mark-ups/Discounts** screen appears follow the below steps to create a new record.

1. Press the **New** button.
2. Select a mark-up/discount type from the drop-down (picture #5)
3. Select the Customer or Part group or specific part as applicable based upon previous mark-up/discount type selection).
4. Enter the discount (negative number (-)) or mark-up (positive number) in the box labeled **Percentage** (picture 6).
5. Press **Save** to save this record.
6. To change an existing mark-up/discount left mouse-click the record in the grid.
7. Either change the cost of the part or change the mark-up/discount value.
8. Press Save to keep the changes.



Downtime - An Overview

An Overview of Equipment Downtime

To work with equipment downtime select  from the button bar. These failures cost your company money in lost production time, unnecessary labor expense, unnecessary parts replacement in some cases and disrupt the normal process possibly leading to poor quality product. MaintSmart© attempts to help you minimize costly equipment failures by analyzing downtime and projecting equipment reliability. This program considers three types of downtime. **Downtime causes must be configured before using the downtime module.**

- 1. Time Down:** The time the equipment stops due to failure to the time it is re-started after temporary or permanent repair.
- 2. Time To Repair:** The actual time that maintenance technicians worked to effect the repair. This value is multiplied internally by MaintSmart by the number of maintenance technicians that work to repaired the equipment failure.
- 3. Impact:** The time the equipment run-time schedule is impacted due to an equipment item failure. This number may be larger than the actual Time Down due to remaking of lost product, etc. This number is important in achieving one of MaintSmart's primary goals which is to account for all costs associated with equipment maintenance. Impact is multiplied by the non-maintenance lineal wage rate and by the number of idled non-maintenance employees internally by MaintSmart to derive the **cost of Impact** for any selected equipment item or group of equipment items:

An example of Impact could be as follows: Bulk Ingredient Oil #2 fails during a production run. The cause is "Sprocket Slipped". This repair is made in 8 minutes (**Repair Time**). The **Time Down** in this case is also 8 minutes because a maintenance technician just happened to be at this location when the failure occurred and he immediately began repair procedures. The **Impact** (impact or lost time to the equipment run-time schedule) was less than the **Repair Time** or the **Time Down** because in this case the non-maintenance personnel didn't need to stop their process for the entire 8 minutes but were instead able to use a portable ingredient oil device for 6 of the 8 minutes hence a 2 minute **Impact** figure. In some cases **Impact** may be larger than **Time Down**. For example suppose a process that stops due to equipment failure requires extra time to restart or perhaps product must be discarded and remanufactured due to an equipment failure. This case would likely cause Impact to be larger than either **Repair Time** or **Time Down**.

The cause of equipment downtime is of critical importance in determining ways to reduce future downtime. **When selecting the cause of downtime select the root cause of the failure if possible.** If you are not sure you can always change it later. By later analyzing downtime records you may be able to observe avoidable trends in equipment failure. Also the equipment reliability section of this program requires that you keep accurate downtime records so that it's able to perform accurate reliability analysis.

downtime reference may be used in addition to the auto-numbering downtime Number. This field is alphanumeric.

Create and use unlimited downtime Types (optional).

This field automatically enters the logged in user with the downtime record.

Operator/Technician Shift fields may be used for other reference besides shift if needed.

Down Time	Down Time Text	Date	Equipment	Cause
9257		3/5/1997	Bagger #2	Lift Mechanism Jammed/Failed
9256		3/14/1997	Pan-O-Mat/K #1	Conveyor Belt Torn/Damaged
9255		3/15/1997	Pan Return Conveyor #1	Water in Machine or Electrical
9254		3/18/1997	Proof Box #1	Push Bar Failed/Jammed
9253		3/19/1997	Leaf Splitter/Turner #1	Clutch/Brake Worn/Fail

Down Time
 Plant: Sacramento
 Down Time Reference: 9249
 Date/Time Occurred: 3/25/1997 12:00 AM
 Operator Shift: 1
 Technician Shift: 2
 # of Technicians: 1
 Equipment: Proof Box #1
 Cause of Break Down: Drive Chain Worn
 Down Time Type: Break Down
 Location: No Area Assignment - 327
 Line: Bread Prod.
 Enter Minutes of Down Time (optional, recommended)
 Time Down: 3
 Repair Time: 3
 Impact: 0
 Submitted By:
 Auto-Create Work Order Record
 Use Parts New Delete Save Cancel

Downtime - Options

Equipment Downtime - Options

To work with equipment downtime select  from the button bar. There are several options related to the downtime module that will speed data input and provide for customization to fit your equipment downtime recording requirements.

Defaults > Always Use Current Date/Time for New Records: this save the user the effort of selecting the Date and Time for new records by submitting the current date/time.

Defaults > Load Work Area/Location on Equipment Selection: this setting auto-populates the Work Area/Location and Line drop-down boxes based upon the Equipment selection. This is the default and recommended setting.

Defaults > Filter Equipment by Work Area/Location: causes the Equipment drop-down to be filtered by the selection from the Work Area/Location drop-down box.

Defaults > Filter Equipment by Line: causes the Equipment drop-down to be filtered by the selection from the Line drop-down box.

Downtime Numbering

The downtime records contain two (2) data fields for numbering. One field is an auto-number field that is strictly numeric. The other is an alpha-numeric field that can contain alphabetic characters at the beginning. An example might be FAIL-1245. In the case of auto-numbering the program simply copies the numeric auto-number field to the alphanumeric field. In this case but values are identical.

Downtime Instance Numbering > Auto-Increment:: this setting causes the downtime number to increment the right-most numeric characters of the downtime number

Downtime Instance Numbering > Auto-Number: this setting copies the downtime auto-number to the downtime number (alphanumeric field) both values are identical.

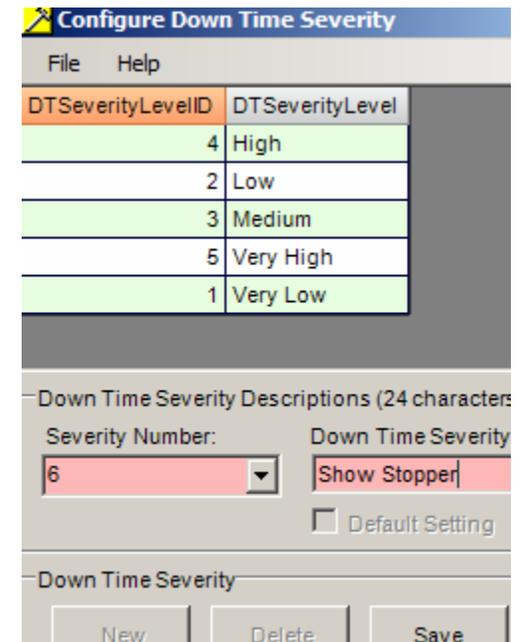
Downtime – More Options and Configuration

Work Order Auto-Create Options – see page 120 for a full explanation of this topic.

Configure Downtime Types... This opens the Downtime Types dialog screen. This screen is only available the System Administrators.

Configure Downtime Severity Levels... This opens the Downtime Severity Levels dialog screen. This screen is only available the System Administrators. Severity levels may be used by the event notifier so that only downtime with designated severity levels) notifies various users.

Downtime Severity Level Configuration



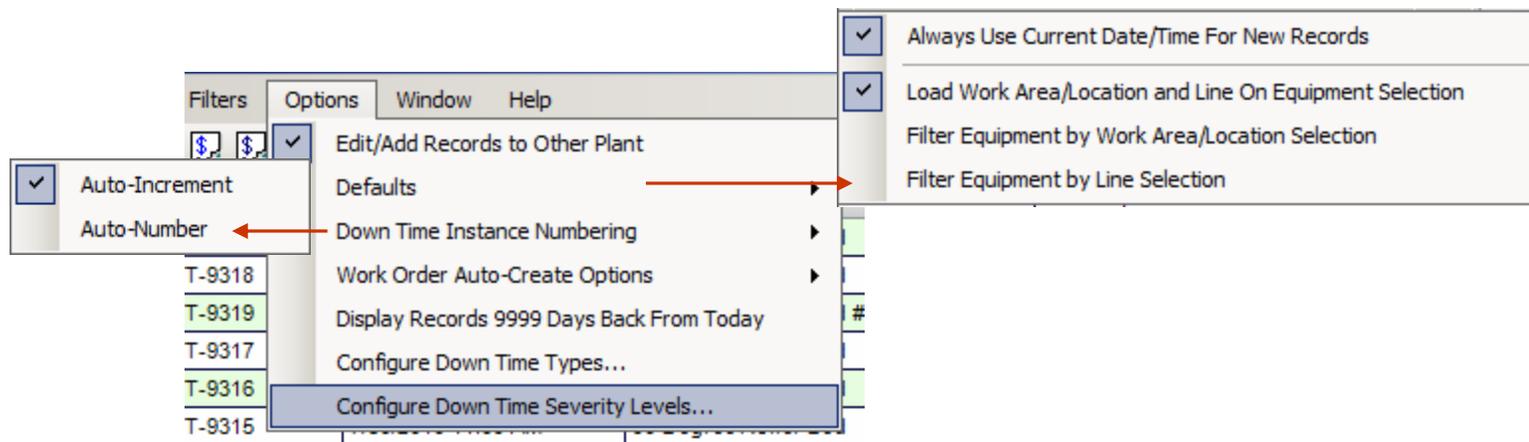
DTSeverityLevelID	DTSeverityLevel
4	High
2	Low
3	Medium
5	Very High
1	Very Low

Down Time Severity Descriptions (24 characters)

Severity Number: Down Time Severity:

Default Setting

Down Time Severity



Downtime - Adding, Editing, Deleting Records

Adding New Equipment downtime Records

To work with equipment downtime select  from the button bar. Follow these steps to create a new equipment downtime record:

1. Press **New** then select the date/time the downtime occurred, the line the equipment is located in, the equipment operator shift at the time of the failure and the maintenance technician shift that responded to the failure.
2. Select the work area that the equipment item is contained in and the equipment item.
3. Enter comments describing the equipment failure if needed. Enter the time down, time to repair and the impact to the equipment run-time schedule, if any. See Downtime - An Overview for an explanation of downtime if needed.
4. Select the cause group to limit the selections in the cause drop-down box. Select the cause of the equipment item failure. Alternatively type any word described in the failure cause description into to Cause of Breakdown drop-down box. If the cause does not immediately appear try typing the next letter in the word you are looking for. After typing 3-4 letters contained in the word you are searching for you may press the <SPACE> bar and MaintSmart© will continue to search one these letters only until it has search the entire list. To restart a search press the <ESC> but only if the Cause of Breakdown box is currently selected.
5. Optionally select a downtime type.
6. Press **Save** to keep the record.

Tip: Click the button labeled **Filter** next to the cause drop-down box. A menu appears containing all of the break down cause groups. Click on the break down cause group you want to work with and MaintSmart© fills the drop-down box with break down causes from that break down cause group only. This really speeds up this process!

Editing Equipment Downtime Records

To edit a downtime record follow these steps:

1. Select the grid row containing the record you wish to edit by left mouse-clicking the row. The row should turn a different color indicating that it is the active row.
2. Make the desired changes in the boxes below the grid. MaintSmart grids are display only and are not meant to be typed into.
3. Press the **Save** button to save the changes.

Tip: MaintSmart helps you to locate a record for editing. By left mouse-clicking the top row of the grid you can make the grid sort on the clicked column ascending/descending. Another method for locating records quickly is to right mouse-click the grid and select the menu item **Filter Grid**. Select the filter criteria from the drop-down boxes on the small screen that appears.

ID	Date/Time	Equipment	Cause of Breakdown
9255	3/15/1997	Pan Return Conveyor #1	Water in Machine or Elect
9254	3/18/1997	Proof Box #1	Push Bar Failed/Jammed
9253	3/19/1997	Loaf Splitter/Turner #1	Clutch/Brake Worn/Fail

Down Time

Plant: Sacramento Down Time Reference: 9254 Date/Time Occurred: 3/18/1997 12:00 AM Operator S: 3

Equipment: Proof Box #1

Cause of Breakdown: Engine

Down Time Type: Location: No Area Assignment - 327 Line: Bread Prod.

Filter by Equipment and Cause to limit items in corresponding drop-down box.

Show All Causes

- Electrical
- Engineering
- Mechanical
- Operational
- Other Causes

Type search any drop-down box.
Note: there is a 1 second keystroke delay on type-searching.

Deleting Equipment Downtime Records

To edit a downtime record follow these steps:

1. Select the grid row containing the record you wish to edit by left mouse-clicking the row. The row should turn a different color indicating that it is the active row.
2. Press the Delete key.
3. When MaintSmart prompts you for approval select the Yes button. The record is permanently deleted.

Duplicating Downtime Records

To duplicate a downtime record follow these steps:

1. Left mouse click the row you want to duplicate.
2. Right mouse click the grid to display the pop-up menu.
3. Select the **Duplicate Downtime Record** from the pop-up menu.

Downtime - Creating Work Orders From Downtime Records

Automatically Create the Right Work Order

To work with equipment downtime select  from the button bar. Follow these steps to auto-create a work order from a downtime record:

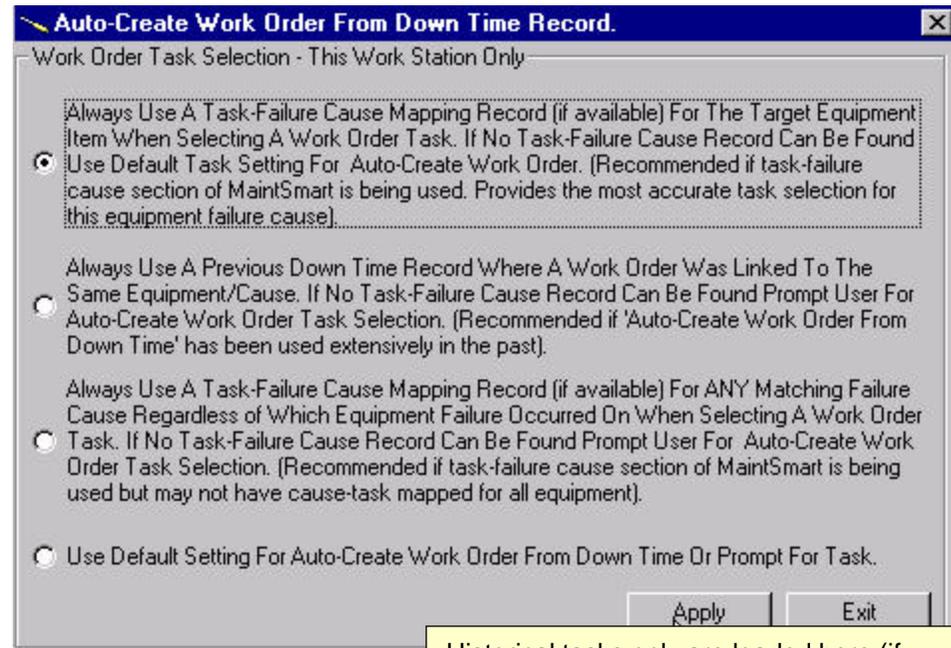
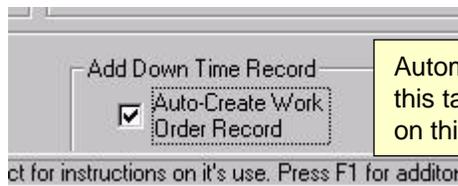
1. Set work order defaults from the work order screen (this is optional but probably helpful especially when you first start using this auto-create feature. See the help topic on setting work order defaults for info on this.

Note: you must also check the checkbox at the bottom of the work order defaults screen for this feature to work with auto-create work orders from downtime.
2. Tell MaintSmart how you want it to decide which task to assign for a given failure cause. **Notice the picture on the upper right.** Read these options to determine how MaintSmart handle task assignment. To access this pop-up screen select the menu items **Options>>Work Order Auto-Create Settings...** from the downtime data entry screen.

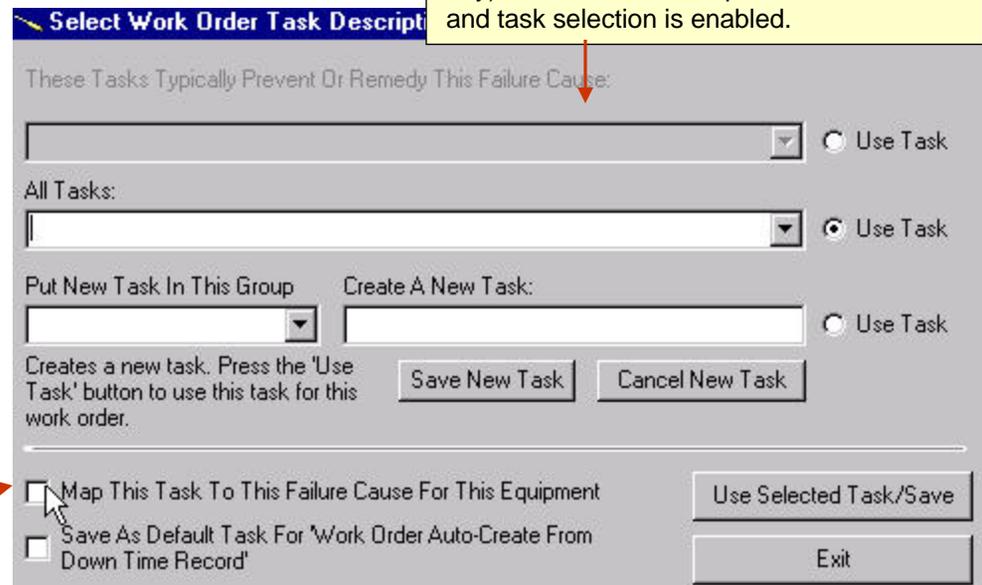
3. To activate auto-create simply check the checkbox (near the bottom of the downtime data entry screen) labeled **Auto-Create Work Order Record** then create a downtime record. MaintSmart responds based upon the auto-create setting you chose and the amount of historical downtime and task to cause mapping records that are present in the database. In many cases (especially after task to cause mapping and some auto-create history has been established) MaintSmart may create the work order without any additional user input. MaintSmart may also automatically print the new work order if you check the menu item **Options>>Print Work Order On Save.**

4. After checking the checkbox and pressing Save for this new downtime record you may be **presented with the screen on the lower right.** This screen displays if MaintSmart cannot decide which task to assign to the work order based upon the failure cause for this downtime record.

5. Choose a task or create a new task. Notice the two checkboxes on this screen. Automatically map this task to the failure cause without going to the task to cause mapping screen. Also note if a work order is created from a downtime record the two records are linked. This provides a way for MaintSmart to go back and look at the task that was used last time for this failure cause (if any) and use this task again or present it for limited selection in the top drop-down of this pop-up screen (Select Work Order Task Description). The more this section is used the more accurate MaintSmart will be in selecting tasks and the less work you'll have because in many cases MaintSmart may be able to create the work order w/o any user input.



Historical tasks only are loaded here (if any). Otherwise this drop-down is disabled and task selection is enabled.



Overall Equipment Effectiveness (OEE) - An Overview

Overview of Overall Equipment Effectiveness (OEE)

To work with OEE select  from the button bar. OEE provides a KPI (key performance indicator) for three metrics: Availability, Performance and Quality. These three metrics are multiplied by each other to obtain one value expressed as a percentage: Overall Equipment Effectiveness or OEE. Each component metric is described below:

- 1.) **Availability** = **Operating Time** / **Planned Production Time** .
Planned Production Time = Scheduled Run Time - Breaks
Operating Time = Planned Production Time - Equipment Downtime
- 2.) **Performance** = **(Total Pieces / Operating Time) / Ideal Run Rate**
Ideal Run Rate = Represents Your Best Possible Cycle Time (expressed in pieces/minute)
Total Pieces = Total Pieces Produced Including Rejects
- 3.) **Quality** = **Good Pieces / Total Pieces**
Total Pieces = Total Pieces (Including **Rejects**)
Good Pieces = **Total Pieces - Rejects**
- 4.) **OEE** = Availability X Performance X Quality

OEE Data Input		Production Time History (deprecated)							
	Breaks	DownTime	Planned Production Time	OperatingTime	Availability	Performance	Quality	OEE	Total Pieces
Maker #1	20	8	460	452	98.26%	99.45%	99.44%	97.17%	44950

Schedule History

Plant: Sacramento All Update By: Plant

Scheduled Start Date/Time: 3/24/2014 8:39 AM Scheduled End Date/Time: 3/24/2014 4:39 PM

Scheduled Time (minutes): 480 Breaks (minutes): 20 Down Time (minutes): 8

Total Pieces: 44950 Good Pieces: 44700 Ideal Run Rate/Minute: 100.00

Schedule Name: Line1Schedule Append Date/Time to Schedule Name

Use Database Down Time

Add Record

Filter By Schedule: Line1Schedule Edit Entire Schedule New Delete Save Cancel

< << >> >
 Cooler Feed Conveyor #2
 Cooler Feed Conveyor #3
 Cooling Tunnel #1
 Crouton incline (portable) #1
 Cuber #1
Divider #1
 Use Equipment:
 Depanner #1
 Depanner #2

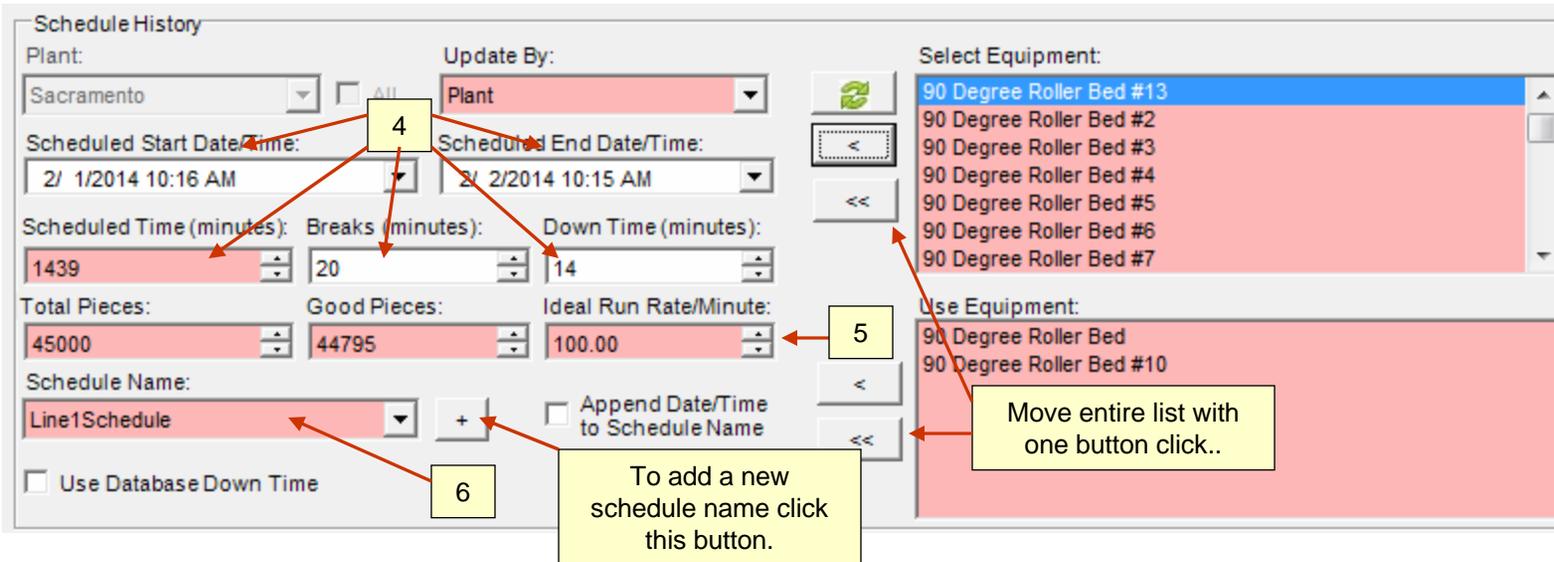
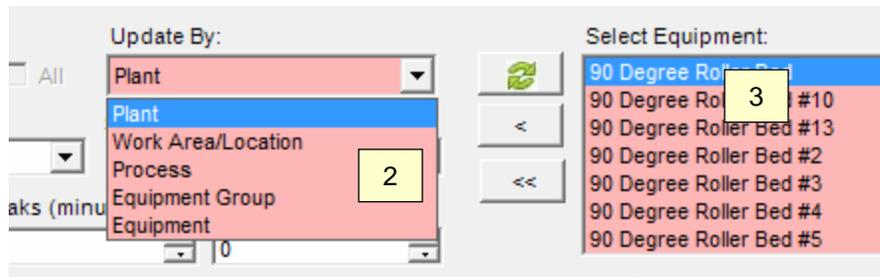
Select equipment to add to this OEE schedule history. Selecting a group loads all equipment that is contained by that group to lower list box.

Overall Equipment Effectiveness (OEE) - Adding New Data

Adding New Overall Equipment Effectiveness (OEE) Schedule History Data

To work with OEE select  from the button bar. Select the screen tab labeled OEE Data Input. To add a new OEE record follow these steps:

- 1.) Click the New button.
- 2.) Choose the Update By: method. This will determine what equipment will receive the run time data. If picking anything other than the Plant or Equipment all equipment contained in the hierarchy grouping will be updated with the OEE run time data at once.
- 3.) Left Click the data item you want to use then click the <single arrow> button to move data item to lower list box.
- 4.) Select the Start and End Date/Time. Notice that the Scheduled Time (minutes) is calculated automatically. Enter scheduled breaks and any equipment downtime that occurred. NOTE: you may check the checkbox at bottom of screen labeled: Use Database Downtime and MaintSmart will automatically enter the appropriate downtime for you.
- 5.) Enter Total Pieces, Good Pieces and Ideal Run Rate.
- 6.) Select the Schedule Name. Schedule names may be reused repeatedly. Alternatively you may create a new Schedule Name by clicking the <+> button and typing in a new schedule name. If you'd like to differentiate the schedule names by date you may optionally check the Append date/Time To Schedule Name.
- 7.) Click the Save button to save this data.



Overall Equipment Effectiveness (OEE) - Editing/Deleting Data

Editing or Deleting an Overall Equipment Effectiveness (OEE) Schedule History Record

To work with OEE select  from the button bar. Select the screen tab labeled OEE Data Input. To edit/delete an OEE record follow these steps:

- 1.) Left-click the grid row containing the data you want to edit or delete.
- 2.) Make needed changes in boxes below the grid then click Save. Alternatively simply click the Delete button after row selection to permanently delete this record.

Schedule Name	Start Time	End Time	Equipment	Breaks	DownTime	Planned Production Time	Op
ne1Schedule	3/24/2014 11:00 AM	3/24/2014 7:00 PM	Labeler/Label Maker #1	20	8	460	
ne1Schedule	2/1/2014 10:16 AM	2/2/2014 10:15 AM	90 Degree Roller Bed	20	14	1419	
ne1Schedule	2/1/2014 10:16 AM	2/2/2014 10:15 AM	90 Degree Roller Bed #10	20	14	1419	

Schedule History

Plant: Sacramento All Update By:

Scheduled Start Date/Time: 2/ 1/2014 10:17 AM Scheduled End Date/Time: 2/ 2/2014 10:15 AM

Scheduled Time (minutes): 1438 Breaks (minutes): 20 Down Time (minutes): 14

Total Pieces: 45000 Good Pieces: 44795 Ideal Run Rate/Minute: 100.00

Schedule Name: Line1Schedule Append Date/Time to Schedule Name

Use Database Down Time

Edit or Delete Record

Filter By Schedule: Line1Schedule Edit Entire Schedule

New Delete Save

Several fields are not available for editing and are grayed out.

Overall Equipment Effectiveness (OEE) - Options

Overall Equipment Effectiveness (OEE) View Options

Right-click the data grid area to display all OEE record data or just the most important OEE data. There are several useful tools and options under the Options menu item as depicted below.

Plant	Availability	Performance	Quality	OEE
Plant #1	98.26%	99.45%	99.44%	97.17%
Free Roller Bed	99.01%	32.03%	99.54%	31.57%
Free Roller Bed #10	99.01%	32.03%	99.54%	31.57%

Right-click to see pop-up menu

Limit grid display with this setting .

Defaults are useful if some or all of the field data items will be used repeatedly

Rename or delete schedules. **NOTE:** deleting a schedule permanently deletes all data contained by that schedule.

Choose which downtime component to use when auto-calculating downtime from database.

Options Window Help

- Edit/Add Records to Other Plant
- Display Records Days From Today
- Auto Increment
- Defaults
- Delete Schedule
- Rename Schedule

Breaks DownTime Planned Production Time OperatingTime Av

- Use Defaults 460 452
- Save Last Entries 419 1405
- Scheduled Time 419 1405
- Breaks
- Down Time
- Total Pieces
- Good Pieces
- Ideal Run Rate
- Use Down Time Component
- Refresh Equipment List On Save

Time Down

Time To Repair

Impact

Overall Equipment Effectiveness (OEE) - Printing/Reporting

Overall Equipment Effectiveness (OEE) View Options

Several report options are available from the File>>Print>>Report menu items as shown below.

Sample Report

File | **View** | **Filters** | **Options** | **Window** | **Help**

Save | Print | Exit | Report | Grid

Report

- OEE Report
- OEE Report - Select Date Range
- OEE Report - Schedule
- OEE Report - Department
- OEE Report - Work Area
- OEE Report - Equipment
- OEE Report - Plant Line
- OEE Report - Equipment Group
- Production History
- Options

Reports are grouped as indicated.

Date options determines which date field is used to filter report display by reporting component when generating reports.

- Use Start Date
- Use End Date
- Include All Plants

OLAP

OLAP provides way to create any data view from underlying grid data set.

Baking Company
Overall Equipment Effectiveness
12:20:09PM

End	Planned (min.)	Down (min.)	Availability	Performance	Quality	OEE
Average OEE						
Schedule						
90 Degree Roller Bed						
2/1/2014 10:16:57AM	2/2/2014 10:15:57AM	1419	14	99.01%	32.03%	99.54% 31.57%
Average: - 90 Degree Roller Bed				99.01%	32.03%	99.54% 31.57%
90 Degree Roller Bed #10						
2/1/2014 10:16:57AM	2/2/2014 10:15:57AM	1419	14	99.01%	32.03%	99.54% 31.57%
Average: - 90 Degree Roller Bed #10				99.01%	32.03%	99.54% 31.57%
Labeler/LabelMaker #1						
3/24/2014 11:00:12AM	3/24/2014 7:00:12PM	460	8	98.26%	99.45%	99.44% 97.17%
Average: - Labeler/LabelMaker #1				98.26%	99.45%	99.44% 97.17%
Average: - Line1Schedule				98.76%	54.50%	99.51% 53.44%
Average: - Sacramento				98.76%	54.50%	99.51% 53.44%
Average:				98.76%	54.50%	99.51% 53.44%

Equipment Run-Time Schedules - An Overview

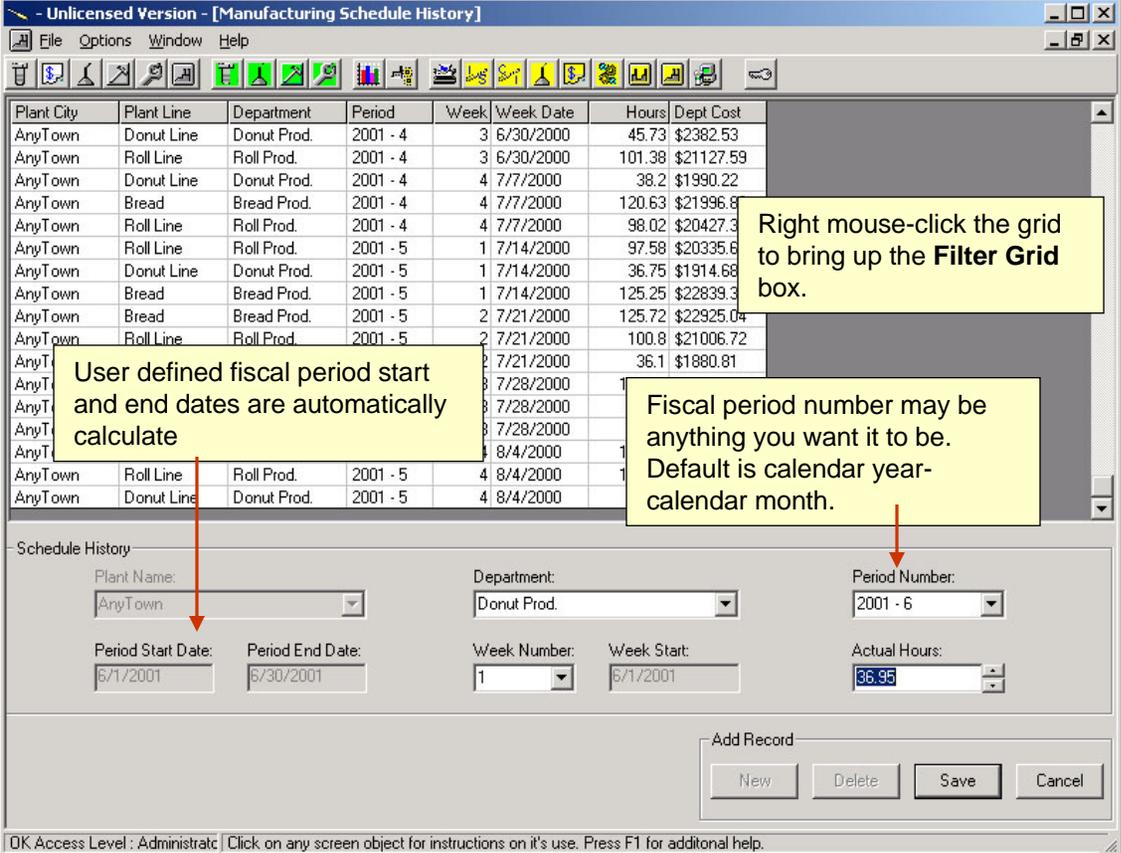
An Overview of Equipment Run-Time Schedules

To work with an equipment run-time schedule history select  from the button bar. In order to view downtime as a percentage of the equipment run-time schedule the maintenance manager must keep records of the equipment run-time schedule history.

MaintSmart© tracks the equipment run-time schedule history of each line. MaintSmart© knows what line an equipment item is contained in. Many of the analysis functions of this program compare the amount of time the equipment is actually running to the break downtime. **Equipment run-time schedule history must be entered to effectively use the reliability analysis portion of MaintSmart.** equipment run-time schedule history is also important in determining PM task intervals. This program uses fiscal periods and calendar weeks as equipment run-time schedule history units. The equipment run-time schedule history section of this program also keeps track of the weekly wage expense for each line based upon run hours for that line.

The benefits of being able to take full advantage of MaintSmart's reliability analysis functions far out weigh the very small time commitment required to enter equipment run-time schedule history.

Note: Fiscal periods are user defined in the Configuration section titled **Configuration - Fiscal Year, Max. Query Days, Downtime Goal**. They default to calendar year-calendar month in the following format: **2001-8**. You are free to define your company's fiscal periods anyway you choose. MaintSmart keeps track of the actual calendar date internally so there's no need for you to ever concern yourself with interpreting fiscal periods into calendar months.



The screenshot shows the 'Manufacturing Schedule History' window. The main area is a data grid with columns: Plant City, Plant Line, Department, Period, Week, Week Date, Hours, and Dept Cost. The grid contains multiple rows of data for various production lines. Below the grid is a 'Schedule History' form with fields for Plant Name, Department, Period Number, Period Start Date, Period End Date, Week Number, Week Start, and Actual Hours. There are also 'Add Record' buttons (New, Delete, Save, Cancel) and a status bar at the bottom.

Right mouse-click the grid to bring up the Filter Grid box.

User defined fiscal period start and end dates are automatically calculate

Fiscal period number may be anything you want it to be. Default is calendar year-calendar month.

Plant City	Plant Line	Department	Period	Week	Week Date	Hours	Dept Cost
AnyTown	Donut Line	Donut Prod.	2001 - 4	3	6/30/2000	45.73	\$2382.53
AnyTown	Roll Line	Roll Prod.	2001 - 4	3	6/30/2000	101.38	\$21127.59
AnyTown	Donut Line	Donut Prod.	2001 - 4	4	7/7/2000	38.2	\$1990.22
AnyTown	Bread	Bread Prod.	2001 - 4	4	7/7/2000	120.63	\$21996.8
AnyTown	Roll Line	Roll Prod.	2001 - 4	4	7/7/2000	98.02	\$20427.3
AnyTown	Roll Line	Roll Prod.	2001 - 5	1	7/14/2000	97.58	\$20335.6
AnyTown	Donut Line	Donut Prod.	2001 - 5	1	7/14/2000	36.75	\$1914.68
AnyTown	Bread	Bread Prod.	2001 - 5	1	7/14/2000	125.25	\$22839.3
AnyTown	Bread	Bread Prod.	2001 - 5	2	7/21/2000	125.72	\$22925.04
AnyTown	Roll Line	Roll Prod.	2001 - 5	2	7/21/2000	100.8	\$21006.72
AnyT					7/21/2000	36.1	\$1880.81
AnyT					7/28/2000		
AnyT					7/28/2000		
AnyT					8/4/2000		
AnyTown	Roll Line	Roll Prod.	2001 - 5	4	8/4/2000		
AnyTown	Donut Line	Donut Prod.	2001 - 5	4	8/4/2000		

Schedule History

Plant Name: AnyTown Department: Donut Prod. Period Number: 2001 - 6

Period Start Date: 6/1/2001 Period End Date: 6/30/2001 Week Number: 1 Week Start: 6/1/2001 Actual Hours: 36.95

Add Record: New Delete Save Cancel

OK Access Level: Administrat Click on any screen object for instructions on it's use. Press F1 for additional help.

