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SECTION 1 - INTRODUCTION

MeasureMate software provides real time measurement data for Ultrasonic Arrays' Thickness and Bond Measurement Systems in a graphic and data window format. The program is designed to run on an IBM compatible computer operating under Windows 95/98 or Windows NT. Data is presented by panel. The unique data window provides a concise summary of press operations to operators.

This version of Ultrasonic Arrays' MeasureMate Software incorporates several significant changes to earlier versions. Some of these are:

- Display multiple charts and graphs on screen simultaneously and tile or cascade as desired.
- Support for interfacing with a remote computer over a network for reporting and data input functions.
- Asymmetric alarms.
- Instantaneous alarms.
- Shift summary report.
- Product list report.
- Bond integrity chart from raw data (Optional Bond Analysis Component).
- Increase from a maximum of five to seven TMS gauges.

Individual thickness measurements are gathered from up to seven thickness gauges by the host computer at rates of up to 58 samples per second. Up to 200 measurement points (each point can represent the average of several individual measurements) are saved for each gauge for each panel.

Data for bond detection are gathered by the host computer from up to 32 gauges sampling at up to 62 samples per second. A maximum of 140 measurement points are saved for each gauge for each panel.

ABOUT THIS MANUAL

This manual uses text formatting conventions to identify different types of program control. Boldface is used to indicate MeasureMate or Windows menu names, such as **File** and **Start**. Underlines are used to indicate options that can be selected from MeasureMate or Windows menu, such as Program Settings. Braces are used to represent specific keys on the keyboard of the computer, such as <Enter>. Small caps are used to show either MeasureMate or Windows command button choices, such as OK or NEXT. Italics signifies an item that should be chosen from either a MeasureMate or a Windows list, such as *Shift 1* or *WinRT*.

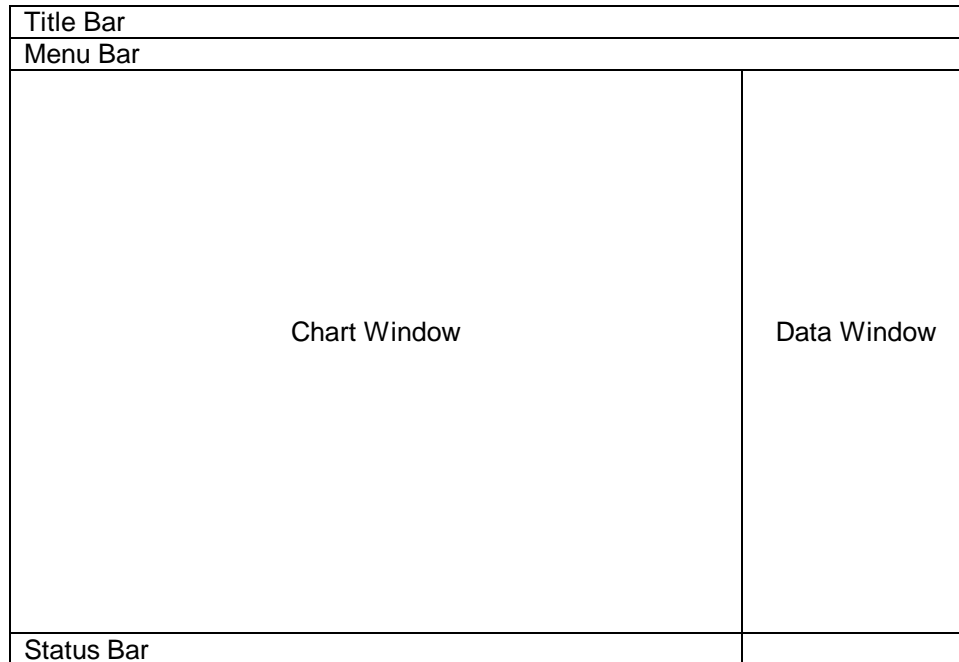
TECHNICAL SUPPORT

Questions concerning installation and program setup can be referred to Ultrasonic Arrays Technical Support at:

- Phone 425/481-6611
- Fax 425/481-4455
- E-mail engr@ultrasonicarrays.com.

SECTION 2 - THE MEASUREMATE ENVIRONMENT

The following is a layout of the MeasureMate screen.



TITLE BAR

The MeasureMate icon appears at the left of the Title Bar. Any mouse click on the MeasureMate icon displays a window control menu, allowing the user to Restore, Move, Size, Minimize, or Maximize the program window or Exit the program. Immediately to the right of the MeasureMate icon, the software name followed by the release number, i.e. V7.01 is displayed.

MENU BAR

The contents of the menu bar from left to right are as follows:

- Shift/Product
- Edit
- View
- Run or Pause depending upon the status of gauge communications.
- Reports
- Window

CHART WINDOW

The Chart Window is where the charts which are provided with MeasureMate are displayed. See Section 8, The View Menu, for descriptions of the MeasureMate charts. Multiple charts can be displayed simultaneously. See Tile and Cascade below.

DATA WINDOW

The Data Window displays data in alpha-numeric format. More than one data window may be open at one time, but only one can be on display. When multiple data windows are open, the window on display will be determined by the active chart.

In many cases you may change the information displayed in the data window by pressing a specified function key. When this option is available, the bottom of the data window will display the current choices and the corresponding function key for each.

STATUS BAR

The contents of the Status Bar from left to right are as follows:

- The current shift.
- Eight digits representing the eight alarm outputs. A zero (0) in any position indicates an alarm condition for that output; a one (1) in any position indicates no active alarms for that output.
- The current TMS panel number.
- The current BMS panel number.
- The name of the current product.
- Networking status indicator. Network MMI = None indicates that the Network I/O Server component is not installed. Network MMI = Active or Network MMI = Inactive, depending upon the status of network communications, indicates that the Network I/O Server is installed.

TILE AND CASCADE

New in release 7.01, Tile and Cascade commands are available under a Windows menu on the main menu bar.

Selecting the Tile command will cause all open charts to be evenly arranged in the Chart Window.

Selecting the Cascade command will cause all open charts will stack in the upper left-hand corner of the Chart Window, with the Title Bar of each chart clearly visible.

SECTION 3 - USING MEASUREMATE MENUS

MeasureMate configuration and reporting functions are accessed through pull-down menus.

ACCESSING MENUS

When the system is first started, the main menu bar is automatically displayed. Menus may be accessed in either of two ways.

1. Use the mouse to position the cursor on the desired menu and click the left mouse button.
2. Use the shortcut key for the desired menu. Shortcut keys are accessed by holding the <Alt> key, then simultaneously pressing the underlined letter from the menu name. The shortcut keys for the menus are as follows:
 - **S:** Shift/Product
 - **E:** Edit
 - **V:** View
 - **R:** Run
 - **P:** Pause
 - **T:** ReporTs
 - **W:** Window

Once a menu is active, selections can be made in either of two ways.

1. Use the mouse to highlight the selection and click the left mouse button or press <Enter>.
2. Use the cursor keys to highlight the selection and press <Enter> or click the left mouse button.

ADDITIONAL SHORTCUT KEYS

Certain keys or key combinations perform special functions within MeasureMate. The key functions are listed below.

<F2> Changes the information displayed in the data window. A line at the bottom of the data window prompts as to the information that will be shown when <F2> is hit. Information displayed in the data window is arranged in a circular manner so that repeatedly hitting <F2> will eventually return you to the report where you started.

<F3> If certain reports are being shown in the data window, this function changes the information that is displayed. This key is not always available. When it is, a line at the bottom of the data window will prompt you as to its use.

<Ctrl + Shift + L> For BMS, this sets products so that they will be re-learned. Before a product has been selected, <Ctrl + Shift + L> resets all products so that they will be learned the next time they are run. After a product has been selected, only the selected product will be learned. Learning forces the BMS “7” parameter to 255 during the first 50 panels processed. Use this feature only when you are sure 50 panels from the current product will be received before product change. If product change occurs before 50 panels are processed, learning re-starts the next time the product is processed.

SELECTING AND MOVING BETWEEN OPTIONS

Most program parameters are set using text boxes, check boxes, or option groups.

Moving between fields can be done in either of two ways:

1. Position the cursor in the field by using the mouse and clicking the left mouse button in the field box.
2. Use the <Tab> key on the keyboard to position the cursor in the desired field.

To enter data in a text box, position the cursor in the box and type.

To select check box options, click on the box next to the desired item or on the item itself.

To select an item from an option group, click on the small round button next to the desired item.

MEASUREMATE MENU TREE

The MeasureMate menu tree is dependent upon installed options. The complete tree is shown below.

Main Menu Item	Main Menu Command	Main Menu Command Description
Shift/Product		
	Set Shift	Specify shift
	Set Product	Specify current product

Main Menu Item	Main Menu Command	Main Menu Command Description
Edit	Products	Add or edit products
	Program Settings	Configure program settings
	Alarms	Optional; configure alarm outputs
	Diagnostics	Access diagnostic tools
	Passwords	Change passwords
	Reset Passwords	Restore passwords to factory defaults
	Configuration	Activate purchased components (for factory use only)
View	Thickness	Select specific thickness chart for display
	Profile Chart	
	Current Trend	
	Range Trend	
	Panel Weight Trend	
	Average Profile	
	Composite	
	Thickness Data	
	Bond Analysis	Select specific bond chart for display
	Panel	
	Bond Integrity	
	Bond Data	
	Spreadsheet	
Run/Pause		A toggle switch to run or pause gauge communications.
Reports		Select report for printing to screen, disk, or printer
	Product Report	
	Shift Report	
	Alarm Report	
	Opening Range	
	Panel Report	
	Shift Summary	
	Alarm Output Config	
	Setup Report	
	Product List	
	Print Screen	
Window		Select between options for window arrangement
	Tile	
	Cascade	

Following is a brief description of each of the main menu choices.

SHIFT/PRODUCT

The current shift and product type must be specified prior to recording data from the gauges. Shift information is saved with data for future analysis. If shift start times have been set during program setup, MeasureMate will track the shifts automatically. A product type must always be selected to make certain the system knows the desired product parameters.

To set either current shift or product type, select Shift/Product from the main menu. See Section 6, The Shift/Product Menu for more information

EDIT

This menu selection provides access to the following functions:

- Adding or updating product specifications.
- Configuring MeasureMate software to your environment.
- Changing passwords or restoring them to factory default settings.
- Activating special diagnostic functions.

Configuring MeasureMate software must be done prior to first use and updated any time significant changes are made such as a change to the line speed.

MeasureMate software must have a definition of any product to be run. A definition of each product must be first entered and updated if changes are made to the product.

See Section 4, Installation and Program Configuration for Program and Product setup procedures; and Section 7, The Edit Menu, for descriptions of the **Edit** menu choices.

VIEW MENU

Selection of this menu item brings up to the **View** menu. The **View** menu allows selection of a chart to be displayed on the computer screen. Section 8, The View Menu, provides detailed information on this menu choice.

RUN/PAUSE

This selection allows for starting and stopping gauge communications. During the time the MeasureMate system is in “Pause” mode, no gauge data acquisition takes place, although the gauges continue to measure on the factory floor. See Section 9, Pause/Run, for instructions on starting and stopping gauge communications.

NOTE: Pausing the gauges re-initializes the trend and average profile charts.

REPORTS

Various text reports are available for reporting to the computer screen or printer. Selecting this menu entry will bring up the **Reports** menu. See Section 10, The Reports Menu, for a description of the reports provided with MeasureMate.

WINDOW

The Window menu offers options to Tile or Cascade all open charts. See Tile and Cascade under Section 2, The MeasureMate Environment.

SECTION 4 – INSTALLATION AND PROGRAM CONFIGURATION

UAI strongly recommends that you make a backup copy of the MeasureMate installation disks and keep the backup in a secure, off-site location.

NOTE: MeasureMate must be installed in the “mmate” directory for proper operation.

MINIMUM HARDWARE CONFIGURATION

MeasureMate requires the following minimum PC configuration for proper operation.

