

SlimWare 2.1 User's Manual

Revision: E

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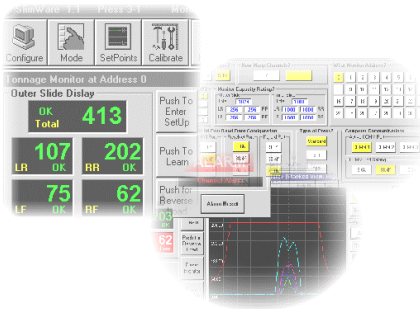
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SlimWare

Introduction

Thank you for purchasing SlimWare, the latest software development from Toledo Integrated Systems that will enable you to easily interface to our line of Signature analysis load monitors.

SlimWare is a 32 bit Windows based software package exclusively developed for Toledo Integrated Systems' SLIM (Signature Load Interface Module) load monitor. SlimWare can also be used with the N260 series of load monitors, however this manual's main focus is toward the use of the Slim. When these load monitors are used in conjunction with resolver-based systems, the units are able to sample the process at each degree, thus allowing the process signature to be acquired and digitized. When these load monitors are used in conjunction with SlimWare, control of the monitor, and analysis of your process's signature are only a touch away.

SlimWare has been designed with touch screen computers in mind. Each screen of the user interface is easily navigated through the use of toolbar buttons and large icons for high visibility. Ease of use was an important factor in the development of this software package.

Before you begin the installation of SlimWare, the following recommendations and notices are given:

- You should be familiar with Microsoft's Windows operating system. (Windows 95, 98, 2000, XP or NT 4.0)
- You should be familiar with using a mouse as a pointing device.
- Your PC should have Windows 95, 98, 2000, XP or NT 4.0 (or later). SlimWare will not function in a DOS or Windows 3.1 environment.
- Your PC should have at least a 133Mhz Pentium or equivalent. Since SlimWare is graphic intensive, performance degradation may be noticeable on systems that have 486-based processors.
- Your PC should have at least 32Mb of memory
- Your PC display should have at least 640 x 480 resolution with at least 256 colors. SlimWare was exclusively developed for touch screen computers with 640 x 480 flat panel displays that have the ability to display 256 colors. If your display device has a higher resolution than 640x480, it is highly recommended to use SlimWare at a resolution of 800 x 600 with a color depth of 65536 (high color). Unpredictable results can occur if the resolution is 1024 x 768 or higher.
- Your PC hard drive should have at least 15 Meg of available space.
- Your PC must have a mouse or Touch screen interface. SlimWare was developed for touch screen and/or mouse driven systems. Some keyboard functions are not implemented.
- Your PC must have a RS232 port or a RS485 port. The available ports are Comm1 through Comm4. If your PC fits the above recommendations, then you're ready to install SlimWare.



1 SlimWare Installation

SlimWare is distributed on two, 3.5" floppy disk in a compressed file format. Before the software can be used, the files must be uncompressed and installed to a directory on your PC hard drive. To begin the SlimWare installation, follow these steps:

- Close all programs that are currently running.
- Locate disk 1 of the SlimWare installation disk pack.
- Place this disk in drive A: (or whatever the letter designation of your floppy drive may be).
- Select the Windows **Start** button.
- Select **Run** from the Windows drop down menu. The **Run** dialog box should appear.
- In the **Open:** box, type **A:\Setup.exe**, where **A:** represents the designation of your floppy disk drive on your computer.
- Select the **OK** button on the **Run** dialog box. The installation of SlimWare will begin.
- Follow the directions given. **It is highly recommended that the default directory of C:\Program Files\SlimWare (where C: represents the hard drive designation on your computer) be used as the installation destination for the software.**

The installation of SlimWare may be stopped at any time and resumed later. To resume the installation process, simply repeat the above steps.

2 Interface Connections

After the SlimWare installation has been completed, your PC's serial data port must be connected to the serial data port of the Slim load monitor that is designated as RS485-1. If your PC has a RS485 port, refer to Figure 2.1 for the correct connections to the Slim. If your PC has a RS232 port, refer to Figure 2.2 for the correct connections to the Slim.