Equipment Run-Time Schedules - Adding, Editing, Deleting Records

Adding New Equipment Run-Time Schedule History Records

To work with equipment run-time schedule history select  from the button bar. Follow these steps to create a new equipment run-time schedule history record:

1. Press **New** then select the line.
2. Select the fiscal period number. The dates corresponding to this period are automatically computed for you.
3. Enter the week number and the equipment run-time hours for that line during that week. **Tip:** Checking **Options>>AutoIncrement** causes the week number to be incremented automatically.
4. Press **Save** to keep the record.

When a record is added the combined wages for all employees in that line is computed and displayed in the grid.

Warning: There may be only one equipment run-time schedule record for each line - week start date combination. An error occurs if you attempt to create a duplicate record.

Important Note: Keep the equipment run-time schedule history up to date and do not skip periods. Doing so limits the reliability analysis capabilities of MaintSmart.

Editing or Deleting Equipment Run-Time Schedule History Records

To edit an equipment run-time schedule record left mouse-click the grid row containing the record to select it. Change the values as needed in the boxes below the grid. Press **Save** to keep the changes.

Warning: There may be only one equipment run-time schedule record for each line - week start date combination. An error occurs if you attempt to create a duplicate record.

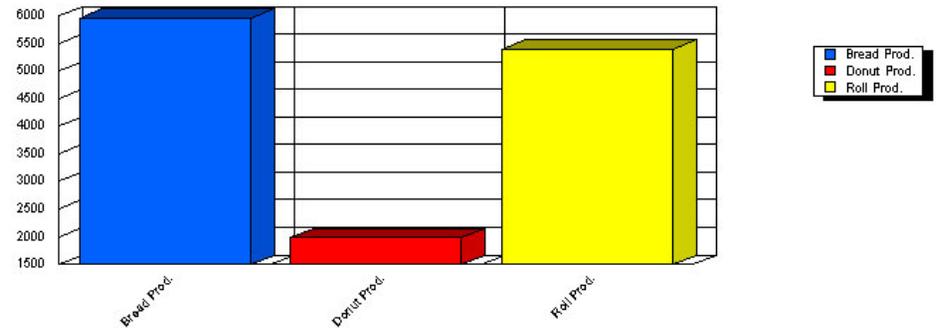
To delete an equipment run-time schedule record left mouse-click the grid row containing the record to select it. Press **Delete** to permanently delete the record.

Acme Baking Company

Run Hours by Department

Print Date: 8/10/2001

Plant Line	Period	Week Date	Hours	Dept Cost
Plant#:	327	AnyTown		



Department: Bread Prod.				
Department	Period	Week Date	Hours	Dept Cost
Bread	2000 - 6	8/27/1999	86.03	\$16687.57
Bread	2000 - 6	9/3/1999	130.27	\$23754.74
Bread	2000 - 7	9/10/1999	128.33	\$23400.98
Bread	2000 - 7	9/17/1999	124.52	\$22706.22
Bread	2000 - 7	9/24/1999	118.95	\$21690.53
Bread	2000 - 7	10/1/1999	136.77	\$24990.01

The purpose of logging equipment run-time schedule history for each line is so that MaintSmart can know how long an equipment item has been in use. This information is used by the analysis sections of MaintSmart and more importantly by the reliability analysis section.

An added feature is the report generated from the equipment run-time schedule history records. Total and average labor hours are presented as well as plant totals.

Lock Out/Tag Out

Adding a New Lock Out/Tag Out Record

Lock out/Tag Out is available from the work order, downtime and PMs data entry screens.

To add a new lockout/tag out record select the menu items **Options>>Lock Out/Tag Out Data Entry**. Follow these steps to create the new record:

1. Press the **New** button.
2. Select the equipment to be locked out, the maintenance technician responsible for the lock out, the date and time locked.
3. Next select the reason why the equipment is being locked out. Possible values for the reason are listed in the box labeled **Task or Work Order Number**. Downtime reference numbers are also listed for a downtime selection.
4. Press **Save**.

Editing or Updating a Lock Out/Tag Out Record

To edit a lockout/tag out record select the menu items **Options>>Lock Out/Tag Out Data Entry**. Follow these steps :

1. Select the grid row containing the record you want to work with by left mouse-clicking the grid row containing the record.
2. Make the required changes in the boxes below the grid.
3. If you are removing a lock out be sure to check the small check box on the date selector after selecting the **Date/Time Unlocked**.
4. Press **Save**.

Deleting a Lock Out/Tag Out Record

To delete a lockout/tag out record select the menu items **Options>>Lock Out/Tag Out Data Entry**. Follow these steps :

1. Select the grid row containing the record you want to work with by left mouse-clicking the grid row containing the record.
2. Press the **Delete** button.

Printing Lock Out/Tag Out Reports

To print a lockout/tag out report **File>>Print>>Report>>...**

Two reports are available: All records or records grouped by equipment item.

The screenshot shows the 'Lock Out/Tag Out - Sacramento' application window. It features a menu bar (File, View, Options, Help) and a data grid with columns: Equipment, Technician, Time Locked, Time Unlocked, Reason, and Task or Work Order. The grid contains several records, including '90 Degree Roller Bed #1' and 'Bulk Yeast CIP System #1'. Below the grid is a form for editing a record, with fields for Plant (Sacramento), Date/Time Locked (2/23/2005 12:05 PM), Date/Time Unlocked (2/23/2005 12:14 PM), Reason (Down Time Number), Technician (Shannon Reeves), and Equipment (Proof Box #1). A dropdown menu for 'Task, Cause, PM, Work Order Number or Down Time Number' is set to '9254'. A comments field contains the text: 'DESCRIPTION: 9253 Date: 3/19/1997 Equip.: Loaf Splitter/Turner #1 Cause: Clutch/Brake Worn/Fail Maint. Shift: 1'. At the bottom right, there are buttons for 'New', 'Delete', 'Save', and 'Cancel'. A yellow callout box points to the comments field with the text: 'Enter additional comments if needed.'

The screenshot shows the 'Lock Out/Tag Out - Sacramento' application window with the 'Print' menu option selected. The 'Print' menu is open, showing options: 'Print', 'Exit', 'Report', and 'Grid'. The 'Report' submenu is also open, showing options: 'Lock Out/Tag Out Report', 'Lock Out/Tag Out Report (date filter)', 'Lock Out/Tag Out Report by Equipment', and 'Lock Out/Tag Out Report by Equipment (date filter)'. The background grid shows the same data as the previous screenshot.

Meter Readings - Creating New Meter Reading Records

Meter Readings

Once you have created one or more meter definitions *and* applied one or more meter/work order template combinations you'll now be ready to start using meters to create work orders for you (automatically if needed). Select from the meters screen the first tab (labeled: **Meter Readings**).

Follow these steps to create a meter reading record.

1. From the drop-down labeled **Equipment Name** select an equipment item. This equipment item is the equipment that you'll be taking meter reading(s) from. Notice that the Meters drop down immediately displays a meter and is loaded with all meters that have been associated with this equipment item. The Current Reading box also become enabled and displays it's value.
- Note:** only equipment associated with a work order template; where that work order template has been associated with one or more meter definitions, will appear in the drop-down.
2. Select the desired meter from the Meters drop-down.
3. Enter the current meter reading into the **Current Reading** drop-down.
4. Press the Apply button to save this new meter reading record.

Equipment	Meter Name	Unit	Current Reading	Reading Date	Last Performed	Last Date	Maximum Reading	Meter ID
Yeast Refrigeration Compressor #4	250 hours	Hour	3000	4/19/2010	855	5/21/2008	99999	40

Meter Readings

Plant: Filter Equipment by Type of Meter Link:

Equipment Name (only loads equip. linked to work order templates):

Meters (only loads meters associated with the above equipment item):

Maximum Reading: Hour

Current Reading: Hour Date Current Reading:

Last Performed: Hour Date Last Performed:

Difference: Hour An Uncompleted Work Order Is Associated With This Meter.

Select an equipment name then a meter (from the above drop-downs) to enable the current and last pref. boxes or left mouse-click a grid row, changed the current and last-performed value then save the record.

Archive Meters On Save

Meter Readings - Updating Meters

Meter Readings

Follow these steps to update a meter reading (current and last performed values and dates)

1. Left mouse-click the grid row containing the meter you want to update.
2. Change the value in the **Current Reading** textbox.
3. Change the value in the **Last Performed** textbox, if needed.

Note: The only time you should have to manually change the **Last Performed** reading would be in the case of a new record or if you needed to edit this value for some reason. MaintSmart sets the last performed value based upon your specification when you complete a work order generated by a meter.

4. Select the date of the current reading value from the Date Current Reading calendar drop-down.

5. Normally the Date Last Performed value is set by MaintSmart when a meter work order is completed. You may change this date if needed though.

6 The checkbox labeled: **An Uncompleted Work Order Is Associated With This Meter** should only be unchecked in the case where you have manually deleted a meter created work order.

Important Note: This checkbox automatically becomes checked whenever a work order has been created from this meter. The reason for this is so that MaintSmart knows not to recreate a work order that is already in progress (regarding this template/meter combination). If you were to manually delete a work order (from the work order data entry screen) that had been created by a meter you would need to manually uncheck this checkbox in order to tell MaintSmart that this work order may be created once again when this meter expires.

7. Press the **Apply** button to update the meter reading.

Equipment	Meter Name	Unit	Current Reading	Reading Date	Last Performed	Last Date	Maximum Reading
Saw #1	500 Cycles	Cycles	234	6/28/2010	0.0000	6/28/2010 3:35 PM	99999999999999
Yeast Refrigeration Compressor #4	250 hours	Hour	8000	4/19/2010	855	5/21/2008	99999

Meter Reading: Saw #1 - 500 Cycles (Cycles)

Plant: Sacramento

Filter Equipment by Type of Meter Link: Work Order Templates and PMs (default)

Equipment Name (only loads equip. linked to work order templates): Saw #1

Meters (only loads meters associated with the): 500 Cycles - 500Cycles

Maximum Reading: 99999999999999 Cycles

Current Reading: 600 Cycles

Date Current Reading: 6/28/2010

Last Performed: 278 Cycles

Date Last Performed: 6/28/2010

Difference: 322 Cycles

An Uncompleted Work Order Is Associated With This Meter.

Archive Meters On Save

Buttons: Apply, Remove, Cancel

Meter Readings
Select an equipment name then a meter (from the above drop-downs) to enable the current and last pref. boxes or left mouse-click a grid row, changed the current and last-performed value then save the record.

Data Analysis

Topics

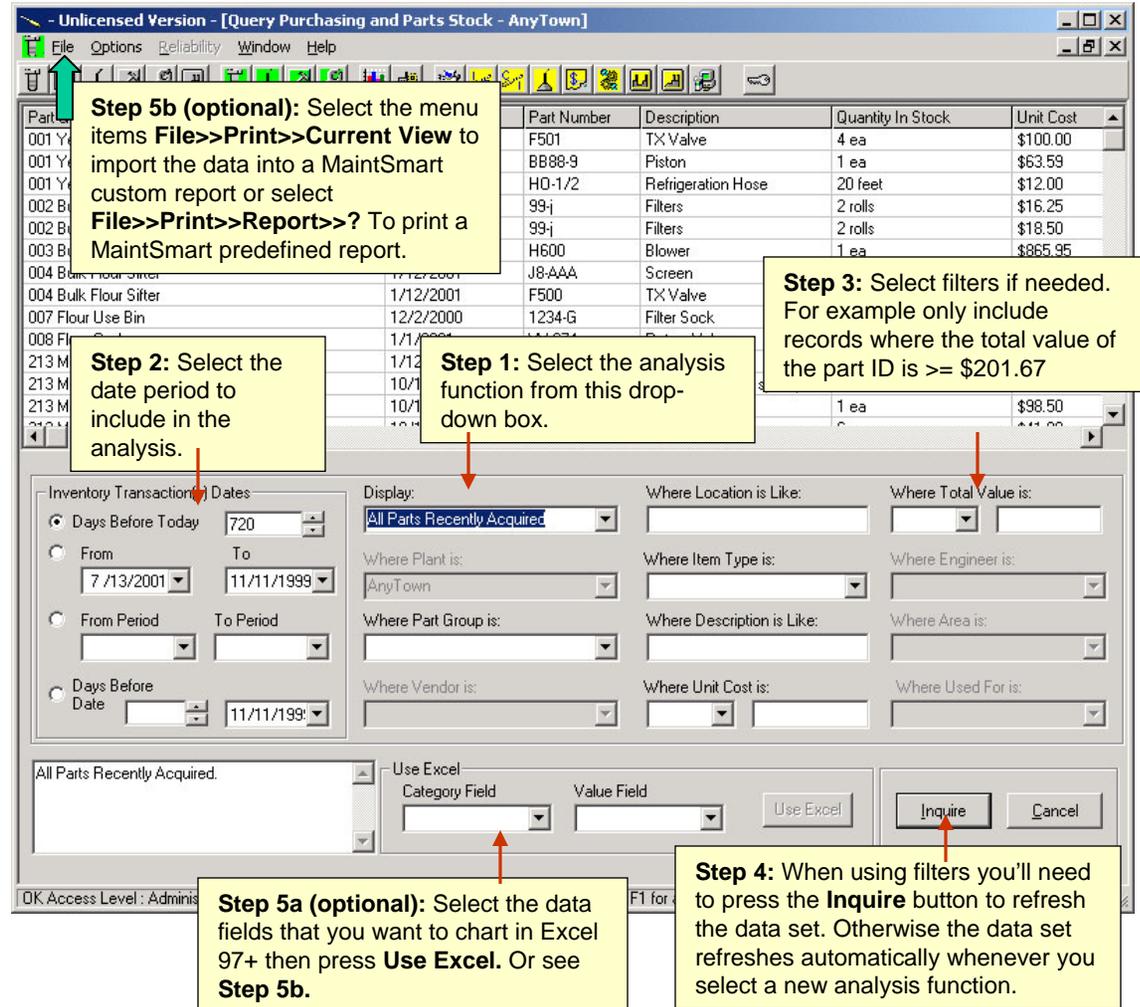
- Inventory Analysis.....132-133
- Inventory Reporting.....134
- Preventive Maintenance Analysis.....135-136
- Preventive Maintenance Reporting.....137
- Downtime Analysis.....138-142
- Downtime Reporting.....143
- Work Order Analysis.....144
- Work Order Reporting.....145

Inventory Analysis

Analyzing Inventory

To analyze inventory select  from the button bar (Inventory Analysis and Query). The following analysis and query scenarios are available:

- All Parts Recently Acquired** displays all parts acquired between the selected date period. Filters included part group, location, item type, description, unit cost and total value.
- All Spare Parts Used** displays spare parts used during the specified date period. Filters are equipment, vendor, item type, description, unit cost, total value, cost center and account.
- Spare Parts List by Location** is useful for quickly locating parts, performing inventory audits and reordering.
- Parts by Vendor** displays all spare parts by vendor. Records can be filtered by vendor, location, description, unit cost, total value, cost center and/or account.
- Purchased Parts Stock Items by Vendor** provides a list of parts where the parts were acquired through a purchase transaction referencing a vendor (not necessarily a preferred vendor).
- Parts Used by Account** shows charges to accounts by fiscal period for parts used during selected time period. Filter by vendor, total value, cost center and/or account.
- Parts Used by Area/Equipment** displays parts used on an equipment item during a specific time period. Filters are equipment, description, total value and area.
- Parts Used by Part Group** displays a list parts used associated to that part's part group. Filters are part group, description and total value.
- Parts Used by Vendor** displays a list of parts used during a specified time period and includes the vendor who supplied the part. Filters are vendor, description, total value, cost center and payment type.
- Parts Used by Who** supplies information about the use of parts during a specified time period including the maintenance technician who used the part. This query also includes why the part was used.
- Purchase by Part Group** totals purchases for each fiscal period and groups them by part group. Filters are vendor, cost center, account and payment type.
- Purchases by Account** sums all purchases by account and fiscal period. This is especially useful for determining total charges to an account each period. Filters are part group, vendor, item type, cost center, account and payment type.
- Purchases by Cost Center** shows the total purchase costs grouped by cost center, fiscal period and item type. This is useful for determining if your purchases are in line with your budget. Filters are part group, vendor, item type, cost center, account and payment type.
- Purchases by Vendor** displays the total expenditure per vendor per fiscal period. Filters are vendor and total value.
- Several more predefined reports are available from the menu items **File>>Print>>Report**.
- All Spare Parts Used by Line**.



The screenshot shows the 'Query Purchasing and Parts Stock' window. At the top, a table lists parts with columns for Part Number, Description, Quantity In Stock, and Unit Cost. Below the table is a filter configuration panel with sections for 'Inventory Transaction Dates', 'Display', and various filter criteria like 'Where Location is Like', 'Where Total Value is', etc. The 'Display' dropdown is set to 'All Parts Recently Acquired'. The 'Where Total Value is' filter is set to '>= \$201.67'. The 'Inquire' button is highlighted.

Step 1: Select the analysis function from this drop-down box.

Step 2: Select the date period to include in the analysis.

Step 3: Select filters if needed. For example only include records where the total value of the part ID is \geq \$201.67

Step 4: When using filters you'll need to press the **Inquire** button to refresh the data set. Otherwise the data set refreshes automatically whenever you select a new analysis function.

Step 5a (optional): Select the data fields that you want to chart in Excel 97+ then press **Use Excel**. Or see **Step 5b**.

Step 5b (optional): Select the menu items **File>>Print>>Current View** to import the data into a MaintSmart custom report or select **File>>Print>>Report>>?** To print a MaintSmart predefined report.

To enable you to get the most out of the Inventory Analysis and Query be sure you understand the following topics:

- What additional functionality do data grids provide? Page 6
- How do I create a grid report? Page 118
- How do I create a detail report? Page 116
- How do I create an Excel report? Page 117

Inventory Analysis – Inventory Change Logging

Analyzing Inventory

To analyze inventory select  from the button bar (Inventory Analysis and Query). The below items are new in MaintSmart 5.0. Inventory Change Logging (Inventory Change Auditing) tracks the inventory data table anytime it's primary field data is changed. These changes could come from any number of different actions including: direct changes to the raw inventory data, parts being used, parts being received, etc. Inventory changes may be printed in a formatted detail report, exported to Excel or other formats. Below the picture shows how to turn change logging on or off.

17. **Inventory Change Log** displays all parts acquired between the selected date period. Filters included part group, location, item type, description, unit cost and total value.

18. **Inventory Change Log by Vendor** displays spare parts used during the specified date period. Filters are equipment, vendor, item type, description, unit cost, total value, cost center and account.

	Description	ChangeDate	User ID	ChangeText	Quantity	Unit	Unit Cost	Location	Item Type
20	3" bolt grade 5	9/6/2016	admin	Update	10	EA	\$25.14	Bolt Stock	Inventory
4	Connecting Rod	9/6/2016	admin	Update	14	EA	\$102.00	Y65	Inventory
4	Connecting Rod	9/6/2016	admin	Update	14	EA	\$102.00	Y65	Inventory

~ (3) Records Loaded in (seconds): 0

Inventory Transaction(s) Dates

Days Before Today

From To

From Period To Period

Days Before Date

Display: Where Location is

- Inventory Change Log
- Inventory Change Log by Vendor
- List of Purchased Items (Received and Not Received)
- List of Received Items
- Parts Used by Account
- Parts Used by Part Group
- Parts Used by Who
- Parts Used by Why

Activate Inventory Change Logging (Auditing) by checking this menu in **Program Configuration** under the **Options** menu.

Audit Inventory Transactions

Delete Inventory Audit Transactions

To enable you to get the most out of the **Inventory Analysis and Query** be sure you understand the following topics:

- What additional functionality do data grids provide? Page 6
- How do I create a grid report? Page 118
- How do I create a detail report? Page 116
- How do I create an Excel report? Page 117

Reporting on inventory changes from the Inventory and Purchasing Analysis screen..

Inventory Reporting

Inventory Reporting

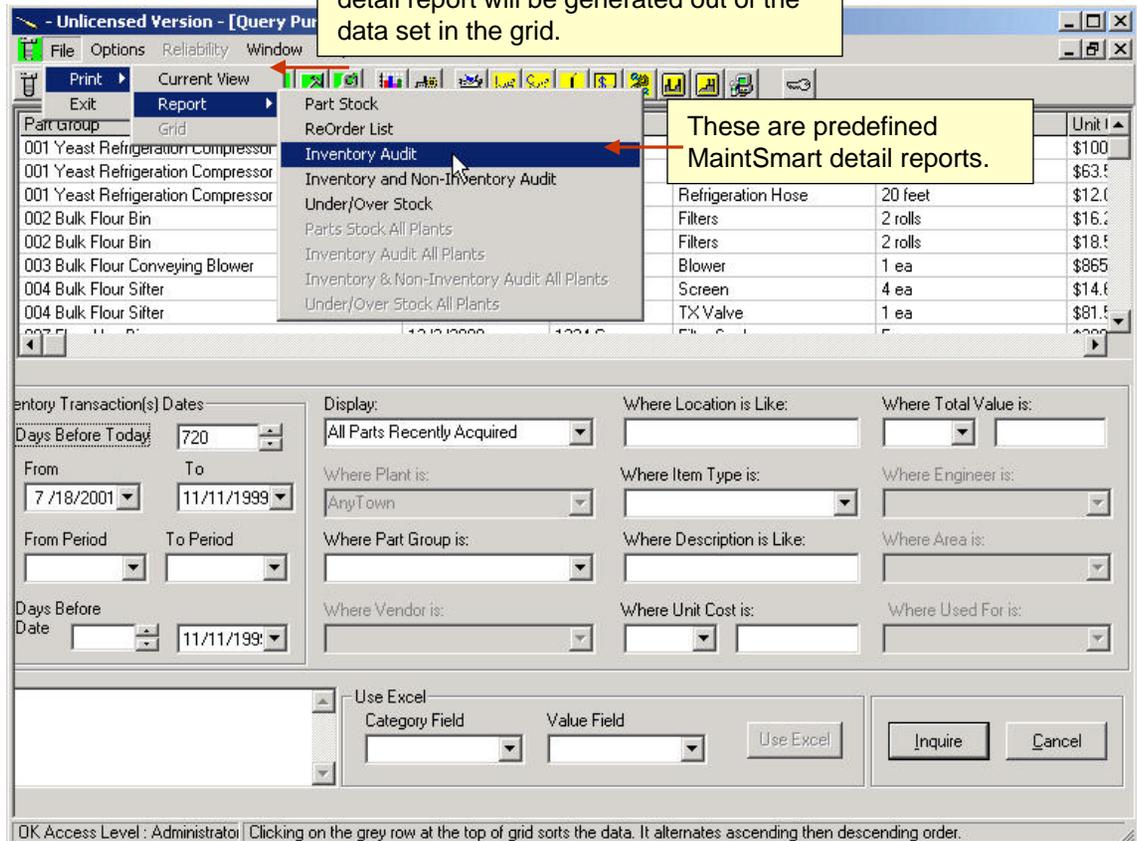
To analyze and report on inventory select  from the button bar, Inventory Analysis.

Many of the user filtered reports may be printed as a MaintSmart Detail report. Detail reports are intrinsic MaintSmart reports. Many contain charts and nearly all of them contain summaries of various columns. For more information on detail Reports turn to page 116.

To create a MaintSmart detail report of the current data set select the menu items in the screen **File>>Print>>Current View>>?** Not all data sets support detail reports in which case you'll need to perform a grid print. Notice the menu items in the screen shot in the menu box farthest to the right. These items are pre-defined MaintSmart detail reports (**Parts List, Inventory Audit**, etc.) The last four items in this menu box are disabled. The reason for this is accessing these menu items gives you access to other plants or top-level entities records. This requires the access permission **Edit Other Plants**. This permission is given by the MaintSmart system administrator. See the section on user access permission on pages 15-16 of this manual.

By selecting **Current View** a MaintSmart detail report will be generated out of the data set in the grid.

These are predefined MaintSmart detail reports.

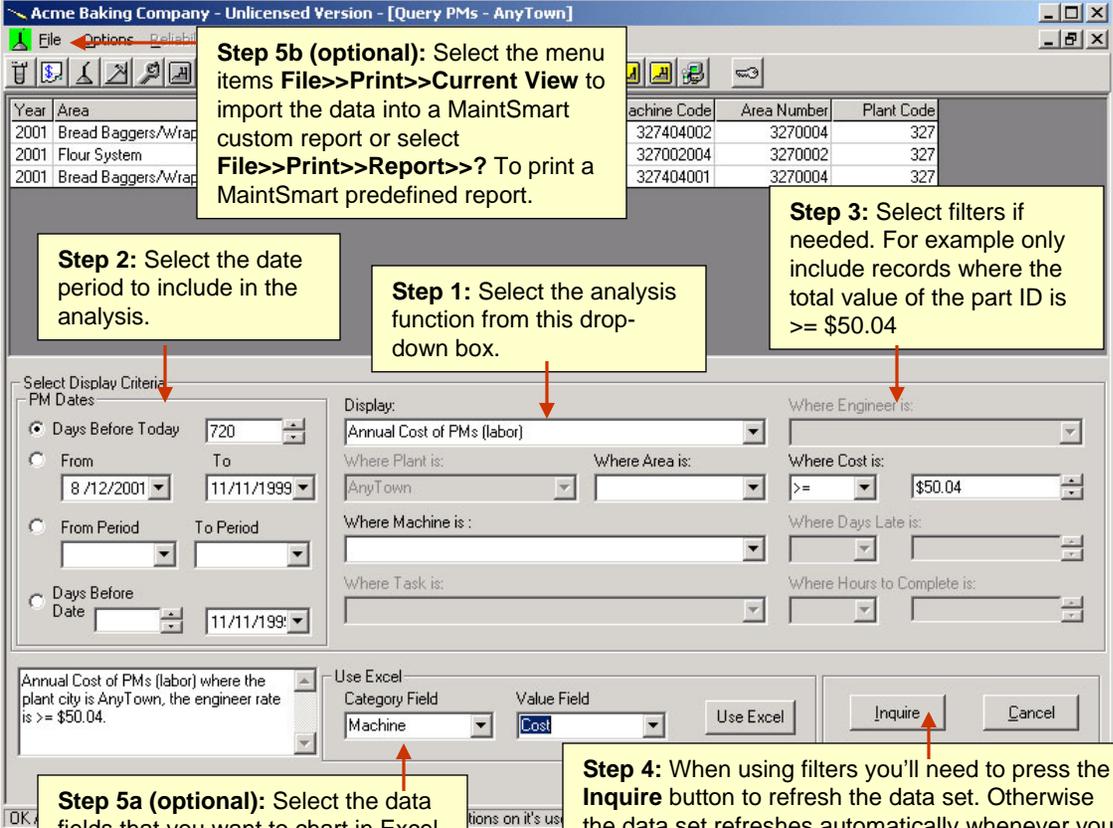


The screenshot shows the software interface with the 'Current View' menu open. The menu items are: Part Stock, ReOrder List, Inventory Audit, Inventory and Non-Inventory Audit, Under/Over Stock, Parts Stock All Plants, Inventory Audit All Plants, Inventory & Non-Inventory Audit All Plants, and Under/Over Stock All Plants. The 'Inventory Audit' item is highlighted. Below the menu is a grid of data with columns for Part Group, Description, Quantity, and Unit Cost. The grid contains several rows of data, including '001 Yeast Refrigeration Compressor', '002 Bulk Flour Bin', and '004 Bulk Flour Sifter'. Below the grid is a filter panel with various dropdown menus and text boxes for filtering data. At the bottom of the screen, there is a status bar that reads 'OK Access Level : Administrator | Clicking on the grey row at the top of grid sorts the data. It alternates ascending then descending order.'

Preventive Maintenance Analysis

To perform preventive maintenance analysis select  from the button bar. The following queries and analysis scenarios are available:

- All Uncompleted PMs** displays general informational regarding all tasks completed within the selected date period. Filters are area, equipment, task, technician and days late.
- All Completed PMs** displays general informational regarding all completed PMs. One report includes a chart.
- PM Statistics Last Two Years** provides statistics regarding hours have been spent on each task for each equipment. Statistics used are average, standard deviation, variance, minimum and maximum. Filters are task and equipment.
- Weekly Percentage of PM Time** shows the percentage of maintenance technician labor hours that have been used towards preventive maintenance. Filters are work area and technician.
- Cost of PMs (labor)** displays the cost of each individual task for each equipment. Filters are area, equipment, task, cost of PM and hours to complete.
- Annual Cost of PMs (labor and parts) Grouped by Year** displays the annual cost of labor hours used for preventive maintenance grouped by calendar year and equipment. Rounded to nearest year. Filters are equipment and cost.
- Cost of PMs (labor)** displays the annual cost of labor hours used for preventive maintenance grouped by calendar year and equipment. Filters are equipment and cost.
- Total Labor Cost/Area by Plant** shows the total labor cost for each work area during the specified date period.
- Total Labor Cost /Equipment for PMs by Area** displays the total labor cost for each equipment in the selected work area and during the specified date period.
- Average Time (hours) Spent on Each Task by Equipment** displays the average time spent one each task for each equipment during the specified date period. Use the merge column capability to group like tasks and/or equipment.
- Avg. Late Days Where Task Completed After Due Date** shows the average days a task was late and how many times it was late during the specified date period. Filter is how many days late.
- Total PM Hours Grouped by Area** shows the total labor hours used for preventive maintenance for each work area during the specified date period.
- Percentage Tasks Completed On Time by Equipment** shows the percentage of total tasks that were completed on time grouped by equipment. If the percentage is consistently low you may consider further evaluation of this work area.
- Percent of Tasks Completed On Time by Area** shows the percentage of total tasks that were completed on time grouped by work area. If the percentage is consistently low you may consider further evaluation of this work area.
- Average and Total Task Hours by Equipment** shows the average and total labor hours used for preventive maintenance during the specified date period grouped by equipment.



Step 1: Select the analysis function from this drop-down box.

Step 2: Select the date period to include in the analysis.

Step 3: Select filters if needed. For example only include records where the total value of the part ID is $\geq \$50.04$

Step 4: When using filters you'll need to press the **Inquire** button to refresh the data set. Otherwise the data set refreshes automatically whenever you select a new analysis function.

Step 5a (optional): Select the data fields that you want to chart in Excel 97+ then press **Use Excel**. Or see **Step 5b**.

Step 5b (optional): Select the menu items **File>>Print>>Current View** to import the data into a MaintSmart custom report or select **File>>Print>>Report>>?** To print a MaintSmart predefined report.

Machine Code	Area Number	Plant Code
327404002	3270004	327
327002004	3270002	327
327404001	3270004	327

To enable you to get the most out of the Preventive Maintenance Analysis and Query be sure you understand the following topics:

- What additional functionality do data grids provide? Page 154-159
- How do I create a grid report? Page 118
- How do I create a detail report? Page 116
- How do I create an Excel report? Page 117

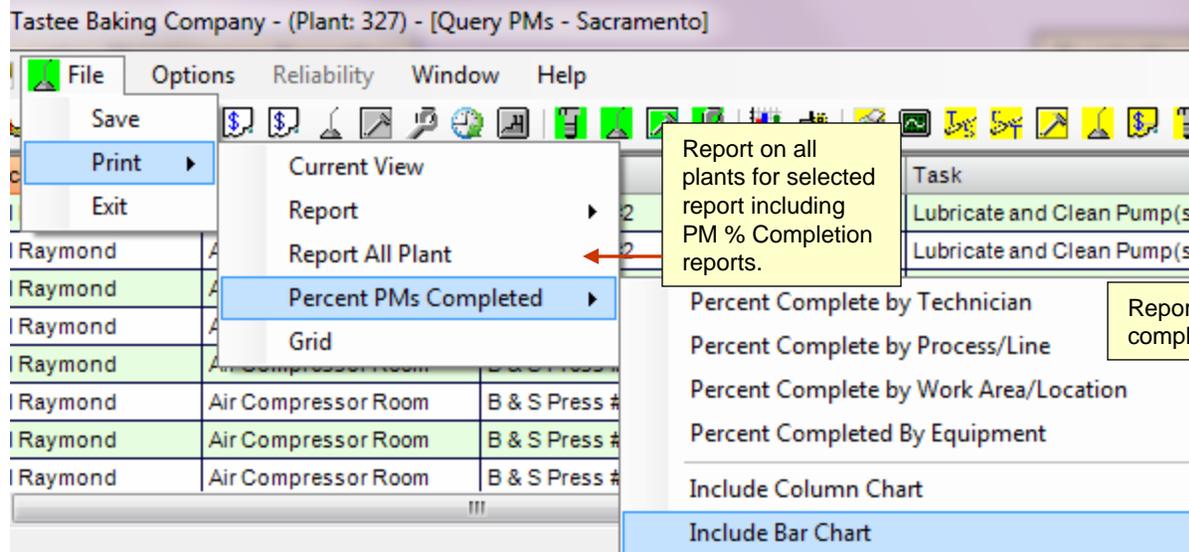
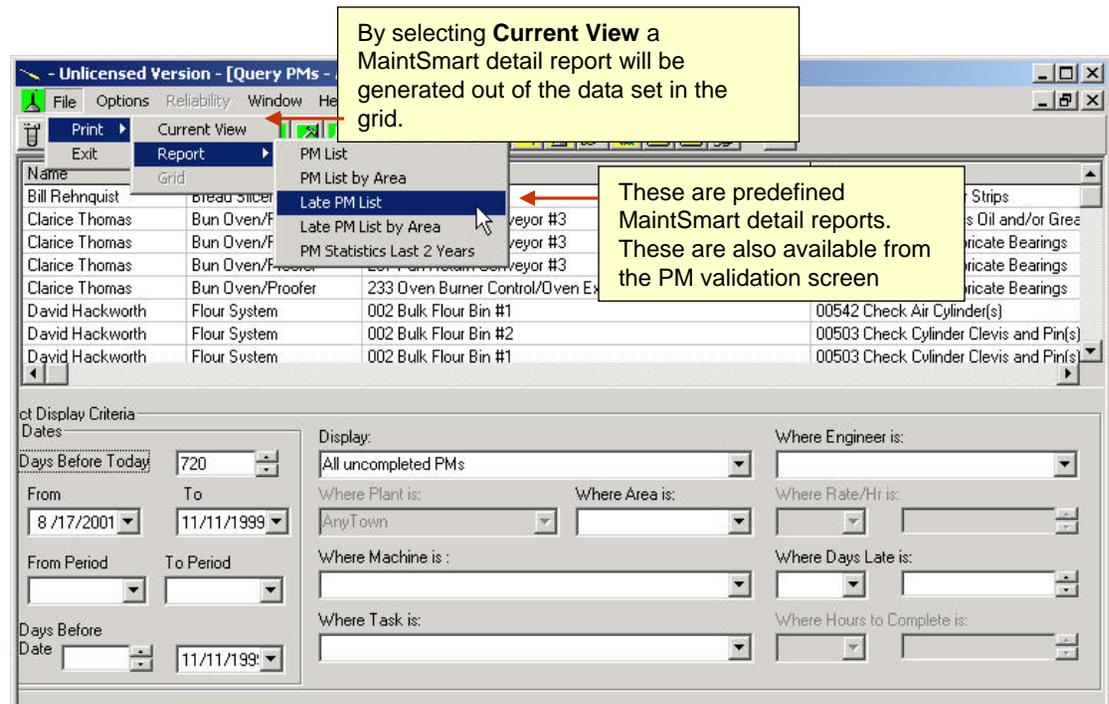
Preventive Maintenance Reporting

Preventive Maintenance Reporting

To analyze and report on preventive maintenance (PMs) select  from the button bar, PM Analysis.

Many of the user filtered reports may be printed as a MaintSmart Detail report. Detail reports are intrinsic MaintSmart reports. Many contain charts and nearly all of them contain summaries of various columns. For more information on detail Reports turn to page 116.

To create a MaintSmart detail report of the current data set select the menu items in the screen **File>>Print>>Current View>>?** Not all data sets support detail reports in which case you'll need to perform a grid print. Notice the menu items in the screen shot in the menu box farthest to the right. These items are pre-defined MaintSmart detail reports (**PM List**, **Late PM list by Area**, etc.)



Equipment Downtime Analysis 1 of 5

To perform equipment downtime analysis select  from the button bar. When you open the **Downtime Analysis and Query** screen the grid is refreshed with all downtime records within the user specified **Maximum Query Days** setting located in the configuration section. The **Maximum Query Days** setting limits the date period used to refresh all MaintSmart grids as follows: **Today's Date - Maximum Query Days**. More information regarding this setting is available in the Configuration section under the heading **Configuration - Fiscal Year, Max. Query Days, Downtime Goal**.

To start analyzing downtime select the menu item **View>>?** And described in the captions to the right. The next four pages of this manual go into detail regarding the four analysis functions under the **Analyze>** menu heading: Best and Worst Downtime Analysis and Query shows the best or worst records from a specified date period based on user selected filters.

Grouped Category Downtime Analysis and Query groups records based on user selected grouping specification and flexible set of filters including day of the week.

Crosstab Downtime Analysis and Query similar to an Excel pivot table. This query calculates a sum, average, count, variance or standard deviation on records, and then groups the result by two types of information one down the left side of the data grid and the other across the top. Very flexible filter set.

Cost of Downtime Analysis and Query same as crosstab (above) but calculates the dollar amount based on wage rate and count of employees entered by user.

Other query and analysis functions are available by selecting the menu item **View>>**. These queries are useful for making quick comparisons between shifts, lines or work areas. There are several detail reports available from the **File>>Print>>Report**. Grid reports are also available. The grid has the following right mouse-click functionality: **Merge Columns, Show Totals and Average, and Equipment Code Info.**:

The **Merge Column** menu item merges rows containing identical data in the clicked grid column. Normal View returns the grid to its normal state. It is possible to merge several columns at once by selecting the columns one by one with a right mouse-click then selecting Merge Column.