- 300 MHz Pentium II
- 64 MB Memory
- 3.2 GB Hard Disk Drive with 1 GB free disk space
- 1.44 MB Floppy Disk Drive
- 8 MB SVGA Card
- 2 Serial Ports
- Third Serial Port for Weigh Scale option
- 1 Parallel Port
- Keyboard
- Mouse or other pointing device
- Network Interface Card for Network Server option
- Windows 95/98 or NT Workstation 4.0
- 17" SVGA Color Monitor
- Host Data Communications Interface Module with Optically Isolated RS-232/422 Serial Interfaces
- RS-422 Junction Box

WINDOWS 95/98 INSTALLATION PROCEDURE

1. Insert the MeasureMate installation disk, Disk 1, into the computer's 3.5" floppy drive.
2. Left click on the Windows **START** button.
3. Select Run from the **Start** Menu and enter “a:\setup” into the text box.
4. Click **NEXT**. Insert Disk 2 when prompted and click **OK**.
5. Click **FINISH**.
6. Create a short cut to MeasureMate on the desktop.

WINDOWS NT INSTALLATION PROCEDURE

1. Follow the steps given under the Windows 95/98 Installation Procedure.
2. Left click on the Windows START button.
3. Select Run from the **Start** Menu, enter “c:\mmate\NT.reg” into the text box, and click OK.
4. Windows will display a message box confirming that the registry entries have been successfully completed. If no message box appears, contact UAI for technical assistance.
5. Close all programs and restart the computer. To complete the next steps, you must log in with administrative privileges. If you do not have administrative privileges, contact your network administrator.
6. After a successful administrative login, click on the START button and select Settings, Control Panel.
7. Depending on the computer, you will see either a list of devices, or a series of icons. Select the item/icon DeVICES to open the devices dialog box.
8. Select *S*erial from the list.
9. Click STARTUP... and choose *M*anual. Click OK.
10. Click the START button.
11. Select *W*inRT from the list.
12. Click the STARTUP... button and choose *A*utomatic. Click OK.
13. Click the START button.
14. Click the CLOSE button.
15. Close all open windows and start MeasureMate by clicking on the “Shortcut to mmate.exe” icon previously created on the desktop.

PROGRAM CONFIGURATION

MeasureMate program configuration begins by selecting Program Settings from the **Edit** menu. When Program Settings is selected, you will be prompted to enter a password. The default program setup password is “mm.” Enter the password and click OK or press <Enter>. The Program Setup Options dialog box appears. Each parameter and command button that appears in the window is examined below.

Plot Direction

Profile, Trend, and BMS Panel charts can run either from left to right or right to left at your's option.

Units of Measurement

Data can be displayed and stored in either Metric or English units at your option.

Display Shading Checkbox

This feature allows you to select one of two ways to plot profile charts. If Display Shading is selected, the area between the target value (center point) and the actual measurement will be shaded green (good), yellow (warning), or red (error) depending on the value of the measurement. This increases the visibility of out-of-tolerance measurements. If it is not selected, the data will be displayed as a simple plot line.

Auto Printing Checkbox

When Auto Print is enabled, MeasureMate automatically prints the screen for each panel after it has passed under the thickness gauge. Unless you have a special application which requires Auto Print, leave this feature disabled. Printing the screen is time consuming; and resource intensive; while the screen is printing, no other reports may be sent to the printer.

End of Press Enable

This feature is used to activate a hardware End of Press signal input instead of relying solely on “dead reckoning” based on panel count. This feature must be used if the TMS and BMS systems are not in the same location.

NOTE: To use the End of Press Enable, the TMS/BMS Order, or if inserting panels, you must provide the PLC logic to relay the signal.

BMS Product Widths Differ

BMS Prod. Widths does not influence the number of channels used to grade product. The number channels used is already coded for each product in the BMS Bank data. Selecting this option causes MeasureMate to shuffle the channels on display for all products.

BMS channels would normally be numbered from one side to the other. Selecting BMS Products Width Differ causes a change to the gauge labeling on BMS charts. Wiring to the channels must be done so that it matches the order shown on the chart labels. Failure to do so will cause the chart to misrepresent readings taken from a panel.

BMS cannot eliminate low numbered channels and still have higher numbered channels operate. When products are differing widths and centered on the line, channels from both edges must be eliminated; thus, when BMS Product Widths Differ is selected, channels are numbered - and should be wired - from the inside out rather than from one side to the other. Looking at a chart, the center (or top center for an even number) channel is numbered 1. Channel 2 is below number 1, channel 3 is above number 1, channel 4 is below number 2, etc. Numbering proceeds from the inside out, with odd numbered channels on top and even numbered channels on the bottom. This way when the high numbered channels are removed for narrow panels, channels are removed from both sides of the centered panel.

NOTE: Do not use the BMS Product Widths Differ option for BMS if the “Relay Split” option is used in BMS (the “U” parameter is $\lt \gt 0$).

BMS PROM Age

MeasureMate performs checks on BMS settings. This is done to ensure that MeasureMate will run properly with the BMS. MeasureMate can perform the checks only for BMS firmware dated after October 21, 1996. This option must be selected for systems with PROMs dated prior to October 21, 1996.

To determine the date of the BMS firmware, locate the EPROM on your BMS controller, located near the top center of your main BMS circuit board. It has a silver or white label which starts with “ULTRASONIC ARRAYS, INC.” The date will be clearly marked.

No BMS Air Cal

Air cal is a self-calibration step that runs during the gap between panels. Air Cal is usually disabled for continuous presses and for BMS-5000 installations. Checking this option disables air cal. This option is not normally changed by the end user.

BMS/TMS Order

This option specifies which gauges come first on the line, TMS or BMS. For MeasureMate purposes, gauges may be considered to be in the same location if a panel will clear the trailing gauges before the next panel reaches the leading gauges. For example, TMS gauges are first, but the gauges are close enough together so that a panel will be past the BMS gauges before the next panel reaches the TMS gauges.

Gauge Labels

Each gauge can be named for easy on-screen identification. The gauge label default names are “Gauge 1” for the first gauge, “Gauge 2” for the second gauge, and so on. Gauge names may include any characters and can be up to 15 characters long.

Shift Setup

Enter the start time for each shift in the appropriate text box using military notation, i.e., 1:30 pm equals 13:30.

If you have fewer than four shifts, leave the extra shift boxes empty.

Line Speed

Enter the approximate speed at which a panel moves down the line. This figure, along with board length, is used in calculating how frequently to query the gauges to get the proper number of samples per panel.

This parameter must be set for systems with no tachometer. Values entered should range from 50-600 using numeric digits only.

Samples per Board

Choosing the number of samples to be taken per board helps MeasureMate run at the optimum speed. The goal is to take as many samples per panel as possible without exceeding the capacity of the serial port. This figure is influenced by the number of gauges on your system. Twice as many readings may be made on a three gauge system as on a 6 gauge system. A reasonable number of samples per panel would be from 100 to 140 samples for an 8 foot board running at roughly 150 feet per minute.

This figure is also used to scale profile charts so that the full chart width represents the number of samples entered here.

Board Length

Entering the length of the board allows the system to calculate how often the gauges must be sampled to get the proper number of samples per board. Enter the length of the board in whole numbers using feet or meters depending upon the unit of measurement previously selected.

Pulses per Reading

This controls the TMS gauge sampling frequency. This method of controlling the sampling frequency is available only if an optional tachometer is attached to your system. If no tachometer is attached to your system, Pulses per Reading must be set to zero (0). See Line Speed and Board Length above for the alternate method of controlling sampling frequency.

This figure is the number of tachometer pulses to be counted between each reading of the gauges. The value entered should be a whole number from 0 to 250 using numeric digits only.

Pulses per Reading should be adjusted so that the TMS Profile Chart comes close to the right edge of the plot area, but does not quite touch the right edge. If plots do reach the right boundary it means that you may be losing readings at the end of the panel. If the plot is short, make this number smaller (shorter time between readings); if the plot is too long, make this number larger (longer time between readings). You may make a change to this parameter and observe the change without exiting **Program Settings**, but expect a delay of a couple of panels after changing this number before seeing the results on the screen.

Edge Skip

This applies only to the TMS component of MeasureMate. The first and last few measurements on a panel are be unreliable. Statistics will more closely represent the true condition of a panel if these edge readings are discarded. Use this parameter to set the number of readings to ignore at the leading and the trailing edges of the panel. The correct value depends on the line speed and gauge positioning and the condition of the panel edges. Set this figure to eliminate spurious readings at the leading and trailing edges of the panel. A good starting point is 10.

BMS Learning Normal Speed

The BMS automatically calibrates itself to the material being run. This is referred to as "learning." When new products are run, or after maintenance of the BMS system, learning is set to "Fast", in order to quickly adapt the system to the product. During normal operations, learning is set to Normal. This allows the system to gradually adjust to the expected, small, long-term changes in the product and the measuring system. A typical value for Normal Learn Speed is between 1 and 8. With a value of 8 for Normal Learn Speed, the system can make a small adjustment on each panel. With a value of 1, several panels must pass the system before even a small adjustment is made.

BMS Learning Number Panels

This parameter sets the number of panels required for learning when "Fast Learning Mode" is selected during product configuration. After the specified number of panels has been run without interruption, MeasureMate will return the BMS learning speed to Normal. Note that if the product is changed before the number of panels specified by this parameter has been run, the learning process will start over the next time the product is run.

History Autosave Days

MeasureMate is capable of saving historical data for analysis at a later date. This item controls whether the data will be saved automatically at the end of each shift and at program shutdown or on a file by file basis by the operator.

When Autosave is enabled, historical data is saved automatically and no operator input is required. Old history files will be automatically deleted after a specified number of days. If it is required that old history files be retained, UAI recommends that they be transferred to storage media prior to automatic deletion.

The data is saved as a set of three matched files. All three files must be present to utilize the historical data.

1. HSTxxxxx.dat File containing the majority of the historical data
2. HSTxxxxx.idx: An index file pointing to each record in the .dat file
3. HSTxxxxx.ref: A cross-reference between the product number and the product name at the time of the production run

The variable information in the History file names (represented by x's in the samples above) can be decoded as follows:

Position 1: One character to indicate the month.

- 1 January
- 2 February
- 3 March
- 4 April
- 5 May
- 6 June
- 7 July
- 8 August
- 9 September
- O October
- N November
- D December

Positions 2 and 3: Two digit day of the month

Position 4: Shift

Position 5: Additional character allowing unique file names. This character makes it possible to have multiple files for a given shift if, for example, MeasureMate is closed and restarted during a shift. The first history file for a shift is designated with an "A," the second with a "B," and so on.

Autosave is enabled by entering a value other than zero (0) for Autosave Days. The value entered also controls the number of days the historical data is retained on the MeasureMate PC prior to automatic deletion.

A value of zero should be specified if it is not required that MeasureMate automatically save the historical data. Instead, at the end of each shift and each time MeasureMate is shutdown, the operator will be asked if the history files should be saved. If the operator clicks YES, he will be asked to enter a file name. Additionally, the disk will not be scanned for old history files to delete.

Historical data can be imported into most spreadsheet applications for further analysis. See Section 14 - Running RPSS for further information.

The Port Setup Command Button

The “Port Setup” Command Button is used to access the Port Setup dialog box. Changes made to the port parameters are not implemented immediately. You must exit MeasureMate and restart the program before changes take effect.

CAUTION: It is important to remember that modifying of these parameters may disable communications between the MeasureMate computer and other components of your system. Before changing any settings in this screen make sure the old settings are available for reference by printing a Setup Report.

To make changes to the Port Setup, click PORT SETUP.

TMS Port

Enter the COM number of the TMS gauge port. Com1 is usually used.

TMS Baudrate

This parameter controls the baud rate used to communicate between the MeasureMate computer and the TMS gauges. The default setting is 9600.

MeasureMate allows you to increase the rate at which readings are taken as the line speed increases. At some point, however, a maximum is reached and the number of readings taken per panel can no longer be increased. If the line speed is high enough, the number of readings per panel may be below a desirable level. Increasing the TMS baud rate increases the maximum frequency at which TMS readings may be taken.

To select a higher baud rate, click on the arrow next to the Baud Rate field. The available baud rates will be displayed.

The higher baud rate is available only on TMS-5000 gauges with firmware versions ending in 97 or higher. The firmware version can be found on a label on the gauge EPROM on the main board. On these versions, the TMS controller will automatically recognize the baudrate. For upgrades or questions, please contact Ultrasonic Arrays.