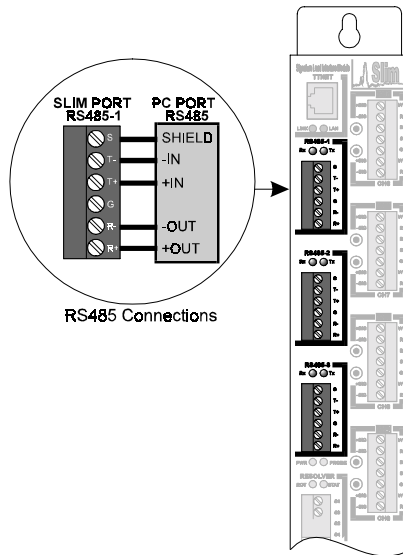


Figure 2.1 - RS485 Connections

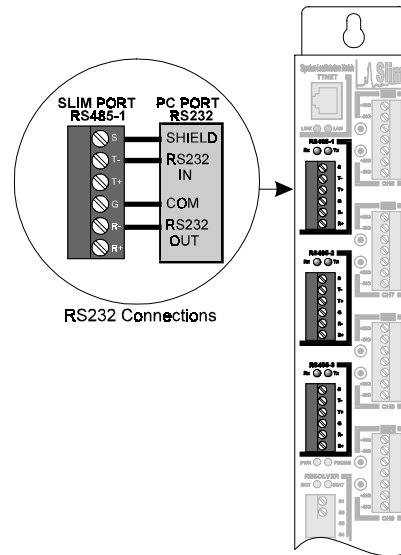


Figure 2.2 - RS232 Connections

After the appropriate connections have been established between the PC serial data port and the Slim load monitor, SlimWare is ready to be started. Follow the instructions in the next section to begin using SlimWare.

3 Starting SlimWare

To begin using SlimWare, click on Window's Start button (usually in the lower left corner of the task bar) . From the fly out menu, select Programs, then select SlimWare. The **Comm Port Selection** dialog box will appear as shown in Figure 3.1.

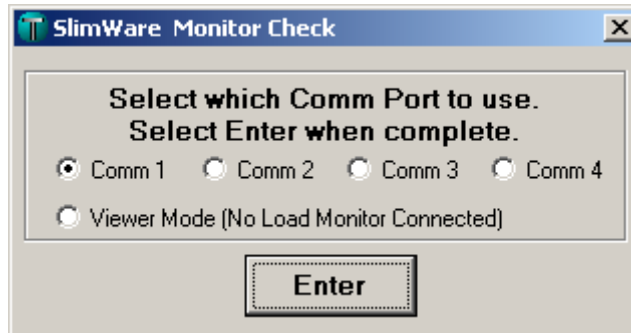


Figure 3.1 - Selecting the correct PC Comm Port or Viewer Mode

Click the Comm Port button that represents the physical connection between your PC Comm Port and the SLIM load monitor or select Viewer Mode (no load monitor connected). Once you have selected the correct Comm port, click **Enter** to continue. If you select a Comm port that is not supported in your PC, or if the serial data port is already in use, SlimWare will inform you of the error as shown in Figure 3.2. Choose "Continue" to select another COMM port, or "Exit" to quit SlimWare and return to the desktop. Selecting Viewer Mode will permit the use of program without load monitor connected for viewing signatures (other functions inoperative without load monitor connection).

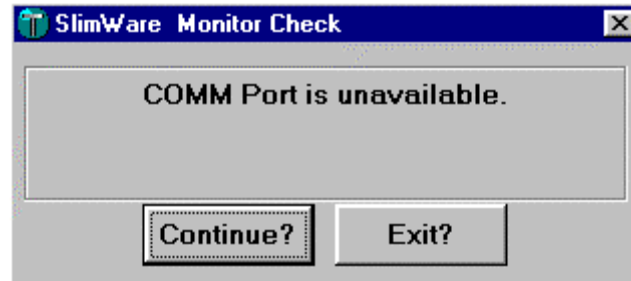


Figure 3.2 – Selected Comm Port is Unavailable

If your PC supports the Comm port selected, the **Monitor Search** dialog box will appear as shown in Figure 3.3. SlimWare is now actively searching for an online Slim load monitor. During this phase of the software operation, SlimWare will search for an online Slim load monitor at addresses 0 through 31 using baud rates of 9600, 38400, and 115200. The progress bar indicates the status of the search. This search can take several minutes to complete if the address of the monitor is 31, and the unit's baud rate is 115200.