The **Show Totals and Average** menu item displays totals and averages of selected query data sets. It is available by right mouse-clicking the grid.

The **Equipment Code Info** menu item is available by right mouse-clicking the downtime analysis grid. It gives a brief summary of the equipment referenced by the equipment code.

The screenshot shows the software interface with the 'Analyze' menu open. The menu items are: Best and Worst Down Time Instance Analysis and Query, Grouped Category Down Time Analysis and Query, Crosstab Down Time Analysis and Query, and Cost of Lost Time Analysis and Query. The 'Use Excel' dialog box is open, showing fields for Plant (AnyTown), Row Heading (Department), Column Heading (Sunday, Monday, Tuesday, Wednesday), and Value Field (Impact). A text box explains that a simple to understand explanation of the question you asked about downtime is presented in this box. Another text box explains that a simple to understand explanation of the question you asked about downtime is presented in this box. A third text box explains that a simple to understand explanation of the question you asked about downtime is presented in this box.

Equipment Downtime Analysis 2 of 5

To perform equipment downtime analysis select  from the button bar. To access the Best and Worst Downtime Analysis and Query select the menu items **View>>Analyze>> Best and Worst Downtime Instance - Analysis and Query**. This method allows you to determine which downtime instances are the best X% or worst X% records with regard to time down, time to repair or impact to equipment run-time schedule. It also allows you to determine which downtime instances are the best X or worst X records.

Example: What are the worst 5% (X%) of impact to equipment run-time schedule downtime instances between a specified date period where equipment = 204 Bagger? This query returns the worst 5% of downtime instances between the specified date period where the equipment involved was a 204 Bagger equipment. If you have five 204 Bagger equipment items in your plant then this query returns records for any and all 204 Bagger equipment items.

Example: What are the worst 25 (X) of impact to equipment run-time schedule downtime instances between a specified date period? This query returns a maximum of 25 records. The data set is drawn from all equipment items because there is no filter as in the previous example.

To use this query and analysis method follow these steps:

1. Select either the **Top %** option or **Top X** option. To see the top worst records check the check box below the option button (Top X). Leave it unchecked to see the best records.
2. Select the downtime type: **Time Down**, **Repair Time**, **Impact**.
3. Select the date period to draw records from.
4. You may specify which field to include in this query by checking the appropriate boxes in the frame labeled **Display Which Fields**.
5. Select one or more filters if desired. Checking the **Not** check box on any filter causes the query to exclude filtered data rather than include filtered data.

To see a plain English representation of the query you are about to run press the button **Show Query**. The text from the English representation is, by default, used as the title of any Excel reports you create.

Note: You may also change this text, and consequently the title of Excel reports, on the main downtime grid screen by directly typing into the text box located at the lower left of the screen.

Press the **Inquire** button to display the requested data set. To create an Excel report from the downtime grid screen follow these steps:

1. In the lower right portion of the screen select the **Category Field** from the drop-down box.
2. Select the value field. This is always a numeric field. The **Use Excel** button is enabled. Press the button to create the report and chart.

Step 1: Select Top % or Top X of Best or Worst downtime instances.

Step 2: Select the time value type to include in analysis

Step 3: Select the date period.

Step 4: Select the fields to include in the display

Step 5: Select filters.

Step 6: Press Inquire to run the analysis.

Optional: Press Show Query to see a simple language display of the analysis question.

Top Worst 21% of Repair Time From 08/13/2001 Through 720 Days Prior to 08/13/2001 Where Plant is AnyTown, Machine Code = 327006001, Department = Bulk Ingredients.

Equipment Downtime Analysis 3 of 5

To perform equipment downtime analysis select  from the button bar. To access the Grouped Category Downtime Analysis and Query select the menu items **View>>Analyze>>Grouped Category Downtime- Analysis and Query**. This downtime query and analysis method enables you to perform the following functions on a user selected grouping of data: minimum, maximum, average, count, variance and standard deviation. You may query for time down, time to repair or impact to equipment run-time schedule.

There are two ways to filter the data. The first way is to limit records returned based on how the minimum, maximum, average, count, variance or standard deviation compare to a user defined value (see example below). There second way is to use one or more of the various filters available. They are: plant, equipment, work area, operator shift, technician shift, day of week, cause and line.

Example: Only include records having an average ≥ 10 and where the work area is "Flour System" and that occurred on Fridays.

To use this query and analysis method follow these steps:

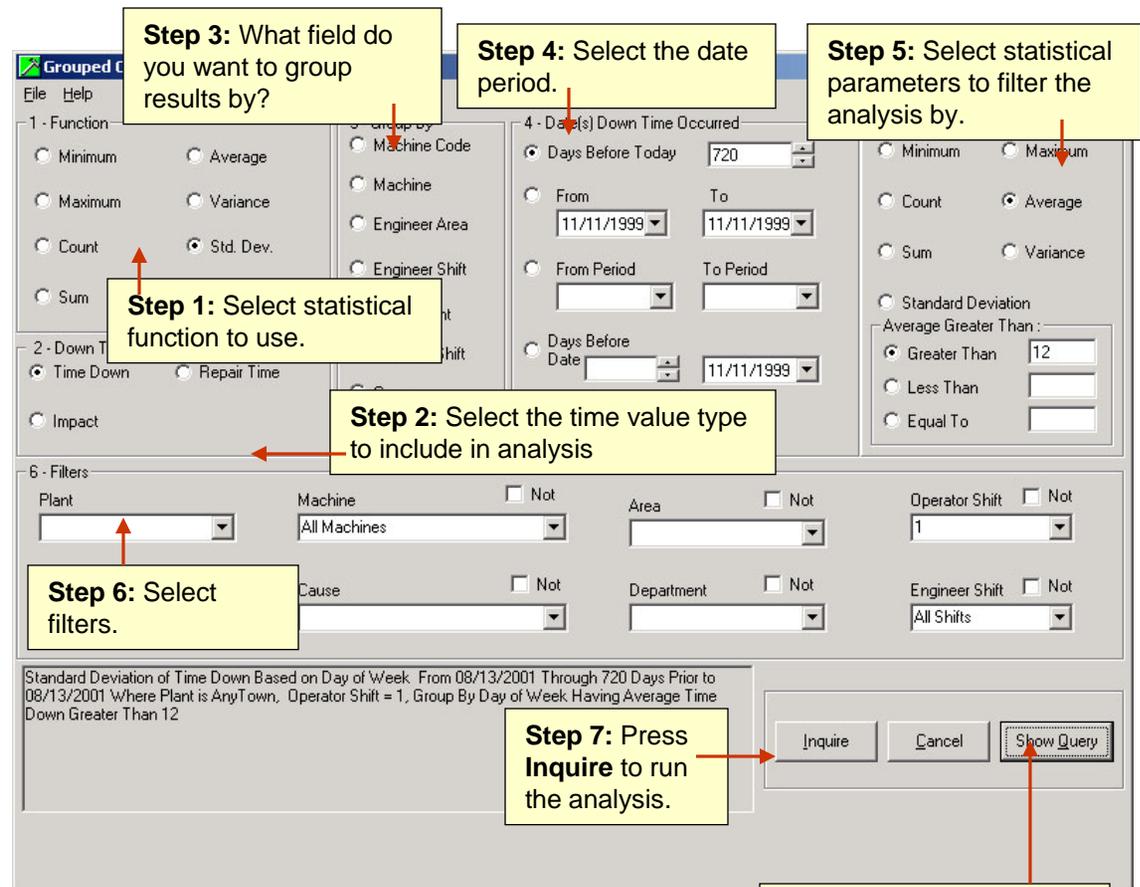
1. Select the statistical function: **Minimum, Maximum, Average, Count, Variance or Standard Deviation**.
2. Select the type of downtime you want to display: **Time Down, Repair Time, Impact**.
3. Choose the field to group the data by.
4. Select the date period to draw records from.
5. Select the filter that limits records based on their value. To avoid using this filter enter zero (0) in the text box next to whichever compare option you have selected i.e.. **Greater Than, Less Than or Equal To**.
6. Select one or more filters if desired. Checking the **Not** check box on any filter causes the query to exclude filtered data rather than include filtered data.

To see a plain English representation of the query you are about to run press the button **Show Query**. The text from the English representation is, by default, used as the title of any Excel reports you create.

Note: You may also change this text, and consequently the title of Excel reports, on the main downtime grid screen by directly typing into the text box located at the lower left of the screen.

Press the **Inquire** button to display the requested data set. To create an Excel report from the downtime grid screen follow these steps:

1. In the lower right portion of the screen select the **Category Field** from the drop-down box.
2. Select the value field. This is always a numeric field. The **Use Excel** button is enabled. Press the button to create the report and chart.



The screenshot shows the 'Grouped Category Downtime Analysis and Query' dialog box. It is divided into several sections:

- 1 - Function:** Radio buttons for Minimum, Maximum, Count, Sum, Average, Variance, and Std. Dev.
- 2 - Downtime Type:** Radio buttons for Time Down, Repair Time, and Impact.
- 3 - Group By:** Radio buttons for Machine Code, Machine, Engineer Area, and Engineer Shift.
- 4 - Date(s) Down Time Occurred:** Fields for Days Before Today (720), From/To dates (11/11/1999), and Days Before Date.
- 5 - Filter Parameters:** Radio buttons for Minimum, Maximum, Count, Average, Sum, Variance, and Standard Deviation. A section for 'Average Greater Than' with options: Greater Than (12), Less Than, and Equal To.
- 6 - Filters:** Fields for Plant, Machine (All Machines), Area, Operator Shift (1), Cause, Department, and Engineer Shift (All Shifts). Each has a 'Not' checkbox.
- Bottom Section:** A text box containing the query description: 'Standard Deviation of Time Down Based on Day of Week From 08/13/2001 Through 720 Days Prior to 08/13/2001 Where Plant is AnyTown, Operator Shift = 1, Group By Day of Week Having Average Time Down Greater Than 12'. Buttons for Inquire, Cancel, and Show Query.

Seven yellow callout boxes with red arrows point to specific elements:

- Step 1:** Points to the 'Average' radio button in the Function section.
- Step 2:** Points to the 'Time Down' radio button in the Downtime Type section.
- Step 3:** Points to the 'Machine' radio button in the Group By section.
- Step 4:** Points to the 'Days Before Today' field in the Date(s) Down Time Occurred section.
- Step 5:** Points to the 'Average' radio button in the Filter Parameters section.
- Step 6:** Points to the 'Machine' dropdown in the Filters section.
- Step 7:** Points to the 'Inquire' button.
- Optional:** Points to the 'Show Query' button.

Optional: Press Show Query to see a simple language display of the analysis question.

Equipment Downtime Analysis 4 of 5

To perform equipment downtime analysis select  from the button bar. To access the Crosstab Downtime Analysis and Query select the menu items **View>>Analyze>>Crosstab Downtime - Analysis and Query**. A crosstab query calculates a sum, average, count, or other type of total on records, and then groups the result by two types of information one down the left side of the data grid and the other across the top. For example, a crosstab query can display the total impact to equipment run-time schedule for each operator shift and for each line. What makes the crosstab so powerful is that you can display all of the lines and all of the operator shifts at the same time. (In contrast the grouped category method allows you to show all lines but only one operator shift.) This makes the crosstab useful when comparisons need to be made.

To use the crosstab query follow these steps:

1. Select the total method by clicking one of the option buttons : **Minimum, Maximum, Sum, Count, Average, Variance or Standard Deviation**.
2. Select the value that you want to analyze (**Time Down, Repair Time or Impact Time**).
3. Select the row heading data group by clicking the appropriate option button in the frame labeled **Group By**.
4. Select the time period form the date box.
5. Select the column heading data group by clicking the appropriate option button in the frame labeled **Compare**.
6. (Optional) Enter the equipment run-time hours during the specified time period. Doing so displays the data set as a percent (%) of actual equipment run-time .
7. Select one or more filters if desired. Checking the **Not** check box on any filter causes the query to exclude filtered data rather than include filtered data.

To see a plain English representation of the query you are about to run press the button **Show Query**. The text from the English representation is, by default, used as the title of any Excel reports you create.

Note: You may also change this text, and consequently the title of Excel reports, on the main downtime grid screen by directly typing into the text box located at the lower left of the screen.

Press the **Inquire** button to display the requested data set. To create an Excel report from the downtime grid screen follow these steps:

1. In the lower right portion of the screen select the row heading from the drop-down box.
2. Select one or more column headings by left mouse-clicking the item in the list box. To select multiple items either click and drag the mouse or hold the **Ctrl** key and click the mouse.
3. Select the value field. Now the **Use Excel** button is enabled. Press the button to create the report and chart.

Step 1: Select statistical function to use.

Step 2: Select the time value type to include in analysis

Step 3: What field do you want to group results by?

Step 4: Select the date period.

Step 5: Select the comparison field.

Step 6: Select filters.

Step 7: Press **Inquire** to run the analysis.

Optional: Press **Show Query** to see a simple language display of the analysis question.

Total(s) of Impact to Schedule From 08/13/2001 Through 720 Days Prior to 08/13/2001 Where Plant is AnyTown, Operator Shift = 1, and Occurred on Sunday Group By Department; Compare to Cause.

Equipment Downtime Analysis 5 of 5

To perform equipment downtime analysis select  from the button bar. To access the Cost of Lost Time Downtime Analysis and Query select the menu items **View>>Analyze>>Cost of Lost Time - Analysis and Query**. This query method is called a crosstab query. The crosstab query calculates a sum, average, count, or other type of total on records, and then groups the result by two types of information one down the left side of the data grid and the other across the top. For example, a crosstab query can display the total impact to equipment run-time for each operator shift and for each line. What makes the crosstab so powerful is that you can display all of the lines and all of the operator shifts at the same time. (In contrast the grouped category method allows you to show all lines but only one operator shift.) This makes the crosstab useful when comparisons need to be made.

To use the **Cost of Lost Time** crosstab query follow these steps:

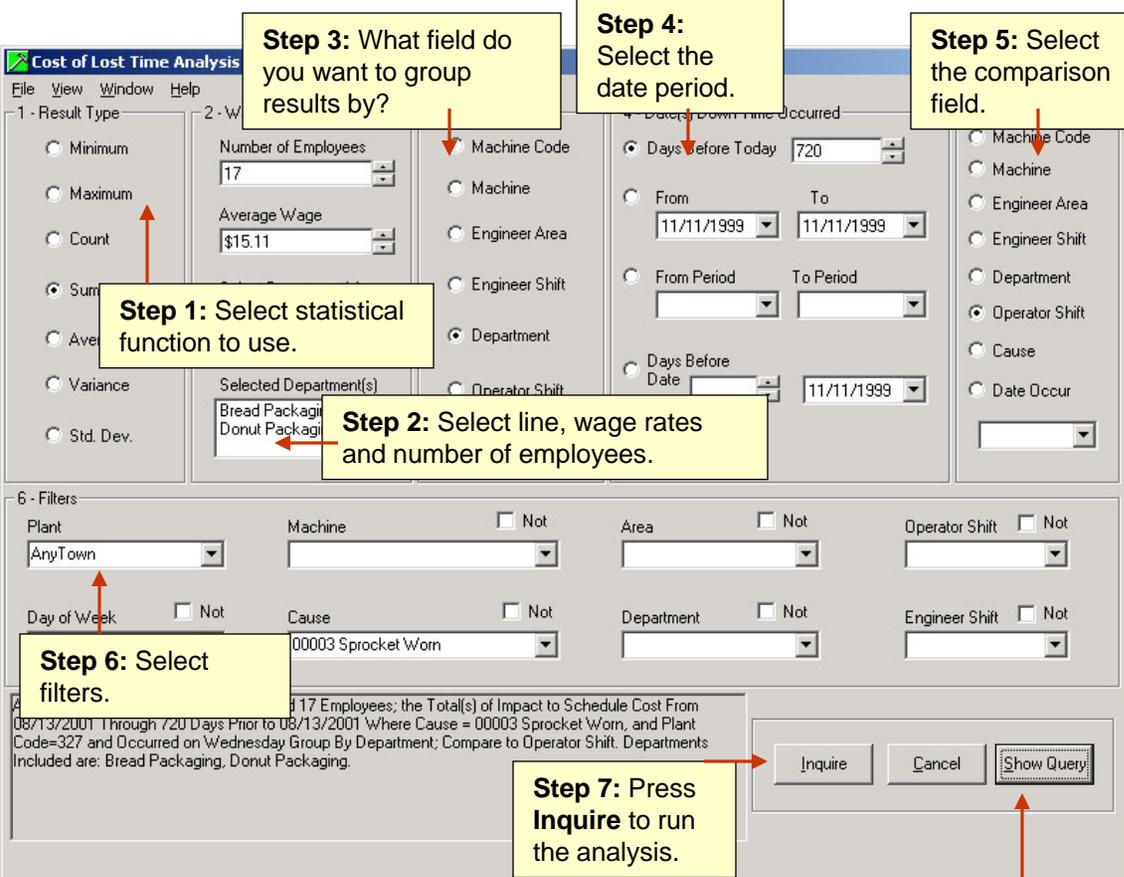
1. Select the total method by clicking one of the option buttons: **Minimum, Maximum, Sum, Count, Average, Variance or Standard Deviation**.
2. Enter the number of non-maintenance employees that are being idled by this equipment failure(s), their average hourly wage rate overall.
3. Select the lines affected by the equipment failure by clicking on the line name in the list box. The lines move to the list box labeled **Selected Line(s)**.
4. Select the row heading data group by clicking the appropriate option button in the frame labeled **Group By**.
5. Select the time period.
6. Select the column heading data group by clicking the appropriate option button in the frame labeled **Compare**.
7. Select one or more filters if desired. Checking the **Not** check box on any filter causes the query to exclude filtered data rather than include filtered data.

To see a plain English representation of the query you are about to run press the button **Show Query**. The text from the English representation is, by default, used as the title of any Excel reports you create.

Note: You may also change this text, and consequently the title of Excel reports, on the main downtime grid screen by directly typing into the text box located at the lower left of the screen.

Press the **Inquire** button to display the requested data set. To create an Excel report from the downtime grid screen follow these steps:

1. In the lower right portion of the screen select the row heading from the drop-down box.
2. Select one or more column headings by left mouse-clicking the item in the list box. To select multiple items either click and drag the mouse or hold the **Ctrl** key and click the mouse.
3. Select the value field. Now the **Use Excel** button is enabled. Press the button to create the report and chart.



The screenshot shows the 'Cost of Lost Time Analysis' dialog box. It is divided into several sections: '1 - Result Type' with radio buttons for Minimum, Maximum, Count, Sum, Average, Variance, and Std. Dev.; '2 - W' with input fields for Number of Employees (17) and Average Wage (\$15.11); '3 - Machine Code' with radio buttons for Machine, Engineer Area, Engineer Shift, and Department; '4 - Dates Downtime Occurred' with radio buttons for Days Before Today (720), From/To dates (11/11/1999), and From Period/To Period; '5 - Compare' with radio buttons for Machine Code, Machine, Engineer Area, Engineer Shift, Department, Operator Shift, Cause, and Date Occur; '6 - Filters' with dropdown menus for Plant (AnyTown), Machine, Area, Operator Shift, Day of Week, Cause (00003 Sprocket Worn), Department, and Engineer Shift, each with a 'Not' checkbox; and a bottom section with 'Inquire', 'Cancel', and 'Show Query' buttons. A preview window at the bottom left shows a sample query: '17 Employees; the Total(s) of Impact to Schedule Cost From 08/13/2001 Through 720 Days Prior to 08/13/2001 Where Cause = 00003 Sprocket Worn, and Plant Code=327 and Occurred on Wednesday Group By Department; Compare to Operator Shift. Departments Included are: Bread Packaging, Donut Packaging.'

Step 1: Select statistical function to use.

Step 2: Select line, wage rates and number of employees.

Step 3: What field do you want to group results by?

Step 4: Select the date period.

Step 5: Select the comparison field.

Step 6: Select filters.

Step 7: Press Inquire to run the analysis.

Optional: Press Show Query to see a simple language display of the analysis question.

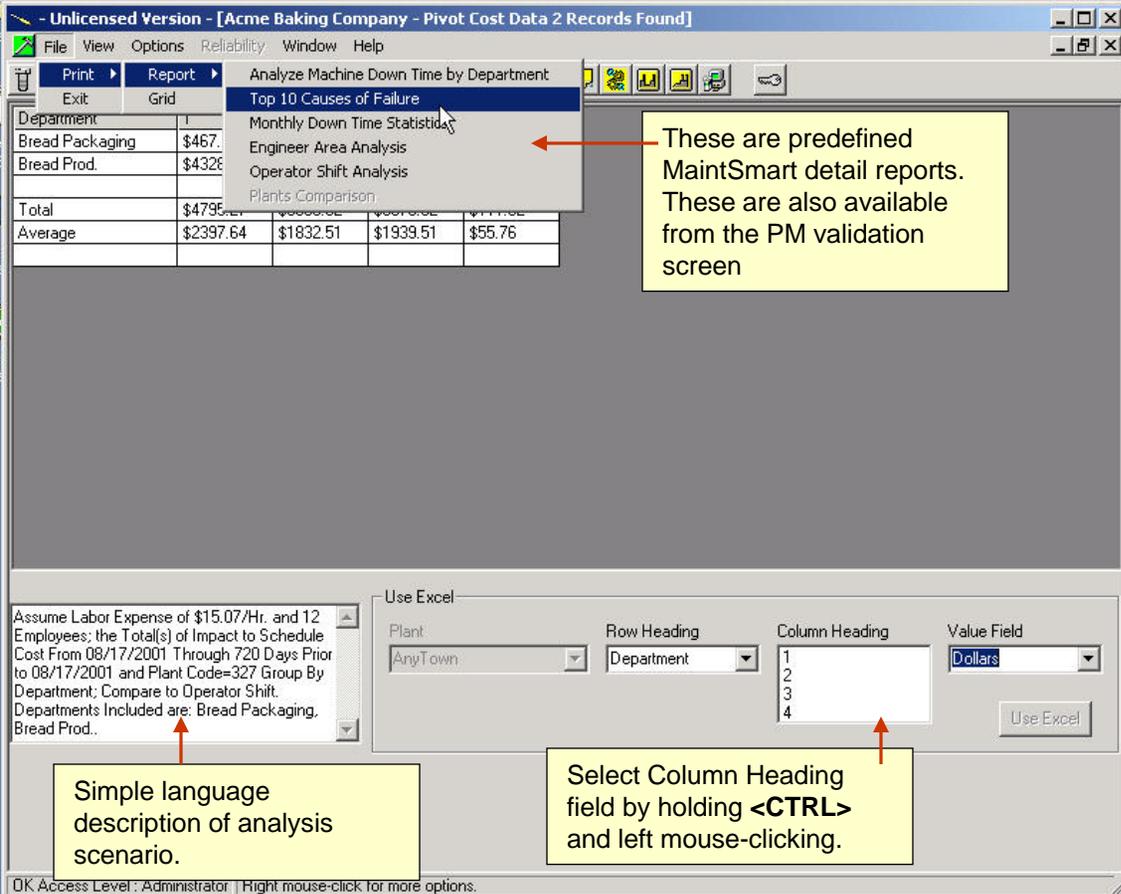
Equipment Downtime Reporting

Equipment Downtime Reporting

To analyze and report on downtime select  from the button bar, Downtime Analysis.

All of the reports in the downtime analysis section are pre-defined and may be printed as a MaintSmart Detail report. Detail reports are intrinsic MaintSmart reports. Many contain charts and nearly all of them contain summaries of various columns. For more information on detail Reports turn to page 116.

To create a MaintSmart detail report of the current data set select the menu items in the screen **File>>Print>>?** If you have Excel 97+ on MaintSmart you may import any data set directly into Excel using the controls in the lower right of the screen. You may select the fields under **Category Heading** by holding **<CTRL>** and left mouse-clicking the field name.



The screenshot shows a software window titled '- Unlicensed Version - [Acme Baking Company - Pivot Cost Data 2 Records Found]'. The menu bar includes File, View, Options, Reliability, Window, and Help. The 'Report' menu is open, showing options: Analyze Machine Down Time by Department, Top 10 Causes of Failure, Monthly Down Time Statistics, Engineer Area Analysis, Operator Shift Analysis, and Plants Comparison. A yellow callout box points to these options, stating: 'These are predefined MaintSmart detail reports. These are also available from the PM validation screen'. Below the menu is a data table:

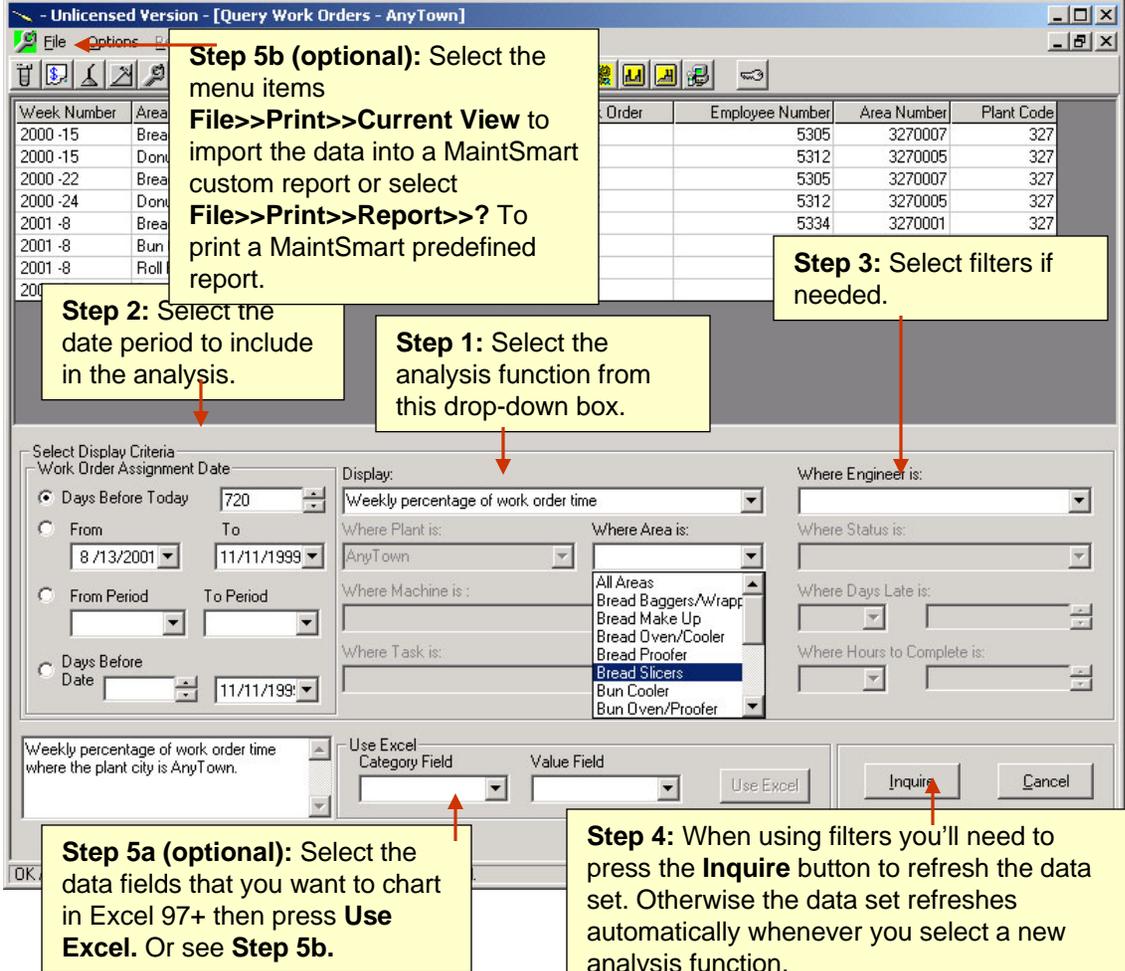
Department				
Bread Packaging	\$467.			
Bread Prod.	\$4328			
Total	\$4795			
Average	\$2397.64	\$1832.51	\$1939.51	\$55.76

At the bottom, the 'Use Excel' dialog box is visible. It has a text area on the left containing a detailed analysis scenario: 'Assume Labor Expense of \$15.07/Hr. and 12 Employees; the Total(s) of Impact to Schedule Cost From 08/17/2001 Through 720 Days Prior to 08/17/2001 and Plant Code=327 Group By Department; Compare to Operator Shift. Departments Included are: Bread Packaging, Bread Prod.'. A yellow callout box points to this text, stating: 'Simple language description of analysis scenario.'. The dialog also has fields for 'Plant' (AnyTown), 'Row Heading' (Department), 'Column Heading' (1, 2, 3, 4), and 'Value Field' (Dollars). A yellow callout box points to the 'Column Heading' field, stating: 'Select Column Heading field by holding <CTRL> and left mouse-clicking.'. A 'Use Excel' button is at the bottom right.

Work Order Analysis

To perform work order analysis select  from the button bar. The following analysis and query scenarios are available from the **Display** box.

1. **All Work Orders.** Displays all basic work order information for the selected time period. Filters available are area, equipment, task, technician, and completion status.
2. **Work Order Statistics Last Two Years.** Displays totals/statistics regarding work orders completed during the last two years. Fields displayed are sum, average, minimum, maximum, variance and standard deviation of the combined hours for all work orders during this time period. The available filter is equipment.
3. **Weekly Percentage of Work Order Time** shows the actual percent (%) of time each maintenance technician spent on work orders each week during the specified time period. Filters are area and technician.
4. **Cost of Work Orders (Labor)** displays the cost of labor hours for each work order based on the assigned maintenance technician's basic wage rate during the specified time period. Filters available are area, equipment, task, technician, and hours to complete.
5. **Cost of Work Orders (Labor and Spare Parts)** displays the cost of labor hours (based on the assigned maintenance technician's basic wage rate) and spare parts used for each work order during the specified time period. This query may be filtered by equipment.
6. **Total Cost of Work Orders Grouped by Area(Labor)** shows the annual cost of all work orders (labor only) for each equipment during the specified time period. Filters available are: equipment and work area.
7. **Annual Cost of Work Orders (Labor and Spare Parts)** shows the annual cost of all work orders (labor and parts) for each equipment during the specified time period. The available filter is equipment.
8. **Total Labor Cost/Area by Plant** displays the total labor cost for work orders for a selected plant grouped by work area during the specified time period.
9. **Total Labor Cost Equipment for Work Orders by Area** displays the total labor cost for work orders for a selected work area grouped by equipment during the specified time period. You must select a work area from the drop-down box before any data is displayed.
10. **Average Time (hours) Spent on Each Task by Equipment** displays the average hours spent per work order grouped by equipment during the specified time period.
11. **Average Late Days Where Tasks Completed After Due Date** shows the average days late for work orders completed after due date. Filter is days late.
12. **Total Work Order Hours Grouped by Area** displays the total hours spent on work orders during the specified date period. Grouped by work area.
13. **Percentage Tasks Completed On Time by Equipment**
14. **Percent of Tasks Completed On Time by Area** shows the percentage of work orders completed on or before the due date. Grouped by work area.
15. **Average and Total Task Hours by Equipment** displays average and total hours spent on work orders tasks grouped by work area.



Step 5b (optional): Select the menu items **File>>Print>>Current View** to import the data into a MaintSmart custom report or select **File>>Print>>Report>>?** To print a MaintSmart predefined report.

Step 2: Select the date period to include in the analysis.

Step 1: Select the analysis function from this drop-down box.

Step 3: Select filters if needed.

Step 5a (optional): Select the data fields that you want to chart in Excel 97+ then press **Use Excel**. Or see **Step 5b**.

Step 4: When using filters you'll need to press the **Inquire** button to refresh the data set. Otherwise the data set refreshes automatically whenever you select a new analysis function.

Order	Employee Number	Area Number	Plant Code
	5305	3270007	327
	5312	3270005	327
	5305	3270007	327
	5312	3270005	327
	5334	3270001	327

To enable you to get the most out of the Work Order Analysis and Query be sure you understand the following topics:

- What additional functionality do data grids provide? Page 154-159
- How do I create a grid report? Page 118
- How do I create a detail report? Page 116
- How do I create an Excel report? Page 117

Work Order Reporting

Work Order Reporting

To analyze and report on downtime select  from the button bar, Work Order Analysis.

Many of the user filtered reports may be printed as a MaintSmart Detail report. Detail reports are intrinsic MaintSmart reports. Many contain charts and nearly all of them contain summaries of various columns. For more information on detail Reports turn to page 116 .

To create a MaintSmart detail report of the current data set select the menu items in the screen **File>>Print>>Current View>>?** Not all data sets support detail reports in which case you'll need to perform a grid print. Notice the menu items in the screen shot in the menu box farthest to the right. These items are pre-defined MaintSmart detail reports.

A Word About Date Period Selection

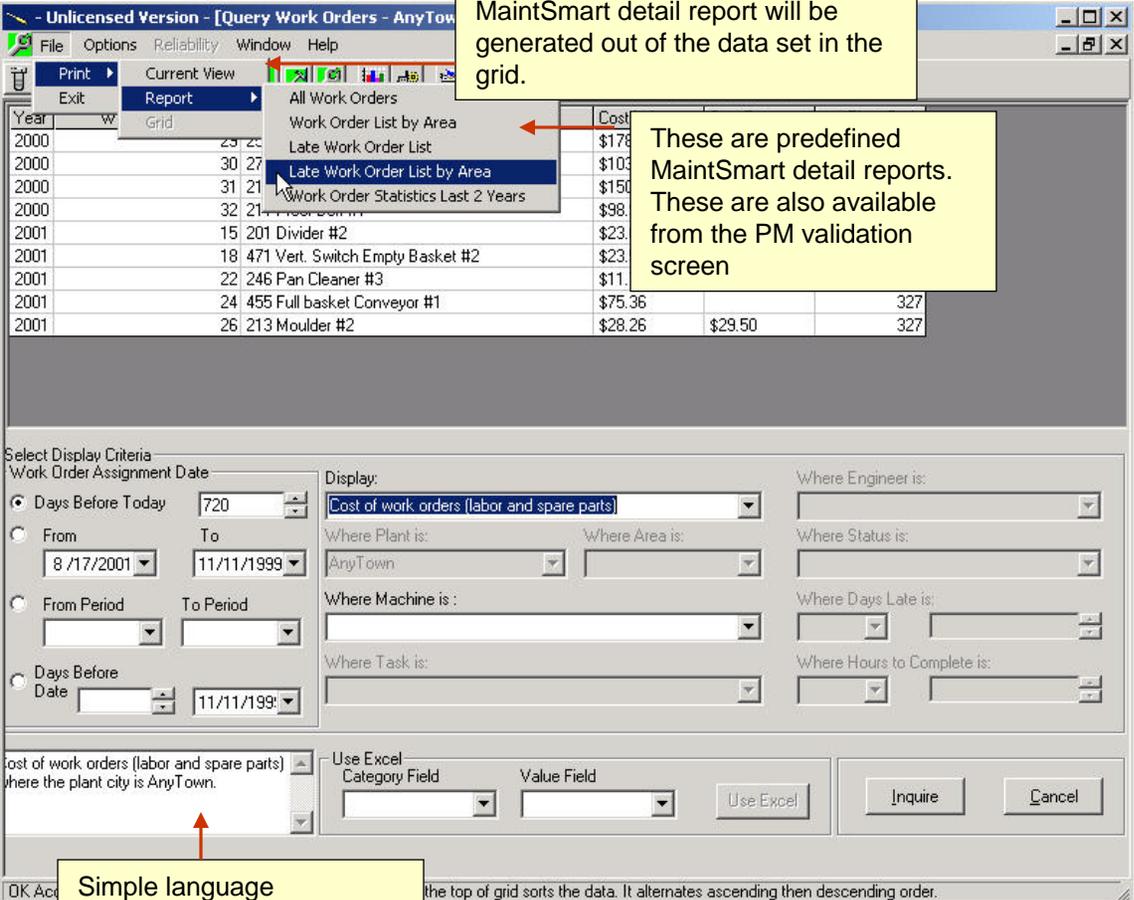
MaintSmart provides flexible date period selection. To use the date period box select one of the the date period modes by clicking one of the option buttons.

Days Before Today: If today is Jan. 30, 2001 and you have entered 20 in the text box the date period used by MaintSmart is Jan. 10, 2001 to Jan. 30,2001. When opening a screen the date period always defaults to the **Maximum Query Days** as set by the system administrator in the **Configuration** section.

From/To: The date selection period is all dates between the selected dates and includes the selected dates.

From Period to Period: Date selection period as interpreted from the **Period Dates** settings in the Configuration section. If your company does not use special fiscal periods MaintSmart defaults to Calendar Year - Calendar Month.

Days Before Date: The date selection period is the date selected and all dates before this date counting back the number of days entered in the text box.



The screenshot shows a software window titled "Unlicensed Version - [Query Work Orders - AnyTown]". The menu path **Print > Current View > Report > Late Work Order List by Area** is highlighted. A table of work orders is visible in the background. Below the table is a configuration dialog box for "Select Display Criteria".

Table Data:

Year	W	Grid	Cost
2000	29	25	\$178
2000	30	27	\$103
2000	31	21	\$150
2000	32	21	\$98
2001	15	201 Divider #2	\$23
2001	18	471 Vert. Switch Empty Basket #2	\$23
2001	22	246 Pan Cleaner #3	\$11
2001	24	455 Full basket Conveyor #1	\$75.96
2001	26	213 Moulder #2	\$28.26
			\$29.50
			327
			327

Configuration Dialog: Select Display Criteria

- Work Order Assignment Date:
 - Days Before Today: 720
 - From: 8 /17/2001 To: 11/11/1999
 - From Period: To Period
 - Days Before Date: 11/11/199
- Display: Cost of work orders (labor and spare parts)
- Where Plant is: AnyTown
- Where Area is:
- Where Machine is:
- Where Task is:
- Where Engineer is:
- Where Status is:
- Where Days Late is:
- Where Hours to Complete is:

Buttons: Use Excel, Inquire, Cancel

Footer: OK Acc... the top of grid sorts the data. It alternates ascending then descending order.