BMS Port

Enter the COM number of the BMS gauge port. Com2 is usually used

BMS Baudrate

This is available only on systems with the BMS option included. This parameter controls the baud rate used to communicate between the MeasureMate computer and the BMS gauges. The default setting is 9600 baud. To change the setting click on the arrow next to baud rate and the available baud will be shown. All BMS systems are capable of operating at 9600 baud. BMS systems that have an EPROM with a release greater than BMS6.A21 are capable of operation at either baud rate.

In those BMS systems capable of operating at either baud rate, the BMS will choose the speed based on a dip switch setting. See the documentation that came with your BMS for instruction on changing the dip switch setting. The baud rate settings at the BMS controller and in MeasureMate must be the same to establish communications.

BMS #2 Port

The BMS #2 parameters apply only to BMS systems with more than 16 bond measurement zones. Enter the COM number of the BMS gauge port.

BMS #2 Baudrate

This parameter controls the baud rate used to communicate between the MeasureMate computer and the BMS gauges. The default setting is 9600 baud. To change the setting click on the arrow next to baud rate and the available baud will be shown. All BMS systems are capable of operating at 9600 baud. BMS systems that have an EPROM with a release greater than BMS6.A21 are capable of operation at either baud rate.

In those BMS systems capable of operating at either baud rate, the BMS will choose the speed based on a dip switch setting. See the documentation that came with your BMS for instruction on changing the dip switch setting. The baud rate settings in the BMS machine and in MeasureMate must be the same or communications will not take place.

Scale Port

Enter the COM number of the Scale port. Com3 is usually used.

Scale Baudrate

This option is used only if a serial scale is installed with your system. To select the scale baud click on the arrow next to baudrate for the available baud.

Scale Type

The type of scale used is selected here. The types will be either a parallel scale before the gauges, parallel scale after the gauges or a serial scale.

Digital I/O Port

This is a parallel port for reading or writing the following:

- Weight measurements from parallel weigh scales
- End of press
- Alarm outputs
- Line moving output
- BMS panel processed input
- Insert panel input.

The port address is entered as a three position hex number and must be 320 (hex).

Counter Port

This is the input for alarm timing or gauge pulse timing for a tachometer. See the tachometer documentation for instructions on setting the I/O address. The counter I/O address must not conflict with any other card installed in your computer. The address of the counter port is entered as a three position hex number and must be 328. If no tachometer is used, enter a value of zero (0).

The Press Setup Command Button

Press setup will normally be performed by UAI personnel. To setup or edit this information yourself, click PRESS SETUP to display the Press Edit dialog box.

Press Name

Enter the commonly used name for the press being configured.

Number of Openings

Enter the correct number of openings for the press being configured. For continuous presses, Number of Openings should equal one (1).

The Openings Equal Checkbox

Checking this item simplifies program and product configuration. This item should be selected if setup parameters for each product will be the same for each opening. If selected, modifications made to one opening will apply to all openings.

The Edit Openings Command Button

This applies only to multi-opening presses.

When all changes have been made click OK to exit and save changes, or CANCEL to exit without saving changes.

PRODUCT CONFIGURATION

From the Edit Menu, select “Products.” You will be prompted to enter the a password; the default password is “mm.” After password verification, the Product Select dialog box appears.

To add a new product, click Add Product to display the Product Edit dialog box. Enter a name for the new product in the Product Label text box.

SETTING BMS PARAMETERS

The following parameters must be configured for proper bond monitoring.

BMS Material Bank Number

User assigned. Relates to banks of numbers stored in the BMS controller.

BMS Group Size

This value controls the number of measurements that are combined into one reading. Set this number so that the number of readings is 140 or less per panel. This number can be computed by knowing board length and line speed, but the effect of this setting can be observed by looking at the Panel chart in the **Bond Analysis** sub-menu. If the plot is short, this number needs to be made smaller. If the plot frequently hits the right boundary the number needs to be made larger.

BMS Blow Level

The value below which a transducer reading must be before the reading is considered a blow. The valid range includes 0 to 1023. Set based on experience; the suggested starting value is 200.

BMS Blow Size

Number of samples in a row that must be below the blow level before a blow is indicated. The suggested starting value is the number of readings that would occur in four inches.

BMS Warning Level

The value below which a transducer reading must be before the reading is considered a warning. The valid range is from 0 to 1023. Set this value based on experience; the suggested starting value is 200.

BMS Warning Size

Number of samples in a row that must be below the warning level before a warning is indicated. The suggested starting value is the number of readings that would occur in three inches.

To exit this screen after making changes click on OK. To exit without saving changes, click CANCEL or the Windows EXIT button in the top right corner of the dialog box.

NOTE: BMS parameters may also be configured at the BMS controller. The values will then be uploaded to MeasureMate, assuming the material bank number was not changed at the controller.

Fast Learning Mode

Product learning speed is set automatically for new products. For new products, the learning speed parameter is set to 255 to force the product to be learned quickly. After a specified number of panels (number of panels is specified in parameter “BMS Learning Number of Panels”), the learning speed is reduced to the normal learning speed. Normal learning speed is specified in “BMS Normal Learning Speed.” Suggested values are 50 for number of panels to learn and 7 for learning speed.

While the product is being learned, during the first 50 panels, BMS alarms are suppressed by reducing the blow level to 1. This eliminates the possibility that good panels will be alarmed while the product is being learned. If the product is changed prior to completion of the learning process, learning starts from the beginning the next time the product is processed.

Editing an Existing Product

To edit an existing product, highlight the product to be edited and click EDIT EXISTING PRODUCT to display the Product Edit dialog box.

SETTING TMS PARAMETERS

Narrow Product

This parameter is found on the Product Edit dialog box and applies only to thickness monitoring systems with five gauges. When Narrow Product is selected, the system automatically stops collecting data from the two outside gauges. Since the center three gauges are the active gauges, the product must be centered on the line.

Target Edit Dialog Box

To set other thickness parameters, from the Product Edit dialog box, click EDIT OPENINGS to display the Target Edit dialog box.

NOTE: A warning may appear stating “Editing Targets for the current product will halt grading of the current product. You will need to re-select the product and run to resume grading. Continue with edit?” If you reply “YES”, gauge communications will be terminated. When you finish editing the product, re-select it and choose Run.

The Target Edit screen controls configuration of the following parameters.

Target Value

Contains the target (desired) thickness. This value is used as the midpoint for the Profile chart and certain other charts.

Plotting Range

This provides the scale limits used when plotting charts. The value entered is added to and subtracted from the target value to define the highest and lowest values that will be displayed. Measurements that exceed the scale endpoints will not appear on the charts.

Upper Warning Level

The Upper Warning Level value is added to the Target Value to define the point at which the plotted data will change from green to yellow in order to signify a warning condition.

Lower Warning Level

The Lower Warning Level value is subtracted from the Target Value to define the point at which the plotted data will change from green to yellow in order to signify a warning condition.

Upper Error Level

The Upper Error Level value is added to the target value to define the point at which the plotted data will change from yellow to red in order to signify an error condition. The Upper Error Level must be greater than the Upper Warning Level.

Lower Error Level

The Lower Error Level value is subtracted from the Target Value to define the point at which the plotted data will change from yellow to red in order to signify an error condition. The Lower Error Level must be lower than the Lower Warning Level.

Allowed Std Deviation

The Allowable Standard Deviation of the thickness from the target thickness. Calculated values of standard deviation which exceed this value can be set to trigger an alarm.

Target Weight (Weight Scale Option)

Enter the target weight of the panel in either English units (pounds) or Metric units (kilograms), depending upon which was selected during Program setup.

Weight Error

Enter the allowable variance from the Target Weight before a weight error is to be triggered. Use the same units as used for the Target Weight.

Exiting Product Setup

To exit Product Setup, after making changes, click OK until all menus have been deactivated. To exit without saving changes, click CANCEL or the EXIT button in the top right corner.

ALARM CONFIGURATION (ALARMS OPTION)

MeasureMate can be run without configure the Alarms option, but it is required for paint sprayers, audible alarms or other connected devices to work. Alarm outputs can be configured with MeasureMate running, which can provide feedback as to the appropriateness of the settings selected.

Select Alarms from the **EDIT** menu. When Alarms is selected, you will be prompted to enter a password. The default alarm setup password is “mm.” Enter the password and click OK or press <Enter> to display the Alarm Outputs dialog box.

Outputs

Outputs are physical alarms activated if the trigger for that output is fired. If bond alarms are to be produced from MeasureMate, Alarm Output1 must be dedicated to the bond alarm (no other triggers are permitted), and Trigger1 must be used for the bond alarm. If bond alarms are not to be produced, Output 1 is identical to the other outputs.

Triggers

Triggers are used to activate a switch to an output when certain conditions are met. Select the trigger to be configured by clicking on the arrow button next to the Triggers field and highlighting the desired trigger.

Types

Refers to the available configuration trigger types. A description of each appears below.

Density

The Density Trigger will cause the output to go active whenever the panel density is above the maximum value or below the minimum value. In order to use this feature, the weight scale option must be configured in MeasureMate. Call ultrasonic Arrays, Inc. for further details if this feature is desired.

To select the Density Trigger you must choose either the <Min Density or the >Max Density Trigger.

Selecting either maximum or minimum density will cause MeasureMate to prompt you for numeric entry of that parameter. If it is desired to have an output trigger on the density be either above the maximum or below the minimum, two triggers must be used.

Avg Thickness

The Average Thickness Trigger will cause the output to be triggered whenever a selected gauge or all of the gauges detect an average thickness for a panel which is over or under either the warning or error level.

Selecting Avg Thickness prompts you to choose a gauge by displaying the Gauge field.

Select all gauges or a specific gauge. After a gauge has been selected (or all gauges) the Error/Warning Level Triggers box appears prompting you to choose the error or warning limit. This completes the configuration of the trigger.

Blow Percent

This alarm triggers when a user-specified number of panels are blown out a previously specified sample size. Since sample size may not be 100, the Blow Percent does not literally represent a percentage of panels blown, but is the actual number of blown panels. This alarm will trigger only if two conditions are true:

1. The last panel contained a blow.
2. The number of bad panels in the last “sample size” panels is equal to or exceeds the specified number.

Blow Percent may be used on only one output; successive uses of this alarm are disallowed. Any output may be used, but it must only trigger for the output. The first trigger will be used regardless of the trigger selected.

The alarm will not be triggered if the last panel is good even though the number of bad panels and sample size condition is met.

When Blow Percent is selected you will be asked to enter the number of blown panels required to trigger an alarm. The sample size is entered during Program Setup. The number of bad panels must be between 1 and 254, and the sample size must be between 1 and 256. Additionally the sample size must be greater than the number of bad panels specified.

BMS Shut Off

The BMS Shut Off Trigger will alert the operator that the BMS System is not sending data or has been shut down.

Bond

The Bond Trigger forces the first output to go active whenever the Bond Analysis system detects a blow or delamination. If a bond alarm is used it must be placed on the first output. In addition, it must be the only trigger for that output. Trigger1 will always be used to store the bond trigger.

Immed. Profile

The immediate profile trigger will cause the output to be triggered immediately after the condition is met rather than waiting until the end of the panel like all other triggers.

Panel Count

This alarm does not represent an error condition. It was included so that MeasureMate can trigger a blow down of the BMS reflectors every so many panels. Panel Count may be used on any output, but it must be the only trigger specified for the output on which it is used. The trigger number selected is ignored; the first trigger is always used.

If Panel Count is selected as a trigger for an output, that output will be triggered on the first panel and then every so many panels after that. The interval (in number of panels) between output triggers is specified by you. If you specify 50 panels the panel numbers 1, 51, 101, 151, and so on will be triggered. The count used to trigger this alarm is not the count that you see on the bottom of the screen, which is affected by product changes and press load rejections. The count used is effected by neither of those events. It is however reset at shift change.

Selecting Panel Count prompts you to enter the number of panels between alarms. Any number between 1 and 32,767 will be accepted.

Panel Trend

The Panel Trend Trigger will cause the output to be active whenever a gauge or all of the gauges detect that a number of samples in a row for any panel trending away from the target thickness.

Selecting Panel Trend prompts you to select the desired gauge.