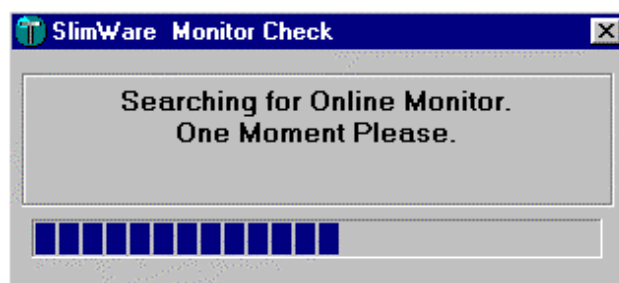


Figure 3.3 - SlimWare Monitor Search Dialog Box

3 Starting SlimWare – continued

If SlimWare finds that there is no Slim load monitor attached when a comm port is selected, a **Monitor Search Error** will occur as shown in Figure 3.4. If this happens, determine if the Slim load monitor has power applied. If power is applied, then check all connections between your PC and the Slim load monitor. If the connections appear to be correct, then make sure the correct PC Comm port was selected. Click OK to close the **Monitor Search Error** box, then restart SlimWare to resume a new search.



Figure 3.4 - Monitor Search Error Dialog Box

If SlimWare is successful at finding an online Slim load monitor, the address and detected baud rate will be verified and the main SlimWare module will be loaded as shown in Figure 3.5 (except in Viewer Mode).

Tonnage Monitor at Address 0

Outer Slide

OK Total **128**

LR **39** OK RR **27** OK

LF **17** OK RF **50** OK

Inner Slide

OK Total **158**

LR **49** OK RR **34** OK

LF **21** OK RF **63** OK

Buttons: Push To Enter SetUp, Push To Learn, Push for Reverse Load, Reset Monitor, Reset Display, Help

Normal Peak CCM (Envl) STD

System Details

Press # Part # Help

Die # Description

Monitor Job # Down Time: **00:00:00** SPM: **65**

Part Count: **106** Parts To Go: **0**

Outer Slide	Total	LR	RR	LF	RF
Capacity	800	200	200	200	200
High Setpoint	207	59	47	37	71
Low Setpoint	48	19	8	0	31
Benchmark	127	39	28	17	51
Benchmark High%	10	10	10	10	10
Benchmark Low%	10	10	10	10	10
Threshold	800				
Inner Slide					
Capacity	1000	250	250	250	250
High Setpoint	259	74	59	47	88
Low Setpoint	60	24	9	0	38
Benchmark	159	49	34	22	63
Benchmark High%	10	10	10	10	10
Benchmark Low%	10	10	10	10	10
Monitor Program	5121				
Press Angle	337				

Figure 3.5 – SlimWare Tonnage Monitor and Detail Window

The screen displayed may differ than that shown, depending on whether the online Slim load monitor is a four channel unit or an eight channel unit. At this point, SlimWare is fully loaded and functional. SlimWare can now be used to monitor your application.

4 SlimWare's Main ToolBar

Figure 4.1 depicts the main toolbar of SlimWare. Directly above the main toolbar, resides the main title bar of SlimWare. This title bar contains the latest software revision number, the press number that SlimWare has been configured to monitor, the current job number of the monitor, the current date, and the current time. When a toolbar is selected, that button's associated window will appear. Menu buttons are enabled/disabled according to password level. Supervisor/Master password level will display all buttons. Setup password level will display all buttons except Configure, Mode and Calibrate. The Operator password level will display all buttons except Configure, Mode, SetPoints, Calibrate and Statistics. Details of each toolbar function are explained in the sections that follow.



Figure 4.1 - SlimWare's Main ToolBar

5 Configuration ToolBar Function (Configure SLIM)



The **Configuration** toolbar function provides dual functionality with the use of a single toolbar button. The initial selection enables the SLIM Tonnage Monitor Configuration window as shown in Figure 5.1. Selecting the toolbar button again, will enable the SLIMWARE Configuration window that will be discussed in Section 6. The SLIM Tonnage Monitor Configuration is used to initially set up the online Slim load monitor. It is also used as a quick reference guide as to how the online Slim load monitor is configured. The SLIM Configuration window is explained in detail below. Parameters on the SLIM Configuration window are password protected. See the **Data Lock** toolbar function for password entry instructions.