By selecting **Current View** a MaintSmart detail report will be generated out of the data set in the grid.

These are predefined MaintSmart detail reports. These are also available from the PM validation screen

Simple language description of analysis scenario.

Reporting Topics

- Reporting With MaintSmart.....147
- Example of MaintSmart Detail Report..... 148
- Example of an Excel Report.....149
- Example of a Grid Report.....150
- Exporting Reports.....151-152
- Email Configuration.....153

Reporting With MaintSmart

Three Types of Reports

With MaintSmart you have three different report formats to choose from.

Detail Reports

Detail reports are available for most data sets. For data other than analysis queries detail reports are generally predefined. Analysis reports are available as either predefined reports or reports based on the query (filtered data). The filtered data reports are very flexible and useful providing statistical summaries and in some cases charts of the data. To use a detail report select the menu items **File>>Print>>Report**. Select the report that you want to print or select Current View (if available) to print the contents of an analysis query.

When the print preview screen appears use the arrow buttons at the top of the screen to navigate from page to page. The print preview screen for detail reports is split into two sections. The section on the left shows a summary of the major groups that the report consists of. By clicking any of these groups the screen focus jumps to that group in the report section of the right side of the screen. This provides a simple and fast way to get to the part(s) of the report that interest you without manually searching page by page. Another useful search lets you type in a word or phrase to locate the word or phrase. To access this feature type in the word or phrase in the text box at the top of the print preview screen. Press **F3** to start the search. Each time you press the search button the screen focus jumps to the next instance of the search word or phrase. The reports data may be changed by another user while you are viewing it. To see the most recent changes in the data press **F5**. This refreshes the data set, the report and chart with the most up to date information. The contents of the print preview screen may be sent to a printer or saved in numerous data formats. The contents may also be emailed from the print preview screen.

Note: Detail report data may be exported from the detail report print preview screen directly into Excel. Now that the data is in Excel it may be charted and analyzed with all of the powerful features of Excel.

In some cases export data from a detail report to Excel may not have the correct number format that Excel needs to create a chart. An example is number data with a dollar sign in front of it. When data is exported to Excel that contains non-numeric characters such as '\$' Excel interprets it as text instead of numbers. Excel only charts numeric data. Excel's format features may resolve this problem but you may have to manually remove the dollar signs first.

Grid Reports

Most grids may be printed by selecting the menu items **File>>Print>>Grid**. In some cases the entire contents of the grid is not printed due to size limitations. In these cases only the most pertinent information is printed.

When the print preview screen appears use the arrow buttons at the top of the screen to navigate from page to page. The contents of the print preview screen may be sent to a printer or saved in numerous data formats.

Note: Grid report data may be exported from the grid report print preview screen directly into Excel. Now that the data is in Excel it may be charted and analyzed with all of the powerful features of Excel.

In some cases export data from a grid to Excel may not have the correct number format that Excel needs to create a chart. An example is number data with a dollar sign in front of it. When data is exported to Excel that contains non-numeric characters such as '\$' Excel interprets it as text instead of numbers. Excel only charts numeric data. Excel's format features may resolve this problem but you may have to manually remove the dollar signs or other characters first.

Excel Reports

Most of the analysis screens include the capability of exporting the contents of the grid directly into Excel. This feature also allows you to select which two grid columns to export. The Excel chart that's created uses the plain English description of the query that generated the data set. You may type directly into the query description text box if you prefer different title to your Excel chart however the maximum size of the title is 255 characters.

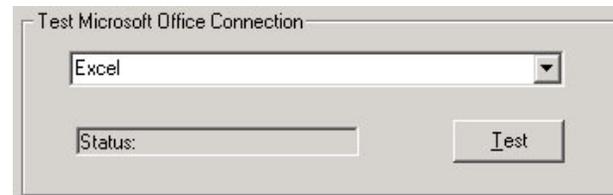
Follow these steps to export a data set directly into Excel:

1. From any of the analysis screens run a query and generate a data set in the grid.
2. Near the bottom of the screen choose the category field(s) and the value field from the drop-down boxes.
3. Press the *Use Excel button.
4. Follow the prompts to create the Excel chart and sheet.

Tip: Use the powerful statistical and charting capabilities of Excel.

Note: This feature requires that Excel 97 or a newer version is installed on the user's computer.

* You need to tell MaintSmart© that you have Excel 97 or later on your computer. This only needs to be done once. See Linking to Microsoft Excel to MaintSmart© below.



Linking to Microsoft Excel

To link Excel to MaintSmart © go to the Configuration screen . Select the tab labeled **System**. Locate the frame labeled **Test Microsoft Office Connection**. Select the Office program you wish to link to. Press the button below. If you are unable to successfully link you may need to reinstall Microsoft Office 97 or greater. Once successfully linked to Excel MaintSmart is able to accept data sets directly from Excel by clicking the **Use Excel** Button on several of the analysis screens.

Example of a MaintSmart Detail Report

Detail Reports

Detail reports are available for most data sets. For data other than analysis queries detail reports are generally predefined. Analysis reports are available as either predefined reports or reports based on the query (filtered data). The filtered data reports are very flexible and useful providing statistical summaries and in some cases charts of the data. Some detail reports provide charts too. Most detail reports provide some sort of analysis, statistics or summary.

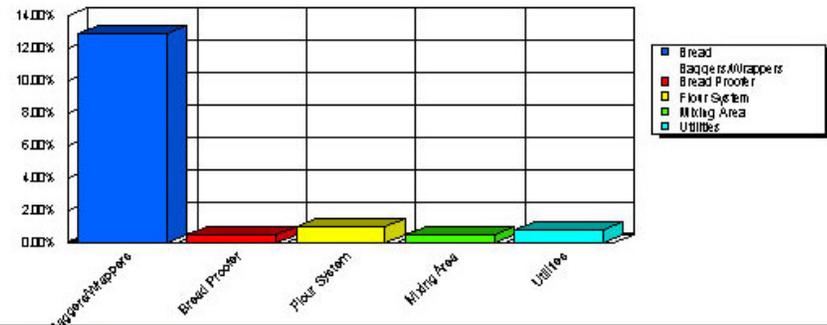
Acme Baking Company

Percent of Time Spent on PMs by Area

Print Date: 8/17/2001

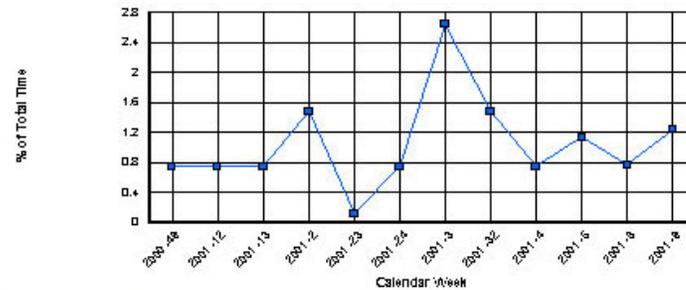
Week Number: Engineer Sim % PM % Other

Plant#: 327



Area: 3270002 Flour System

Percent of Time Spent on PMs by Calendar Week Number



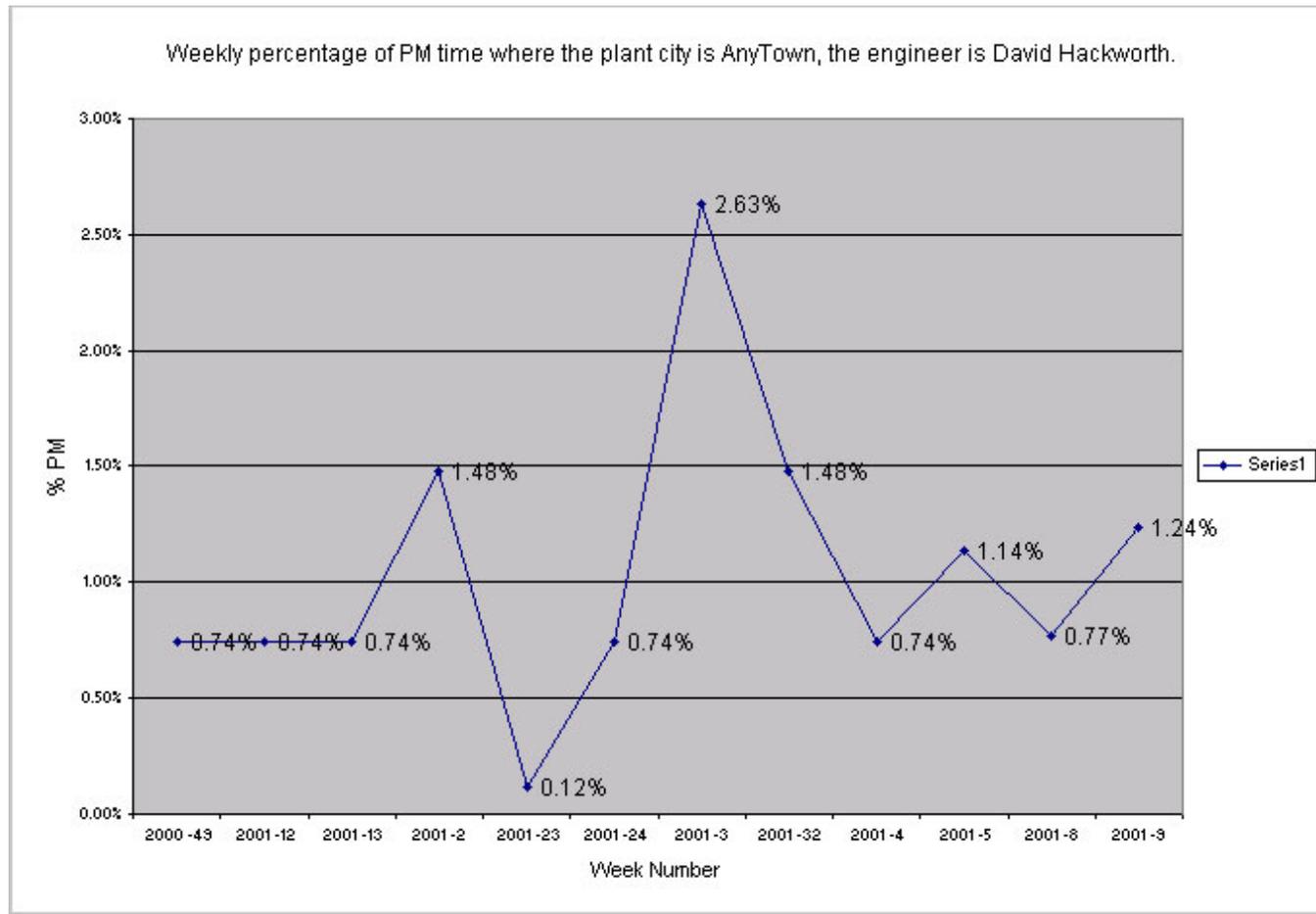
2000-49	David Hackworth	1	74%	99.26%
2001-12	David Hackworth	1	74%	99.26%
2001-13	David Hackworth	1	74%	99.26%
2001-2	David Hackworth	1	1.48%	98.52%
2001-23	David Hackworth	1	.12%	99.88%
2001-24	David Hackworth	1	74%	99.26%
2001-3	David Hackworth	1	2.63%	97.37%
2001-32	David Hackworth	1	1.48%	98.52%
2001-4	David Hackworth	1	.74%	99.26%
2001-5	David Hackworth	1	1.14%	98.86%
2001-8	David Hackworth	1	.77%	99.23%
2001-9	David Hackworth	1	1.24%	98.76%

Example of an Excel Report

Excel Reports

Excel reports are available if you have Excel 97 or higher on your work station. MaintSmart creates a chart and some basic statistics for you automatically. Once the data set is in Excel it may be manipulated and analyzed with all of Excel's powerful features !

See the instructions on page 117 for more information on Excel reports.



Example of a Grid Report

Grid Reports

All grids in MaintSmart may be printed by selecting the menu items **File>>Print>>Grid**. MaintSmart displays the print options dialog box. Depending upon your printer driver you'll select the appropriate button on the print dialog needed to perform the print job. Another way to a print grid is to first save the grid by selecting the menu items **File>>Save** then saving the grid as **Excel (.xls)**, **Web Page (.html)**, **Comma Separated Value (.csv)** or a **simple text**. Once the grid has been saved you may print the grid from the appropriate program (i.e. Internet Explorer, Netscape, Excel, etc).

Depending upon how your system is configured you may be able to also fax the grid directly from MaintSmart.

Note: Some grids are too wide to fit on one sheet and may spread over two or more sheets of paper.

Example of a grid report saved as an Excel spreadsheet (.xls).

	A	B	C	D	E	F	G	H
1	Department	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	Bread Packaging	35	0	0	42	61	7	0
3	Bread Prod.	70	82	87	301	190	13	77
4	Crouton	0	0	0	17	0	0	0
5	Donut Packaging	122	35	30	30	30	0	68
6	Donut Prod.	0	0	0	0	20	0	0
7	Roll Packaging	91	0	45	67	26	5	0
8	Roll Prod.	155	120	9	155	36	60	10

Example of a grid report saved as a web page (HTML).

Department	Sunday	Monday	Tuesday	Wednesday	Thu
Bread Packaging	35	0	0	42	
Bread Prod.	70	82	87	301	
Crouton	0	0	0	17	
Donut Packaging	122	35	30	30	
Donut Prod.	0	0	0	0	
Roll Packaging	91	0	45	67	
Roll Prod.	155	120	9	155	

Exporting Reports

Exporting Reports

All detail reports may be exported from the print preview screen. The print preview screen will display with the selected report when the **File>>Print>>** menu items are clicked. Reports may be exported via email, printer or saved as one of the supported exported file types.

Supported export file types include:

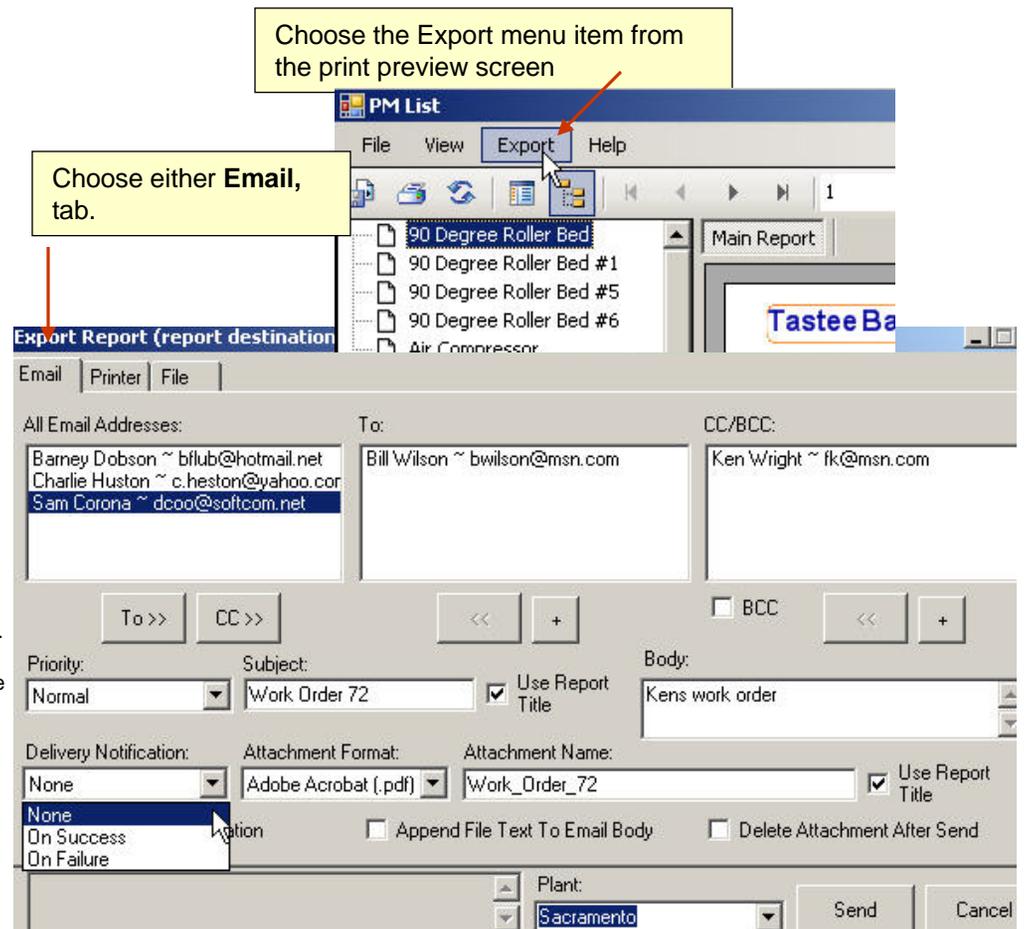
- Adobe Acrobat (.pdf)
- MS Word (.doc)
- Rich Text (.rtf)
- HTML
- Excel (.xls)
- Comma Separated (.csv)
- Text (.txt)
- XML (.xml)

Export - Email

NOTE: before using the email export you must first configure you email settings for the MaintSmart's email utility. Additionally to have email addresses appear in the Email list users must have a linked valid email address.

To email a report open the **Export Report** screen then select the screen tab labeled Email. Follow these steps to send an email with the report added as an email attachment.

- 1.) Select email addresses from the leftmost list box then click either the **To>>** button or the **CC>>** button. Add unconfigured email addresses by clicking the **+** button under either the To or the CC/BCC lists.
- 2.) Choose a **Priority**, enter a **Subject**. If you'd like to use the report title as the subject check the **Use Report Title** checkbox.
- 3.) Enter a message **Body** if needed.
- 4.) If you want the receiving email box to acknowledge delivery of the email select a Delivery Notification other than None.
- 5.) Choose an attachment (the report) format and give the attachment a file name if you'd like. Otherwise MaintSmart will create a unique file name for you. You can also optionally use the report title for the attachment name.
- 6.) Check the appropriate check boxes. NOTE: **Append File Text to Email Body** creates text from the report contents and embeds it in the email body. Some formatting is usually lost with this method.
- 7.) Press the **Send** button to send the email with the attachment.



Exporting Reports - Printing/Saving to File

Export - Printer(s)

NOTE: MaintSmart will list all available printers local or network.

To print a report open the **Export Report** screen then select the screen tab labeled **Printer**. Follow these steps to print a report to one or more printers.

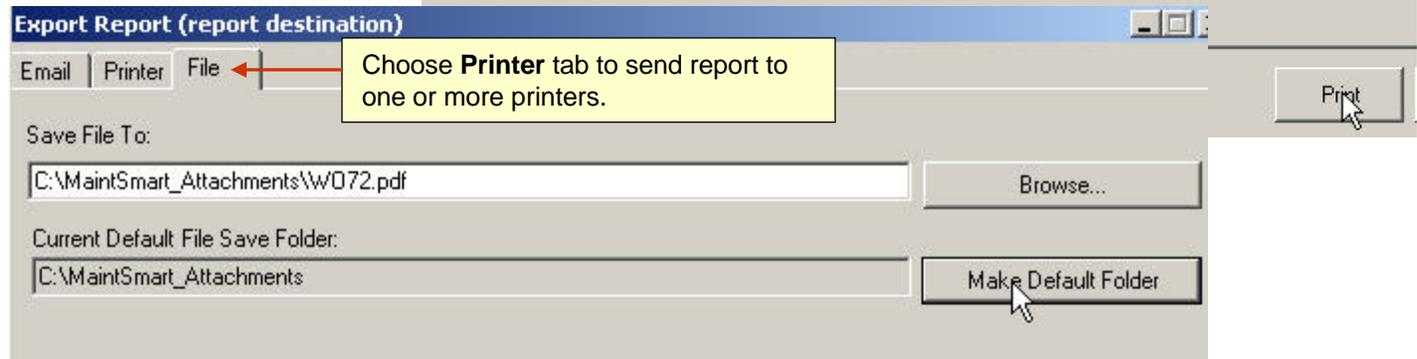
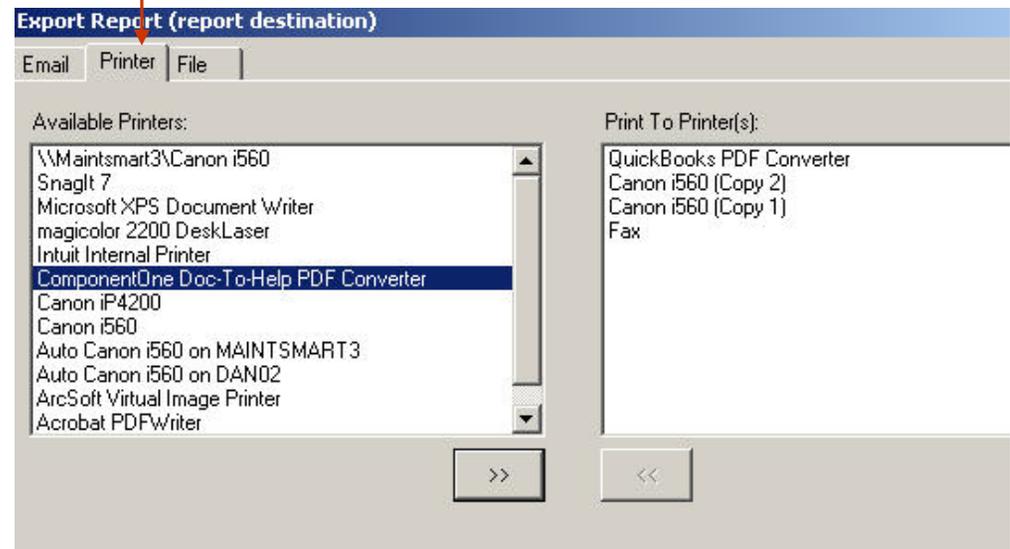
- 1.) Select printer(s) from the leftmost list box then click either the >> button.
- 2.) Click the **Print** button.

Export - File Save

To save a report to a file open the **Export Report** screen then select the screen tab labeled **File**. Follow these steps to print a report to one or more printers.

- 1.) Click the **Browse...** button. Select a folder to save the report into then enter the file name.
- 2.) Choose a report format from the file **Save As** dialog screen.
- 2.) Click the **Save** button.

Choose **Printer** tab to send report to one or more printers.



Email Configuration

Overview of Email Configuration - Sender Configuration

MaintSmart uses an emailing component to send reports to email addresses. [To begin using this email component you must first configure the senders' email settings.](#) These settings include email address, server name, port, as well as other settings (including security settings). MaintSmart uses SMTP for sending email. MaintSmart does not receive email rather your default email program receives the email. In order for a logged in user to send email they must have email settings configured. [You may use the same email setting for more than one user. In fact it may make sense to configure groups of users with the same email settings. This simplifies this process however it will not be possible for the receiver to determine who sent the email \(if multiple user IDs are linked to the same email address\) from the sender email address alone.](#)

Configuring email also may include defaults such as Email Priority, Delivery Notification, Attachment Format, and other settings. These settings are linked to individual email addresses (users) but may be updated in bulk by multi-selecting many email users at once. Remember these are all sender settings. There are basically two strategies for configuring sender email:

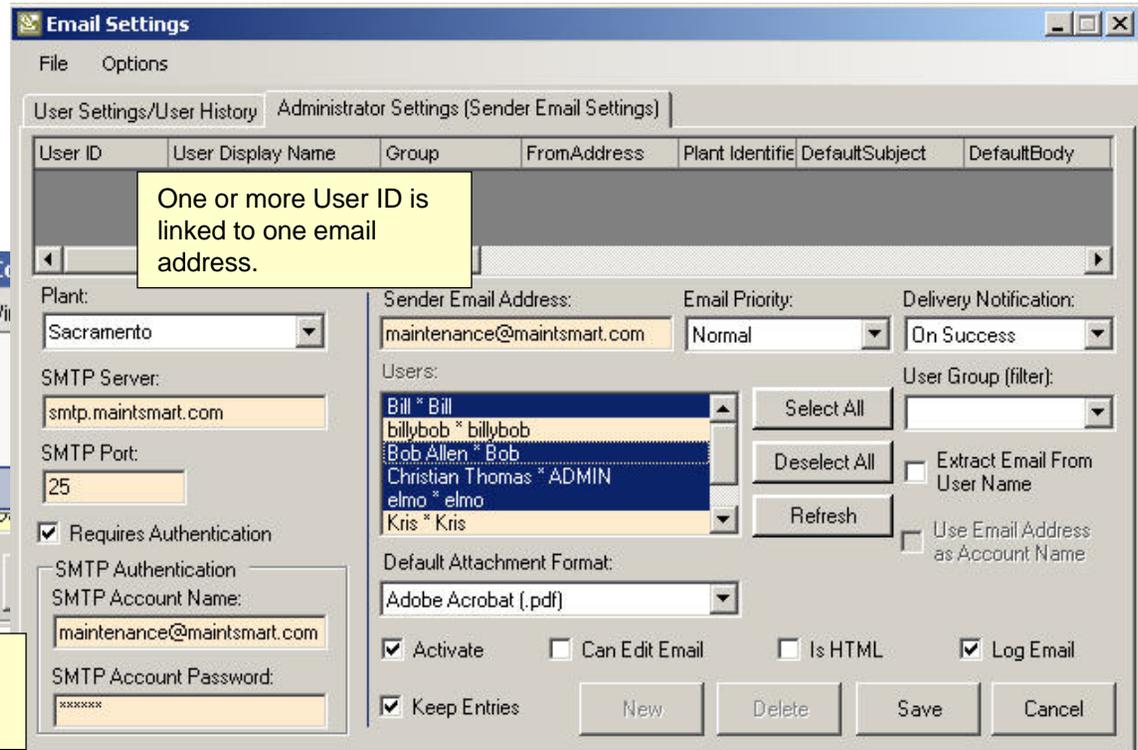
- 1.) Link multiple user IDs to one email address and its settings. This might be useful where you have many users within the same department (for example) and want to simply link all users within this department to the same sender email.
- 2.) Link each user or groups of users to their own specific sender email address.

User (receivers of email) email addresses are pulled from the maintenance technician database, the requestor database. Both the technician and requestor email data is suggested from the passwords data email field when linking either the requestor or the technician to a user ID.

This part of MaintSmart will require information regarding your SMTP email server. Typically this will require IT or a person in a network administrator position to acquire this information..



In many cases the SMTP server will require authentication.



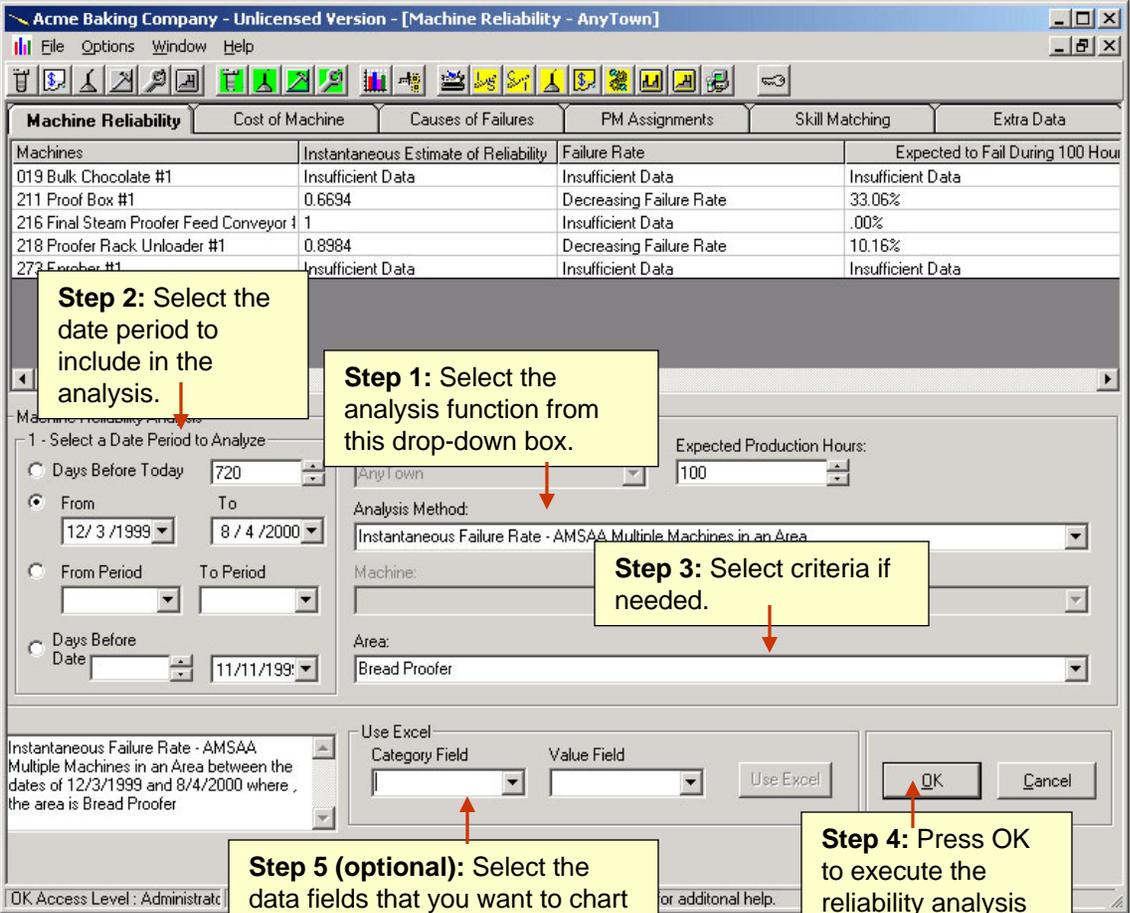
Reliability Analysis and OLAP Topics

- Reliability Analysis.....155
- Cost to Own an Equipment Item.....156
- Causes of Failures - and Solutions.....157-162
- PM Assignment Tree View.....163
- Skill Matching.....164
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- OLAP (online analytical processing).....166 -170

Reliability Analysis

To perform reliability analysis select  from the button bar. *The overall goal of the reliability section of this program is to make your plant run with fewer failures and an efficient maintenance labor force.* There are several different ways you may analyze reliability:

- 1. Simple Reliability Analysis** – Evaluate all equipment items in a plant's equipment list. All equipment items in a plant's equipment list are evaluated using a simple reliability analysis method.
- 2. Simple Reliability Analysis** – Evaluate one specific equipment. One specific equipment in a plant's equipment list are evaluated using a simple reliability analysis method.
- 3. Reliability Prediction Based on Estimated Up Time** – All equipment items. This method is useful when equipment reliability is based on the up time necessary to achieve production demands. The purpose of this method is to give you an idea of what the minimum equipment reliability needs to be.
- 4. Reliability Prediction Based on Estimated Up Time** – One specific equipment. This method is useful when equipment reliability is based on the up time necessary to achieve production demands. The purpose of this method is to give you an idea of what the minimum equipment reliability needs to be. Select one equipment to analyze.
- 5. Serial Data Analysis – AMSAA Time Terminated Test**, single equipment. This reliability method helps you determine whether the equipment has a decreasing, increasing or constant failure rate. This method works best when there are adequate records available for analysis. This reliability method uses the entire user specified time period in its calculation as opposed to the failure terminated test that uses the time period up to the time of the last failure within the specified time period. Select one equipment item to analyze.
- 6. Serial Data Analysis – AMSAA Time Terminated Test**, all equipment items in a work area. This reliability method helps you determine whether the equipment has a decreasing, increasing or constant failure rate. This method works best when there are adequate records available for analysis. This reliability method uses the entire user specified time period in its calculation as opposed to the failure terminated test that uses the time period up to the time of the last failure within the specified time period. Select a work area and all equipment items in that work area are analyzed.
- 7. Serial Data Analysis – AMSAA Failure Terminated Test**, single equipment. This reliability method helps you determine whether the equipment has a decreasing, increasing or constant failure rate. This method works best when there are adequate records available for analysis. This reliability method uses the time period up to the time of the last failure within the specified time period as opposed to the time terminated test that uses the entire user specified time period in its calculation including time beyond the last recorded failure. Select one equipment item to analyze.



Step 2: Select the date period to include in the analysis.

Step 1: Select the analysis function from this drop-down box.

Step 3: Select criteria if needed.

Step 5 (optional): Select the data fields that you want to chart in Excel 97+ then press Use Excel..

Step 4: Press OK to execute the reliability analysis functions..

Machines	Instantaneous Estimate of Reliability	Failure Rate	Expected to Fail During 100 Hours
019 Bulk Chocolate #1	Insufficient Data	Insufficient Data	Insufficient Data
211 Proof Box #1	0.6694	Decreasing Failure Rate	33.06%
216 Final Steam Proofer Feed Conveyor #1	1	Insufficient Data	.00%
218 Proofer Rack Unloader #1	0.8984	Decreasing Failure Rate	10.16%
273 Encoder #1	Insufficient Data	Insufficient Data	Insufficient Data

Machine Reliability Analysis

1 - Select a Date Period to Analyze

Days Before Today: 720

From: 12/3/1999 To: 8/4/2000

From Period: To Period

Days Before Date: 11/11/1999

Expected Production Hours: 100

Analysis Method: Instantaneous Failure Rate - AMSAA Multiple Machines in an Area

Machine: Bread Proofer

Area: Bread Proofer

Use Excel

Category Field: Value Field

Use Excel OK Cancel

Instantaneous Failure Rate - AMSAA Multiple Machines in an Area between the dates of 12/3/1999 and 8/4/2000 where the area is Bread Proofer

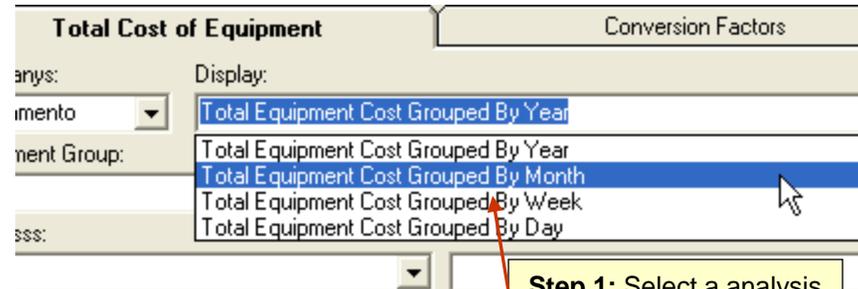
OK Access Level: Administrator for additional help.

- 8. Serial Data Analysis – AMSAA Failure Terminated Test**, all equipment items in a work area. This reliability method helps you determine whether the equipment has a decreasing, increasing or constant failure rate. This method works best when there are adequate records available for analysis. This reliability method uses the time period up to the time of the last failure within the specified time period as opposed to the time terminated test that uses the entire user specified time period in its calculation including time beyond the last recorded failure. Select a work area and all equipment items in that work area are analyzed.
- 9. Instantaneous Failure Rate – AMSAA Single Equipment Item** Provides an estimate of reliability during a specified time period where the failure rate has not yet stabilized. Select one equipment item to analyze.
- 10. Instantaneous Failure Rate – AMSAA All Equipment in a Work Area.** Provides an estimate of reliability during a specified time period where the failure rate has not yet stabilized. Select a work area and all equipment items in that work area are analyzed.

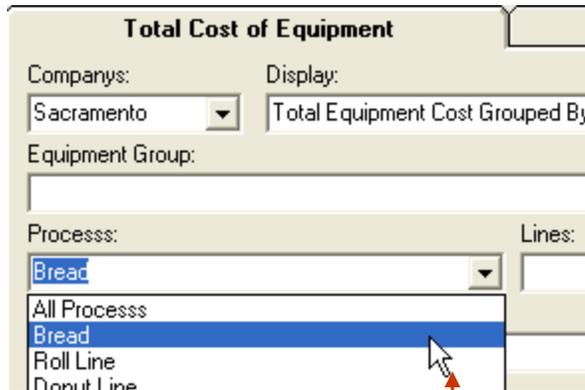
Reliability Analysis - Cost to Own an Equipment Item

To determine the cost of owning an equipment item select  from the button bar. After selecting an equipment item (to create an active equipment) from the **Equipment Reliability** tab select the tab labeled **Cost to Own**. Pressing the **Inquire** button loads the grid with total cost based upon the **Display** scenario chosen from the drop-down box.

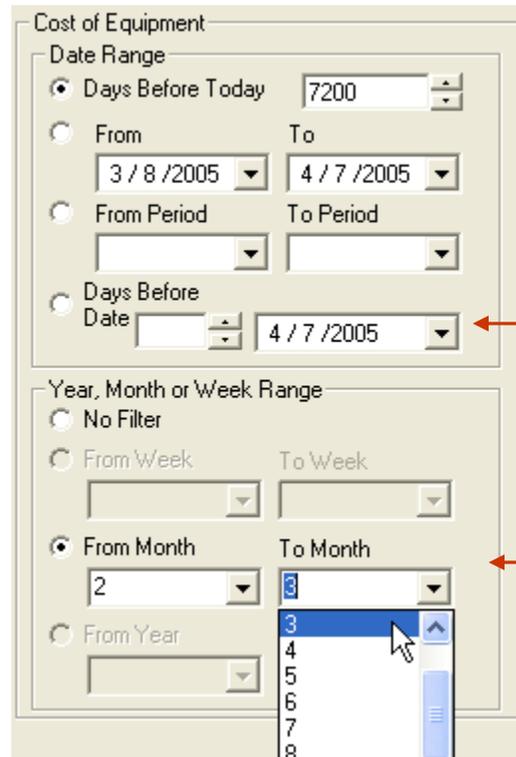
Select a date range, date filters and other filters as required the press the Inquire button. To print the report select the menu items **File>>Print>>Report>>Current View** (or **Current View With Chart**).