Once the alarm conditions are met, the output will be turned on immediately and stay on until a good panel is graded. The delay and duration coded on the output are ignored.

Profile

The Profile Trigger will trigger the output whenever a selected gauge or all of the gauges detects a set of thickness samples that are over or under either the warning or error level.

Selecting Profile causes a box to appear which prompts the operator to enter the number of samples in a row that must be detected for a trigger condition. Type the desired number in using the keyboard. Currently, the number of samples in a row that is entered will be tied to the Output. So setting the number of samples for one trigger on the output sets the number of samples in a row for all existing triggers on the output. Each trigger *cannot* have a different number. Where different numbers of samples in a row are needed, separate outputs should be used and be tied together. For example, if the operator wanted to spray a panel when one gauge had 8 out of specification samples in a row or when all gauges had 4 bad samples in a row, the two separate alarm outputs would be tied together and then be connected to the sprayer.

Range

The Range trigger will force the output to go active whenever a selected gauge or all of the gauges detect any two readings on a panel whose difference is greater than the difference between the warning levels. In other words, if the thickness reading minus the thinnest readings for a panel are more than twice the value entered for “WRN LVL” in the Setup Products screen, then the output will be triggered.

Selecting Range brings up the Gauge Select field. Make the desired gauge selection. This completes the definition of the trigger.

Sigma

The Sigma trigger will cause the output to be triggered whenever data from a selected gauge or all of the gauges has a standard deviation greater than the limit set for that product. The limit for sigma is set during product setup.

Selecting Sigma causes the Gauge Select field to be displayed. Make the desired gauge selection. This completes the definition of the trigger.

Weight

In order to use this feature, the weigh scale option must be installed in Measure-Mate. Call Ultrasonic Arrays, Inc. for further details if this feature is desired.

This feature uses the target weight and weight error threshold information entered into the product update screen.

When Weight is selected, the Error/Warning Level Trigger box is displayed on screen prompting you to choose the error level.

Delay

This is the amount of time to wait after the end of the panel has passed under the gauges before turning on the alarm. Delay can be measured in either seconds or pulses.

Delay in Pulses

Use this option only if a tachometer is used. After selecting this item you will enter the number of pulses to delay the activation of this alarm output after the alarm is triggered. The number entered may range from 0 to 2,000,000,000.

Delay in Seconds

This option is used when the line is operated at a fairly constant speed and no tachometer is installed. After selecting this item you will enter the number of seconds the systems uses to delay the alarm output after it is triggered. The number entered can range from 0 to 65 seconds.

Dwell

This is the amount of time to leave the alarm on once activated. Dwell can be measured in either seconds or pulses.

Dwell in Pulses

Use this option only if a tachometer is used. After selecting this item you will enter the number of pulses to keep the activated output on. The number can range from 0 to 2,000,000,000.

Dwell in Seconds

This option is used when no tachometer is installed. After selecting this item you will enter the number of seconds the system will maintain the alarm output once activated. The number entered can range from 0 to 65 seconds.

Gauges

This field is used to select the gauge to be used for the trigger. Gauge selection is used with the following trigger types:

- Avg. Thickness
- Immed. Profile
- Panel Trend
- Profile
- Range
- Sigma

Selecting the gauges is one of the final steps in defining the trigger.

Error/Warning Level Triggers

Several of the trigger types require you to select a limit level. If this is required the Error/Warning Level Triggers box will appear prompting you to select the desired limit.

>Warning Level

Selecting this option will cause the output to be triggered whenever the specified measurements are above the maximum warning level the required number of times in row.

<Warning Level

Selecting this option will cause the output to be triggered whenever the specified measurements are below the minimum warning level the required number of times in row.

>Error Level

Selecting this option will cause the output to be triggered whenever the specified measurements are above the maximum error level the required number of times in a row.

<Error Level

Selecting this option will cause the output to be triggered whenever the specified measurements are below the minimum error level the required number of times in a row.

PRINTING MEASUREMATE CONFIGURATION REPORTS

Make sure your printer is connected and on-line. From the **Reports** menu, select Setup Report. A dialog box will appear for printing to screen, printer, or disk. Enter a “p” from the keyboard (for printer) and press <Enter>.

That report lists the configured during Program Setup.

Next select Alarm OutpConfig Rpt from the **Reports** menu. A dialog box will appear for printing to screen, printer, or disk. Enter a “p” from the keyboard (for printer) and press <Enter>.

Store the reports in the labeled pockets provided at the back of this manual for future reference.

INITIAL SETUP COMPLETED

This completes the special steps necessary for first time startup. Return to the Menu Bar. You are now ready to proceed with running MeasureMate.

CONTROLLING GAUGE COMMUNICATIONS

Select **SHIFT/PRODUCT** from the Menu Bar.

If shift start times have not been entered, position the pointer on Set Shift to highlight and bring up the shift choices.

Highlight the desired shift and click on the left mouse button. This selects the shift and immediately brings up the product selection window.

Select the desired product from the Product Select menu by highlighting the product and clicking OK or pressing <Enter>.

From the menu bar, click RUN.

MeasureMate Software is now running.

EXITING MEASUREMATE

To exit MeasureMate, click on the exit icon in the upper right corner. The system will ask you for a password to exit enter “mm” and click OK or press <Enter>.

SECTION 5 - MEASUREMATE COMPONENTS AND OPTIONS

MeasureMate software may be configured with either or both of two major components which are used to monitor Ultrasonic Arrays gauging systems.

1. Thickness Monitoring Component, for use with TMS-Series Thickness Measurement Systems
2. Bond Analysis Component, for use with BMS-Series Bond Measurement Systems

THICKNESS MONITORING COMPONENT OVERVIEW

The Thickness Monitoring Component collects data from TMS-Series Thickness Measuring Systems. Data is collected for up to 200 points along the length and up to seven zones across each panel. Real time displays make thickness variations immediately apparent. Charting and reporting options are available to help the operator identify problems. Optional alarm outputs can be connected to paint sprayers, bells, or lights and be set to trigger when errors occur.

BOND ANALYSIS COMPONENT OVERVIEW

The Bond Analysis Component collects data from BMS-Series Bond Measuring Systems. Data is collected for up to 140 readings taken along a panel by up to 32 transducer pairs ranged across the panel. Defects detected by the gauges can be immediately displayed to the Operator. Optional alarm outputs can trigger a bell, light or ink marking system. BMS defect detection is supported by a comprehensive reporting system that helps the Operator identify trends and errors in press setup.

HISTORY OVERVIEW

The History Component allows saves production readings automatically at the end of each shift or at program shutdown. The data may be used to create a printed report or it can be converted to a format which may be loaded by most spreadsheet applications. Possible uses of saved history data include problem analysis, trend analysis and shift statistics.

CHARTS OVERVIEW

MeasureMate offers a variety of on-screen charting capabilities, allowing you to view current data.

REPORTS OVERVIEW

MeasureMate offers a variety of reports that can be displayed on-screen, saved to disk, or printed allowing further analysis of current data.

ENCODER INPUT OVERVIEW

Encoder (or tachometer) input is used to control reading frequencies. A tachometer is provided as standard equipment with BMS-Series Bond Measuring Systems. MeasureMate's Encoder Input feature uses pulses to measure the panel more consistently and is recommended if line speed varies.

ALARMS OPTION OVERVIEW

MeasureMate software supports up to eight separate alarm outputs. These are used to alert manufacturing personnel when product is out of specification. Each alarm output can be independently configured with a delay before it becomes active; and dwell, or duration of activity, after a trigger occurs. The delay and dwell times can be defined in seconds or tachometer pulses.

WEIGH SCALE OPTION OVERVIEW

The Weigh Scale option allows a scale to be connected to the computer so that the weight of each panel can be read by MeasureMate software. This allows MeasureMate to check for errors based on weight (or density) and to report panel density in its various reporting and alarm functions.

NETWORK I/O SERVER OPTION OVERVIEW

The Network Server option allows access to current data Net DDE or OPC interfaces from any computer connected to the network. Users can access any of the defined Tag Names from their WonderWare, Intellution, Rockwell Automation, or other Net DDE or OPC aware software. In addition, users can access the data using custom programs written in Visual Basic, Visual C, or even Microsoft Excel. Multiple users can access the same data.

See Appendix H for a list of MeasureMate Tag Names.

SECTION 6 – THE SHIFT/PRODUCT MENU

The shift and product must be selected upon program startup, prior to starting gauge communications.

SET SHIFT

If shift start times were entered during program configuration, MeasureMate will determine the shift for you.

If shift start times have not been previously specified, the shift must be specified upon starting MeasureMate software and again at each shift change. Not only is this necessary for reporting purposes, but MeasureMate software stores considerable data for the current shift. Setting the correct shift at shift change is required by MeasureMate software to keep the amount of storage space required for that data within reasonable bounds.

To set the current shift, select Set Shift from the **Shift/Product** menu. Select the desired shift. The Set Product window will open automatically.

SET PRODUCT

Highlight this menu item and press <Enter> to display the Product Select dialog box.

The Available Products list box contains a listing of all products previously entered. Highlight and click the mouse button on the name of the product to be run and click <OK> or press <Enter> to select the product.

To add or edit products, see Section 3.

Once a product has been selected, you are returned to the Menu Bar.

SECTION 7 – THE EDIT MENU

PRODUCTS

This password protected menu item should be selected for product setup. To add or edit products, see Section 4, Installation and Program Configuration.

PROGRAM SETTINGS

This menu selection allows configuration of MeasureMate software to your environment. Some configuration options are:

- Parameters to configure MeasureMate to your computer such as specifying ports and drives.
- Parameters to configure MeasureMate to your production hardware such as line speed or gauges on-line.
- Parameters to configure MeasureMate to your product such as panel length or board area.
- Parameters to configure MeasureMate to your reporting preferences such as shading and gauge names.
- Changing Passwords.

Program Setup parameters should be reviewed every time there is a change to computer hardware or to the MeasureMate operating environment.

This menu item is password protected. To edit Program Settings, refer to Program Configuration in Section 4, Installation and Program Configuration.

ALARMS

This item is used to edit alarms for TMS and BMS. This menu item is password protected. For alarms editing procedure, refer to Alarms Configuration in Section 4, Installation and Program Configuration.

DIAGNOSTICS

Diagnostic aids are included for verifying and troubleshooting operation of the gauges.

SET PASSWORDS

Choose this menu item to change passwords. The Product Edit/Program Exit, Program Setup, and Diagnostics passwords may be changed. The initial password for Product Edit/Program Exit and for Program Setup is “mm.” Passwords may be up to 15 characters.

Select the password to be changed.

When the password has been selected, you will be asked to enter the old password. Enter the old password followed by <Enter>. If you correctly entered the old password, you will be asked to enter a new password. Enter the new password followed by <Enter>. <Backspace> characters are valid characters in a password, so they cannot be used to back over mistakes.

After you have entered the new password for the first time, you will be asked to enter it again for verification. This precludes the possibility of locking yourself because of a typing error. If your attempt to change the password fails, you will be repeatedly asked to enter a new password and then to verify it until you have entered and successfully verified a new password.

After the new password has been entered and verified, the system will display a confirmation message. When you exit the **Edit** menu, commit setup changes or the password changes will be lost.

RESET PASSWORDS

This menu item causes the Setup and Diagnostic passwords to be reset to their original values. When this option is selected, you will be asked to enter a password. This function uses a special password which is used only for this function and cannot be changed. The password for this function will be given only to selected individuals.

CONFIGURATION

This menu item is used by Ultrasonic Arrays personnel to enable purchased options. This menu item is password protected and inaccessible to you except at the direction of Ultrasonic Arrays' personnel.

EXITING THE EDIT MENU

Certain changes to setup parameters will not take effect until the next time MeasureMate software is run. A message will be displayed if changes have been made to such parameters. If you wish the changes to take effect immediately, exit and then re-start MeasureMate; or pause and then run gauge communications.

SECTION 8 – THE VIEW MENU

This menu is activated by selecting **View** from the Menu Bar.

THICKNESS SUB-MENU

Profile Chart

The Profile Chart displays “real time” thickness readings for each panel as it moves through the TMS system. The chart graphically illustrates panel thickness measurements and how they relate to warning and error tolerances. One chart for each thickness gauge up to seven is simultaneously drawn on the screen. The profile chart is the default chart shown upon starting gauge communications if your system has the TMS component installed.