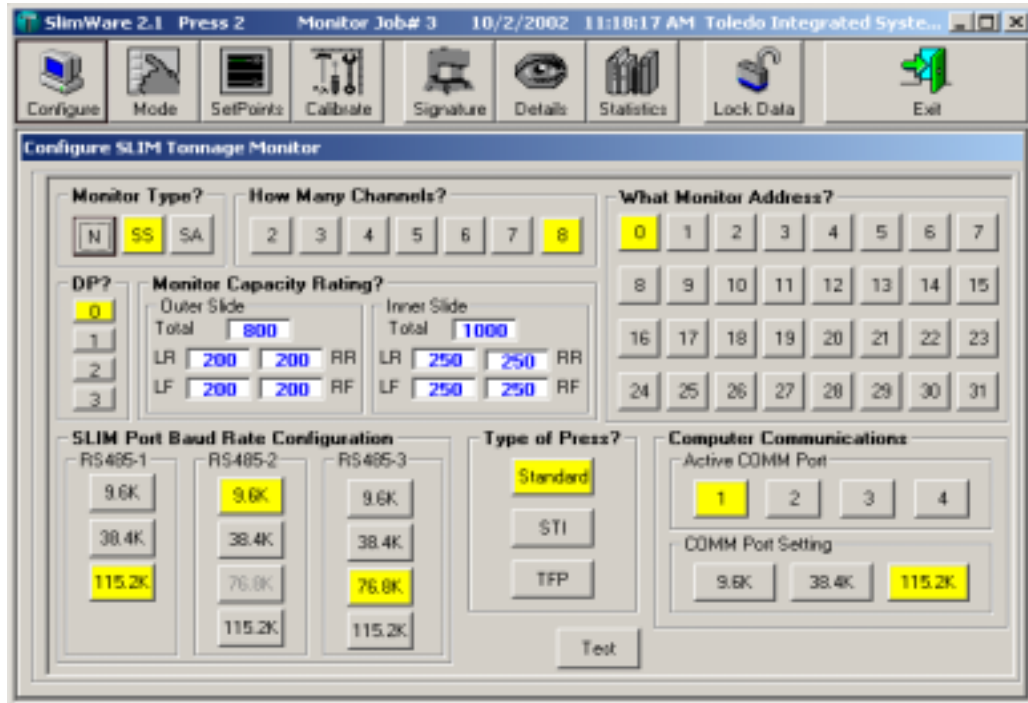


Figure 5.1 - SLIM Tonnage Monitor Configuration Window

Monitor Type: Defines/displays the type of load monitor SlimWare will be interfaced with. The default monitor type is Standard SLIM. The button designations are as follows: N = N260 monitor SS = Standard SLIM SA = Slim with ANALOG peak output option.

How Many Channels: Defines/displays the number of channels the online load monitor has been configured for.

What Monitor Address: Defines/displays the communication address of the online load monitor.

DP: Defines/displays the number of decimal places the online load monitor will use in displaying load values and related data.

Monitor Capacity Rating: Defines/displays the maximum load values per channel that the online load monitor is configured for. For eight channel units, the inner slide values become active. To change the capacity rating of the online load monitor, select the channel of interest, then enter the value. If data is entered into the Total box, the capacity value will be equally divided amongst the channels. As an example, if you enter 1000 into the Total box, the other channels will equal 250. If you have an eight channel load monitor, capacity values are entered separately for the outer and inner slides.

SLIM Port Baud Rate Configuration: Defines/displays the baud rate settings for the three communication ports of the Slim load monitor. This parameter field is unavailable if the N260 type monitor is selected in the Monitor Type box. The HMI port is associated with the Slim port designated as **RS485-1**.

Type of Press: Displays the type of press SlimWare is monitoring. The other functions of STI and TFP are currently not supported.

Computer Communications: Displays the host computer's serial data port number and baud rate settings that SlimWare is configured for. Port number is determined at SlimWare startup. Baud rate is determined by HMI port baud rate settings.

Help: Available online help for the SLIM Configuration page.

Test: Factory test unavailable to end users. Factory authorized password is needed to gain access.



6

Configuration ToolBar Function (Configure SlimWare)



Selecting the **Configuration** toolbar after the Configure SLIM Tonnage Monitor window is displayed, enables the Configure SlimWare window as shown in Figure 6.1. Selecting the toolbar button again, will return the user to the Configure SLIM Tonnage Monitor window.

The SlimWare configuration window is used to initially set up SlimWare software. It also serves as a quick reference guide as to how SlimWare is configured. The SlimWare configuration window is explained in detail below. Parameters within this window are Supervisor/Master password protected. The Supervisor/Master password must be entered before access is granted to this page. See the **Data Lock** toolbar function for password entry instructions.