Step 1: Select a analysis scenario.



Step 2: Select one or more filters.



Step 3: Select a date range. You may also filter by month, week or year too.

In this case a date *range* and a month *filter* has been chosen. The month range is optional. This analysis would only show the months of Feb. and March for the date range selected

Causes of Failures and PM Optimization

To analyze causes of failures and to optimize PMs select  from the button bar. Next select the tab labeled **Causes of Failures**. To display general statistics press the button labeled **General Statistics**. Clicking the gray row above any column sorts the column. This is useful for quickly locating the worst or best.

Next press the button labeled **Causes vs PM Tasks**. This displays all downtime causes and their associated mapped tasks for the active equipment as well as the mean time between failures (MTBF) and the non-maintenance wage expense for each equipment failure cause. By comparing the MTBF to the mapped task interval you can decide whether or not you need to adjust the task interval.

For example if the interval for a task is 90 days and the MTBF is 60 days for this particular cause to task mapping then you may want to reset the interval to 60 days or less as a way of preventing this failure cause from reoccurring. Right mouse-click the grid row containing the task you want to adjust. From the pop-up menu you may add a new task interval or edit an existing task interval. The pop-up menu also allows you to add new tasks to this equipment or map the tasks to a cause. Press the **Causes vs PM Tasks** button to refresh the grid and show any changes you've made.

Lengthening the task intervals for equipment/cause combinations that show very high MTBFs (aren't experiencing equipment failures or very few failures) may give you the opportunity to use your manpower more efficiently.

The purpose of this section is to appropriately set tasks and their associated intervals to head off equipment failures and to enable you to configure work areas and their associated PM task lists for maximum efficiency.

Step 2: Look for equipment in the above grid that either has no task interval, **Interval** Column, or has **MTBF** that is less than the task interval directly to the right of it. In this case the 3rd row from the top represents a task that should have it's interval shortened to perhaps 14 days or less to circumvent the 16.04 MTBF.

Machines	Cause	Assigned Task	MTBF (Days)	Interval	Coun
211 Proof Box #1	00058 Gate Broken		319.563235302669		
211 Proof Box #1	00020 Structural Failure		924.864601864505		
211 Proof Box #1	00015 Table Top Chain Off	00007 Lubricate Wear Strips	16.0434033663816	30	
211 Proof Box #1	00034 Conveyor Jammed		83.3315408819559		
211 Proof Box #1	00032 Carrier Chain Broken		Insufficient Data		
211 Proof Box #1	00095 Push Bar Failed/Jammed		Insufficient Data		
211 Proof Box #1	00212 Photo Eye Failed		Insufficient Data		
211 Proof Box #1	00042 Valve Failed		Insufficient Data		
211 Proof Box #1	00011 Drive Belt Failed		Insufficient Data		
211 Proof Box #1	00049 Crossfeed Jammed/Broken		Insufficient Data		
211 Proof Box #1	00234 Loose or Bad Relay		Insufficient Data		
211 Proof Box #1	00240 Elec. Component Out of Adjustment		Insufficient Data		
211 Proof Box #1	00227 Safety Interlock Open		Insufficient Data		
211 Proof Box #1	00239 AC/DC Drive Fail/Malfunction		Insufficient Data		
211 Proof Box #1	00004 Sprocket Slipped	00007 Lubricate Wear Strips	Insufficient Data	30	
211 Proof Box #1	00122 Mechanical Interlock Didn't Engage		Insufficient Data		
211 Proof Box #1	00098 Jammed (Other)	00007 Lubricate Wear Strips	Insufficient Data	30	
211 Proof Box #1	00406 Impact by Foreign Object		Insufficient Data		
211 Proof Box #1	00211 Switch (Other) Failed		Insufficient Data		
211 Proof Box #1	00303 Damaged Evaporator		Insufficient Data		
211 Proof Box #1	00403 Safety Interlock Open		Insufficient Data		
211 Proof Box #1	00093 Loose Drive Chain		Insufficient Data		

Step 3: Right mouse-click the row containing the task you want to work with. See the next page for further instructions on this example.

Step 1: Select an equipment item from the **Equipment Reliability** tab by left mouse-clicking the row containing the equipment item. This makes this equipment item the **Active Equipment**. Next press the button labeled **Causes vs PM Tasks**. Depending on the speed of your computer it may take awhile to load the grid.

The rows showing **Insufficient Data** are examples of where either there hasn't been enough failure instances to enable the reliability analysis functions to work or there is inadequate equipment run-time schedule records available to establish equipment run time history (see page 95).

Change a Task Interval:

Assigned Task	MTBF (Days)	Interval	Count
	213.042156868446		
	616.576401243003		
Off	00007 Lubricate Wear Strips	10.6956022442544	30
d			
ken			
Jammed			
	Insufficient Data		
	Insufficient Data		
	Insufficient Data		
ed/Broken			
lay			
Out of Adjustment			
Open			
/Malfunction			
ock Didn't Engage	00001 Check and Oil Chains		
	00007 Lubricate Wear Strips		
h Object			
iled			
rator			
Open			
n			

Step 4: In this example select **Change PM Interval** from the pop-up menu.

..this example is continued on the next page →

Assigned Task	MTBF (Days)	Interval	Count
	213.042156868446		
	616.576401243003		
Off	00007 Lubricate Wear Strips	10.6956022442544	30
d		55.5543605879706	
ken			
Jammed			
	Insufficient Data		
ed/Broken			
lay			
Out of Adjustment			
Open			
/Malfunction			
ock Didn't Engage	00001 Che		30
	00007 Lubr		30
h Object			
iled			
rator			
Open			
n			

Set New Task Interval

Select a New Interval for the Task : 00007 Lubricate Wear Strips.

OK Cancel

Step 5: When the input box appears enter the new interval It defaults to the MTBF. Then press OK. The task interval for this task has been changed in the PM list for this equipment item.
Hint: You can refresh the grid to display the changes by pressing the **Causes vs PM Tasks** button.

← ..continued from previous page

Create a New Task Interval:

Causes of Failures		PM Assignments	Skill Matching	Extra Data
	Assigned Task	MTBF (Days)	Interval	Count Ti
		213.042156868446		
		616.576401243003		
Off	00007 Lubricate Wear Strips	10.6956022442544	30	
d				
ken				
Jammed				
d/Broken				
ay				
Out of Adjustment				
Open				
/Malfunction	00001 Check and Oil Chains			
ock Didn't Engage	00007 Lubricate Wear Strips			
Object				

Step 1: In this example select **Create a New Interval For This Task** from the pop-up menu.

- Change PM Interval
- Create New Interval For This Task**
- Add Tasks to This Machine
- Map Tasks to This Cause

..how to associate preventive tasks with failures on the next page →

Causes of Failures		PM Assignments	Skill Matching	Extra Data
	Assigned Task	MTBF (Days)	Interval	Count Ti
		213.042156868446		
		616.576401243003		
Off	00007 Lubricate Wear Strips	10.6956022442544	30	
d		55.5543605879706		
ken		Insufficient Data		
Jammed				
d/Broken				
ay				
Out of Adjustme				
Open				
/Malfunction	00001 Check			30
ock Didn't Engage	00007 Lubrica			30
n Object				
iled				
rator				

Set New Task Interval

Select a New Interval for the Task : 00007 Lubricate Wear Strips.

OK Cancel

Step 2: When the input box appears enter the new interval Then press OK. There are now 2 task intervals for this task assignment.

Assign task intervals based on MTBF to the other tasks. Continue to monitor these changes and easily adjust as needed until you have the optimum task list.

Reliability Analysis - Causes of Failures ...and Solutions 4 of 6

How to Add Tasks From The Reliability Analysis Screen:

Causes of Failures		PM Assignments	Skill Matching	Extra Data
	Assigned Task	MTBF (Days)	Interval	Count
		213.042156868446		
		616.576401243003		
Off	00007 Lubricate Wear Strips	10.6956022442544	30	
ed				
ken				
Jammed				
ed/Broken				
lay				
t Out of Adjustment				
Open				
l/Malfunction				
d	00001 Check and Oil Chains			
lock Didn't Engage	00007 Lubricate Wear Strips			
n Object				
ailed				

Step 1: Right mouse-click the row that you want to work with. Select **Add Tasks to This Equipment Item** from the pop-up menu.

- Change PM Interval
- Create New Interval For This Task
- Add Tasks to This Machine**
- Map Tasks to This Cause

..how to map tasks to failure causes →

Step 3: Take note of the task(s) added for the **Task to Failure Cause Mapping** you are about to perform..

Step 2: When the Tasks and PM Lists screen appears go ahead and add one or more tasks and appropriate intervals to this equipment.

- Unlicensed Version - [Tasks and PM Lists - AnyTown]

File Options Window Help

Task Groups	Tasks	Task Packages	Job List Templates	PM Lists
Task Number	Tasks Already Assigned to 211 Proof Box #1		Interval	
10030	00001 Check and Oil Chains		30	
70030	00007 Lubricate Wear Strips		30	
2040030	00204 Check Sprockets/Replace		30	
2060030	00206 Check Drive Chain Alignment		30	
2140030	00214 Check/Tighten Set Screws		30	
5400007	00540 Check Air Hoses/Fittings For Leaks		7	
5410007	00541 Fill Air Line Diler(s)		7	

Assign/Delete Tasks and Job Lists to Machines

Plant Name: [Dropdown]

Machine to Add Tasks to: [211 Proof Box #1] Filter

Start Date: [8/17/2001]

Job List Template to Copy Tasks From: [Dropdown] View Detailed Instructions

Task Package Name: [Dropdown] View

Task: [00007 Lubricate Wear Strips] Filter Interval: [Dropdown]

Add/Delete Tasks: 211 Proof Box #1

Edit Delete Save Cancel

Reliability Analysis - Causes of Failures ...and Solutions 5 of 6

How to Map Preventive Tasks to Failure Causes:

Cause	Assigned Task	MTBF (Days)
00058 Gate Broken		213.042156868446
00020 Structural Failure		616.576401243003
00015 Table Top Chain Off	00007 Lubricate Wear Strips	10.6956022442544
00034 Conveyor Jammed		55.5543605879706
00032 Carrier Chain Broken		Insufficient Data
00095 Push Bar Failed/Jammed		Insufficient Data
00212 Photo Eye Failed		
00042 Valve Failed		
00011 Drive Belt Failed		
00049 Crossfeed Jammed/Broken		
00234 Loose or Bad Relay		
00240 Elec. Component Out of Adjust		
00227 Safety Interlock Open		
00239 AC/DC Drive Fail/Malfunction		
00004 Sprocket Slipped		
00122 Mechanical Interlock Didn't Engage		
00098 Jammed (Other)		
00007 Lubricate Wear Strips		

- Change PM Interval
- Create New Interval For This Task
- Add Tasks to This Machine
- Map Tasks to This Cause

Step 1: Right mouse-click the row that you want to work with. Select **Map Tasks to This Cause** from the pop-up menu.

..see the final result →

- Unlicensed Version - [Map Tasks to Down Time Causes - AnyTown]

Machines	Cause	Preventive Task
211 Proof Box #1	00004 Sprocket Slipped	00001 Check and Oil Chains
211 Proof Box #1	00005 Drive Chain Broken	00001 Check and Oil Chains
211 Proof Box #1	00005 Drive Chain Broken	00204 Check Sprockets/Replace
211 Proof Box #1	00005 Drive Chain Broken	00206 Check Drive Chain Alignment
211 Proof Box #1	00015 Table Top Chain Off	00007 Lubricate Wear Strips
211 Proof Box #1	00035 Conveyor Broken/Failed	00574 Check Wear Strips
211 Proof Box #1	00035 Conveyor Broken/Failed	00581 Check/Repair Transfer Roller(s)
211 Proof Box #1	00035 Conveyor Broken/Failed	00583 Check Conveyor Frame
211 Proof Box #1	00098 Jammed (Other)	00007 Lubricate Wear Strips
211 Proof Box #2	00035 Conveyor Broken/Failed	00574 Check Wear Strips
211 Proof Box #2	00035 Conveyor Broken/Failed	00581 Check/Repair Transfer Roller(s)
211 Proof Box #2	00035 Conveyor Broken/Failed	00583 Check Conveyor Frame
237 Pan Return Conveyor	00014 Table Top Chain Broken	00002 Check and Lubricate Bearings
238 Cooler Feed Conveyor	00035 Conveyor Broken/Failed	00573 Check Carrier Chain
238 Cooler Feed Conveyor	00035 Conveyor Broken/Failed	00574 Check Wear Strips

Map Tasks to Down Time Causes

Plant: AnyTown

Machine: 211 Proof Box #1

Down Time Cause: 00015 Table Top Chain Off

Select From These Tasks:

- 00001 Check and Oil Chains
- 00002 Check and Lubricate Bearings
- 00003 Check Oil Level In Gearbox(es)
- 00004 Lubricate Carrier Chain
- 00005 Lubricate Fan Shaft
- 00006 Oil Valve Stem at Packing Gland
- 00007 Lubricate Wear Strips

Do These Tasks to Prevent: 00015 Table Top Chain Off

- 00001 Check and Oil Chains
- 00002 Check and Lubricate Bearings
- 00003 Check Oil Level In Gearbox(es)
- 00004 Lubricate Carrier Chain

Recent Causes: All Causes:

Add a New Record

New Delete Save Cancel

OK Access Level : Administrator | Lists actual recent down time causes or all causes.

Step 2: When the **Map Tasks to Downtime Causes** screen appears select tasks (at the very least the tasks you just added to the PM Task List) by selecting them and pressing the >> button. When you're done leave this screen and refresh the Causes vs Tasks grid to see the task mappings and PM list changes.

Reliability Analysis - Causes of Failures ...and Solutions 6 of 6

- Unlicensed Version - [Active Machine: 211 Proof Box #1, AnyTown]

File Options Window Help

Machine Reliability Cost of Machine **Causes of Failures** PM Assignments Skill Matching Extra Data

Machines	Cause	Assigned Task	MTBF (Days)	Interval
211 Proof Box #1	00058 Gate Broken		213.042156868446	
211 Proof Box #1	00020 Structural Failure		616.576401243003	
211 Proof Box #1	00015 Table Top Chain Off	00001 Check and Oil Chains	10.6956022442544	30
211 Proof Box #1		00002 Check and Lubricate Bearings	10.6956022442544	21
211 Proof Box #1		00004 Lubricate Carrier Chain	10.6956022442544	30
211 Proof Box #1		00007 Lubricate Wear Strips	10.6956022442544	7
211 Proof Box #1		00007 Lubricate Wear Strips	10.6956022442544	14
211 Proof Box #1		00007 Lubricate Wear Strips	10.6956022442544	30
211 Proof Box #1		00034 Conveyor Jammed		55.5543605879706
211 Proof Box #1	00032 Carrier Chain Broken		Insufficient Data	
211 Proof Box #1	00095 Push Bar Failed/Jammed		Insufficient Data	
211 Proof Box #1	00212 Photo Eye Failed		Insufficient Data	
211 Proof Box #1	00042 Valve Failed		Insufficient Data	
211 Proof Box #1	00011 Drive Belt Failed		Insufficient Data	
211 Proof Box #1	00049 Crossfeed Jammed/Broken		Insufficient Data	
211 Proof Box #1	00234 Loose or Bad Relay		Insufficient Data	
211 Proof Box #1	00240 Elec. Component Out of Adjustme		Insufficient Data	
211 Proof Box #1	00239 AC/DC Drive Fail/Malfunction		Insufficient Data	
211 Proof Box #1	00227 Safety Interlock Open		Insufficient Data	
211 Proof Box #1	00122 Mechanical Interlock Didn't Engag		Insufficient Data	
211 Proof Box #1	00004 Sprocket Slipped	00001 Check and Oil Chains	Insufficient Data	
211 Proof Box #1		00007 Lubricate Wear Strips	Insufficient Data	14
211 Proof Box #1	00098 Jammed (Other)	00007 Lubricate Wear Strips	Insufficient Data	30
211 Proof Box #1		00007 Lubricate Wear Strips	Insufficient Data	7

Analyze and Improve - 211 Proof Box #1

General Statistics Causes vs PM Tasks

OK Access Level : Administrator Click on any screen object for instructions on it's use. Press F1 for additional help.

Notice all of the newly mapped tasks are now appearing in this grid. Reliability analysis may also be used to remove tasks or lengthen task intervals thus freeing personnel for other duties.

Insufficient Data labeled tasks may be handled in the same way as the previous example. But you will not have the benefit of reliability analysis to guide your decisions.

PM Assignment Tree View

PM Assignment Easily Adjusted From Reliability Screen

To use the PM assignment tree view select  from the button bar. To view the PM assignment tree select  from the button bar. Select the tab labeled **PM Assignments**. Press the button labeled **Load PMs or Refresh**. Loading the PM tree view may take some time. The tree view displays each work area, the equipment contained in the work area and the tasks assigned to each equipment item. This makes it easy to see the overall picture regarding work area assignments. The average weekly labor hours spent on PMs for each area is also displayed.

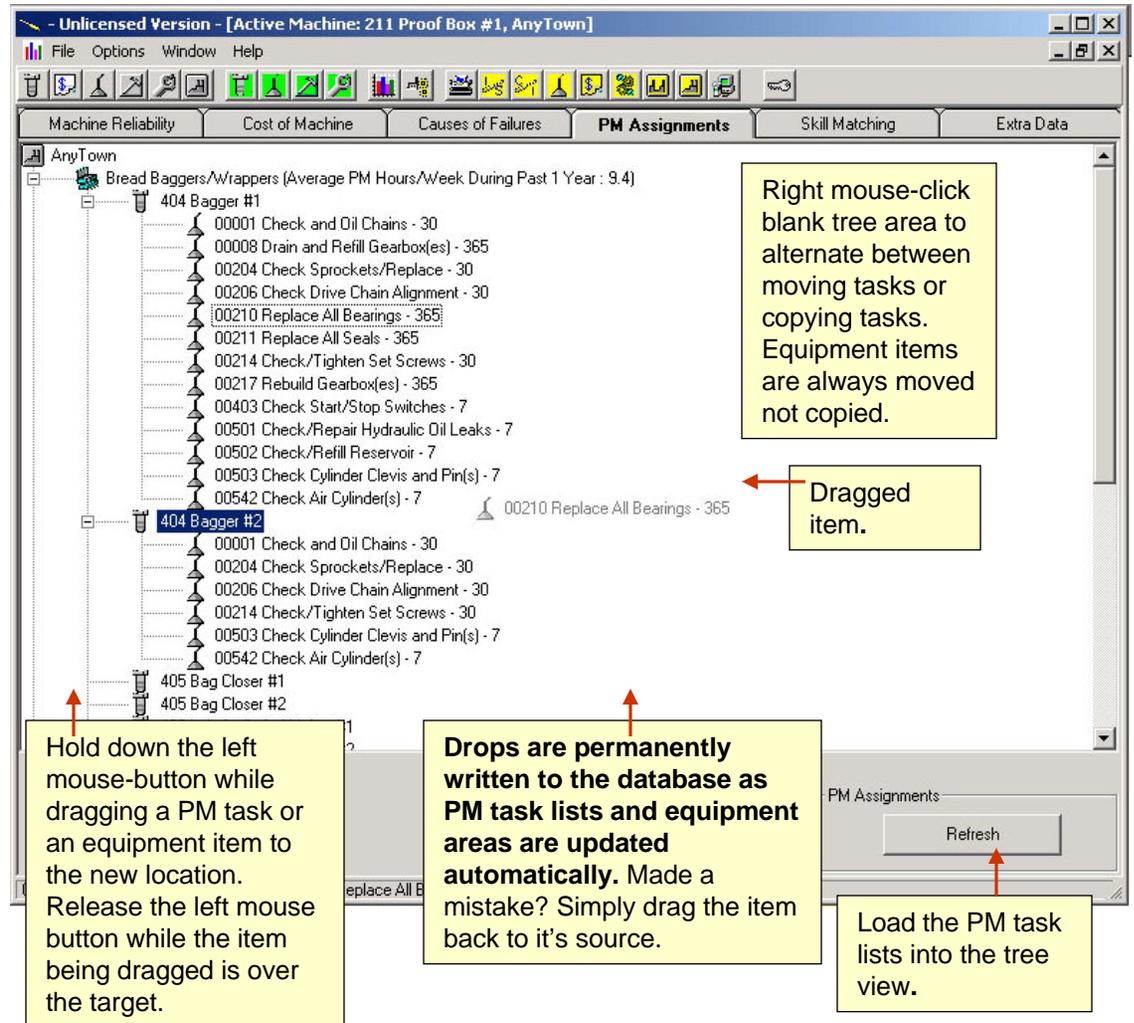
In addition to simply displaying this information you may also move equipment to different work areas and copy or move PM tasks to different equipment. All changes made in this graphical environment are written to the database. By determining which equipment/cause combinations (using the **Equipment Reliability** and **Causes of Failures** tabs) are the largest contributors to equipment failures you may want to adjust the PM task list(s). For example if you have a work area assignment whose average weekly labor hours spent on PMs is excessively high and the equipment in this work area are also experiencing high failure rates you may easily remove equipment from this area and add them to another area. The effectiveness of changes such as this may be easily tracked by using the Equipment Reliability section at some future date.

To move equipment to a different work area follow these steps:

1. Press the + box next to any work area. The area expands to show it's contained equipment.
2. Press the + box next to any equipment to display the equipment's task list.
3. Left mouse-click the bolt icon next to the equipment you want to move. Holding down the left mouse button and drag the equipment to the work area you want to move the equipment to. Release the mouse button.
4. The equipment and its associated task list is moved to the new area.

To move or copy tasks to an equipment item follow these steps:

1. Press the + box next to any work area. The area expands to show its contained equipment.
2. Press the + box next to any equipment to display the equipment's task list.
3. Left mouse-click the oil can icon next to the task you want to copy. Holding down the left mouse button and drag the task to the equipment you want to copy the task to. Release the mouse button.
4. The task is copied to the equipment. To move a task to an equipment item right mouse-click the white space on the screen. When the pop-up menu appears select **Move Task**. A check mark appears next to the active drag mode (Move or Copy).



Right mouse-click blank tree area to alternate between moving tasks or copying tasks. Equipment items are always moved not copied.

Dragged item.

Hold down the left mouse-button while dragging a PM task or an equipment item to the new location. Release the left mouse button while the item being dragged is over the target.

Drops are permanently written to the database as PM task lists and equipment areas are updated automatically. Made a mistake? Simply drag the item back to it's source.

Load the PM task lists into the tree view.

Personnel Skills Analysis

Skills vs.. Tasks Required to Complete PM Tasks

To determine if technician skills are adequate to perform the tasks in their associated work area select  from the button bar. Select the tab labeled **Skill Matching**. Only tasks that have been mapped to skills appear in the data grid. Go to the **Task to Skill Mapping** section of this program to map tasks to skills if you haven't done so already.

Follow these steps to analyze skills:

1. Select active , any other or an entire work area from the drop-down box labeled **View**.
2. If you choose **Select an Equipment Item** or **All Equipment in an Area** choose an item from either the Equipment or the Area drop-down box as appropriate.
3. Press the button labeled **Analyze** to see how well the maintenance technician is matched to the required tasks for this area. It is up to your personal judgement as to whether or not the maintenance technician has adequate skills to perform the required tasks. Options for technicians that do not have adequate skills include training and either moving the technician to another work area or removing equipment from his area.
4. The text box display also indicates how many skills for the tasks remain unmapped. The drop-down box labeled **These Tasks Have Not Been Assigned Any Skills** contains unmapped skills, if any.
5. Press the **Map Skill** button to map the skill to the required task. After completing task to skill mapping be sure to refresh the data grid by press the **Load Skills** button.

AreaDescription	Machines	Name	Task	Required Skill	Has This Skill
Bread Proofer	211 Proof Box #1	Ricky Nixon	00001 Check and Oil Chains	PMs	True
Bread Proofer	211 Proof Box #1	Ricky Nixon	00206 Check Drive Chain Alignment	Mechanical	True
Bread Proofer	211 Proof Box #1	Ricky Nixon	00206 Check Drive Chain Alignment	PMs	True
Bread Proofer	211 Proof Box #1	Ricky Nixon	00214 Check/Tighten Set Screws	Mechanical	True
Bread Proofer	211 Proof Box #1	Ricky Nixon	00214 Check/Tighten Set Screws	PMs	True

These Tasks Have Not Been Assigned Any Skills:

- 00007 Lubricate Wear Strips
- 00204 Check Sprockets/Replace
- 00540 Check Air Hoses/Fittings For Leaks
- 00541 Fill Air Line Diler(s)

These are unmapped skills

in 100.00% of the PM tasks are 4 unmapped skills needed for 4 tasks.

View: Active Machine

Area:

Machine:

Buttons: Suggest Areas, Analyze, Print, Clear, Load Skills

Status: OK Access Level : Administrati Skills in this drop-down box have not yet been mapped to tasks assigned to the machine in question.

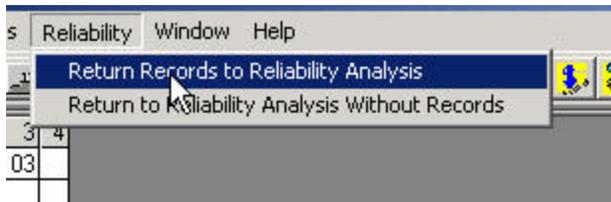
Analyze skill to task ratio.

Does this person have the necessary skills to perform the PM work on his assigned equipment?

Extra Data

While working in the reliability analysis section you may need to quickly obtain another data set for the purpose of analysis or verification. MaintSmart provides for this too. Simply select the menu items **Options>>More Data>>?**.

MaintSmart takes you to the screen of your choice. Once there perform a data analysis as you normally would. Once you have the data you requested in the grid select the menu item **Reliability>>Return Records to Reliability Analysis** to automatically insert the data set into the reliability analysis section **Extra Data**.



The screenshot shows the 'Acme Baking Company - Unlicensed Version' interface. The title bar indicates '[Active Machine: 211 Proof Box #1, AnyTown]'. The menu bar includes 'File', 'Options', 'Window', and 'Help'. The main window is divided into several sections:

- Machine Reliability:** A grid with columns for months (Jan-Jul) and rows for OperShift (1-4).
- Cost of Machine:** A grid with columns for months (Jan-Jul) and rows for OperShift (1-4).
- Causes of Failures:** A grid with columns for months (Jan-Jul) and rows for OperShift (1-4).
- PM Assignments:** A table with columns for Area #, Area, and Total Cost.
- Skill Matching:** A table with columns for Area #, Area, and Total Cost.
- Extra Data:** A table with columns for Area #, Area, and Total Cost.

The 'Extra Data' table contains the following data:

Area #	Area	Total Cost
3270002	Flour System	\$563.56
3270004	Bread Baggers/Wrappers	\$588.75
3270006	Mixing Area	\$4.71
3270007	Bread Proofer	\$4.71
3270011	Utilities	\$154.91

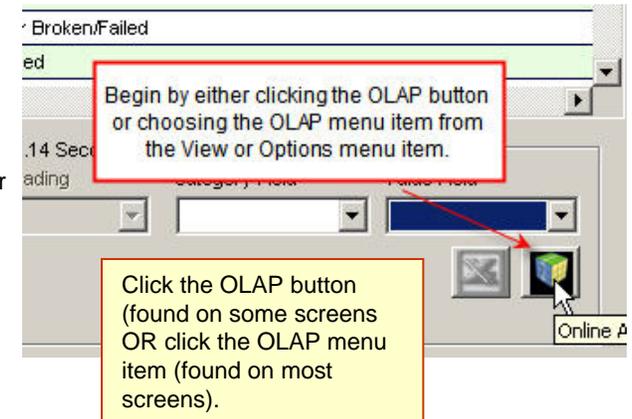
Other sections include 'DOWN TIME: Assume Labor Expense of \$15.05/Hr. and 8 Employees; the Total(s)', 'PMs: Total Labor Cost/Area by Plant where the plant city is AnyTown.', 'WORK ORDERS:', and 'INVENTORY:'. A callout box with a red arrow points to a grid area, containing the text: 'Right mouse click to print any grid.'

OLAP (online analytical processing)

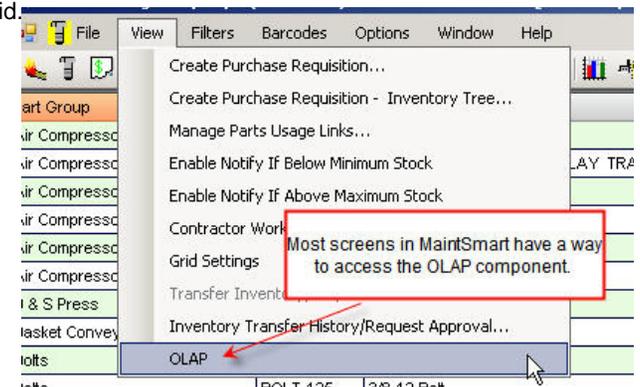
OLAP is a tremendously powerful component that provides analytical processing features similar to those found in Microsoft Excel Pivot Tables and Pivot Charts. Drag-and-drop views give you real-time information, insights, and results in seconds. Drag up to five column fields, five row fields and five value fields to generate a user-defined two or three dimensional data set of virtually any data in the MaintSmart database.

MaintSmart leverage the data queries you create in the MaintSmart Analysis screens by linking to these user defined data sets with the OLAP component. Additionally OLAP is available on most other screens including work order, downtime, purchasing, inventory and preventive maintenance screens. Data from any of these screens may be arranged as needed by drag and drop in the OLAP screen. This data may then be totaled by row and column using one of several statistical functions. This data set is then charted automatically.

Clicking on a grid cell in the OLAP data grid causes the underlying data for that cell to be displayed in a separate grid. The OLAP data grid may be exported directly to Excel (just like all grids in MaintSmart) for further analysis.



Cause	1	2	3	Total
Ac/dc Drive Fail/malfunction	48	0	0	48
Actuator Failed/Broken	78	36	2	116
Adjust Timing				8
Adjustment Screw Stripped/Broken				4
Air Compressor Failure				2
Air Cylinder Failed				12
Bad Circuit Board		3	0	3
Bad Terminal/Connection	60	0	0	60
Blade(s) Broken	8	23	5	37
Blown		5	0	5
Brack		6	0	6
Broken/Damaged Photo Eye Reflector	3	0		3
Broken/Damaged Wire	30	30		60
Burned/Damaged Coil	26	0		26
Burned/Damaged Motor Winding	50	0		50
Carrier Chain Off Track/Sprocket	0	50	0	50
Circuit Breaker Tripped	10	3	3	16



When OLAP screen appears drag and drop fields from the uppermost field box to the lower list boxes. You may drag up to 20 fields into each box, however the data grid and chart may become cluttered with this much data.

OLAP (online analytical processing)

Field Settings: TimeDown

Filter Subtotals Format Display High Values Low Values

Sum
Count
Average
Maximum
Minimum
First
Last
Variance
Standard Dev
Variance Pop
Standard Dev

Right mouse-clicking the values in the Column, Row or Value Fields lists provides additional filtering, formatting and other capability that may be applied to the data set. In this case the Subtotals tab is selected. This provides a way to change this function from the default which is "sum".

Weigh by: (None)

OK

Cause	Time Down (Sum)
Burned/Damaged Coil	26
Burned/Damaged Motor Winding	50
Carrier Chain Off Track/Sprocket	0

There are several options available by *right-clicking on the selected field(s)* and choosing from the resulting dialog screen. These include filtering, formatting and formatting based upon the value.

Field Settings: TimeDown

Filter Subtotals Format Display High Values Low Values

Apply to values Above: 20 Absolute

Style: Not Set Absolute Percentage

Background: Red

Foreground:

Bold:

Using the "High Values" option you may highlight values beyond a certain level. "Low Values" works similarly for below range values. Colors are completely user defined.

OK Cancel

Cause	1	2
Ac/dc Drive Fail/malfunction	48	0
Actuator Failed/Broken	78	36
Operator Shift	6	2
Adjust Timing	0	0
	0	0
	2	0
	3	0
	0	23
	5	0
	6	0
	0	0
	0	0
	30	0
	0	0
	0	0
	50	0
	3	0

OLAP (online analytical processing)

Down Time Type

Technician Shift

Impact

Equipment Code

How Many Technician

Operator Shift

Plant ID

Time Down

Repair Time

User ID

Drag fields between areas below:

Filter

Column Fields

Technician Shift

Operator Shift

Multiple fields may be used for each column, row and/or value.

Row Fields

Σ Values

Cause

Time Down (Sum)

Repair Time (Sum)

Cause	2		3		Total	Total
	own	Repair Time	Time Down	Repair Time	Time Down	Repair Time
Roller Broken/Failed	0	0	0	0	15	15
Roller(s) Bad	0	0	0	0	5	5
Safety Interlock Open	0	0	0	0	59	59
Scaper Damaged or Fell Out	0	0	0	0	60	60
Shaft Bearing Failed					38	25
Sprocket Slipped					95	95
Sprocket Worn					15	12
Stop Plate Failed					7	7
Structural Failure					2	2
Switch (Other) Failed					33	24
Switch Sticking Switch StickingSwitch Sticker	0	0	0	0	2	2
Table Top Chain Broken	6	6	0	0	47	45
Table Top Chain Off	0	0	0	0	5	5
Temp. Controller Malfunction	45	2	0	0	45	2
Temperature Sensor Loose or Fail	0	0	0	0	2	2
Track Belt	0	0	0	0	3	3
Variable Pulley Failed	0	0	0	0	14	14
Water in Machine or Electrical	0	0	0	0	325	325
Total	349	289	2	2	2,931	2,747

This graphic shows how multiple fields are displayed. In this example there are two column fields and two value fields. The value fields are summed in this case in separate columns, grouping by Operator and Technician Shift. Rows are also summed.

Easily export the resulting data set from grid to Excel.

Right-click outside of grid area to export to Excel

Export OLAP Grid

OLAP (online analytical processing)

Cause	Time Down	Repair Time	Time Down	Repair Time	Time Down
Ac/dc Drive Fail/malfunction	41	57	7	6	0
Actuator Failed/Broken	34	29	44	44	0
Adjust Timing	6	6	0	0	0
Adjustment Screw Stripped/Broken	2	2	0	0	0
Air Compressor Failure	2	2	0	0	0
Air Cylinder Failed	0	0	10	10	0
Bad Circuit Board	0	0	0	0	0
Bad Terminal/Connector	0	0	60	60	0
Blade(s) Broken	0	0	0	0	9
Blade(s) Dull	0	0	0	0	0
Blown Fuse	0	0	0	0	0
Bracket Failed	0	0	0	0	0
Broken/Damaged Photo	0	0	3	3	0
Broken/Damaged Wire	0	0	30	30	0
Burned/Damaged Coil	0	0	26	26	0
Burned/Damaged Motor	0	0	50	50	0
Carrier Chain Off Track	0	0	0	0	0
Circuit Breaker Tripped	0	0	0	0	10
Clutch/Brake Worn/Fail	0	0	5	5	0
Contacts Burned/Damaged	0	0	0	0	30
Conveyor Belt Torn/Damaged	0	0	5	5	0
Conveyor Broken/Failed	0	0	0	0	0

This is the resulting Excel spreadsheet. You may also click the Excel icon at top of screen however this option simply saves the data as Excel but doesn't automatically open the spreadsheet after saving.

Filter any field with a custom filter. Right-click a Value field and you will have the opportunity to format, filter or change the subtotal setting for that value. Subtotal settings include: Sum, Average, Max, Min, Variance, Standard Deviation and more.

Field Settings: Impact

Filter Subtotals Format Display High Values Low Values

Filter the data. In this case we are filtering for "Impact" time greater than 90 (for example)

Greater Than...

Format colors based upon high or low value constraints as shown below:

Field Settings: Impact

Format

Is Greater Than 90

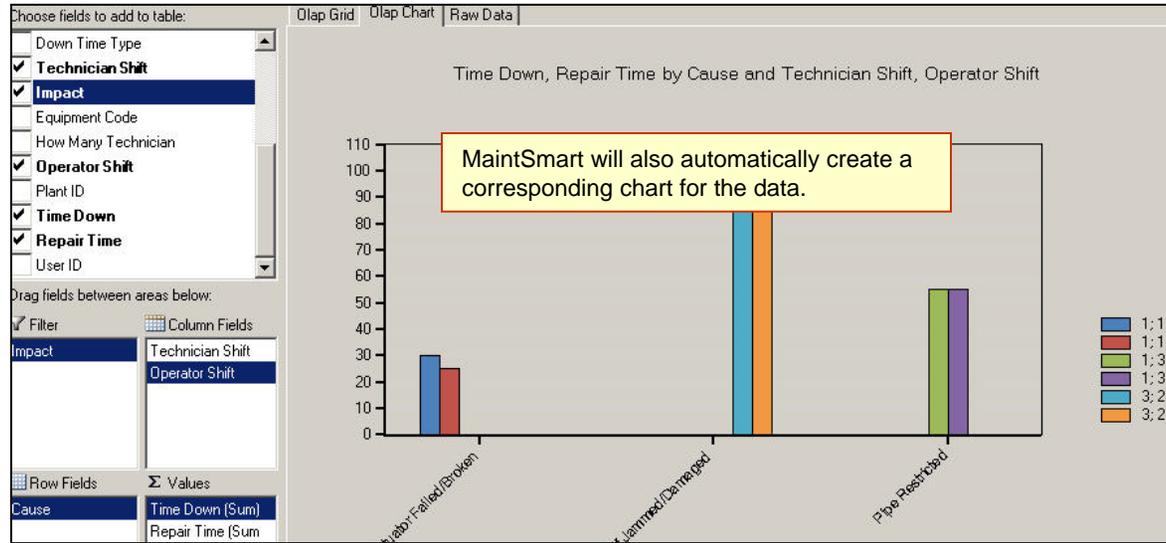
Numeric Filter

Right-click a sub-total data cell to display underlying data.