Each profile has a gauge label for easy identification. This label can be altered as desired from the menu; see Section 3. The current profile will remain on the screen until the next panel has appeared in the thickness gauge measurement zone. The right side of each chart is labeled with values representing the following information (in order from top to bottom): Upper Chart Scale, Upper Error Level, Upper Warning Level, Target Thickness (center) Lower Warning Level, Lower Error Level and Lower Chart Scale. These set points are established when parameters for a product are configured.

If an individual measurement point is within specified limits, a line representing the measured thickness is drawn on the screen in green. If the thickness exceeds the warning levels, (upper or lower) the line will turn yellow. If the measurement exceeds the error levels (upper or lower) the line will turn red. Shading can be selected during Program Setup to increase the error and warning conditions more visible. Shading will cause the area between the actual values and the target values to be filled with green, yellow, or red depending on the relationship of the data point to the warning and error limits. See Section 3.

Current Trend

For a broader view of product measurement trends, select the Current Trend chart. This display shows the average thickness of the last 120 panels. If 120 panels have not yet been accumulated, it will plot all available data and update the screen as each successive panel is measured.

Lines are drawn from the center line up if the average thickness of a panel is above the target or down if the average thickness is below the target thickness. If the average thickness falls within the warning limits the vertical line will be green. If the average exceeds the warning limits, the line will be yellow. If the average exceeds the error limits the line will be red.

Data for accumulated panels will be reset at change of product or at change of shift.

Range Trend

The Range Trend chart graphs the range of the measurements from each gauge, for each panel, from the last load. Range is defined as the highest reading minus the lowest reading for a scan. This information is plotted by gauge for the last 120 panels. This chart is reset at product and shift changes.

Panel Weight Trend (Optional)

The Panel Weight Trend chart plots the weight of the last 120 panels. This chart is available only on systems with Weigh Scale installed. This chart is reset at product and shift changes.

Average Profile

This chart displays the average profile for each active gauge, the average value for each of the last 50 panels for the current product.

Composite

This permits the selection of a group of sequential panels for analysis. Up to 50 panels may be chosen; all press loads must be for the same product. Average readings are computed for all the panels from all the press loads chosen, making a composite panel. The thickness values are charted for each gauge for the composite panel. Upon selection, the user is prompted for the first and last panels desired for analysis.

Thickness Data

Thickness Data is an alpha-numeric representation of thickness data displayed in the Data Window. Using specified function keys, the operator may select which thickness data is displayed. When Run is first selected after starting MeasureMate, Thickness Data is displayed along with the Panel Chart.

Thickness Data provides function keys to cycle several data screens. The function keys will work only if the Thickness Data window is the active window.

BOND ANALYSIS SUB-MENU

This menu contains the charting options available in MeasureMate Software for Bond Analysis. The **Bond Analysis** sub-menu is accessed by clicking of the **View** menu and selecting *Bond Analysis*.

Channels are normally numbered from one side of the panel to the other. This scheme changes, however, when two conditions are present. They are:

1. The width of the panels varies between products
2. The panel is centered on the line.

Under these circumstances, the first channel is in the center of the panel, and the gauges are numbered from the center out; odd numbered gauges on top. For a more detailed explanation see Product Widths in Section 4, Installation and Program Configuration.

Panel

This option graphs blows and warnings for the panel that was just completed (just passed under the BMS gauges). Up to 16 charts are produced, one for each gauge. The length of the panel is represented horizontally on the chart. Readings of no warnings or blows are shown with a thin green line. Warnings are shown with a wider yellow block, and blows are shown as a still wider red block.

BOND INTEGRITY

In manufactured panels, defects in bond integrity can be determined by the sound transmission properties of the completed panel. Two pieces of wood that are well bonded transmit sound well, while two pieces of wood that are unbonded or poorly bonded do not. The bond integrity chart shows the amplitude of the ultrasound pulses received after traveling through the panel being tested. The chart is similar to a topographical map that shows the height of mountains and valleys using color; the bond integrity chart shows the amplitude of received sound using color. A scale showing the relationship between color and reading value is shown on the bottom of the chart. If a blow is detected then the amplitude is not shown. The blown areas of the panel are displayed in red.

SPREADSHEET

This screen is a very quick method of obtaining data on recent production. Spreadsheet will provide overall data on the last panel, the previous panel, and the last ten panels. Spreadsheet is not a chart but a text-based report. The spreadsheet cannot be printed.

SECTION 9 - PAUSE/RUN

Pause/Run is not a menu, but a command. It does not indicate the current status of gauge communications. If MeasureMate is currently communicating with the gauges, the command **Pause** is displayed. If communications are currently halted, the command **Run** is displayed.

RUN

To begin gauge communication when starting up the system, or to resume gauge communications after a Pause, position the pointer on **Run** and click the mouse button. If the system is configured as a TMS only or combination TMS/BMS system, the Profile Chart will automatically be displayed, along with Thickness Info. In a system with BMS only, the Panel chart will be automatically displayed.

PAUSE

To suspend gauge communications, select **Pause** and click the left mouse button.

SECTION 10 – THE REPORTS MENU

Selection of the Reports menu allows the user to choose from a selection of predefined reports.

Available printer reports are:

- Product Report
- Shift Report
- Alarm Report
- Opening Range
- Panel Report
- Shift Summary
- Alarm Output Config
- Setup Report
- Product List
- Print Screen

Reports are selected by moving the cursor to **Reports** on the menu bar and clicking the left mouse button. The system will ask the operator if the report should be displayed on the screen or sent to the printer.

Once the report has been selected, you will be asked to specify the report destination. Three choices are possible:

- To the printer (reply with the letter “P”).
- To the screen (reply with the letter “S”).
- To the disk (reply with the letter “D”).

Selection of the Screen option will open a separate session of the Windows Notepad application; thus, several reports may be open simultaneously.

NOTE: Make sure the printer is on-line before selecting it as the report destination.

If you have chosen the “Panel Report” you will next be asked to specify the panel number.

If you routed the print to disk, printing will be completed with no feedback to you. Each report will be placed in its own file in the MeasureMate directory. The format of the report is the same as if it had been printed, including all page headings and printer control characters. File names are assigned as follows:

- Alarm Report ALARMnnn.RPx
- Opening Range Report OPNRGnnn.RPx
- Output Report OUTPTnnn.RPx
- Panel Report PANELnnn.RPx

- Product Report PRDCTnnn.RPx
- Setup Report SETUPnnn.RPx
- Shift Report SHIFTnnn.RPx

The “nnn” in the name above is a sequentially assigned number. This provides a unique file name for each report, allowing the operator to store several of the same type of report.

The “x” in the names above indicates which execution of MeasureMate the report is from. Choices follow:

- RPT - The last run of MeasureMate.
- RP2 - The run of MeasureMate prior to the last one.
- RP3 - The run of MeasureMate three executions ago.

Reports are kept for three runs of MeasureMate, after which the reports are deleted to save disk space. To retain reports that would otherwise be deleted, it is recommended that report files be copied to storage media.

PRODUCT REPORT

This selection produces a report that summarizes production data for the current product type. This is a highly summarized report which lists the number of boards and press loads that were run, the average thickness and average standard deviation of the panels. It also lists the measurements by the individual gauges with the alarms detected. Since this is a highly summarized report it is a short report. See Appendix A for a sample of the report output.

SHIFT REPORT

The Shift Report lists the total panels and press loads run, during the current shift. The average thickness, the average delta from the target thickness, and the average density for all panels of the product are also printed out. Shift Reports also list the average, the delta from the target thickness, and the average density for each press load. The report is time and date stamped. There must be at least one valid press load in order to print this report. See Appendix B for a sample of the report output.

ALARM REPORT

The Alarm Report summarizes the number of panels for which a thickness error (over or under) or bond alarm condition occurred. This report should not be confused with the Alarm Configuration report printed during program setup. The report has two sections, a summary section followed by a detail section. In the detail section one line is produced for every alarm produced. See Appendix C for a sample of the output.

OPENING RANGE REPORT

The Opening Range Report is a summary of the opening range data listed by gauge and the average range for the opening. Range is the highest reading minus the lowest reading for the panel.

PANEL REPORT

The Panel Report lists the individual gauge measurements for a panel. The printout lists the date and time the panel was measured, as well as the product type, an ordered list of the individual measurements by gauge, the average dimension, and the standard deviation of the measurements. See Appendix D for sample output.

SHIFT SUMMARY

This report produces a summary of products run during the shift. One line is produced for each product run. If a product is run two or more times during a shift, each run is listed separately on the report.

Your alarm setup determines which warning and error levels are reported. This provides you the flexibility to set up unusual conditions. If you sand your panels you may wish to reject based on the warning level on the thin side, and reject on the error level on the thick side. Since panels alarmed as errors will also be alarmed as warnings, summing the percentages for warnings, errors and on-target panels will not always add up to 100%; however, it should be easy to understand the difference if you understand how alarms are set up. In a system where both under and over conditions are alarmed for both error and warning limits, then the warning percentage and on-target percentage will add up to 100%

ALARM OUTPUT CONFIGURATION REPORT

This report lists the current alarm configuration data if the optional alarm software package is configured for your system. It is recommended that a printout of the most current Output Configuration Report be stored in the pocket provided in this manual. See Appendix E for sample output.

SETUP REPORT

The Setup Report lists the system's setup parameters. It is recommended that a printout of the most current Setup Report be stored in the pocket provided in this manual so that the setup can be restored if the setup file is accidentally changed. See Appendix F for sample output.

PRODUCT LIST

This report produces a list of your product setup. The report shows whether each product has been learned (BMS).

PRINT SCREEN

Whatever is currently displayed on the screen can be written to the printer. It takes about two minutes to print an image of the screen, because of the high resolution graphics involved.

To print the screen, select Print Screen from the **Reports** menu.

NOTE: The system will not allow any more print screens until the previous screen is completely printed.

SECTION 11 - THE DATA WINDOW

A powerful feature of MeasureMate software is the data window. Its purpose is to provide users with summary data by press load without having to switch screens. The windows may be changed by using specified function keys. The function keys will work only if the Data Window is the active window.

LAST PANEL

Shows summary data for the last panel that was sampled. This information is grouped by gauge with a composite average for each gauge, and for all 3 gauges at the bottom. The gauge information shown in the Data Window includes the average thickness, the standard deviation (Sigma), and the minimum and maximum values of the readings, and the difference between the average value and the target value (Delta).

The Panel Average data information shown in the Data Window includes: the average thickness for all the gauges, the average of the standard deviations for the gauges (Sigma), the weight of the panel (if the weigh scale option is included) and the average density of the panel (if the weigh scale option is included).

In the current panel window color is used to indicate the status of the various statistical values. If the average is outside the warning levels, (or the error levels) the average of the data window will turn yellow (or red). If the Standard Deviation calculated for a particular panel exceeds the value for sigma entered in the Target Edit screen of the Products menu, the calculated value for sigma, in the data window will turn red to signify an error condition. If the Delta is greater than the warning (or error) limits, then the Delta value in the data window will turn yellow (or red).

CURRENT SHIFT

Pressing the function key <F1> from the Last Panel data screen changes the data window to show the average thickness and average delta for the most recent 32 pressloads. The function key <F2> can be used to swap between the data for the most recent 32 pressloads and the 18 pressloads before that. This allows a total of 50 pressloads to be viewed. Pressing the function key <F1> from this data screen changes the data window back to Last Panel.

SECTION 12 - RUNNING RPSS

RPSS is a MeasureMate reporting program used to produce reports from MeasureMate history files.

RPSS will produce a wide variety of reports, and the reports may be tailored to suit your requirements; however individual readings for panels are not available for RPSS reporting. They are discarded to save space on your hard drive. Summary level information such as panel averages, maximum reading, minimum reading, sigma, number of blows, etc., is available.

HISTORY FILES

Each history file is really a matched set of 3 files. See Section 4, Installation and Configuration, for a description of the files and filenames.

DATA AVAILABILITY

The only history file unavailable for reporting is the history file currently being built by MeasureMate.