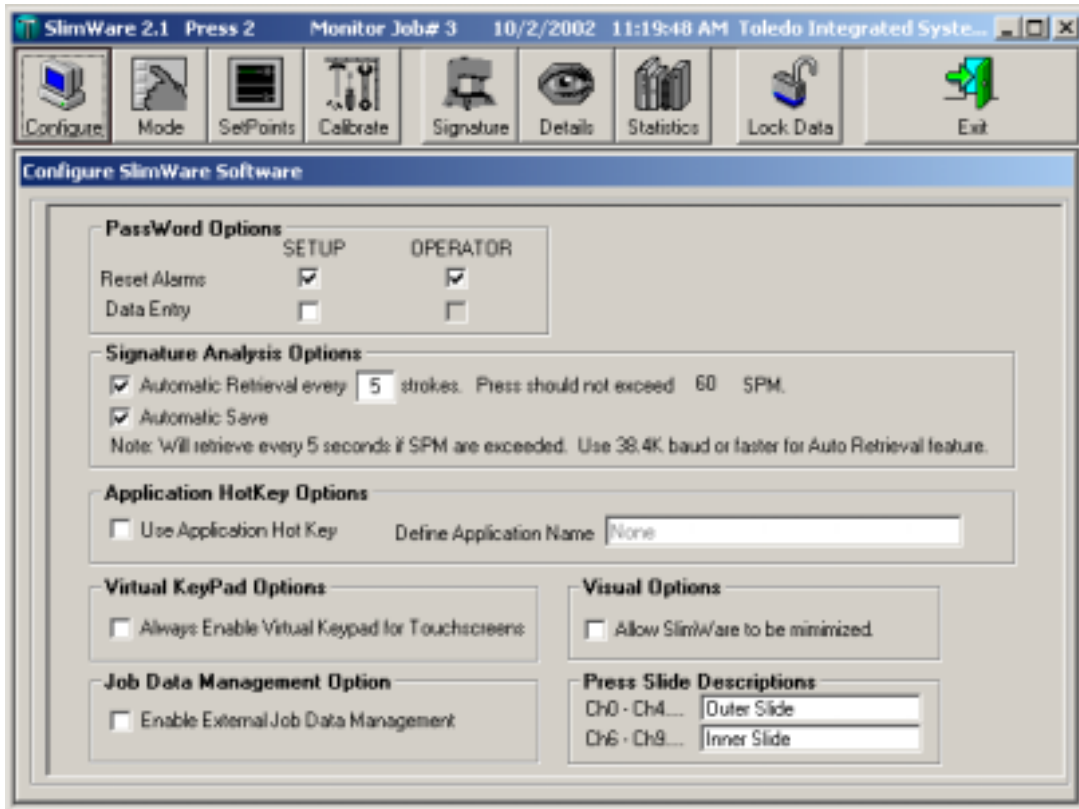


Figure 6.1- SlimWare's Configuration Window

PassWord Options

Reset Alarms: If this option is selected, the listed password level user (SETUP or OPERATOR) can reset alarms.

Data Entry: If this option is selected, the SETUP level password user can enter data.

Signature Analysis Options: Selecting "Automatic Retrieval" enables or disables the automatic retrieval of signature data from the online tonnage monitor. If this option is selected, signatures will be automatically retrieved at selected SPM intervals. Maximum SPM are listed for a given stroke interval. Selecting "Automatic Save" will also automatically save signatures to a file if automatic signature retrieval is also turned on.

Application HotKey Options: Selecting this option enables the use of the application hotkey. Using the hotkey will bring another application to the foreground. You must enter the application name in the 'Define Application Name' data field. The application name is the name that appears in the title bar of the running application.

Virtual Keypad Options: Selecting this option will allow the virtual keypad to be displayed each time a data entry box is selected. This option is usually used with systems that have a touch screen as the user interface.

Visual Options: When selected, this option will allow SlimWare to be minimized on the Windows desktop. By default, SlimWare is not allowed to be minimized.

Job Data Management Option: This option allows data to be inputted to SlimWare from an external file.

Press Slide Descriptions: Entering data into these data fields allows the user to change the descriptions of the slides.

Help: Available online help for the SlimWare Software Configuration page.