Right-click on a grid cell to see a grid of the underlying data that generated the value for that grid cell. (Note: actual field names are displayed in this case)

AreaDescription	Cause	Comments	CommonName	DateOccur	Value
Bun Wrapping	Safety Interlock Open		Bagger #3	3/30/1997	59
No Area Assignmer	Safety Interlock Open		Proof Box #1	4/6/1997	60
Bread Slicers	Safety Interlock Open		er #2	4/17/1997	38
No Area Assignmer	Safety Interlock Open		of Box #1	6/15/1997	95
Bread Baggers/Wr	Safety Interlock Open		apping Machine	6/20/1997	15
No Area Assignmer	Safety Interlock Open		Proof Box #1	7/3/1997	7
No Area Assignmer	Safety Interlock Open		Proof Box #1	7/4/1997	2
Bun Cooler	Safety Interlock Open		et Conveyor #	7/23/1997	33

OLAP (online analytical processing)



Many options available. Use "Report" menu to export the data to a report. Use the Save icon to save as an Adobe Acrobat file.

This is an example of a filtered data set. In many cases you'll want to filter the data especially if you want a legible uncluttered chart.

Cause	1		3		Total	Total
	Time Down	Repair Time	Time Down	Repair Time		
Actuator Failed/Broken	0	0	0	0	30	25
Oven Shelf Jammed/Damaged	0	0	105	105	105	105
Pipe Restricted	55	55	0	0	55	55
Total	55	55	105	105	190	185

Hot Sheet Topics

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Hot Sheet Overview

Overview of the Hot Sheet

The Hot Sheet provides different ways of viewing and working with the four main areas in MaintSmart:

1. Work Orders
2. Preventive Maintenance
3. Inventory
4. Down Time

There are four tabs on the Hot Sheet that provide different ways of looking at the data in order to help you quickly identify items that need attention. The four tabs are:

1. Key Performance Indicators (KPIs)
2. Dashboard
3. Hot Sheet Tree
4. All Data Tree

The Hot Sheet is interactive in that purchasing, requisition, work order, preventive maintenance task and downtime may all be either modified or printed from the Hot Sheet without leaving the Hot Sheet. Much of the functionality is based upon drag and drop making it simple to modify and create purchase orders, requisitions and more. KPIs provide many different scenarios for analysis and are based upon each users' specific need. All settings are linked to the user ID so that the user always see the important data that they need to see only.

The screenshot displays the Hot Sheet interface with a tree view on the left and a context menu on the right. The tree view shows the following structure:

- Sacramento
 - Inventory Parts Understocked:9
 - Vendor
 - Bob the Builder Under stock:4
 - 99999FF Piston Ring Set Quantity:0 PO:14 (Christian Thom
 - 99999FF Piston Ring Set Quantity:0 PO:14 (Christian Thom
 - 99999FF Piston Ring Set Quantity:0 PO:14 (Christian Thom
 - 99999FF Piston Ring Set Quantity:0 PO:14 (Christian Thom
 - Delta Rubber Under stock:1
 - LIN-A Tank Liner Quantity:0 Requisition:1 (Christian Thomas
 - Motion Industries Under stock:3
 - 6215 Timkin Bearing Quantity:0 Requisition:10 (Christian Tr
 - 6215 Timkin Bearing Quantity:0 Requisition:10 (Christian Tr
 - No Vendor Under stock:1
 - .50 X 6 SS Bolt Quantity:0 Min Stock:1

The context menu is open over the 'Motion Industries Under stock:3' item, showing the following options:

- Collapse Tree
- Expand Tree
- Clear Selection
- Print All
- Create Requisitions for All
- Create Purchase Orders for All
- Remove Selected Items From Basket
- Remove All Items From Basket

A yellow callout box points to the 'Motion Industries Under stock:3' item with the text: "Drag and drop items to right-most screen pane (shopping basket)."

The bottom of the interface shows the Hot Sheet controls:

- Plant: Sacramento
- Display Category: Vendor
- Work Orders:
- Inventory:
- PM:
- Down Time:
- Refresh:
- Delay Refre:
- Create Requisitions:
- Create Purchase Ord:

Hot Sheet Configuration

Configuration of Key Performance Indicators (KPIs)

This Hot Sheet tab displays a configurable set of speedometer-like gauges for each KPI that the viewer wishes to monitor. Each user can choose from a set of provided KPIs to display when they are using MaintSmart. The KPI selection area is on the left side of the screen. First choose the KPI Type from the drop-down box and then place a check next to each KPI that you want to view. All KPIs of all Types will be displayed together in the right side of the screen. In the example below the first gauge is for the Work Order Average Completion Time KPI and the other gauges display Inventory-related KPIs. After changing the KPI selection it is necessary to click the **Refresh** button to update the display to reflect your new KPI selection.

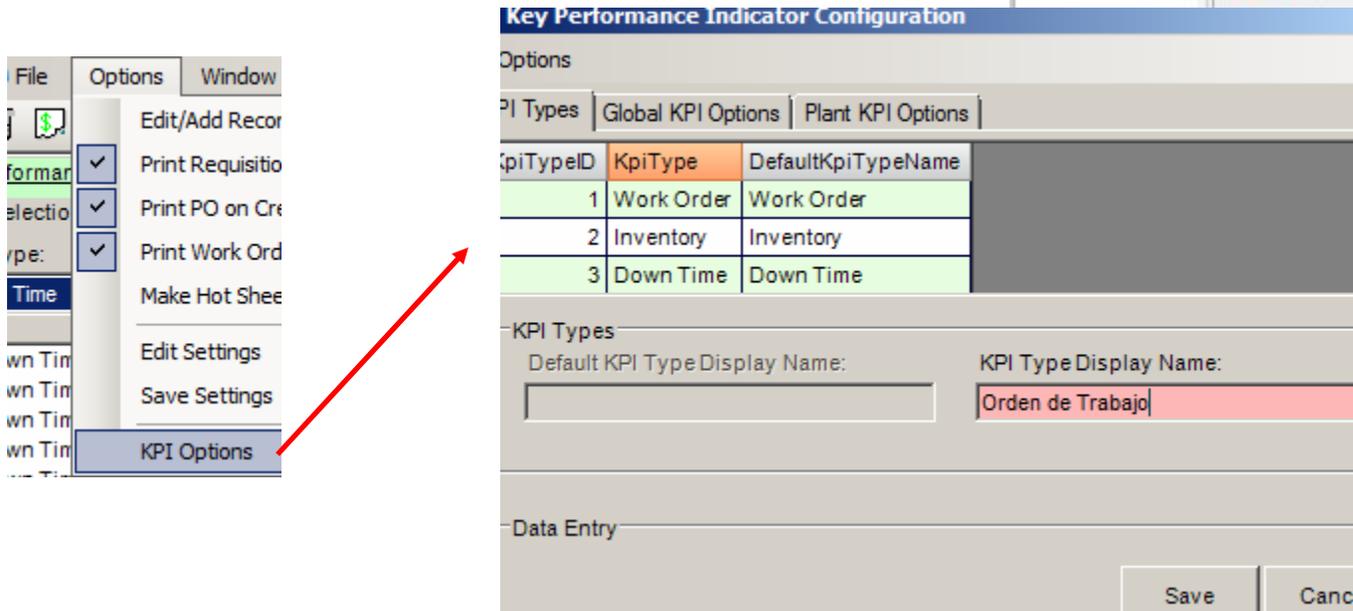
Configuring the KPI Display

The value of the KPI is indicated by the gauge's pointer position and also by text directly beneath the gauge. Each gauge indicates three value ranges using the colors green, yellow, and red. Green indicated an acceptable range for the KPI, yellow indicates a questionable range, and red indicates a range of undesirable values for the KPI.

The oval "light" directly above the pointer's axis is the same color as the KPI color range to which the pointer is pointing. If the "light" is white it indicates that no data was available for this KPI.

A MaintSmart administrator can set the values for a number of KPI options for each plant. To permanently set KPI options for a plant select the **Options > KPI Options** from the menu. The KPI Options window will open. On the **KPI Types** tab you can change the names that are displayed for the types (categories) of KPIs. On the **Global KPI Options** tab you can change the names and units that are displayed for the , the KPI Target values, and other options that control how the individual KPIs are displayed. On the **Plant KPI Options** tab you can change the plant-specific KPI Target values, and other options that control how the individual KPIs are displayed.

The order of the gauges in the display can be changed by using the mouse to drag the gauge to the position where you want it to appear.



Hot Sheet Configuration – View Settings

Hot Sheet Configuration – View Settings

There are two types of settings that are used by the Hot Sheet: View settings and Inventory settings. View setting control how data is displayed in the Hot Sheet and Inventory Settings control how the Hot Sheet performs actions on Inventory items.

To edit View Settings select the **Options > Edit View Settings** menu item.

It is critical to understand that when settings are changed they only affect the current session (as long as the Hot Sheet remains open). To save the settings so they are used again in the future you must explicitly save them by clicking on the appropriate **Save Settings** menu item after changing the settings. You can choose to save the **Inventory Settings**, the **View Settings**, or **All Settings**.

The **View Settings** are categorized on separate tabs. The **Hot Sheet** tab contains settings that control defaults that apply to the Hot Sheet tree as a whole.

The other tabs contain settings that control the specific types of data that can be displayed on the Hot Sheet. To change the text color for any of the states, click on the text under **Node Colors** and a color selection dialog will pop up.

The screenshot shows the 'Hot Sheet Settings' dialog box with the 'Options' menu open. The 'Edit Settings' option is highlighted. A yellow callout box points to 'Edit Settings' with the text 'Edit settings menu'. Another yellow callout box points to the 'Hot Sheet' tab in the 'View Options' section with the text 'Choose category to edit settings for.' The 'Node Colors' section is visible, showing a list of states and their corresponding colors.

Node Colors
Under Stock
Under Stock with Requisition (User Cannot Approve)
Under Stock with Approved Requisition
Under Stock with Partially Approved Requisition (User Cannot Add Approval)
Under Stock with Partially Approved Requisition (User Can Add Approval)
Under Stock with Requisition (User Can Add Approval)
Under Stock with Requisition (User Can Approve)
Under Stock with Partially Approved Requisition (User Can Add Final Approval)
Under Stock with Approved Requisition Released to Purchasing
Under Stock with Purchase Order

Hot Sheet Configuration – View Settings for Inventory

Hot Sheet Configuration – View Settings for Inventory

Inventory settings control how parts are reordered and how requisitions and purchase orders are created.

The screenshot shows the 'Hot Sheet Settings' application window. The title bar reads 'Hot Sheet Settings'. Below the title bar is a menu bar with 'File', 'Inventory', and 'View Options'. The main window has three tabs: 'General Settings', 'Requisition Creation', and 'PO Creation'. The 'General Settings' tab is active. The settings are organized into several sections:

- PO Type:** A dropdown menu.
- P. O. Release (number):** A numeric input field with the value '0'.
- Job Reference:** A text input field.
- Ship Date:** Radio buttons for 'Today' and 'Days After Today' (selected), with a numeric input field for '1'.
- Receive Date:** Radio buttons for 'Today' and 'Days After Today' (selected), with a numeric input field for '7'.
- Cost Center (default):** A dropdown menu showing 'CC-123-456 - AnyTown Plant'.
- Account (default):** A dropdown menu showing 'MR-5552-0098745 - Tools'.
- Item Type (default):** A dropdown menu showing 'Inventory'.
- Shipping Information:** Radio buttons for 'Use User Defaults' (selected) and 'Use Plant Defaults'.
- Department:** A dropdown menu.
- Freight Terms:** A text input field.
- Notes:** A text input field.

Three yellow callout boxes with red arrows point to specific settings:

- 'Set General Inventory and Purchasing default settings.' points to the 'General Settings' tab.
- 'Requisition settings.' points to the 'Requisition Creation' tab.
- 'Purchase order setting.' points to the 'PO Creation' tab.

Displaying the Hot Sheet

The Hot Sheet can be displayed automatically or it can be displayed manually whenever you need to see it.

Manually

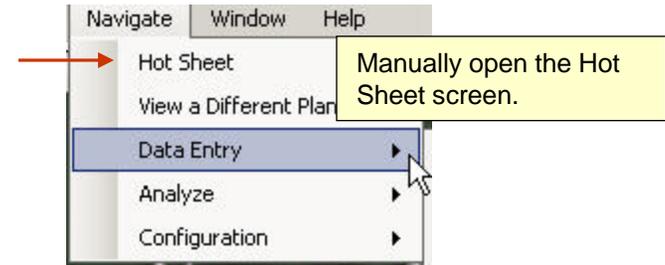
There are two ways to display the Hot Sheet manually (on-demand):

1. Click on the  button bar button
2. From the main MaintSmart screen select the **View >> Hot Sheet** menu

Automatically

There are two ways to configure the Hot Sheet to display automatically whenever MaintSmart is started:

1. Check the **Make Hot Sheet the Default Screen** checkbox on the **Configuration – More** tab of the Configuration  screen.
2. From the Hot Sheet screen select the **Options >> Make Hot Sheet the Default Screen**.

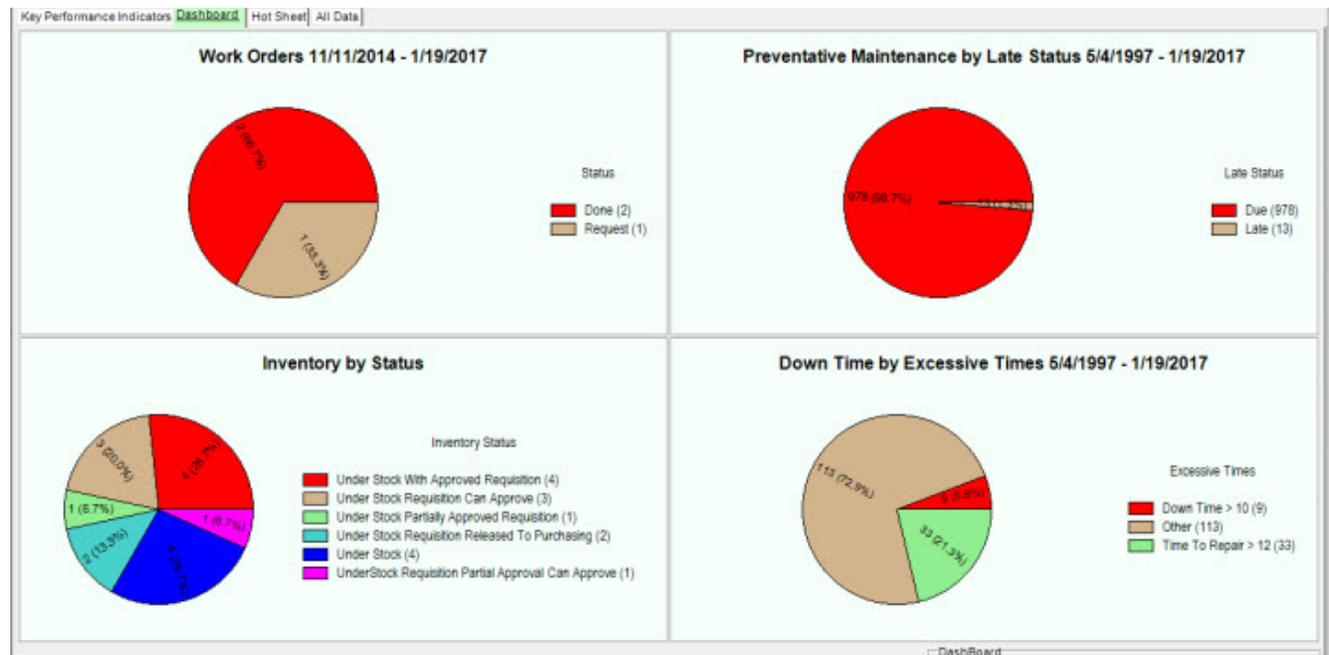


Dashboard

The Dashboard view displays a pie chart for:

1. Work Orders by Status
2. Preventive Maintenance by Late Status
3. Inventory by Stock Level
4. Down Time by excessive time measures.

If you click on one of the pie charts you will be taken the Hot Sheet showing the data for the chart that you clicked on.



Hot Sheet – Hot Sheet Tree View

Hot Sheet Tree View

The Hot Sheet displays data in a tree view for one of the four main areas: Work Orders, Preventive Maintenance, Inventory, Down Time. It also allows some functions to be performed on the items displayed in the tree.

The Hot Sheet is divided into two panes: the full Hot Sheet on the left and the Basket on the right. Items in the left-hand tree can be selected and then dragged into the Basket. The purpose of the basket is to provide a place to accumulate all the items on which you want to perform a given action. For example, when the left-hand tree is displaying Inventory items (parts) you can drag all inventory items that have unapproved requisitions to the basket and then approve the requisitions all at once. It is important to understand that only items that are compatible, in the sense that they can have the same actions performed on them, can be placed in the basket together. This means, for example, that it is not allowed to place parts with approved requisitions and parts with unapproved requisitions in the basket at the same time because there are no actions that can be performed on both of them.

The screenshot displays the 'Hot Sheet' interface. At the top, there are tabs for 'Performance Indicators', 'Dashboard', 'Hot Sheet', and 'All Data'. The main area is split into two panes. The left pane shows a tree view for 'Sacramento' with categories like 'Down Time' and 'Equipment'. Under 'Equipment', several items are listed with their respective 'Downtime Count' and 'Time to Repair'. The right pane is labeled 'Shopping Basket' and contains a few items, including 'Carton Former #1 Downtime C' and 'Carton Former #1, Drive Chai'. A yellow callout box with a red arrow points from an item in the left tree to the Shopping Basket, with the text: 'Left mouse-down on item(s) then drag and drop in shopping basket.' At the bottom, there is a control panel for the 'Hot Sheet' with a 'Plant' dropdown set to 'Sacramento', a 'Display Category' dropdown set to 'Equipment', and radio buttons for 'Work Orders', 'Inventory', 'PM', and 'Down Time' (which is selected). There is also a 'Refresh' button and a checked 'Delay Refresh' checkbox.

To select the type of data displayed in the Hot Sheet tree click on one of the radio buttons to select the type of data and then select an item from the **Display Category** drop-down box. In this example Downtime data categorized by Equipment will be displayed. If the **Delay Refresh** checkbox is checked, then you will need to click on the **Refresh** button to update the Hot Sheet tree. If the **Delay Refresh** checkbox is not checked, the Hot Sheet tree will be updated immediately each time you click on one of the radio buttons or change your selection in the **Display Category** drop-down box. If there is a large amount of data this may take longer to refresh the Hot Sheet tree than you would like.

Hot Sheet – Hot Sheet Tree View

Viewing Items in the Tree

The items in the Hot Sheet tree are colored and have different icons to make it easier to see their type and state. One way to get more information about an item is to hover the mouse cursor over it. A "Tool Tip" (small popup window) will appear that will contain more information about the item. Another way to get more information about an item is to right-click on the item and select the **Edit Selection** menu item. This will open the item in the screen where it was originally created or edited.

The screenshot displays the 'Hot Sheet' view of a 'Sacramento' dashboard. The tree structure shows 'Inventory Parts Understocked:6' with several vendors listed, including 'Bob the Builder Under stock:2', 'Delta Rubber Under stock:1', 'Motion Industries Under stock:1', 'No Vendor Under stock:1', and 'Performance Machinery Under stock:1'. A tooltip is shown over the '6215 Timkin Bearing' item, providing the following details:

Current Stock	0
Minimum Stock	10
Requisition Number	2
Requisition Item Number	1
Quantity Requested	16
Signatures Needed	1
Signatures	0

A context menu is also visible, listing the following actions: Refresh, Load All Detail Data, Collapse Tree, Expand Tree, Select All, Clear Selection, and Edit Selection.

Hover mouse over item in Hot Sheet tree and tool tip displays status of that item.

Hot Sheet – Hot Sheet Tree View

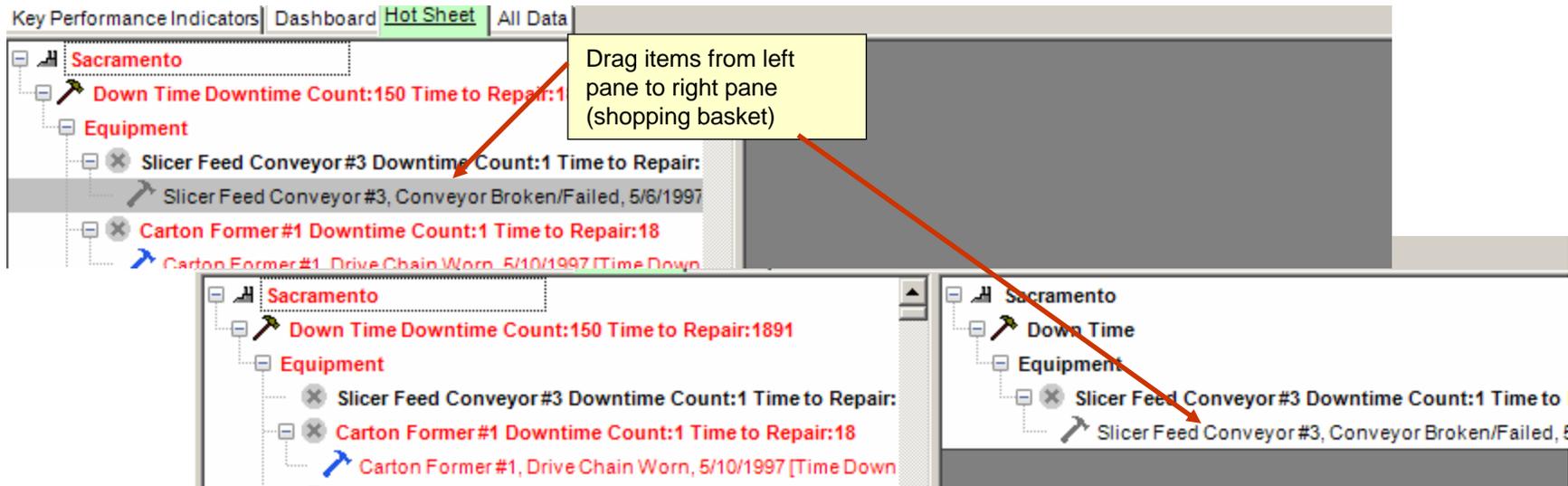
Using the Basket

Before dragging an item into the basket you must select the item. When the item is selected it will be highlighted like the item (WB Moulder #2) in the example. Multiple items may be selected. Use the mouse to drag the selected items from the Hot Sheet tree and drop them on the basket. After dropping them on the basket you they will be in the basket and no longer in the Hot Sheet tree. If you change your mind you can drop items out of the basket and back into the Hot Sheet tree.

When there are items in the basket, buttons will appear at the bottom of the screen that will perform actions on all items in the basket. In this example the basket contains Downtime items so a button appears that allow you to create Work Orders for each Downtime in the basket.

After an action is performed on the basket, you will be notified of the results. Then the basket will be emptied and the Hot Sheet tree will be refreshed.

Note that the performance of actions in the Hot Sheet and Basket are subject to restrictions on the user's permissions. Thus, a user that does not have permission to approve requisitions on the Approve Requisitions screen cannot not approve requisitions on the Hot Sheet. Also the proper configuration of related settings is necessary. For example, in order to create Work Orders for Down Times, it is necessary to have configured **Work Order Auto-Create Options** from the Down Time Entry screen.



After item is moved to shopping basket create a corresponding work order from the downtime record. Actions for other data items could be requisition, purchase order and other actions depending on item dropped in basket.

Hot Sheet

Plant: Display Category:

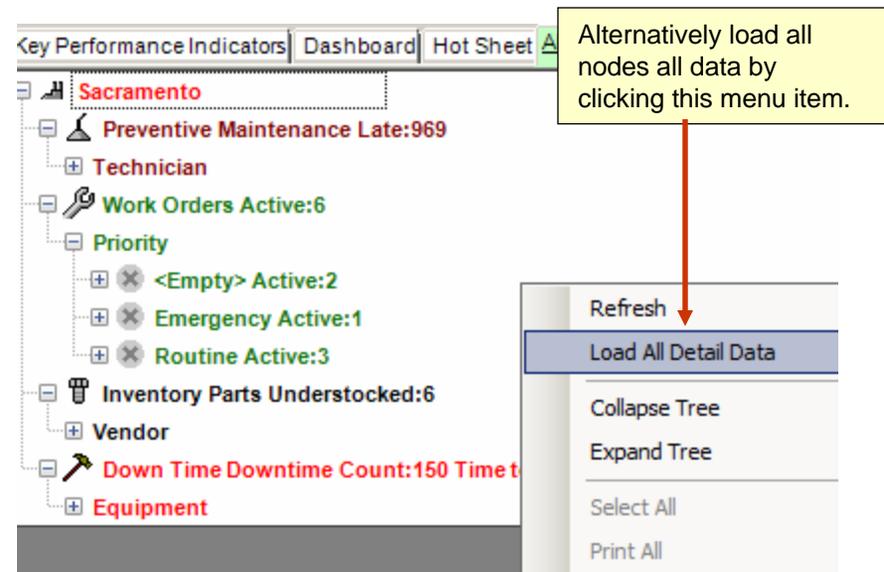
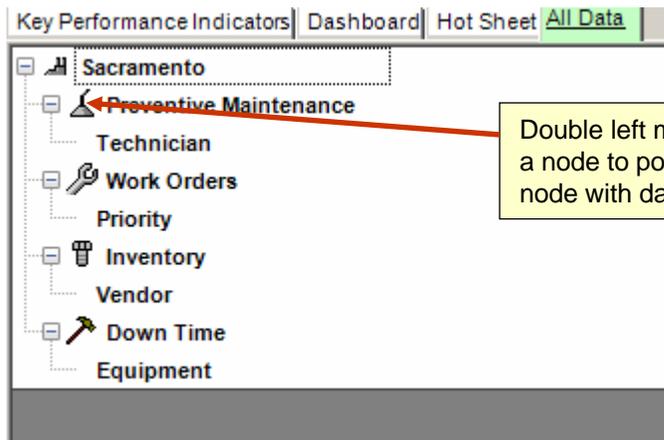
Hot Sheet – All Data Tree View

Hot Sheet All data Tree View

The **All Data** tab is similar to the Hot Sheet tab with several differences. The **All Data** tab can display multiple types of data simultaneously whereas the Hot Sheet will display one at a time. When the **All Data** tab is refreshed it displays a skeleton tree without any data.

To load data into the tree double-click on a node in the tree to load the data under that node. In this example the user clicked on the **Vendor** node and parts by vendor were loaded. To load all data for all areas, right click on the tree and select **Load All Detail Data** from the context menu. Be aware that this might take awhile to complete if you have a large amount of data.

The **All Data** tab does not contain a basket and does not provide all of the editing actions that are provided by the Hot Sheet tree.



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Barcodes

Barcode Overview

Barcodes are used by MaintSmart for equipment labels, inventory labels and to quickly identify work orders for the purpose of status updates. MaintSmart uses the Code 39 barcode standard. MaintSmart installs the proper Code 39 font when it's installed. In some cases you'll need to reboot after installing MaintSmart to register the new barcode font. Barcodes scans are interpreted by MaintSmart as key strokes within the screen object that has the screen focus when the scan is performed. Using barcodes can save time and provide greater accuracy when performing inventory audit and using spare parts especially. Equipment labels provide information about the equipment item and print a barcode. Work orders have barcodes printed at the top of the sheet. When updating work order completion status simply scan the barcode and MaintSmart locates the corresponding record in the grid for you.

To use barcode scanning (work orders, inventory set-up/audit, or inventory used) you must first check the menu item **Barcodes>>Enable Barcode Scanner**. This tells MaintSmart to configure the screen in such a way as to make barcode data readable by MaintSmart.

Hardware Requirements

Hardware (USB tethered barcode scanner): To read bar codes you'll need a barcode scanner capable for interpreting Code 39 fonts. Typically this scanner plugs into a USB port. We have found the ID Tech IDT4439U to be reasonably priced (\$119.00 USD), reliable and easy to use. There are many Code 39 scanners to choose from. All of these scanners need to be configured for the font and other characteristics like initialization and termination characters.

Hardware (printing sheet labels): Any reasonably modern laser printer (preferred) or inkjet printer will work for printing sheet labels. Laser printers are recommended because of the fine resolution needed to scan these barcodes and because of the durability of the barcode in possibly adverse or wet conditions.

Hardware (printing Dymo single labels): To print single Dymo labels a Dymo LabelWriter printer is needed. The LabelWriter Turbo 450 works quite well and is recommended. This printer may be obtained for under \$100 typically. This printer must be properly configured to print Dymo labels and does not come configured properly by default. Configuration of the Dymo labeler is covered on the next page.

Printing Hints: Printing barcodes is best accomplished with a laser printer though some high resolution ink jet printer print readable barcodes too. It's usually best to use the a high printer resolution option when printing labels and always print a test sheet first to make sure the labels are readable.



Barcodes – Scanner Configuration and Dymo Printer (labeler) Configuration

Barcode Configuration - Hardware

Scanner Configuration

Each barcode scanner brand and model will come with a manual that instructs on configuration of that particular scanner. When configuring your scanner the following points are important:

Configure the scanner for Code 39 font

Configure the initialization and termination characters. These characters are used to tell the scanner when to start reading the barcode and when to stop reading the barcode. The most common problem scanning labels in MaintSmart is improper configuration of these characters. The characters must both be set to read an exclamation point (!). Any other character will not properly read.

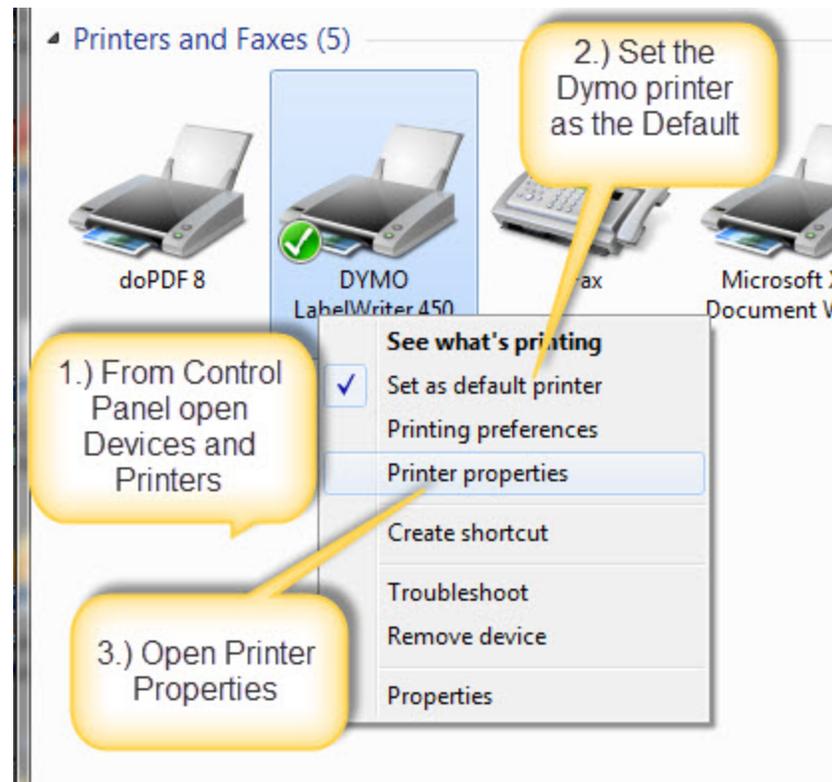
To test that you have this properly set do the following:

1. Print out one or more labels from any source in MaintSmart
2. Place your mouse cursor in some sort of word-processing screen document, such as MS Word, Notepad or WordPad. Scan the code with your configured barcode scanner.
3. The scanned text should immediately appear in the word processor program document and should begin and end with an exclamation point (!). An example could be is scanning a label representing the Inventory Internal ID Number = 10005 then the document text should display !10005! .

Dymo Printer/Labeler Configuration

The Dymo LabelWriter 450 Turbo printer does NOT come configured properly for printing barcode labels from MaintSmart. See the images below for instructions on how to configure this Dymo printer/labeler.

Step 1/4



Continued on next page...

Barcodes - Dymo Printer (labeler) Configuration

Dymo Printer/Labeler Configuration

The image shows two overlapping windows from the Dymo LabelWriter 450 Turbo Properties dialog. The main window is the 'Advanced' tab, and the smaller window is the 'Paper/Quality' sub-dialog.

Step 1/4: A yellow callout bubble points to the 'Advanced' tab in the main dialog, with the text: "1.) Choose Advanced screen tab."

Step 2/4: A yellow callout bubble points to the 'Printing Defaults...' button in the main dialog, with the text: "2.) Click Printing Defaults...".

Step 3/4: A yellow callout bubble points to the 'Advanced...' button in the Paper/Quality sub-dialog, with the text: "Click Advanced button."

The 'Advanced' tab in the main dialog includes the following options:

- Always available
- Available from 12:00 AM
- Priority: 1
- Driver: DYMO LabelWriter 450 Turbo
- Spool print documents so program finishes printing faster
- Start printing immediately
- Print directly to the printer
- Hold mismatched documents
- Print spooled documents first
- Keep printed documents
- Enable advanced printing features

The 'Paper/Quality' sub-dialog includes the following options:

- Orientation: Portrait
- Page Order: Front to Back
- Page Format: Pages per Sheet: 1
- Draw Borders

Continued on next page...

Barcodes - Dymo Printer (labeler) Configuration

Dymo Printer/Labeler Configuration

DYMO LabelWriter 450 Turbo Advanced Options

DYMO LabelWriter 450 Turbo Advanced Document Settings

- Paper/Output
 - Paper Size: 30252 Address
- Graphic
 - Print Quality: 300 x 300 dots per inch
- Document Options
 - Advanced Printing Features: Enabled
 - Pages per Sheet Layout: Right then Down
 - Color Printing Mode: Enhanced
 - Halftoning: Photo Quality
- Printer Features
 - Print Quality: Text Only
 - Print Density: Normal
 - Continuous Mode: Disabled

Step 4/4

Click OK when all settings match.

OK Cancel

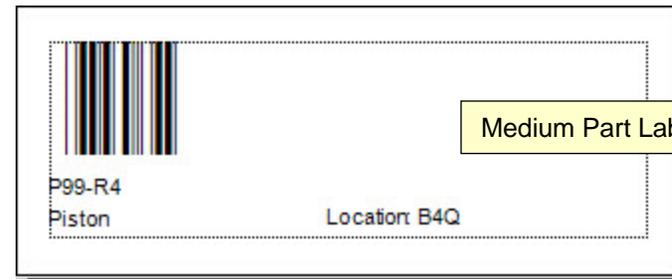
Dymo Printer/Labeler Label Selection

Labels used by the MaintSmart Dymo labeling system are as follows:

Small Dymo 30346
Medium Dymo 30321
Large Dymo 30256



Small Part Label



Medium Part Label



Parts Bin Label

Barcodes Sheet Labels - Inventory

Barcode Inventory Parts

Inventory labels with varying amounts of information about the part and a corresponding barcode provide an accurate a quick way to maintain your inventory. For information on how MaintSmart uses barcodes when using inventory parts see the Help Topic: Barcode Inventory Used. This topic deals with barcodes as pertaining to the **Inventory Set-Up** screen . From this screen you may create labels, the later scan parts while performing a physical inventory audit.

Each time an inventory record is created a new barcode record is also created. This barcode is unique to the part ID number, unit cost and whether or not the part is "Inventory" or Non-Inventory". When a part is later scanned all of this information and more becomes available to MaintSmart without any additional user input.

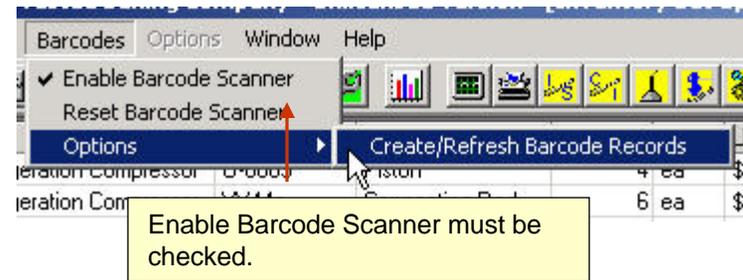
Note: if you already have MaintSmart and are upgrading from a previous version you'll need to select the menu items **Barcodes>>Options>>Create/Refresh Barcode Records**. This action creates barcode records for your existing inventory.

Creating Labels: To create labels using the **Label Creator** for Inventory parts see the Help Topic: **Barcode Label Printing** . The **Label Creator** provides flexible label printing giving you the option of how many of each label along with countless filters. To print one label for each part number (not every part) select the menu items **File>>Print>>Labels>>Inventory Labels -** . Several filters and formats are available from this menu. When printing labels you are first presented with a print preview screen so go ahead and see what each label format has to offer before deciding on a specific label.

Scanning Barcodes: After configuring your Code 39 barcode scanner simply select the menu items **Barcodes>>Enable Barcode Scanner**. This tells MaintSmart that you will be inputting data with the barcode scanner until this menu item is unchecked. Follow these steps to scan an inventory part barcode (this example would be useful in the case where you wanted to adjust part quantities as in an inventory audit):

1. Scan the barcode label.
2. MaintSmart selects the grid row containing the record and makes it visible.
3. The quantity box is enabled. Change the quantity if needed.
4. Press **<ENTER>** or the **Save** button to save the record .