If History Autosave Days is enabled, MeasureMate automatically deletes old history files. If history files were allowed to accumulate unchecked they would eventually fill your disk and cause MeasureMate to crash for lack of disk space. To prevent crashes of this nature MeasureMate deletes files when they are several days old. You may specify the number of days MeasureMate is to keep history files. From the MeasureMate program select “Edit” from the main menu then “Program settings” from the drop down menu. Enter your installation’s password. The parameter to change is labeled “History Autosave days”. In this case “Autosave” means automatically delete after the specified number of days.

Data may be saved beyond the normal deletion time by doing either of two things:

1. Rename the file name to something else. Do not change the extension name (“.DAT”, “.IDX”, & “.ref”); instead the first name. Change the name so that the first 3 characters are something other than “HST” since MeasureMate matches on those characters for deletion purposes. Each of the three components of the history file must be changed so that the first name matches. Note that simply changing the first character in the file name to an “X” or changing “HST” to “SAV” will accomplish this.
2. Move or copy the files to another directory on your disk or onto other storage media.

PREDEFINED REPORTS

Detail

Provides one line on the report for each panel graded. Total lines are produced at change of product and at end of shift.

Summary for Each Load

Writes total lines for each load graded. No detail lines are produced at the panel level.

Summary for Each Run of a Product

This report produces total lines at the end of each product and at end of shift. No detail lines are produced at the panel level.

Product Summary with Runs Combined

This report is the same as the one above except that if a product is run several times in a day, all the runs of that product are totaled together and reported as one set of total lines.

Summary by Time Interval

This report can tell you that in this 15 minute period we produced so many panels and had so many thickness/bond problems, and in the next 15 minute period we produced so many panels and had so many thickness/bond problems. The “Time Interval” field to the right specifies the length of each time interval. If “product name” is included in the report then the first product run in the time interval is reported.

Alarm Detail

History records are screened for alarms or blows. Detail lines for records with alarms or blows are shown. Totals are displayed at the end of each product run and at end of shift.

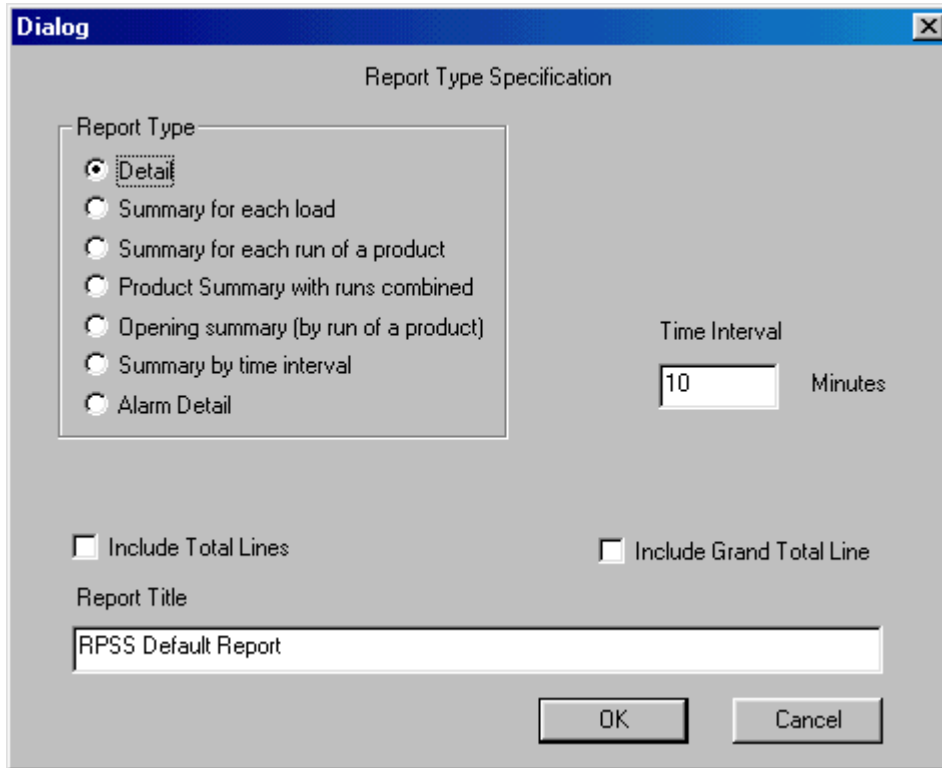
GENERATING A REPORT

Generating a report is a two step process.

1. Select **Report** from the main menu, then Edit or Load, depending upon the desired report.
2. From the **File** menu, select open, then choose the desired history file.

EDITING A REPORT

All RPSS predefined reports are designed to be easily customizable by the user. To open or customize an RPSS report, from the **Report** menu, select Edit. The following dialog box will be displayed.



The image shows a Windows-style dialog box titled "Dialog" with a close button (X) in the top right corner. The main title of the dialog is "Report Type Specification".

Under the heading "Report Type", there is a list of radio button options:

- Detail
- Summary for each load
- Summary for each run of a product
- Product Summary with runs combined
- Opening summary (by run of a product)
- Summary by time interval
- Alarm Detail

To the right of these options is a "Time Interval" section with a text input field containing the number "10" and the label "Minutes".

Below the radio buttons are two checkboxes:

- Include Total Lines
- Include Grand Total Line

At the bottom, there is a "Report Title" label above a text input field containing the text "RPSS Default Report".

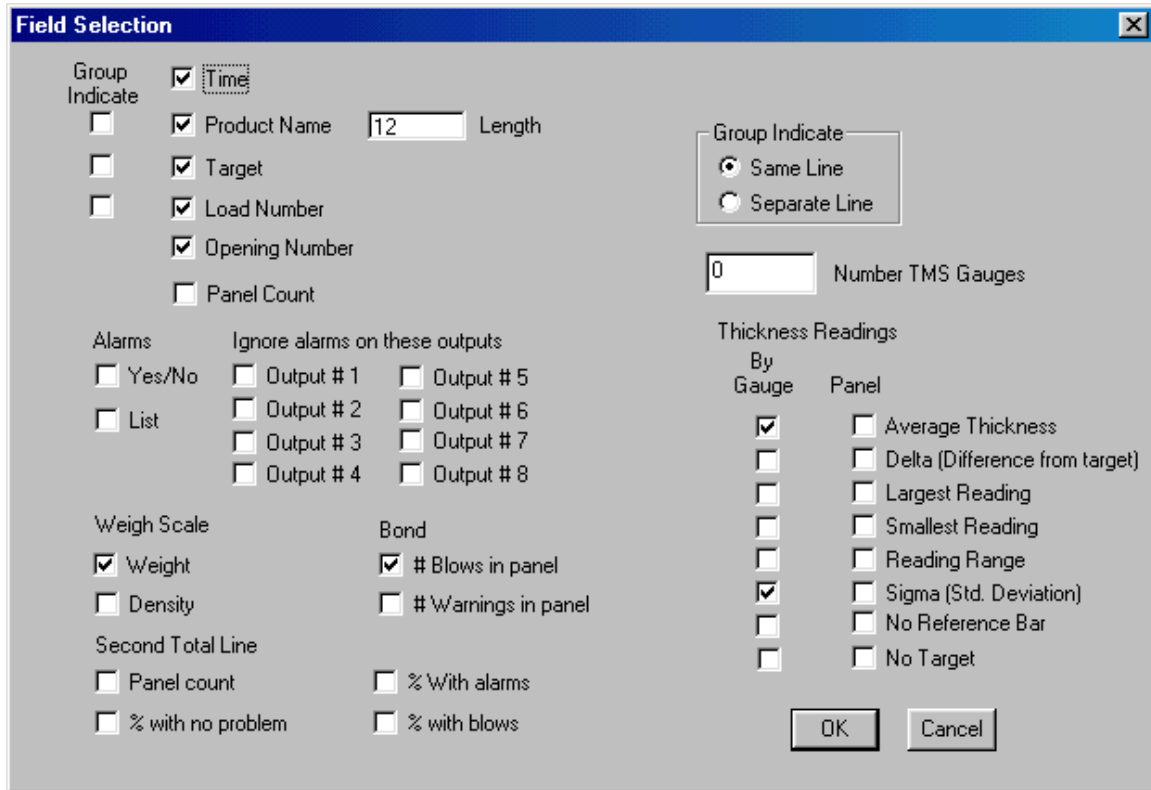
At the very bottom of the dialog are two buttons: "OK" and "Cancel".

Select the desired report type from the choices provided. If the Time Interval report is selected, also enter the Time Interval in minutes in the space provided.

Determine whether you wish to have total lines and/or a grand total line at the end. If you are going to produce spreadsheet output, the total lines may interfere with the spreadsheet functions you are going to want to do. Summary reports (no detail lines) include totals. If you choose a summary level report and do not select total lines, RPSS will turn total lines on for you.

If you plan to customize the report, enter a title that will accurately reflect the contents of the report.

Click OK. The Field Selection Dialog box will be displayed.



The image shows a 'Field Selection' dialog box with a blue title bar and a close button. The dialog is organized into several sections:

- Group Indicate:** A list of checkboxes for 'Time', 'Product Name', 'Target', 'Load Number', 'Opening Number', and 'Panel Count'. The 'Product Name' field has a text input containing '12' and the label 'Length'.
- Group Indicate (Secondary):** Radio buttons for 'Same Line' (selected) and 'Separate Line'.
- Number TMS Gauges:** A text input field containing '0'.
- Alarms:** A section with checkboxes for 'Yes/No' and 'List'.
- Ignore alarms on these outputs:** A grid of checkboxes for 'Output # 1' through 'Output # 8'.
- Weigh Scale:** Checkboxes for 'Weight' (checked), 'Density', and 'Second Total Line'.
- Bond:** Checkboxes for '# Blows in panel' (checked), '# Warnings in panel', '% With alarms', and '% with blows'.
- Thickness Readings:** A section with a 'By Gauge' column and a 'Panel' column. Under 'Gauge', 'Average Thickness' and 'Sigma (Std. Deviation)' are checked. Under 'Panel', 'No Reference Bar' and 'No Target' are checked.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

This dialog box allows the user to select the specific fields that will appear on the report. Clicking on the check box next to an item will cause that item to appear on the report. If the check box next to an item is clear, the item will not appear.

Note: The boxes checked in the dialog box may differ from the boxes checked in the example above. The checked boxes reflect the makeup of the report loaded when you started report edit. The selections here are for the default RPSS report.

To print the default fields for the report selected, click OK. To customize a report, select the desired fields from those detailed below.

Field Options

The table below details what information will appear detail lines (for non-summary reports), in title lines, and in the header for each field.

Field	Title	Detail Line	Total Line	Grand Totals
Time	Time	Panel Finish Time	Time for first of totaled panels	“*****”
Product Name	Product Name	Name given in product setup	Name given in product setup ¹	“Grand Totals”
Target	Target	TMS Thickness target	TMS Thickness target	“*****”
Load	Load	Load Number for Panel	“****”	“****”
Opening	Op	Opening Number for Panel	“**”	“**”
Panel Count	Panel Count	Blank	Number of panels	Number of panels
Alarms ² Yes/No	Alarm Y/N	“Yes” or No	Count: number of panels with alarms	Count of panels with alarms
Alarms ² List	List of Alarms	List of alarms e.g. “2,5,7”	Count: number of panels with alarms	Count of panels w/ alarms
Weight	Weight	Panel Weight ³	Average Panel Weight ³	Blank
Density	Density	Panel Density ³	Average Panel Density ³	Blank
# Blows in Panel	Bond Blows	Number blow alarms in panel	Number of panels with blows	No. panels with blows
# Warns in Panel	Bond Warns	Number warning alarms in panel	Number of panels with warnings	No. panels with warnings

¹In the summary by time interval, the name shown is the name of the product for the first panel in the period. Since the product may change at any time, the product may be different than the ending panel in the same period.

²Some alarms, such as alarm every so many panels, do not represent errors, and should be excluded from error reporting. If you use those alarms you may exclude them from reporting by checking the appropriate box in the “Ignore alarms on these outputs” section of the dialog box.

³Available only if you have a weigh scale. The field will be blank if you do not have a scale.

The following fields may be selected for either the gauge level or the panel level. If the panel level is selected then one column will be generated for each gauge on your system. The first line in the title will have “Gau 1 Gau 2 Gau 3 ...”.