7 Mode ToolBar Function



The **Mode** toolbar function will enable the Tonnage Monitor window and the System Mode Parameters window as shown in Figure 7.1. The Tonnage Monitor window displays the latest load data, while the System Mode Parameters window is used to display and change operating modes, alarm enabling settings, and various other features incorporated into the online load monitor. Changing parameters on the System Mode Parameters window requires password entry. See the **Lock Data** toolbar function for password entry instructions. Details for the Tonnage Monitor window and the System Mode Parameter window are explained in the following sections.

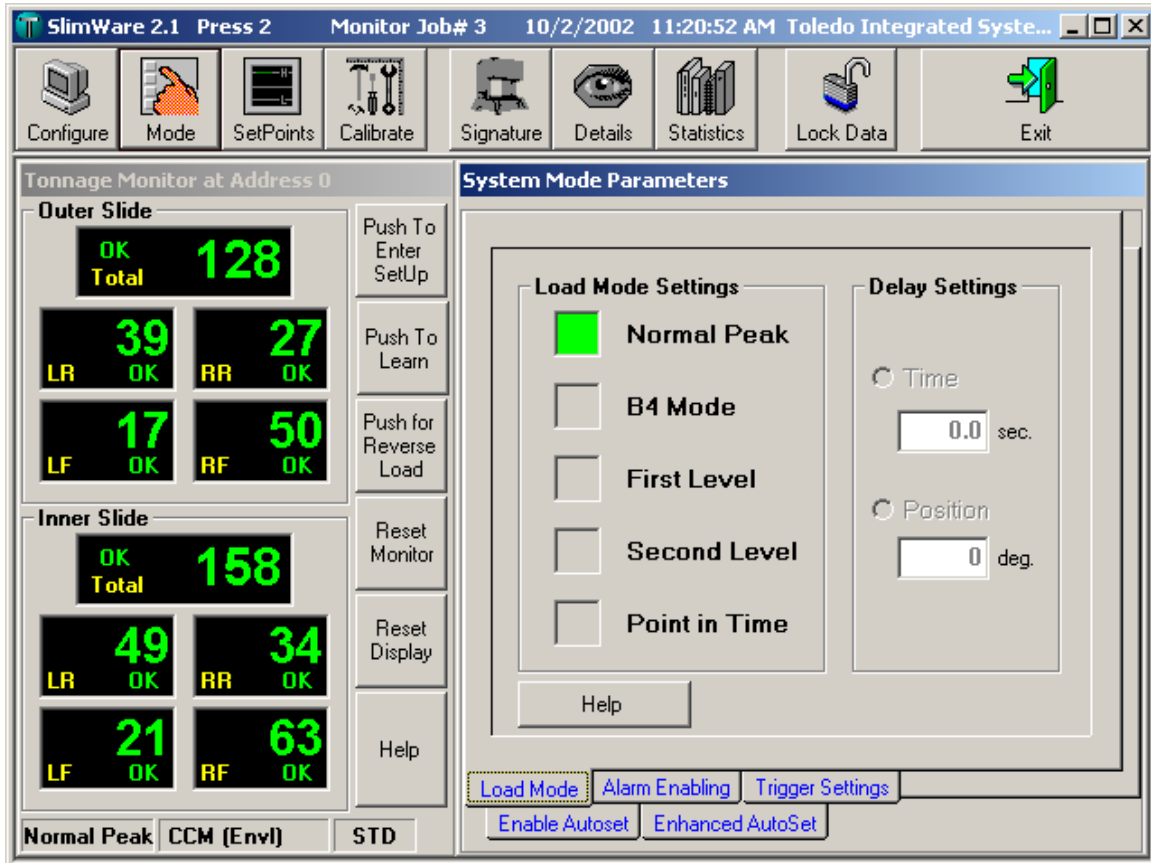


Figure 7.1 - SlimWare's Tonnage Monitor and System Mode Parameters windows

7 Mode ToolBar Function - continued



Tonnage Monitor Window

The **Tonnage Monitor** window shown in Figure 7.2, is always visible when the System Mode Parameters window is active. This allows the user to continuously track load and alarm status while viewing or changing the online Slim's operating mode characteristics. To the right of the tonnage monitor display are six buttons that are used to control the operation of the online Slim load monitor. The explanation of the Tonnage Monitor window follows.