In some cases it's possible for MaintSmart to become out-of-sync with the scanner. If this happens you'll scan a barcode but MaintSmart will not recognize the action. Select the menu items **Barcodes>>Reset Barcode Scanner** to correct this situation. In some cases MaintSmart may accept the scan but instead of enabling the data input box you'll receive a message on the button frame (in red) stating that MaintSmart was unable to resolve the barcode. This occurs when an inventory part was deleted but the old label remained on the part. Great care should be taken when deciding to delete inventory items from the Inventory Set-Up screen.



Scanning Barcodes - Inventory Used Screen

Barcode Inventory Used

To scan inventory parts as they are used follow these steps:

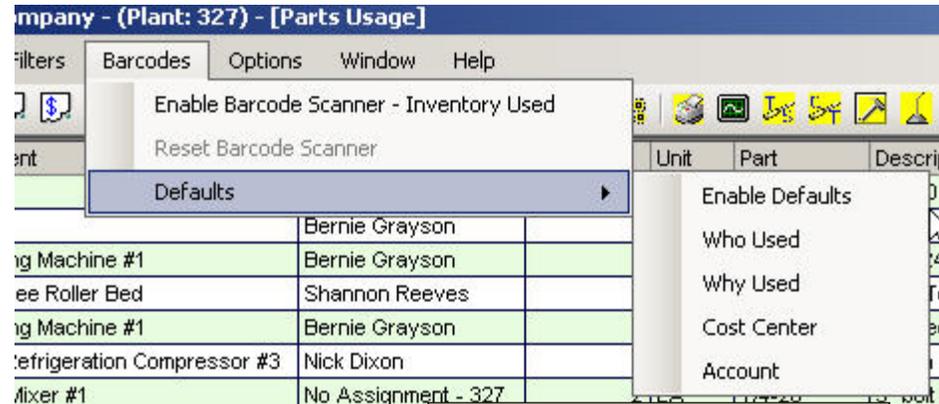
1. Open the **Purchasing and Parts Usage** screen.
2. Select the tab labeled **Use Parts Stock**.
3. Select the menu items **Barcodes>>Enable Barcode Scanner**. (MaintSmart is now ready to accept input from your configured Code 39 barcode scanner.)
4. Scan the barcode label previously created by MaintSmart.
5. The **Quantity, Date Used, Who Used, Why Used, Cost Center and Account** input boxes become enable. The **Spare Parts Use** screen may also appear.
6. Enter the required data into these enabled boxes.
7. Press **<ENTER>** or the **Save** button to save the record.

Note: When in barcode mode in the Inventory Used screen you must stay on the Use Parts Stock tab. If you attempt to leave this tab you'll receive a warning message.

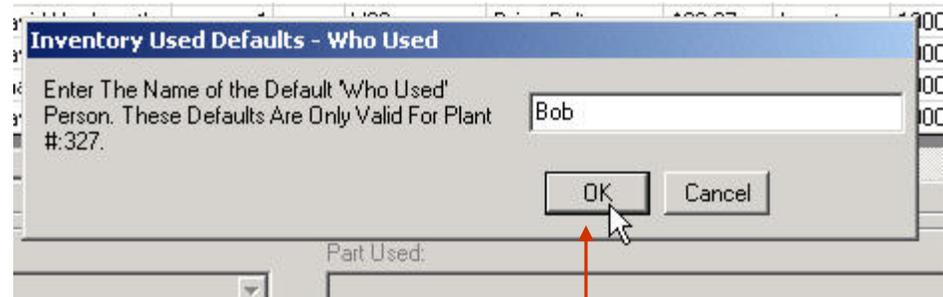
Setting Default Values

Select the menu items **Barcodes>>Defaults>>Who Used**. Enter the common name of the person you wish to use as the default Who Used person. Next check the menu items **Barcodes>>Enable Defaults** to tell MaintSmart that you want to use default settings whenever a barcode is scanned. This can be a real time-saver. You may also set defaults for **Why Used, Cost Center and Account**. When using a default Why Used setting MaintSmart automatically presents the Why Used screen with the proper tab selected.

Note: In some cases it's possible for MaintSmart to become out-of-sync with the scanner. If this happens you'll scan a barcode but MaintSmart will not recognize the action. Select the menu items **Barcodes>>Reset Barcode Scanner** to correct this situation. In some cases MaintSmart may accept the scan but instead of enabling the data input boxes you'll receive a message on the button frame (in red) stating that MaintSmart was unable to resolve the barcode. This occurs when an inventory part was deleted but the old label remained on the part. Great care should be taken when deciding to delete inventory items from the **Inventory Set-Up** screen.



Setting defaults further speeds data entry when using barcodes for inventory usage.



Example of setting a default barcode 'Inventory Used' data item.

Scanning Barcodes - Work Orders Screen

Barcode For Work Order Status Updates

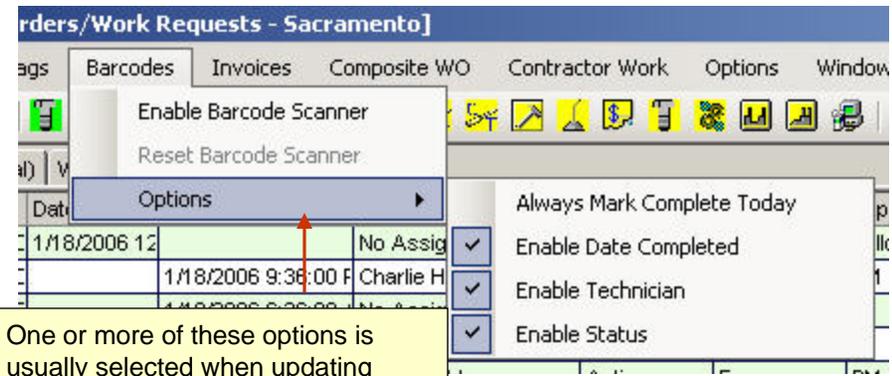
The purpose of barcodes on work orders is to provide a quick and accurate way for you to update the status of a work order by simply scanning the barcode. Follow these steps to scan a work order barcode:

From the work order data entry screen select the menu items **Barcodes>>Enable Barcode Scanner**.

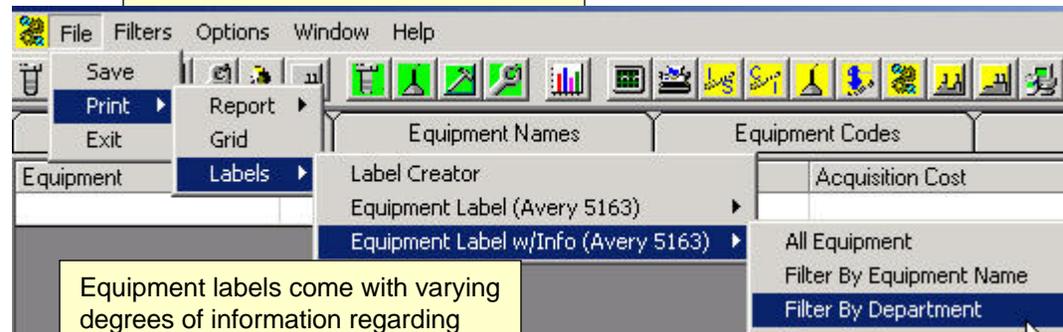
1. Scan a work order barcode
2. Enter the hours into the Hours box.
3. Press **Save** or **<ENTER>** to save the record.

To set barcode defaults select the menu items **Barcodes>>Options>>?**. Checking **Always Mark Complete Today** will cause MaintSmart to automatically mark the work order complete on the day it's scanned. Don't forget to enter the time to complete in the **Hours** box. Checking **Enable Date Completed** provide a way for you to mark the work order as complete. **Enable Status** enables the status box providing a way to edit the status of the work order. Enable Status only works if **Always Mark Complete Today** is not checked.

If you make a mistake simply uncheck **Enable Barcode Scanner** then edit the record in the conventional way by left mouse-clicking the grid row.



One or more of these options is usually selected when updating work orders.



Equipment labels come with varying degrees of information regarding the equipment item. The larger the label the more information contained by the label.

Barcodes - Equipment Labels

You may create equipment barcode labels as follows:

1. From the **Equipment Configuration** screen select the menu items: **File>>Print>>Labels>>Equipment Label**.
2. Choose the format and filter if needed.
3. When the print preview screen appears confirm your selection the press the printer icon to print.

Alternatively see the Help Topic: Barcode Label Printing for more flexible printing capabilities.

Barcode Troubleshooting

Nothing Happens When I Scan the Barcode

Solution #1 In some cases it's possible for MaintSmart to become out-of-sync with the scanner. If this happens you'll scan a barcode but MaintSmart will not recognize the action. Select the menu items **Barcodes>>Reset Barcode Scanner** to correct this situation. In some cases MaintSmart may accept the scan but instead of enabling the data input boxes you'll receive a message on the button frame (in red) stating that MaintSmart was unable to resolve the barcode. This occurs when an inventory part was deleted but the old label remained on the part. Great care should be taken when deciding to delete inventory items from the Inventory Set-Up screen.

Solution #2 Make sure you have your scanner hardware properly configured. Unfortunately MaintSmart support is unable to support the hundreds of different barcode scanners on the market.

Solution #3 Poor printer resolution or a damaged label can cause the barcode to become unreadable. It's recommended that you use a laser printer with at least 600 dpi when printing barcode labels and work orders with barcodes.

Red Error Message Appears in Frame Around Buttons When I Attempt a Scan

Solution #1 This occurs when the scanner is able to read a value from the barcode but the value is not found in the barcode database. This situation could arise if inventory labels are created then the inventory part is deleted in the Inventory Set-Up screen.

Scanning Barcodes – Barcode Screen

Refreshing Barcodes

Before starting with barcodes be sure to refresh the barcodes from the Technician , Inventory set up and Equipment set up screen. This is especially important if upgrading to MaintSmart 5.0 or higher from an older version of MaintSmart.

The screenshot shows two overlapping windows from the software. The top window is the 'Technician' screen, and the bottom window is the 'Equipment' screen. Both have their 'Options' menus open, with 'Refresh Barcodes' highlighted. A yellow callout box with a red arrow points to the 'Refresh Barcodes' option in the Technician screen's menu.

Technician Screen Options:

- ✓ Edit/Add Records to Other Plant
- Edit Skills
- Add Default User
- Validate Email
- Refresh Barcodes**

Equipment Screen Options:

- ✓ Edit/Add Records to Other Plant
- OLAP
- Options - Equipment Items Screen
- Options - Equipment Details Screen
- Consolidate Equipment
- Use Equipment Descriptor As Display
- ✓ Auto Increment Equipment Index
- ✓ Add Equipment Index To Descriptor
- ✓ Save Last Entries
- Save Last Equipment Display Name
- ✓ Auto-Increment Sequence
- Grid-Click Sequence Mode
- ✓ Hide Equipment Descriptor
- ✓ Hide Equipment Group
- Refresh Barcodes**

Equipment Table:

Equipment ID	Equipment Name	Quantity	Product
Free Roller Bed #12		12	Bread Packaging
Free Roller Bed #13		14	Bread Packaging
Free Roller Bed #2		2	Bread Prod.
Free Roller Bed #3		4	Bread Prod.
Free Roller Bed #4		4	Bread Prod.

Refresh barcodes on the Technician screen and the Equipment set up screen.

Barcode Options and Settings

Options may be set for commonly used defaults from the Barcodes screen. Setting these saves time and provides consistency. These settings are user settings so each user may set different preferences.

The screenshot shows the 'Barcode Options and Settings' screen. The 'Options' menu is open, and the 'Other Defaults' sub-menu is also open, with 'Work Orders' selected. The background shows a table of equipment items.

Barcode Options and Settings Options:

- Use Defaults
- Defaults
- Other Defaults
 - Date Assigned / Start
 - Date Due
 - Date Completed
 - Days Back
 - ✓ **Work Orders**
 - PMs
 - Downtime
 - Parts List

Equipment Table:

Equipment ID	Equipment Name	Quantity	Product
90 Degree Roller Bed #10		✓	Clea
90 Degree Roller Bed #10		✓	Clea
90 Degree Roller Bed #10		✓	Clea
90 Degree Roller Bed #10		✓	Clea
90 Degree Roller Bed #10		✓	Clean/Inspect Electrical Components
90 Degree Roller Bed #10		✓	Clean/Replace Filter(s)

Scanning Barcodes – Barcode Screen

Scanning Barcodes

Scanning a barcode brings up the selected, associated data for that barcode.. Equipment barcodes display parts list, work orders, preventive maintenance and downtime. Technician barcodes display either work orders or preventive maintenance tasks. Filters may be applied to limited the scan results and these filters may be saved as defaults.

The screenshot displays the Barcode Screen interface. At the top is a menu bar with 'File', 'Options', and 'Window'. Below the menu is a toolbar with various icons. The main area features a table with the following data:

Equipment	Late	Task	Interval	Start Date	Due Date
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean Feeder	7	12/21/2012	12/28/2012
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean Filter(s)	7	12/21/2012	12/28/2012
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean Oil Tank	7	12/21/2012	12/28/2012
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean Pump Suction Strainer	7	12/21/2012	12/28/2012
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean/Check Air Jets	7	12/21/2012	12/28/2012
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean/Inspect Electrical Components	7	12/21/2012	12/28/2012
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean/Replace Filter(s)	30	12/21/2012	1/20/2013
30 Degree Roller Bed #10	<input checked="" type="checkbox"/>	Clean/Replace Filter(s)	75	12/21/2012	3/6/2013

Below the table, the interface shows filter settings:

- Filters ~ (21) Records Loaded in (seconds): 0.04
- Technician: Bemie Grayson
- Date Parameter: Date Start
- Date From: 1/21/2003 12:17 PM
- Date To: 02/20/2017 12:17:26
- Type: [Dropdown]
- Priority: [Dropdown]
- Status: [Dropdown]
- Minimum Interval: 0
- Maximum Interval: 0

At the bottom, there are four radio buttons for filtering:

- Show Work Orders
- Show PMs
- Show Downtime
- Show Parts List

Two callout boxes provide instructions:

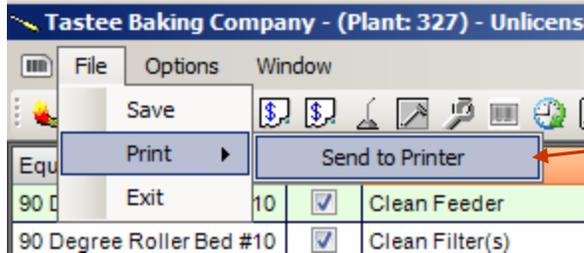
- Scan **equipment barcode** to display preventive maintenance, work orders, downtime or parts list. (Points to the 'Show PMs' radio button)
- Scan **technician barcode** to display preventive maintenance, work orders for that technician. (Points to the 'Show Parts List' radio button)

Buttons for 'Print', 'Print All', and 'Reset' are located at the bottom right.

Scanning Barcodes – Printing from the Barcode Screen

Scanning Barcodes

Scanning a barcode brings up the selected, associated data for that barcode.. Equipment barcodes display parts list, work orders, preventive maintenance and downtime. Technician barcodes display either work orders or preventive maintenance tasks. Filters may be applied to limited the scan results and these filters may be saved as defaults.



Default printing displays report in a print preview screen. To send directly to your default printer choose **Send to Printer**. This will place a check mark by this menu and save it as a user setting.

ler Bed #10	<input checked="" type="checkbox"/>	Clean Filter(s)		/	12/21/2012	1.
ler Bed #10	<input checked="" type="checkbox"/>	Clean Oil Tank		7	12/21/2012	1.
ler Bed #10	<input checked="" type="checkbox"/>	Clean Pump Suction Strainer		7	12/21/2012	1.
ler Bed #10	<input checked="" type="checkbox"/>	Clean/Check Air Jets		7	12/21/2012	1.
ler Bed #10	<input checked="" type="checkbox"/>	Clean/Inspect Electrical Components		7	12/21/2012	1.
ler Bed #10	<input checked="" type="checkbox"/>	Clean/Replace Filter(s)		30	12/21/2012	1.
ler Bed #10	<input checked="" type="checkbox"/>	Clean/Replace Filter(s)		75	12/21/2012	3.

1) Records Loaded in (seconds): 0.04

Date Parameter: Date:

Type: Priority: Status:

Interval: Maximum Interval:

Print

Print the entire contents of the data grid by clicking **Print All**.

Print selected items. Items are selected by left-clicking item. Multi-select by also holding the <CTRL> key while left-mouse clicking. Range select by holding <SHIFT> key and left-click.

OPC Meter Linking Topics

OPC and OPC Meter-Linking - Overview.....	193
Working With OPC Items and Tags.....	194
Associating, Updating OPC Links to Meter Records.....	195

OPC Meter Linking - Overview

What is OPC?

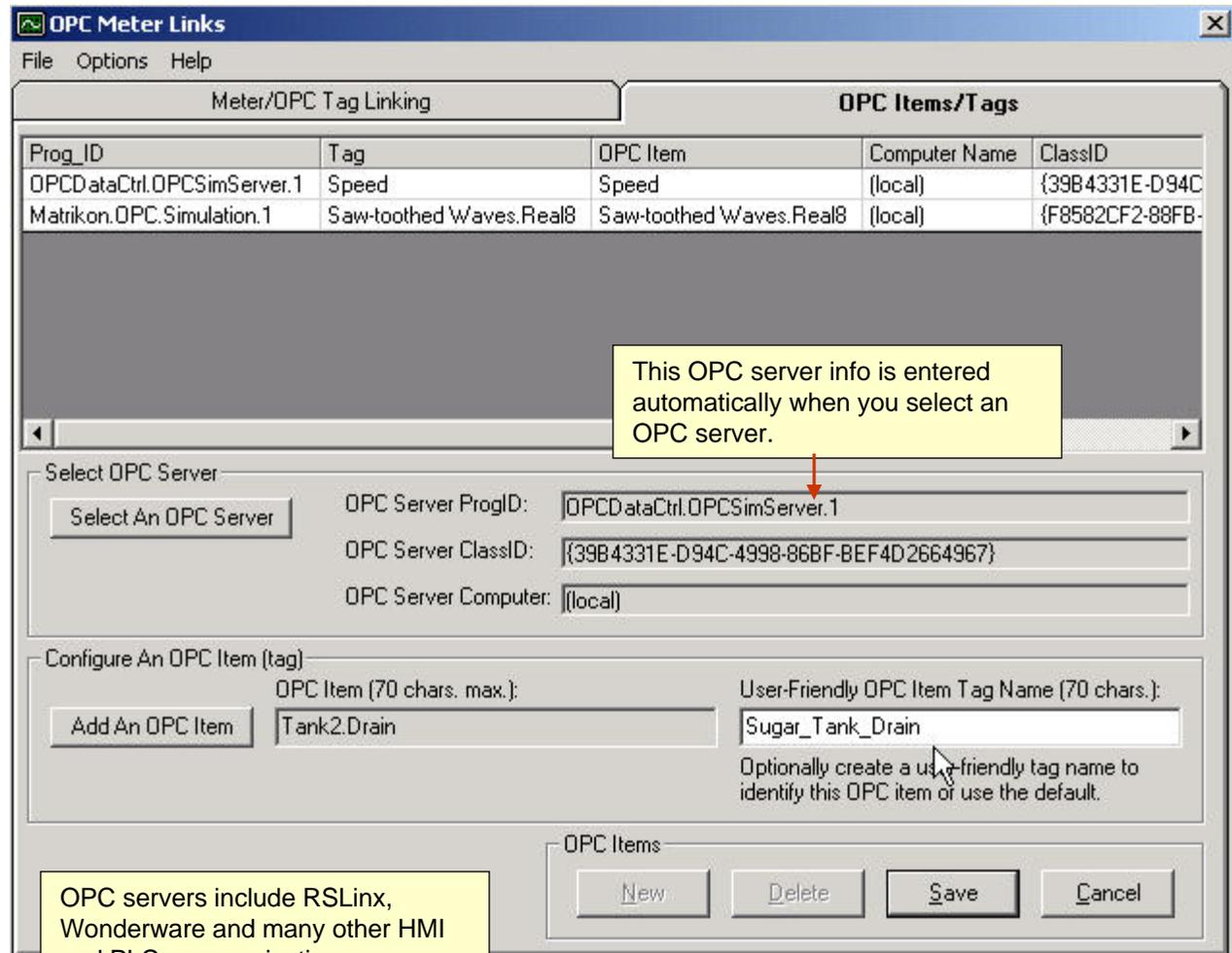
OPC is an acronym for **OLE for Process Control**. OPC provides a way for you to link MaintSmart meters to PLCs (programmable logic controllers). By doing so you may automatically update a meter reading with the value in the linked PLC memory address. Like DDE (Dynamic Data Exchange) OPC basically shares data between applications. OPC is similar to DDE but simpler, faster and more reliable than DDE.

Most modern HMI and PLC communication applications or services are OPC compliant. If you are not sure if your application is OPC compliant you'll need to contact the vendor of the software in question. For more information on OPC go to <http://www.opccompliant.org>.

Overview of OPC Tag/Meter Linking

See the help topic on Meters for a full understanding on what meters are and how they work. MaintSmart provides two ways to read OPC data into meter records thereby updating the current reading for that meter. Meter records are then linked to work order templates. When a meter interval (as defined by you) expires a work order is created automatically by MaintSmart. When the work order is completed ("Done") the meter records' "Last Performed" data field is updated and so on. This is a powerful, time-saving feature offered only by MaintSmart.

MaintSmart OPC requires that you have one of these operating systems installed on your workstation: WinNT 5.0, Windows 2000 or Windows XP. Furthermore you must have an OPC compliant server program running somewhere on your system or network. Most modern HMI and PLC communication applications or services are OPC compliant. If you are not sure if your application is OPC compliant you'll need to contact the vendor of the software.



Associating, Updating OPC Links to Meter Records

Linking OPC Tags to Meters

Linking OPC data tags or items to MaintSmart meters provides a way for MaintSmart to read data directly from OPC servers. Common OPC compliant servers include PLC communication software such as Rockwell's Logix series, Wonderware, Seimans and many more. For example you may have an equipment item in your manufacturing plant that has an hour meter address in the PLC. MaintSmart can read this value then based upon your meter configuration can trigger an event that creates a work order automatically at exactly the right time.

From the Work Orders screen select the menu items **Meters>>Manage OPC Links...** From the Meters screen select the menu items **Options>>Manage OPC Links...**

When the **OPC Meter Links** screen appears select the tab labeled **Meter/OPC Tag Linking**. Follow these steps to delete or edit an meter/OPC tag link:

1. Press the **New** button.
2. Select the equipment item from the drop-down. MaintSmart then loads meters associated with this equipment item. **Note:** If the meters drop-down is empty this is because no meters have been associated with this previously selected equipment item. If this is the case go to the meters section of MaintSmart and create one or more meter records first.

Also Note: the menu items **Options>>Equipment Names**. Checking the first sub-menu item causes the equipment drop-down to be filled with equipment names that are actually used with configured meter reading. Checking the second sub-menu item loads the drop-down with equipment names that are linked to work order templates but have not yet been added to the meter reading data table. If you check the second sub-menu item you may not see the record added to the grid as expected when you press the Save button.

3. Select a meter from the **Meters Linked To Selected Equipment** drop-down.
4. Press the button labeled Select OPC Server. Select the OPC server containing the OPC items (tags) you want to link to this meter.
5. The **Display Items(Tags)** drop-down fills with OPC tags or items contained by the selected OPC server.
6. Make sure the checkbox **Activate This Meter Link** is checked.
7. Press **Save**.

OPC Read-Minimum Data Quality provides a way to avoid recording OPC data of poor quality. Note other options.

Update Readings button is pressed to read data from PLCs into MaintSmart meters table.

Equipment	glD	OPCItem
001 Yeast Refrigeration Compressor #1	CDataCtrl.OPCSimServer.1	Speed
001 Yeast Refrigeration Compressor #1	Saw-toothed Waves.Real8	Matrikon.OPC.Simulation.1

Meters OPC Tag/Item Linking - Computer Name: (local), ProdID: OPCDataCtrl.OPCSimServer.1

Plant: AnyTown Equipment Currently Linked To Meters: 002 Bulk Flour Bin #1

Meters Linked to the Selected Equipment: Major Overhaul - 30Day

Select Server: [] Display Items: [] Display Tags: []

Meters OPC Tag/Item Linking: Speed, Sugar Tank Drain

Activate This Meter Link [Update Readings] [New] [Delete] [Save] [Ca]

Editing or Deleting OPC Meter Links

To edit or delete an OPC tag/meter link record left mouse-click the grid row containing the record the press **Delete** to permanently delete the record. You may also deactivate an OPC meter link by un-checking the checkbox labeled: **Activate This Meter Link** then press **Save**.

Working With OPC Items and Tags

Creating An OPC Tag Record

From the Work Orders screen select the menu items **Meters>>Manage OPC Links...** From the Meters screen select the menu items **Options>>Manage OPC Links...**

Note: the menu item **Manage OPC Links...** is only available if the workstation operating system is Windows NT 5.0, Windows 2000 or Windows XP. You'll need to have defined some OPC item in your OPC server before MaintSmart will be able to access these OPC items. See you OPC server application manual or vendor for information on this. MaintSmart does not support configuration of OPC items in the various OPC servers.

When the OPC Meter Links screen appears select the tab labeled OPC Tags and Items. Follow these steps to create a new OPC tag:

1. Press the **New** button.
2. Press the button labeled **Select OPC Server**.
3. When the OPC server popup box appears select the OPC server then press the **OK** button.
4. Press the button labeled **Add An OPC Item**.
5. When the OPC item box appears select the topic or group of previously configured items in the left pane of the popup.
6. After selecting the topic or group in the left pane (branches) the right pane (items) should display the available data items.
7. Select a data item from the right pane. The items must only contain number values.
8. Press the OK button on the **OPC Item Browser** popup.
9. Enter a user-friendly tag name to associate with the OPC data item.
10. Press the **Save** button to save this OPC item/tag record.

Alternatively you may create this record by following steps 1.-3. Then simply type into the grayed-out OPC item text box. This requires that you use the exact syntax necessary to connect to the data in the OPC server.

Now that you've created an OPC tag record you may associate this tag record with a previously created MaintSmart meter.

Deleting or Editing An Existing OPC Tag Record

From the Work Orders screen select the menu items **Meters>>Manage OPC Links...** From the Meters screen select the menu items **Options>>Manage OPC Links...**

When the OPC Meter Links screen appears select the tab labeled **OPC Tags and Items**. Follow these steps to delete or edit an OPC tag:

The image shows two screenshots of the software interface. The top screenshot is titled "Select An OPC Server - Tag Configuration" and shows a tree view of OPC servers. A yellow callout box with the number "2" points to the "OPCDataCtrl.OPCSimServer" server. The bottom screenshot is titled "Select OPC Server" and shows the configuration fields for the selected server. A yellow callout box with the number "4" points to the "User-friendly OPC item tag name" field. Below this, another yellow callout box with the number "1" points to the "New" button in the "OPC Items" section.

2. Select an OPC server by pressing button then selecting server from server browser.

3. Select an OPC item by pressing button then selecting OPC data item from Item Browser or enter the data item reference manually by typing into the gray and the white textboxes.

4. Give new OPC data item a user-friendly tag name or keep default. Press **Save** to keep record.

1. Press **New** button.

1. Select the record you want to work with by left mouse-clicking the grid row containing the record.
2. You may edit the Tag Name only by typing a new tag name into the box labeled **User-Friendly OPC Tag Name**.
3. Press **Save** to keep the changes.

To delete the record follow step 1. Above then press the Delete button.

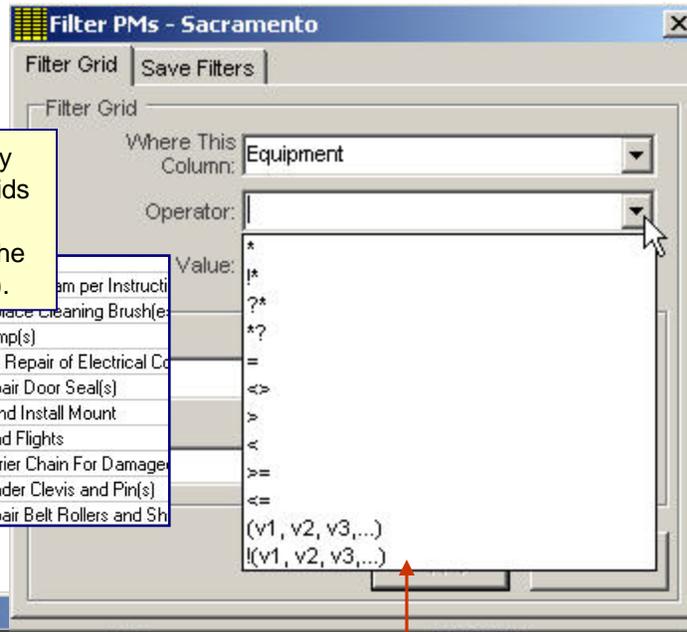
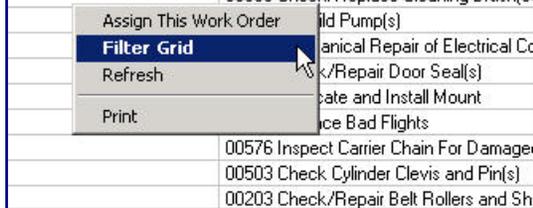
Note: deleting the tag record also deletes all meter link records associated with this tag.

MaintSmart Grid Utilities

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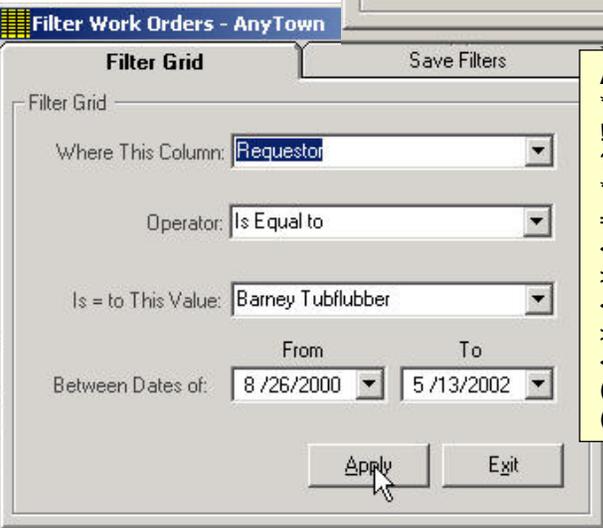
Filtering Data Grids

Step 1 : To filter any data entry grid and most configuration grids begin by right mouse-clicking anywhere on the grid. Select the option **Filter Grid** (if available).

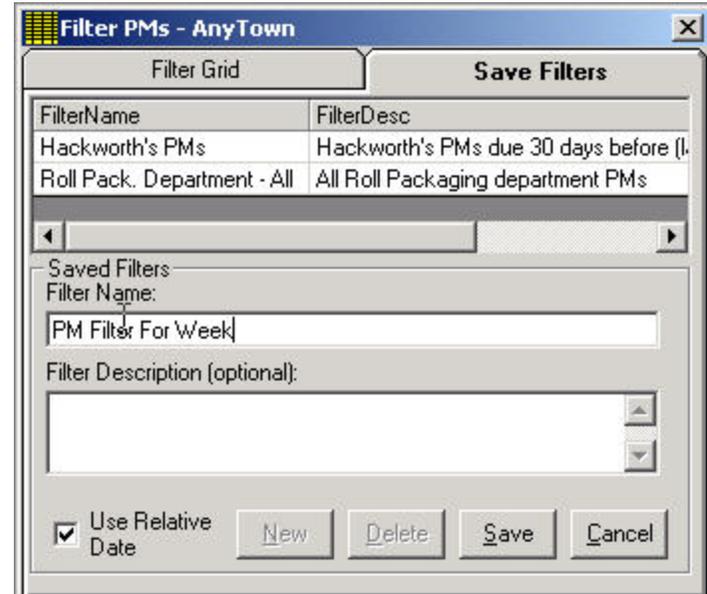


Available Filter Operators:

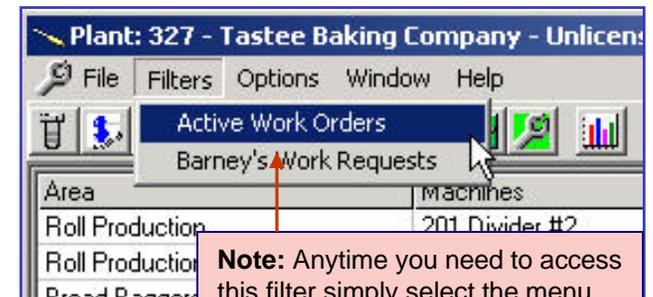
- * Contains (text)
- !* NOT Contains (Text)
- ?* Begins With (text)
- *? Ends With (text)
- = Equals (any data type)
- <> NOT Equals (any data type)
- > Greater Than (any data type)
- < Less Than (any data type)
- >= Greater Than or Equal to (any data type)
- <= Less Than or Equal to (any data type)
- (v1,v2,v3... (data IN (any data type))
- (!v1,v2,v3... (data NOT IN (any data type))



Step 2 : Create a filter using the drop-down boxes. Be sure to use a valid date period if applicable. Press **Apply** to apply the filter to the data grid.



Step 3 : To save the filter as a menu item on the data screen select to tab labeled **Save Filters**, press the **New** button, enter a filter name (this appears as a menu item after saving) and a description (optional). Press **Save**.



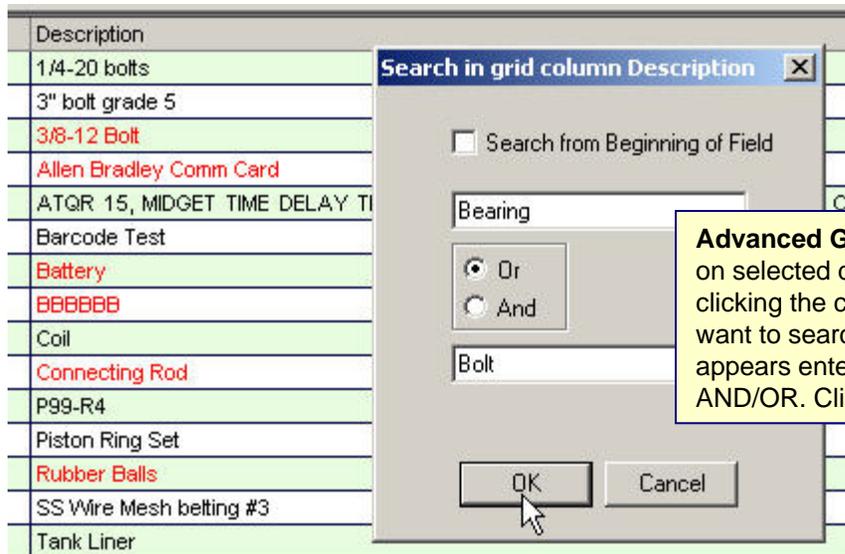
Note: Anytime you need to access this filter simply select the menu item! You can delete filters too. Define up to 25 filters per screen.

Searching Data Grids



Quick Grid Search (Step 1) : To search any column on selected data grids begin by right mouse-clicking the column header for the column you want to search and choose the menu item: **Quick Grid Search**. In this example the column header is "Description" from the Inventory set-up screen.

Quick Search (Step 2) : Begin typing the search text into the now white text box that has replaced the column header. Located item(s) containing the search text (in any position within the word) become highlighted with the default selection row color. To clear the search box right mouse click the grid area and choose **Cancel Search**.



Advanced Grid Search : To search any column on selected data grids begin by right mouse-clicking the column header for the column you want to search. When the Search dialog screen appears enter the target text and logical operator AND/OR. Click **OK**.

Data Grid Column Filters

Invoices Composite WO Contractor Work Options Window Help

ory (optional)

Date Completed	Technician	Status	Priority	Type	
00:00:00	No Assignment - 327	Active	Emergency	Foll	
21:36:00	1/18/2006 21:36:00	Charlie Huston	Done	Routine	Coc
1/18/2006 06:26:00	No Assignment - 327	Done			
1/18/2006 00:00:00	No Assignment - 327	Active		rgency	Coc
1/18/2006 00:00:00	No Assignment - 327	Active			

Grid Column filtering: left click the column header (small arrow) that you want to filter. The filter dialog screen will appear.

Step 1: Click down arrow on any column header

der History (optional)

Date Due	Date Completed	Technician	Status	Priority	Type	Equip
8/20		Bob Wright	Active	Emergency	Code Complis	90 Di
8/20		Bob Wright	Done		Service	g
		Bob Wright	Active	Emergency	Work Order	
		Bob Wright	Done	Emergency	Work Order	
36/20		Bill Raymond	Done	Urgent	PM	
3/2010 00:00:00		Bob Wright	Active	Routine	Work Order	Work
2/2012 11:58:00	1/8/2012 19:47:00	Bob Wright	Done	Routine	Work Order	

This is a view of the resulting data. Notice check mark in filtered column header. You can further filter this data set from other columns as needed, then export to Excel, etc.

Step 3: View results then filter these results by additional column filters.

es Composite WO Contractor

nal)

Date Completed	Technician	Status	Priority	Type	Equipment
	(Select All)				
1/18/2006 21:36:00	Bernie Grayson				ion Co
1/18/2006 06:26:00	<input checked="" type="checkbox"/> Bill Raymond				ntrol/O
1/18/2006 05:30:00	<input checked="" type="checkbox"/> Bob Wright				Bed
	Charlie Huston				Bed
1/18/2006 00:00:00	Clarice Thomas				Bed
	David Hackworth				Bed
	Frank Pierce				Bed

B Text Filter Apply Clear Cancel

Date Completed	Technician	Status	Priority	Type	Equipment
	No Assignment - 327	Active			90 Degree Roller Bed

Step 2: Select filter items OR use User Configurable filter button at lower left Text Filter .