The following table lists fields available for panel selection.

Field	Title	Detail Line	Total Line	Grand Totals
Average	Panel Thick	Average thickness	Average thickness	Average thickness
Delta	Panel Delta	Average thickness minus target	Average difference from target	Avg. dif. from target
Largest Reading	Max Thick	Maximum reading for panel	Blank	Blank
Smallest Reading	Min Thick	Minimum reading for panel	Blank	Blank
Reading range	Panel Range	Maximum minus minimum	Blank	Blank
Sigma	Panel Sigma	Thickness sigma (standard deviation)	Average thickness sigma	Average thickness sigma
No Reference bar ¹	Panel NoRef	Number of no ref bar readings	Number of no ref bar readings	Number of no ref bar readings
No Target ¹	Panel NoTar	Number of no target readings	Number of no target readings	Number of no target readings

¹Both “No Reference bar” readings and “No Target” readings represent errors. No reference bar means that the gauge could not return a reading because it could not detect the reference bar attached to the gauge. Common causes include dust on the reference bar, improperly installed or dirty environmental filters, or bad transducers. See gauge documentation. “No Target” may be caused by many of the same problems, but may also be a “Normal” error. Any abnormality in or on the panel which causes reflected sound to be sent off into space rather than back to the transceiver may cause the problem. Chips on the panel or irregularities in untrimmed edges may cause “No Target” readings, and do not represent real problems.

All the fields above may appear in detail lines (except in summary reports) and in total lines. The total lines follow the same columnar format as the detail line. There are a few fields which may appear in a second total line. That total line does not follow the columnar format of the rest of the report. Fields which may be included on that line include:

1. Panel count (Panel Count = nnnn), Number of panels
2. % with no problem (Good Panels = nn.n%), per-cent of panels with no alarms or blows.
3. % with alarms (Panels with alarms = nn.n%), Per-cent of panels that have alarms.
4. % with blows (Panels with blows = nn.n%), Per-cent of panels that have blows. Available only if your system has BMS (bond).

You may ignore specific alarm outputs in these figures by marking the appropriate alarm output(s) in the “Ignore alarms on these outputs” section of the dialog box.

The “Number TMS gauges” field is used by the reporting system in determining the number of columns to make for the “By Gauge” fields. If you leave the “Number TMS gauges” field zero RPSS will determine the number of gauges by looking at the first history record. That will work well except if you have narrow and wide products. If the history file starts with a narrow product, the number of gauges will not be increased when you come to a wider product. If your product widths vary and have requested “by gauge” fields, enter the number of gauges that will be used for wide products in the “Number TMS gauges” field.

“Group Indicate” means that the field’s value is listed only when it changes and at the top of the page. “Group Indicate” has not yet been implemented. When it is implemented “Group Indicate on a separate line” will allow you to reduce the width of your lines.

When you are satisfied with the fields included on the report select OK. You may now view the report by selecting data to report, save the report, or re-edit the report. You may repeatedly edit the report and view data until you are satisfied with the report and then save the report’s format.

SAVING A REPORT FORMAT

From the **Report** menu, select Save. A standard Windows file save dialog box will be displayed with the report title entered as the default file name. It is recommended that you use the default filename to avoid confusion. Click SAVE to save the report format.

SELECTING DATA TO REPORT

After the selecting the report format, the user must select data to be reported.

From the **File** menu, select Open or choose one of the recently used files listed at the bottom of the **File** menu. The Open File dialog box will be displayed. The default file type is .dat (data) files; the default directory is the “mmate” directory. When the desired file is highlighted, click OPEN.

OUTPUT TO A SPREADSHEET

With the desired report displayed, select Save Spreadsheet Data from the **File** menu. A standard Windows Save As dialog box will be displayed. Enter a filename and click SAVE.

OUTPUT TO A PRINTER

With the desired report displayed, select Print from the **File** menu.

APPENDIX A - THE PRODUCT REPORT

PRODUCT REPORT
Tue Jun 04 13:05:47 1996

Shift: 1

0.625

Total Panels: 19

Opening Num/Name	Gauge 1		Gauge 2		Gauge 3	
	Average Inches	Sigma	Average Inches	Sigma	Average Inches	Sigma
1 op1	0.628	0.002	0.624	0.002	0.625	0.002

Opening Num/Name	Total Average	Off Target	Average Density
	Inches	Inches	Lbs/Cu.Ft
1 op1	0.626	0.001	59.880

Total Average Thickness: 0.626"
Total Average Off Target: 0.0005"
Total Average Density: 59.911 Lbs/Cu. Ft.

APPENDIX B - THE SHIFT REPORT

SHIFT REPORT

Tue Jun 04 14:44:29 1966

Shift 1

Total Panels = 359, Rejected Press Loads = 2

Product	Load Cnt	Average	Off Target	Avg. Density	Blown Pnls
0.625	1	0.627"	0.001"	59.857 Lbs/Cu. Ft.	2
0.625	2	0.626"	0.001"	59.905 Lbs/Cu. Ft.	2
0.625	3	0.625"	0.000"	59.976 Lbs/Cu. Ft.	1
0.625	4	0.626"	0.001"	59.904 Lbs/Cu. Ft.	2
0.625	5	0.625"	0.000"	60.001 Lbs/Cu. Ft.	1
0.625	6	0.624"	-0.001"	60.121 Lbs/Cu. Ft.	2
0.625	7	0.624"	-0.001"	60.098 Lbs/Cu. Ft.	2
0.625	8	0.627"	0.002"	59.809 Lbs/Cu. Ft.	1
0.625	9	0.625"	0.000"	60.048 Lbs/Cu. Ft.	2
0.625	10	0.624"	-0.001"	60.072 Lbs/Cu. Ft.	1
0.625	11	0.627"	0.002"	59.857 Lbs/Cu. Ft.	1
0.625	12	0.625"	0.000"	59.976 Lbs/Cu. Ft.	2
**Total Prod	12	0.625"	0.000"	59.969 Lbs/Cu. Ft.	19
0.625 no. 3	1	0.624"	-0.002"	60.145 Lbs/Cu. Ft.	1
0.625 no. 3	2	0.625"	0.000"	59.977 Lbs/Cu. Ft.	1
0.625 no. 3	3	0.625"	0.000"	60.048 Lbs/Cu. Ft.	1
0.625 no. 3	4	0.625"	0.000"	59.976 Lbs/Cu. Ft.	2
0.625 no. 3	5	0.625"	0.000"	60.048 Lbs/Cu. Ft.	1
**Total Prod	5	0.624"	0.000"	60.039 Lbs/Cu. Ft.	6

Page 1

APPENDIX C - THE ALARM REPORT

ALARM REPORT

Tue Jun 04 14:44:29 1966

Shift: 1

0.625

Opening #	TMS Alarms	BMS Alarms
1	2	4

Alarms for Shift

1	Load	1	Opening	1	Panel	0	BMS
2	Load	5	Opening	1	Panel	20	BMS
3	Load	5	Opening	1	Panel	21	TMS
4	Load	10	Opening	1	Panel	40	BMS
5	Load	11	Opening	1	Panel	44	BMS
6	Load	11	Opening	1	Panel	45	TMS

APPENDIX D - THE PANEL REPORT

PANEL DATA REPORT

Tue Jun 04 14:44:29 1966

Shift: 1

0.625

Panel Number: 20
Panel Density: 60.289

Gauge Name---->	Gauge 1	Gauge 2	Gauge 3
Average	0.629"	0.619"	0.619"
Std. Dev.	0.002"	0.002"	0.004"

Sample Number	Gauge 1	Gauge 2	Gauge 3
1	0.625"	0.625"	0.625"
2	0.625"	0.625"	0.625"
3	0.625"	0.626"	0.626"
4	0.626"	0.626"	0.626"
5	0.626"	0.626"	0.626"
6	0.626"	0.626"	0.626"
7	0.626"	0.625"	0.626"
8	0.626"	0.625"	0.625"
9	0.626"	0.624"	0.625"
10	0.627"	0.624"	0.625"
11	0.627"	0.623"	0.624"
12	0.627"	0.623"	0.623"
13	0.628"	0.623"	0.623"
14	0.628"	0.622"	0.624"
15	0.629"	0.621"	0.624"
16	0.629"	0.621"	0.624"
17	0.630"	0.621"	0.624"
18	0.630"	0.621"	0.623"
19	0.629"	0.621"	0.622"
20	0.630"	0.620"	0.622"
21	0.629"	0.619"	0.622"
22	0.629"	0.620"	0.622"
23	0.630"	0.619"	0.623"
24	0.630"	0.618"	0.623"
25	0.631"	0.618"	0.623"
26	0.631"	0.618"	0.623"
27	0.630"	0.618"	0.623"
28	0.630"	0.618"	0.623"
29	0.630"	0.618"	0.622"
30	0.630"	0.618"	0.622"
31	0.631"	0.618"	0.622"

...

Page 1 of 3

PANEL DATA REPORT

Tue Jun 04 14:44:29 1966

Shift: 1

0.625

Panel Number: 20
Panel Density: 60.289

Gauge Name---->	Gauge 1	Gauge 2	Gauge 3
Sample Number			
39	0.627"	0.617"	0.621"
40	0.628"	0.618"	0.620"
41	0.628"	0.617"	0.620"
42	0.627"	0.617"	0.620"
43	0.628"	0.617"	0.621"
44	0.629"	0.618"	0.622"
45	0.630"	0.618"	0.621"
46	0.629"	0.618"	0.622"
47	0.629"	0.618"	0.621"
48	0.629"	0.618"	0.620"
49	0.630"	0.618"	0.620"
50	0.631"	0.618"	0.620"
51	0.631"	0.618"	0.620"
52	0.631"	0.617"	0.621"
53	0.630"	0.618"	0.622"
54	0.630"	0.618"	0.622"
55	0.629"	0.618"	0.622"
56	0.629"	0.617"	0.622"
57	0.628"	0.617"	0.621"
58	0.627"	0.618"	0.620"
59	0.627"	0.617"	0.619"
60	0.627"	0.618"	0.618"
61	0.627"	0.617"	0.618"
62	0.627"	0.616"	0.618"
63	0.627"	0.616"	0.618"
64	0.627"	0.616"	0.618"
65	0.627"	0.617"	0.617"
66	0.627"	0.617"	0.617"
67	0.626"	0.617"	0.616"
68	0.626"	0.618"	0.615"
69	0.627"	0.619"	0.615"
70	0.626"	0.620"	0.615"
71	0.627"	0.620"	0.616"
72	0.627"	0.619"	0.616"
73	0.628"	0.619"	0.616"
74	0.629"	0.619"	0.616"

...

PANEL DATA REPORT

Tue Jun 04 14:44:29 1966

Shift: 1

0.625

Panel Number: 20
Panel Density: 60.289

Gauge Name---->	Gauge 1	Gauge 2	Gauge 3
Sample Number			
78	0.630"	0.619"	0.614"
79	0.630"	0.619"	0.615"
80	0.630"	0.619"	0.614"
81	0.630"	0.619"	0.614"
82	0.630"	0.618"	0.614"
83	0.630"	0.618"	0.614"
84	0.630"	0.619"	0.614"
85	0.629"	0.619"	0.613"
86	0.630"	0.619"	0.612"
87	0.629"	0.619"	0.612"
88	0.629"	0.619"	0.611"
89	0.629"	0.620"	0.610"
90	0.630"	0.620"	0.611"
91	0.631"	0.620"	0.611"
92	0.631"	0.620"	0.611"
93	0.632"	0.620"	0.612"
94	0.632"	0.621"	0.613"
95	0.632"	0.622"	0.614"
96	0.632"	0.621"	0.615"
97	0.632"	0.622"	0.616"
98	0.632"	0.622"	0.616"
99	0.632"	0.621"	0.616"

APPENDIX E - THE ALARM OUTPUT CONFIGURATION REPORT

ALARM OUTPUT CONFIGURATION REPORT

Tue Jun 04 14:44:29 1966

Alarm Configuration Summary: Output # 1

Delay in Seconds = 0.1
Dwell in Seconds = 0.3

T	Type	Gauge	Limit	Value	Smgs	Row
0	Bond	n/a	n/a	n/a	n/a	
1	Idle					
2	Idle					
3	Idle					
4	Idle					
5	Idle					
6	Idle					
7	Idle					

Alarm Configuration Summary: Output # 2

Delay in Seconds = 0.0
Dwell in Seconds = 0.5

T	Type	Gauge	Limit	Value	Smgs	Row
0	Profile	All	> ELVL	n/a	1	
1	Profile	1	> ELVL	n/a	1	
2	Idle					
3	Idle					
4	Idle					
5	Idle					
6	Idle					
7	Idle					

Alarm Configuration Summary: Output # 3

Delay in Seconds = 0.1
Dwell in Seconds = 0.6

T	Type	Gauge	Limit	Value	Smgs	Row
0	Profile	All	< ELVL	n/a	1	
1	Profile	1	< ELVL	n/a	1	
2	Idle					
3	Idle					

...

ALARM OUTPUT CONFIGURATION REPORT

Tue Jun 04 14:44:29 1966

Alarm Configuration Summary: Output # 4

Delay in Seconds = 0.1
Dwell in Seconds = 0.6

T	Type	Gauge	Limit	Value	Smpls	Row
0	Profile	All	< ELVL	n/a		1
1	Profile	1	< ELVL	n/a		1
2	Idle					
3	Idle					
4	Idle					
5	Idle					
6	Idle					
7	Idle					

Alarm Configuration Summary: Output # 5

Delay in Seconds = 0.1
Dwell in Seconds = 0.4

T	Type	Gauge	Limit	Value	Smpls	Row
0	Profile	All	< WLVL	n/a		1
1	Profile	1	< WLVL	n/a		1
2	Idle					
3	Idle					
4	Idle					
5	Idle					
6	Idle					
7	Idle					

Alarm Configuration Summary: Output # 6

Delay in Seconds = 0.0
Dwell in Seconds = 1.0

T	Type	Gauge	Limit	Value	Smpls	Row
0	Profile	2	> ELVL	n/a		1
1	Idle					
2	Idle					
3	Idle					
4	Idle					
5	Idle					
6	Idle					
7	Idle					

ALARM OUTPUT CONFIGURATION REPORT

Tue Jun 04 14:44:29 1966

Alarm Configuration Summary: Output # 7

Delay in Seconds = 0.0
Dwell in Seconds = 1.0

T	Type	Gauge	Limit	Value	Smps	Row
0	Profile	3	> ELVL	n/a		1
1	Idle					
2	Idle					
3	Idle					
4	Idle					
5	Idle					
6	Idle					
7	Idle					

Alarm Configuration Summary: Output # 8

Delay in Seconds = 0.0
Dwell in Seconds = 0.0

T	Type	Gauge	Limit	Value	Smps	Row
0	Idle					
1	Idle					
2	Idle					
3	Idle					
4	Idle					
5	Idle					
6	Idle					
7	Idle					

APPENDIX F - THE SETUP REPORT

PANEL DATA REPORT

Tue Jun 04 14:44:29 1966

Shift: 1

Software Revision:... 4.24
Setup File:..... prod.dat
Number of Gauges:... 3
 Gauge/Scan Name: 0 Gauge 1
 Gauge/Scan Name: 1 Gauge 2
 Gauge/Scan Name: 2 Gauge 3
Plot Direction:..... Left to Right
No. Active Gauges:... 3
Line Speed:..... 190
Sample Time:..... 1
BMS/TMS:..... BMS & TMS
History:..... Yes
Alarms:..... Yes
Weigh Scale:..... Yes Parallel Before Gauges
Corners:..... Yes
Shading:..... On
Board Length:..... 16 feet
Samples per Board:... 100
Edge Skips:..... 3
Sub Group Size:..... 1
Units:..... ENGLISH
Board Area:..... 32.00 square feet
Density Histogram Limits Low: 55.00 High 65.00
History Drive:..... C
Digital I/O Port:... 0x320
Counter Port:..... 0x0
BMS Port Number:.... 2
Qty BMS gauges:.... 2
Shift Start Times:... 800, 1630, 100, -1
Autosave Days:..... 2
Product Order:..... Sorted by Title
Printer Type:..... Epson LQ
Auto Print:..... No
Product Widths:..... Vary

Definition of Selected Product

PRODUCT 1: 0.625

Bank Number:..... 3
Size of a sample:.. 8
Blow level:..... 200
Blow Size:..... 18
Warning level:..... 190
Warning Size:..... 10

Opening:..... 1
 Unload Seq:.... 1
 Target:..... 0.625
 Delta:..... 0.020
 Warning Level:. 0.007
 Error Level:... 0.014
 Target Weight:. 100.00
 Weight Error:.. 0.010
 Sigma:..... 0.005

Opening:..... 2
 Unload Seq:.... 2
 Target:..... 0.625
 Delta:..... 0.020
 Warning Level:. 0.007
 Error Level:... 0.014
 Target Weight:. 100.00
 Weight Error:.. 0.010
 Sigma:..... 0.005

Opening:..... 3
 Unload Seq:.... 3
 Target:..... 0.625
 Delta:..... 0.020
 Warning Level:. 0.007
 Error Level:... 0.014
 Target Weight:. 100.00
 Weight Error:.. 0.010
 Sigma:..... 0.005

Opening:..... 4
 Unload Seq:.... 4
 Target:..... 0.625
 Delta:..... 0.020
 Warning Level:. 0.007
 Error Level:... 0.014
 Target Weight:. 100.00
 Weight Error:.. 0.010
 Sigma:..... 0.005

APPENDIX H - NET DDE I/O TAG NAMES

TMSReadings

Thickness gauge 1 reading 1	sThk1Pnt1	float	TMS
Thickness gauge 2 reading 1	sThk2Pnt1	float	TMS
Thickness gauge 3 reading 1	sThk3Pnt1	float	TMS
Thickness gauge 4 reading 1	sThk4Pnt1	float	TMS
Thickness gauge 5 reading 1	sThk5Pnt1	float	TMS
Thickness gauge 6 reading 1	sThk6Pnt1	float	TMS
Thickness gauge 7 reading 1	sThk7Pnt1	float	TMS
Thickness gauge 1 reading 2	sThk1Pnt2	float	TMS
Thickness gauge 2 reading 2	sThk2Pnt2	float	TMS
Thickness gauge 3 reading 2	sThk3Pnt2	float	TMS
Thickness gauge 4 reading 2	sThk4Pnt2	float	TMS
Thickness gauge 5 reading 2	sThk5Pnt2	float	TMS
Thickness gauge 6 reading 2	sThk6Pnt2	float	TMS
Thickness gauge 7 reading 2	sThk7Pnt2	float	TMS
.			
.			
Thickness gauge 1 reading 48	sThk1Pnt48	float	TMS
Thickness gauge 2 reading 48	sThk2Pnt48	float	TMS
Thickness gauge 3 reading 48	sThk3Pnt48	float	TMS
Thickness gauge 4 reading 48	sThk4Pnt48	float	TMS
Thickness gauge 5 reading 48	sThk5Pnt48	float	TMS
Thickness gauge 6 reading 48	sThk6Pnt48	float	TMS
Thickness gauge 7 reading 48	sThk7Pnt48	float	TMS

LastPanel

Average Panel Thickness All Gauges	sAveThk	float	TMS
Panel Standard Deviation All Gauges	sStdDev	float	TMS
Average Panel Thickness Gauge 1	s1AveThk	float	TMS
Average Panel Thickness Gauge 2	s2AveThk	float	TMS
Average Panel Thickness Gauge 3	s3AveThk	float	TMS
Average Panel Thickness Gauge 4	s4AveThk	float	TMS
Average Panel Thickness Gauge 5	s5AveThk	float	TMS
Average Panel Thickness Gauge 6	s6AveThk	float	TMS
Average Panel Thickness Gauge 7	s7AveThk	float	TMS
Panel Standard Deviation Gauge 1	s1StdDev	float	TMS
Panel Standard Deviation Gauge 2	s2StdDev	float	TMS
Panel Standard Deviation Gauge 3	s3StdDev	float	TMS
Panel Standard Deviation Gauge 4	s4StdDev	float	TMS
Panel Standard Deviation Gauge 5	s5StdDev	float	TMS
Panel Standard Deviation Gauge 6	s6StdDev	float	TMS
Panel Standard Deviation Gauge 7	s7StdDev	float	TMS
Panel Weight	sWeight	float	TMS
Panel Density	sDensity	float	TMS
Panel Maximum Thickness All Gauges	sMaxThk	float	TMS
Panel Minimum Thickness All Gauges	sMinThk	float	TMS
Panel Maximum Thickness Gauge 1	sMaxThk1	float	TMS
Panel Maximum Thickness Gauge 2	sMaxThk2	float	TMS
Panel Maximum Thickness Gauge 3	sMaxThk3	float	TMS
Panel Maximum Thickness Gauge 4	sMaxThk4	float	TMS

LastPanel (Continued)

Panel Maximum Thickness Gauge 5	sMaxThk5	float	TMS
Panel Maximum Thickness Gauge 6	sMaxThk6	float	TMS
Panel Maximum Thickness Gauge 7	sMaxThk7	float	TMS
Panel Minimum Thickness Gauge 1	sMinThk1	float	TMS
Panel Minimum Thickness Gauge 2	sMinThk2	float	TMS
Panel Minimum Thickness Gauge 3	sMinThk3	float	TMS
Panel Minimum Thickness Gauge 4	sMinThk4	float	TMS
Panel Minimum Thickness Gauge 5	sMinThk5	float	TMS
Panel Minimum Thickness Gauge 6	sMinThk6	float	TMS
Panel Minimum Thickness Gauge 7	sMinThk7	float	TMS
Average Thickness 1 st half of panel	sAveThkFr	float	TMS
Average Thickness 2 nd half of panel	sAveThkRe	float	TMS
Number of Blows in Zone 1	sBmsZone1	short	BMS
Number of Blows in Zone 2	sBmsZone2	short	BMS
Number of Blows in Zone 3	sBmsZone3	short	BMS
Number of Blows in Zone 4	sBmsZone4	short	BMS
Number of Blows in Zone 5	sBmsZone5	short	BMS
Number of Blows in Zone 6	sBmsZone6	short	BMS
Number of Blows in Zone 7	sBmsZone7	short	BMS
Number of Blows in Zone 8	sBmsZone8	short	BMS
Number of Blows in Zone 9	sBmsZone9	short	BMS
Panel ID (number)	sPanelID	short	Both
Panel Opening Number	sOpening	short	Both
Press Load Number within Product	sPress	short	Both

LastPress

Press Average Thickness Gauge 1	sPressAveThk1	float	TMS
Press Average Thickness Gauge 2	sPressAveThk2	float	TMS
Press Average Thickness Gauge 3	sPressAveThk3	float	TMS
Press Average Thickness Gauge 4	sPressAveThk4	float	TMS
Press Average Thickness Gauge 5	sPressAveThk5	float	TMS
Press Average Thickness Gauge 6	sPressAveThk6	float	TMS
Press Average Thickness Gauge 7	sPressAveThk7	float	TMS
Press Standard Deviation Gauge 1	sPressStdDev1	float	TMS
Press Standard Deviation Gauge 2	sPressStdDev2	float	TMS
Press Standard Deviation Gauge 3	sPressStdDev3	float	TMS
Press Standard Deviation Gauge 4	sPressStdDev4	float	TMS
Press Standard Deviation Gauge 5	sPressStdDev5	float	TMS
Press Standard Deviation Gauge 6	sPressStdDev6	float	TMS
Press Standard Deviation Gauge 7	sPressStdDev7	float	TMS
Average Weight for Press	sPres-AveWeight	float	TMS

Miscellaneous MM

BMS Chanel Count Message & Password Error	sLogo	string	BMS
Msg			
Product	sProduct	string	Both
Blow Size	sBlow_Size	short	BMS
Blow Level	sBlow_Level	short	BMS
Password for Blow Level Change	sBlowPassword	string	BMS

BMS – Defined if customer system installed with BMS.

TMS – Defined if customer system installed with TMS.

Both – Always defined.

Float – Passed as a floating point number.

Short – Passed as a short (16 bit) binary integer.

String – Passed as a character string.