Un-check the "Select All" box then check the desired items for viewing. Click the "Apply" button at bottom of this dialog screen.

- Quick Grid Search
- Advanced Grid Search
- Preserve Grid Search
- Print Preview Selected W
- Print Selected Work Order
- Duplicate Work Order
- Delete
- Refresh
- Save W
- Filter Gr
- Take Su

Click "Refresh" from pop-up menu to restore all records to grid.

Step 4: To clear the filter select Refresh (if on PMs Update screen click Display All Records (PMs)).

Grid - Options and Functions

Set Grid Preferences:

Select the **Program Configuration** menu button  from the button bar at the screen. Select the tab labeled **System**. Locate the box at the lower right labeled **Set Grid Colors**. Select the option you wish to set. Available color settings relate to grid row selection, grid back color, alternate row color, font and font color and line color. After selecting the option press the **Set Color** button. When the color dialog box appears select a color then press **OK**.

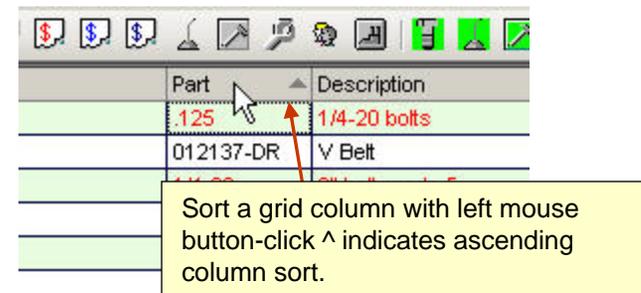
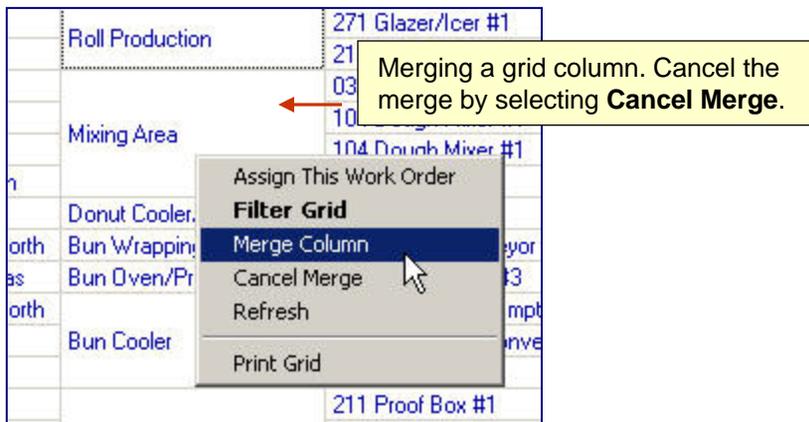
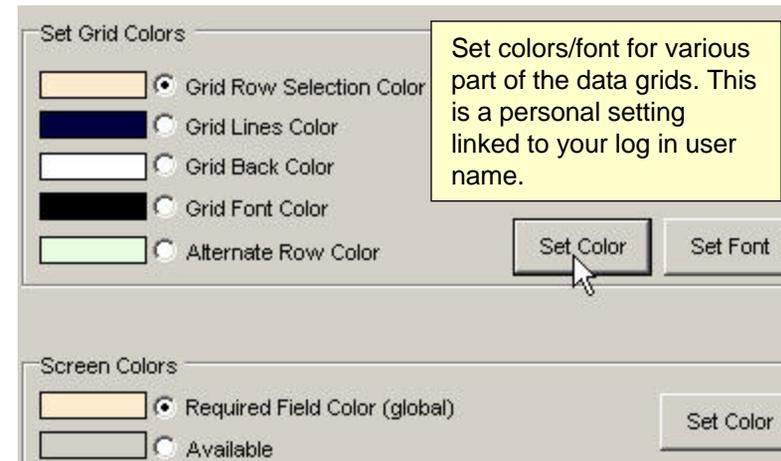
Merging Grid Columns

MaintSmart grids provide merging capability. Grid merges group identical data in a column with similar data. This is useful for grid viewing and evaluation purposes.

To merge a column place the mouse cursor over the column you want to merge. Press the right mouse button. When the pop-up menu appears select the menu item **Merge Column**.

Sorting Grids:

Left mouse-click the column header of any grid row to alternately sort a grid column ascending/descending. All grids in MaintSmart have this capability.



More Grid Options

Analysis Grid Options:

Analysis grids provide additional functionality over configuration and data entry grids. Analysis grids implement additional function to provide a way for you to display the data that's important to you and provide some simple column statistics.

Dragging Grid Columns

To drag a grid column to a different position press the left mouse button down (and hold it down) over the grid column header you want to drag. Drag the column to the desired position as indicated by the highlighted vertical bar then release the mouse button to drop the column. Column dragging may provide a more useful view of the analysis data presented in the grid.

Quick Grid Statistics:

Right mouse-click the column you want to generate statistics on. It must be a numeric column. Select the menu item Show Stats from the pop-up menu. You may create statistic summaries on more than one column at a time.

Equipment	Cost Labor	Cost Parts
271 Glazer/Icer #1	\$23.65	\$30.00
471 Vert. Switch Empty Basket #2	\$23.58	
440 Wrapping Machine #1	\$4.71	
104 Dough Mixer #1	\$56.52	
246 Pan Cleaner #3	\$11.78	
455 Full basket Conveyor #1	\$75.36	
104 Dough Mixer #1	\$16.48	
272 Fryer #1	\$103.62	
211 Proof Box #1	\$150.72	
502 Cuber #1	\$101.27	

This column (**Cost Parts**) will be located between **Equipment** and **Cost Labor** if the mouse button is released at this point. Note: highlighted vertical bar.

Cost Labor	Plant	Cost Pa
\$23.65	327	\$30.00
\$23.58	327	
\$4.71	327	
\$56.52	327	
\$11.78	327	
\$75.36	327	
\$16.48	327	
\$103.62	327	
\$150.72	327	
\$101.27	327	

Right mouse-click the column you want to generate stats on then select the menu item **Show Stats**.

Equipment	Cost Labor	P
440 Wrapping Machine #1	\$4.71	
104 Dough Mixer #1	\$56.52	
246 Pan Cleaner #3	\$11.78	
455 Full basket Conveyor #1	\$75.36	
104 Dough Mixer #1	\$16.48	
272 Fryer #1	\$103.62	
211 Proof Box #1	\$150.72	
502 Cuber #1	\$101.27	
229 90 Degree Roller Bed #1	\$18.84	
211 Proof Box #1	\$7.10	
Cost Labor Statistics		
Total	\$593.63	
Average	\$49.47	
Minimum	\$4.71	
Maximum	\$150.72	
Variance	\$2,288.16	
Variance (Population)	\$2,097.48	
Standard Deviation	\$47.83	
Standard Deviation (Population)	\$45.80	

Statistics may be generated on multiple columns. If statistic description text obscures stats from an adjacent column simply drag one of the columns to another location.

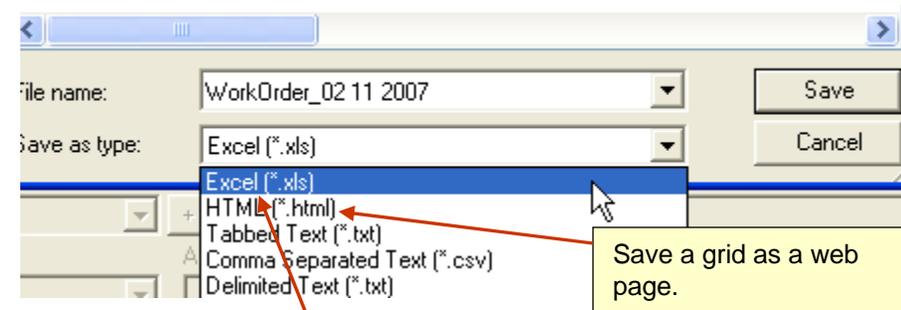
Grids - Printing and Saving

Saving Grids

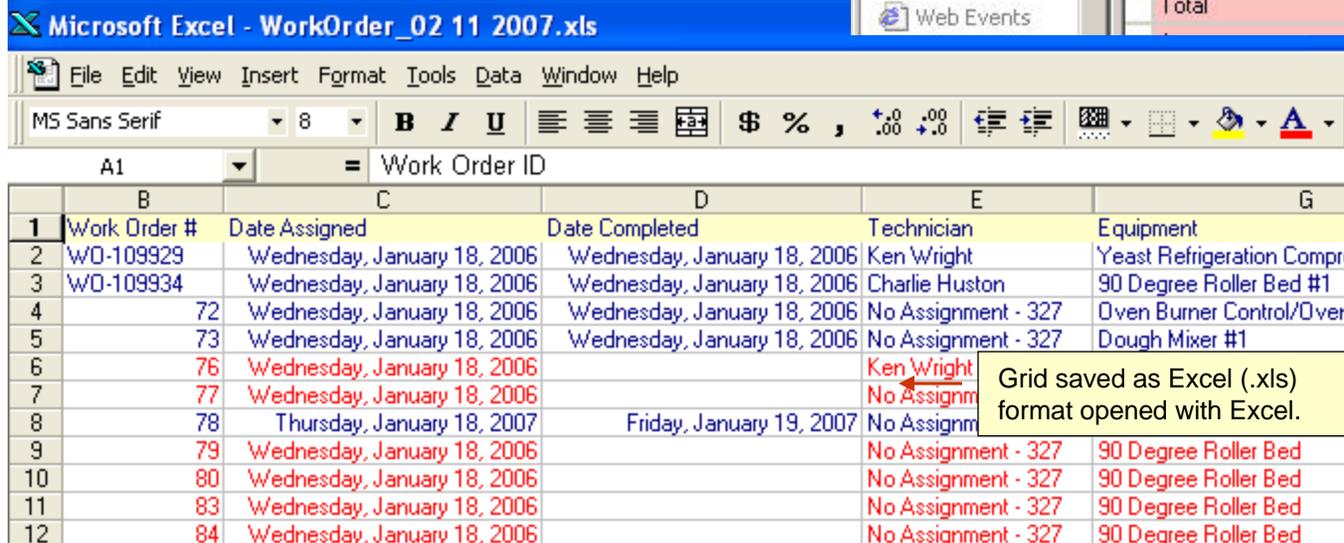
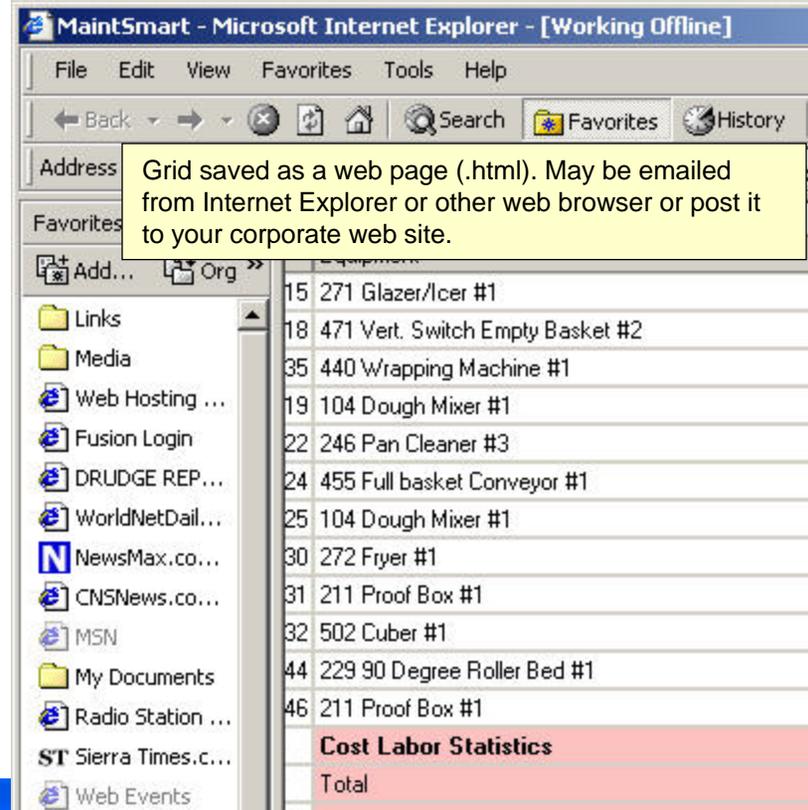
MaintSmart provides several different formats for saving grids. Select the menu items **File>>Save**. Select the save file format then press the **Save As** button. Saving a grid as a web page is handy and then you can post the grid to your company web site or email it from your browser. To save a grid for use with Excel select the .csv save format.

Printing Grids

MaintSmart provides direct grid printing or you can save a grid as Excel or HTML format then print from your browser or from Excel.



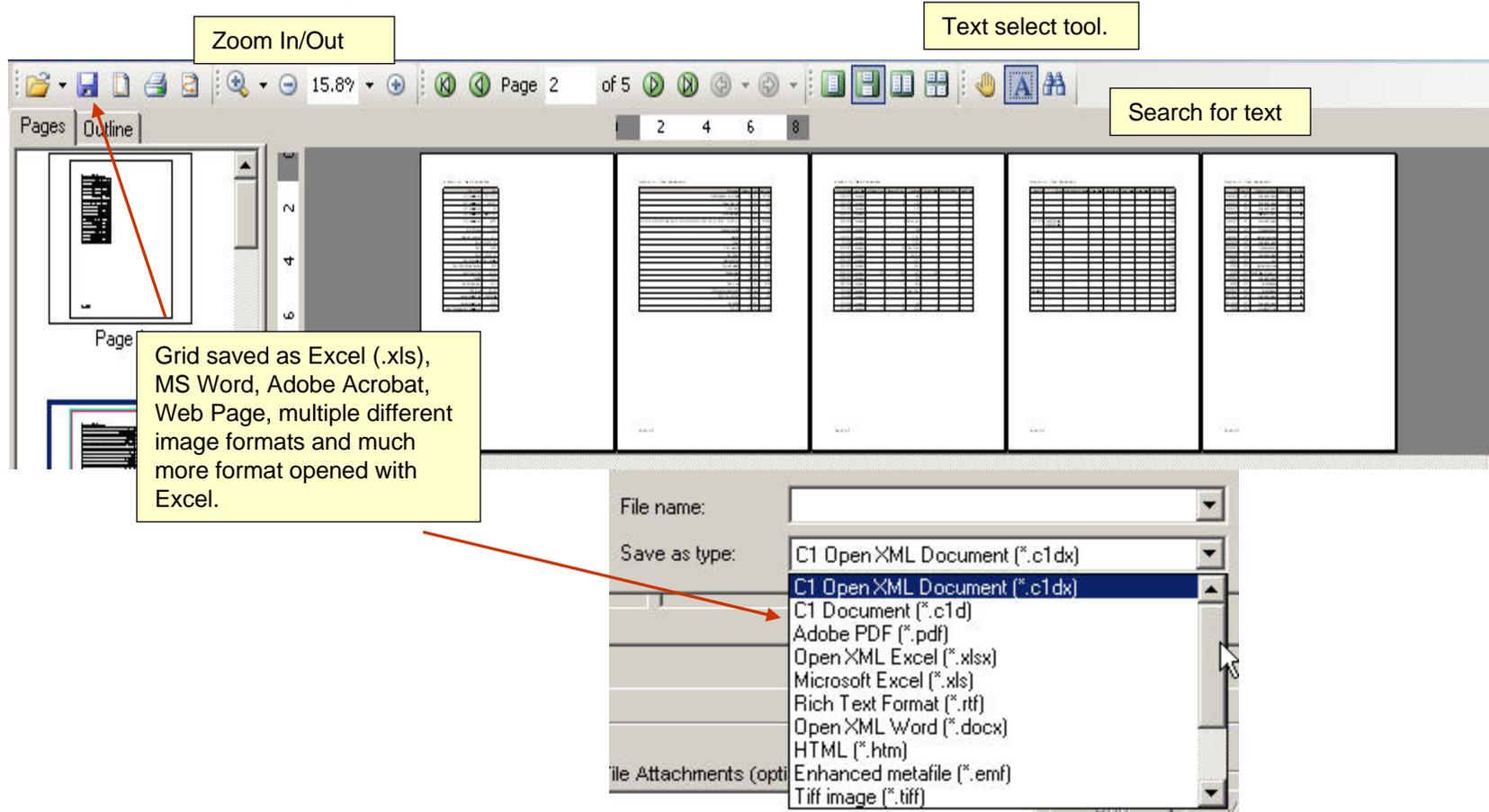
Save a grid as an Excel spreadsheet (.xls) then open the file with Excel. Column headers and row formats are imported to Excel along with all data.



Grids - Printing and Saving

Printing Grids

MaintSmart provide powerful and flexible direct grid printing.



Data Grid Utilities - Sizing, Hiding and Freezing Columns

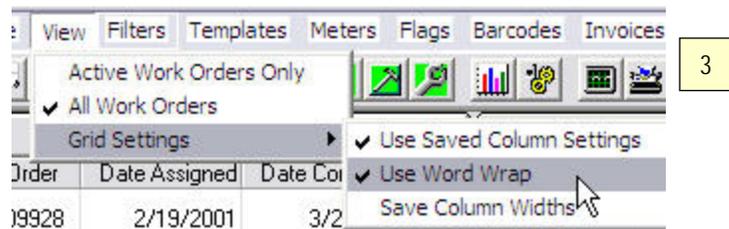
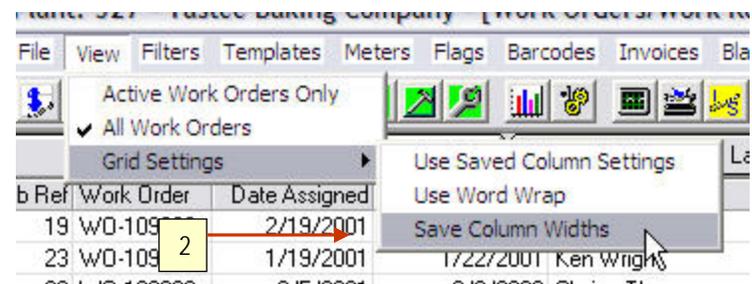
Sizing and Hiding Grid Columns:

The following data grids contain this functionality: work order, downtime, inventory configuration and PM validation. To use this feature begin by setting the size of the columns. This is done by left mouse-clicking the grid column header and dragging to the left while holding down the left mouse button. **Note:** it is difficult to completely hide the column in this manner as depicted in picture #1, however MaintSmart will completely hide column that are sized in this manner after saving the column sizes and activating this feature (next couple of steps).

Next select **Save Column Widths** from the **View>>Grid Settings** menu items as depicted on the right (picture #2). This action saves the grid column settings for this screen. To activate the column settings check the menu items **View>>Grid Settings>>Use Saved Column Widths**. Whenever this screen is loaded the grid displays with the saved column widths as long as this menu item is checked. You may restore the original (all columns displayed) view by unchecking **View>>Grid Settings>>Use Saved Column Widths**.

Check the menu item **View>>Grid Settings>>Use Word Wrap** to wrap long text strings in their cell (picture #3).

Work Order Data Entry		
ead_Eng_Hours	City	Comments
.1	Anytown	Repair leak i
.0	Anytown	Rebuild sani



Grid Column and Row Freezing:

Selected data grids enable you to freeze one or more columns or in some cases rows. To freeze a column place your mouse cursor over the left-most column grid line (not grid header line) until the small lock icon appears (picture #4). Press the left mouse button down while dragging to the right to freeze one or more columns (picture #5). To un-freeze reverse the drag direction.

This is a useful feature especially when working with wide data grids.

A screenshot showing a mouse cursor over the left-most column grid line. A small lock icon appears, indicating that the column is being frozen. The background shows a data grid with columns for 'Work Order' and 'Date Assigned'.

A screenshot showing the first column of a data grid frozen. The first column is highlighted in yellow, and a small lock icon is visible on the left side of the column header. The background shows a data grid with columns for 'Work Order' and 'Equipment'.

MaintSmart Utilities

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Appendix C - Turning On the Print/Email Scanner.....	210-211

Database Utilities - Exporting Data

Exporting Your Current MaintSmart Database to an Updated MaintSmart Database

In some cases it's necessary for the MaintSmart database file **MaintSmart.mdb** to be altered in order to accommodate an updated version of MaintSmart. This is generally easy to accomplish by using the **MaintSmart Data Export Utility**. To access this useful tool you must have Administrator access rights.

From the home screen select the menu items **View>>Configuration>>Utilities>>Export Data To A MaintSmart Database**. In the box labeled **OLD DATABASE** enter the file path to the database you are currently using. (This is usually entered by default when you open this utility screen.) Press the button labeled **Locate Old DB** if you need to locate the data source (or Old database) file.

Important: The file labeled **OLD DATABASE** is the database file from which you are going to export the data. This file is unaffected by the export process as this utility merely reads data from this file. The file labeled **NEW DATABASE** receives the data from the old database. The **NEW DATABASE** file is written to by MaintSmart. **ALWAYS BACK UP YOUR DATA BEFORE PERFORMING AN EXPORT. FAILURE TO DO SO MAY RESULT IN LOSS OF YOUR VALUABLE DATA!**

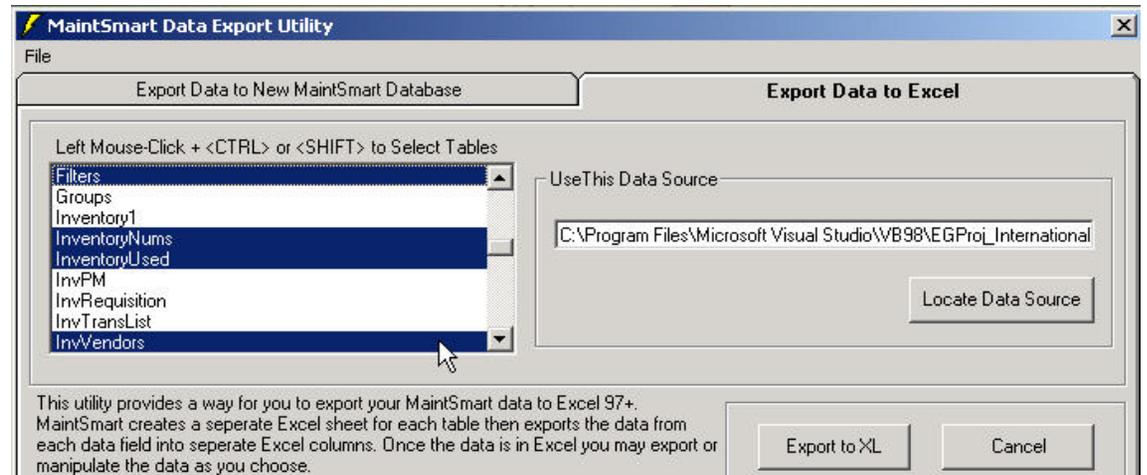
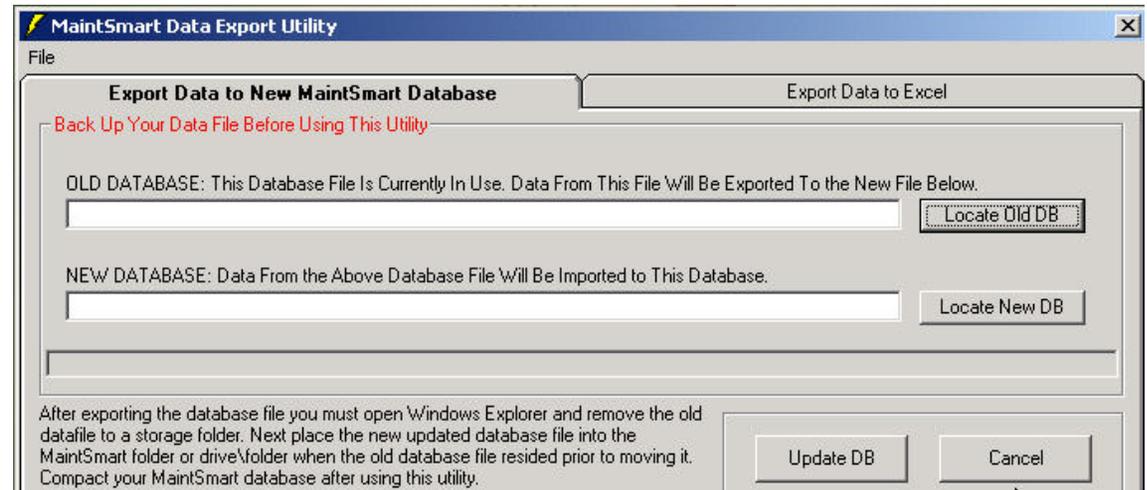
After you have selected the data source locate the data file where you want to export the data to. Typically this would be an updated MaintSmart database that has been included with a MaintSmart Update CD. It's important to note that this update utility only exports data to another MaintSmart database. Type the file path to the new database (export target) or use the button labeled **Locate New DB** to browse to the new database file **MaintSmart.mdb**.

Press the **Update DB** button to start the export process. If no messages are displayed then all data should have been successfully exported to the updated database file. If messages do appear during the update process you'll need to take note of what they say and possibly contact MaintSmart for support in exporting any data tables that failed to export properly or completely.

Exporting a MaintSmart Database to Excel 97+

MaintSmart data may be exported to Excel 97 or higher. This is useful in a couple of unrelated situations: exporting data to Excel for the purpose of using Excel's powerful functions or exporting to Excel for the purpose of using Excel as an intermediate data format then exporting or converting the Excel data into another desired data format.

Select the tab labeled **Export Data To Excel**. Press the button labeled **Locate Data Source** or type the file path into the text box.



Select the data tables you want to export from the list box on the left by left mouse-clicking each entry while holding down either the <SHIFT> key or the <CTRL> key. Press the **Export To XL** button. Each data table is represented by a separate Excel sheet. The data field name is in bold type at the top of each column.

This process may take several minutes. Once the process starts in may not be interrupted until it completes.

Product Support Topics

MaintSmart Product Support

MaintSmart's **Help system** may be accessed at any time from MaintSmart by selecting the menu items **Help>>Contents**. Help is also available by pressing **F1** on any screen or in some cases screen objects or screen tabs. MaintSmart comes with 60 day free technical support.

Web Support

MaintSmart's Web Help system may be accessed at any time from MaintSmart by selecting the menu items **Help>>MaintSmart on the Web>>?** from the start screen or **Help>>Web Help** from many other screens. Select the topic of interest and see useful instructions and in some case examples.

Email Support

Email MaintSmart with questions. Include all appropriate information and a screen shot in .gif or .jpg formats if you'd like. No bitmaps (.bmp) please. We'll reply within 2 hours in most cases.

Email: support@maintsmart.com

Phone Support

Before calling our technical support staff please attempt the following:

- Check this manual for the answer to your question.
- Check online help
- Consider the email support option.

If you purchased MaintSmart within the last 60 days you may use our toll-free telephone support hot-line. Please be ready to respond with your user license number and a accurate description of the situation you need help with including any error codes or messages. Call 1-888-398-0450 (within the United States/Canada only) or 1-541-751-0450.

Extended MaintSmart Product Support

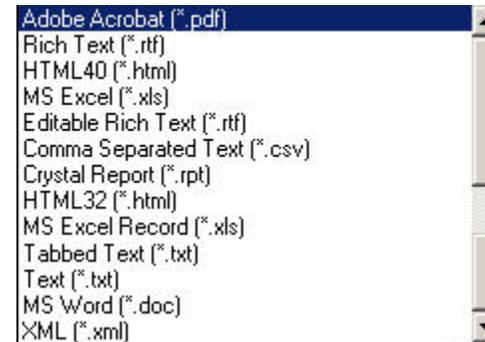
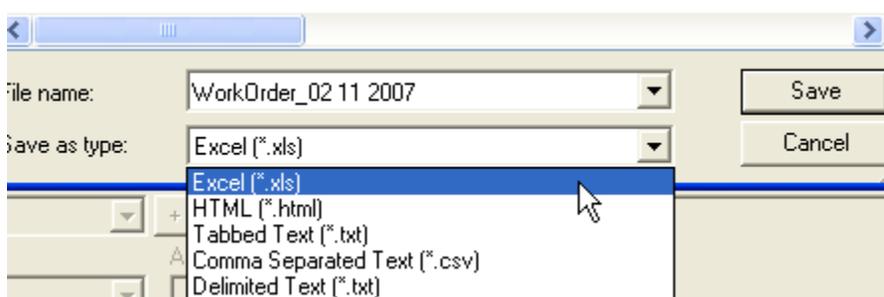
Call for pricing for single and multi-user licenses requiring this support option. Extended support entitles you to unlimited toll-free (within the United States) support for one year from date of purchase as well as all upgrades.

Appendix A - Exporting MaintSmart Data

Exporting Data To Excel, Adobe, MS Word and Many More Formats

Method #1 (Excel, HTML, Text)

- Obtain the grid display you want in MaintSmart. This can be adjusted in numerous ways (sorting, filtering, querying, etc.)
- 'Save' the grid with the **File>>Save** menu item. Choose the .xls format. Excel opens with your data when you click Save. (You can change a setting in Program Configuration that just save the data w/o opening Excel.) Can also save as web page , text, etc



Method #2

- Use one of the "Detail Reports" (actually Crystal Reports 2008) to print preview the desired data set from **File>>Print>>Report>> (<report selection>)** .
- When print preview appears click on the (red arrow pointing into an envelope) icon at the top of the print preview screen. This is the **Export** button and provide several useful export formats for the report being viewed.
- From the 'Export' pop-up screen select a 'Format' (example: 'Excel 8.0 (extended)') then a destination (Example: "Disk File").

Method #3

- From the home screen select menu items **View>>Configuration>>Utilities>>Export Data To Excel**.
- When Export screen appears Select the Export data To Excel tab. Next click **Locate Data Source** button and navigate to the database (MaintSmart.mdb).
- Select the table to export from the list box on the left.
- Click **Export to XL** button after selections have been made in list box.
- This is a raw data dump from the Access database directly to Excel.

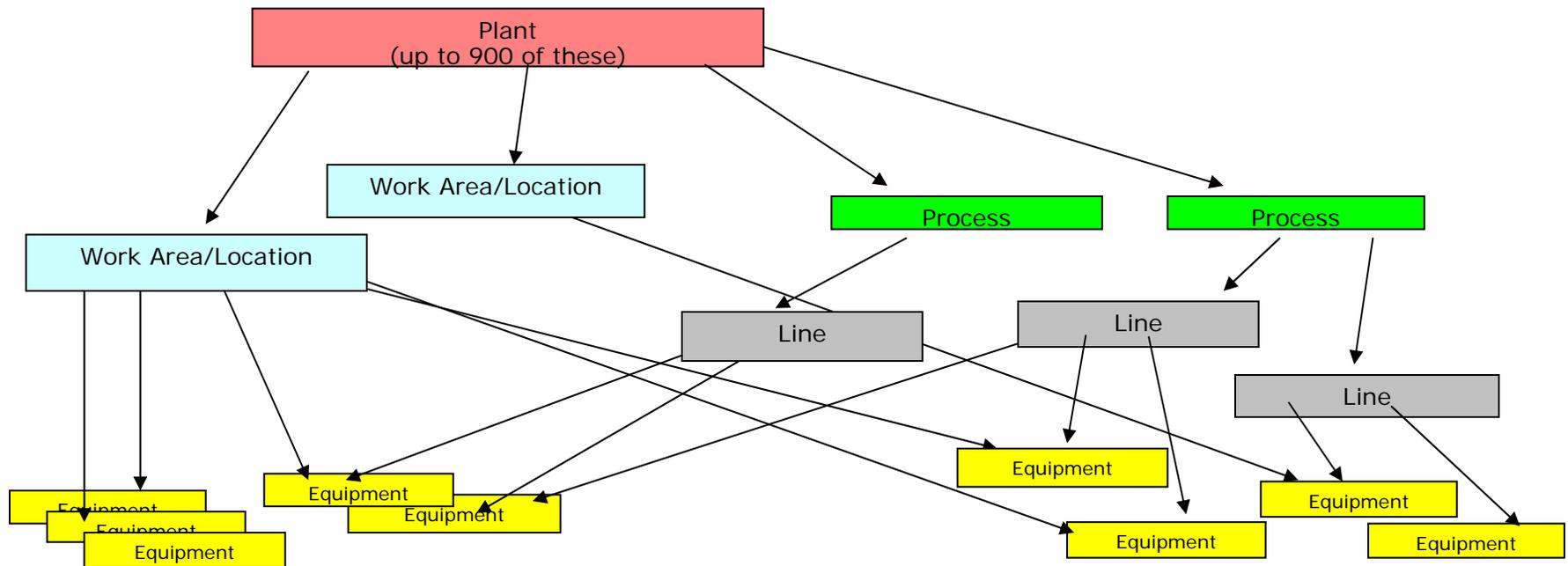
Method #4

- From any Detail report print preview screen export to many formats, email or print. See Print Scheduler manual for more info.



Appendix B - Equipment Hierarchy Strategies

Graphical Representation of Manufacturing Plant Equipment Hierarchy





Appendix C - MaintSmart Auto-Print Scheduler - Configure the Auto-Print Scanner

Please see the Print Scheduler Manual for a Complete Explanation of this Topic.

Auto-Print Scanner Properties and Options (continued)

Auto-Print (auto-create) Work Orders From Metered Work Order Templates

It is often useful to schedule a work order for creation and printing as print job. This is fine if you want this work order to be triggered from by a date/time. In some cases however you may want to trigger a work order from a work order template by some other mechanism. MaintSmart provides auto-printing of metered work orders to address this situation. **Continued on next page...**

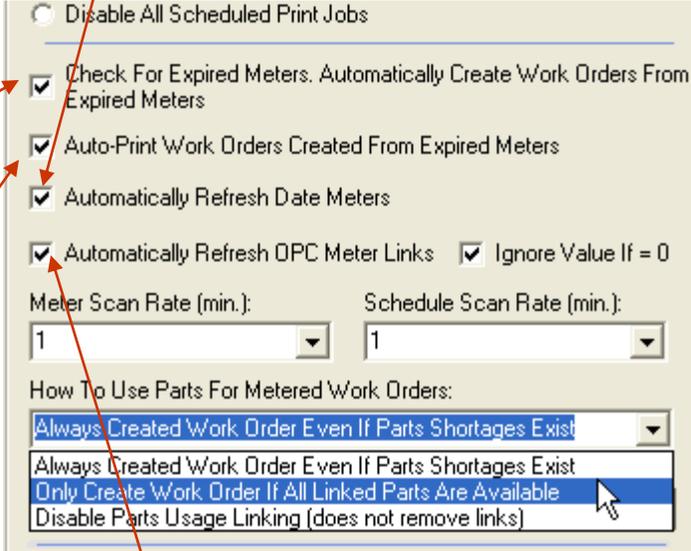
Meters that expired from any source create a work order. (i.e. manual update to meter screen (current reading), OPC meter data read automatically from PLCs or other OPC data sources or DDE meters and "Day" meters that increment by the system clock).

 Print work orders that are created from metered work order templates.

MaintSmart determines where to send a metered work order as follows (in this order):

- The printer defined in print settings that is linked to the "workorders" screen default is used.
- Printer for the logged on user and the *default screen* ("AllOther") is used. This is a catch-all screen default.
- Printer defined in printer setting that uses the *default user* "Printer100" (example) is used. This user is created automatically by MaintSmart for use with the auto-print scanner only.
- Default system printer as defined in **Windows>>Control Panel>>Printers** is used.

Automatically update "Day" meters. Meter records are updated automatically.



Automatically update OPC linked meters. Meter records are updated automatically.



Appendix C - MaintSmart Auto-Print Scheduler - Configure the Auto-Print Scanner

Auto-Print Scanner Properties and Options (continued)

To access the auto-print metered work orders scanning configuration properties open the **Program Configuration** screen  then select the second tab named **Configuration – More**. From the framed area labeled: **Auto-Print Scanner and Report Properties** The following is a listing of the various settings:

A.) Check For Expired Meters. Automatically Create Work Orders From Expired Meters:

MaintSmart checks for expired meters every X minutes as defined in the drop-down box labeled: Meter Scan Rate.

B.) Auto-Print Work Orders Created From Expired Meters:

MaintSmart automatically prints these work orders that are created as a result of A.) being checked. MaintSmart uses the 'workorders' print settings for the printer name, printer driver and port properties. It's best to have this checkbox checked after configuring a 'workorders' print setting/screen default. Otherwise each time the print job is executed MaintSmart open a new print preview screen. These screens can quickly clutter the screen.

C.) Automatically Refresh Date Meters:

MaintSmart increments Day meters by one each day.

D.) Automatically Refresh OPC Meter Links:

MaintSmart updates OPC linked meter readings at the Meter Scan Rate. Expired meters immediately create a work order and attempt to print the work order if B.) (above) is checked.

E.) Ignore Value If=0 checked causes MaintSmart to ignore meter values when they are 0. This is useful if your OPC connection is interrupted.

Checked ignores zero (0) values when updating meters table. Only non-zero updates are written to the meters table. Prevents invalid data from being used in the case where your OPC server is disconnected.

Disable All Scheduled Print Jobs
 Check For Expired Meters. Automatically Create Work Orders From Expired Meters
 Auto-Print Work Orders Created From Expired Meters
 Automatically Refresh Date Meters
 Automatically Refresh OPC Meter Links Ignore Value If = 0
 Meter Scan Rate (min.): 1 Schedule Scan Rate (min.): 1
 How To Use Parts For Metered Work Orders:
 Always Created Work Order Even If Parts Shortages Exist
 Always Created Work Order Even If Parts Shortages Exist
 Only Create Work Order If All Linked Parts Are Available
 Disable Parts Usage Linking (does not remove links)

 You may instruct MaintSmart on how to use parts linked to work order templates when a work order is generated automatically from one of these templates.