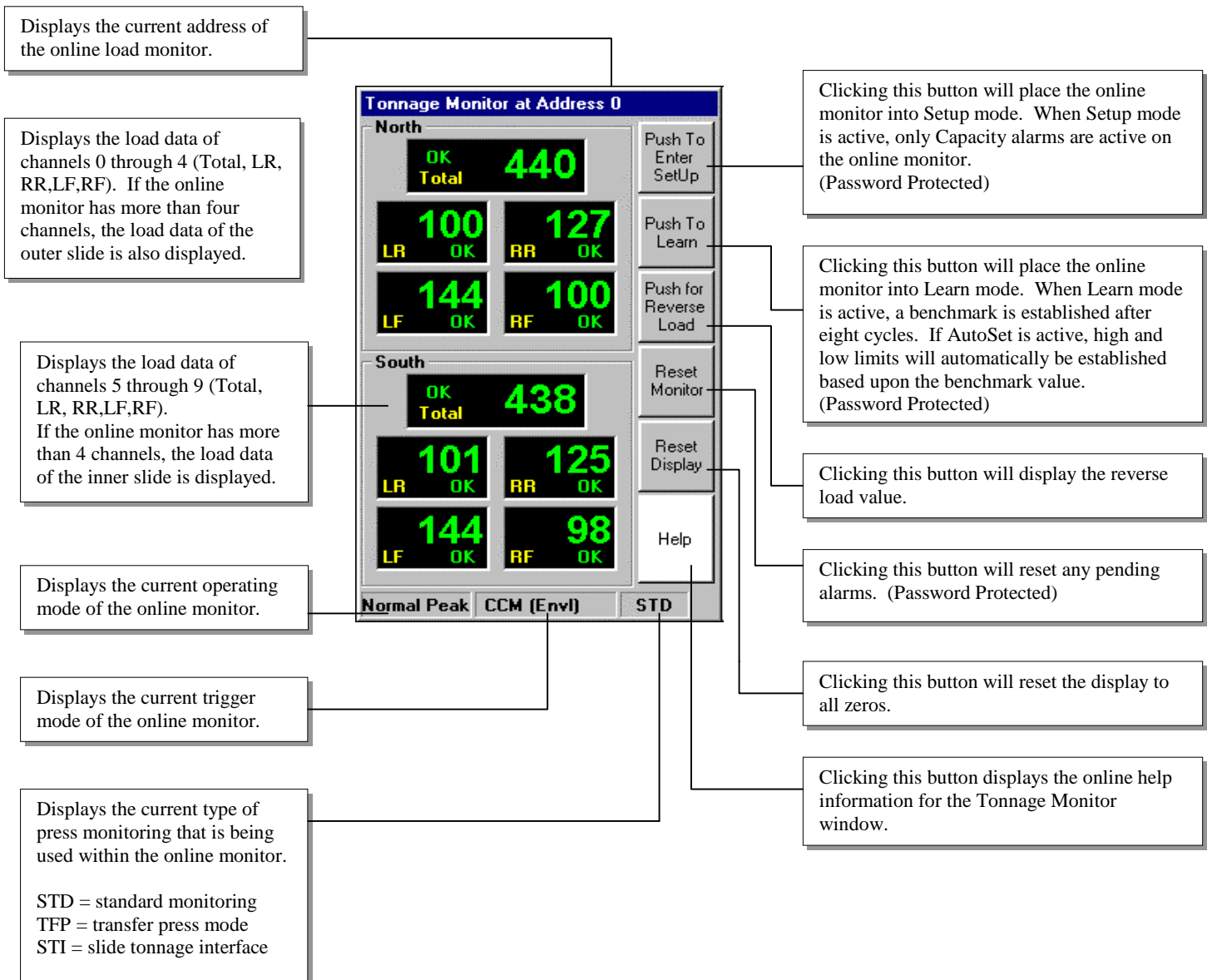


Figure 7-2 – Tonnage Monitor Window Details



7 Mode ToolBar Function - continued



System Mode Parameters Window

The **Systems Mode Parameters** window is used to display or set various operating characteristics of the online Slim load monitor. The window is divided into five separate sub-functions, each being displayed at the lower portion of the window. When a sub-function is selected, the components of that sub-function become available to the user. These sub-functions are **Load Mode**, **Alarm Enabling**, **Trigger Settings**, **Enable Autoset**, and **Enhanced Autoset**.

System Mode Parameters Window - Load Mode

The **Load Mode** sub-function sets the operating mode of the online Slim load monitor. Selecting an operating mode only allows that mode to be active. Figure 7.3 details the components of the **Load Mode** sub-function.

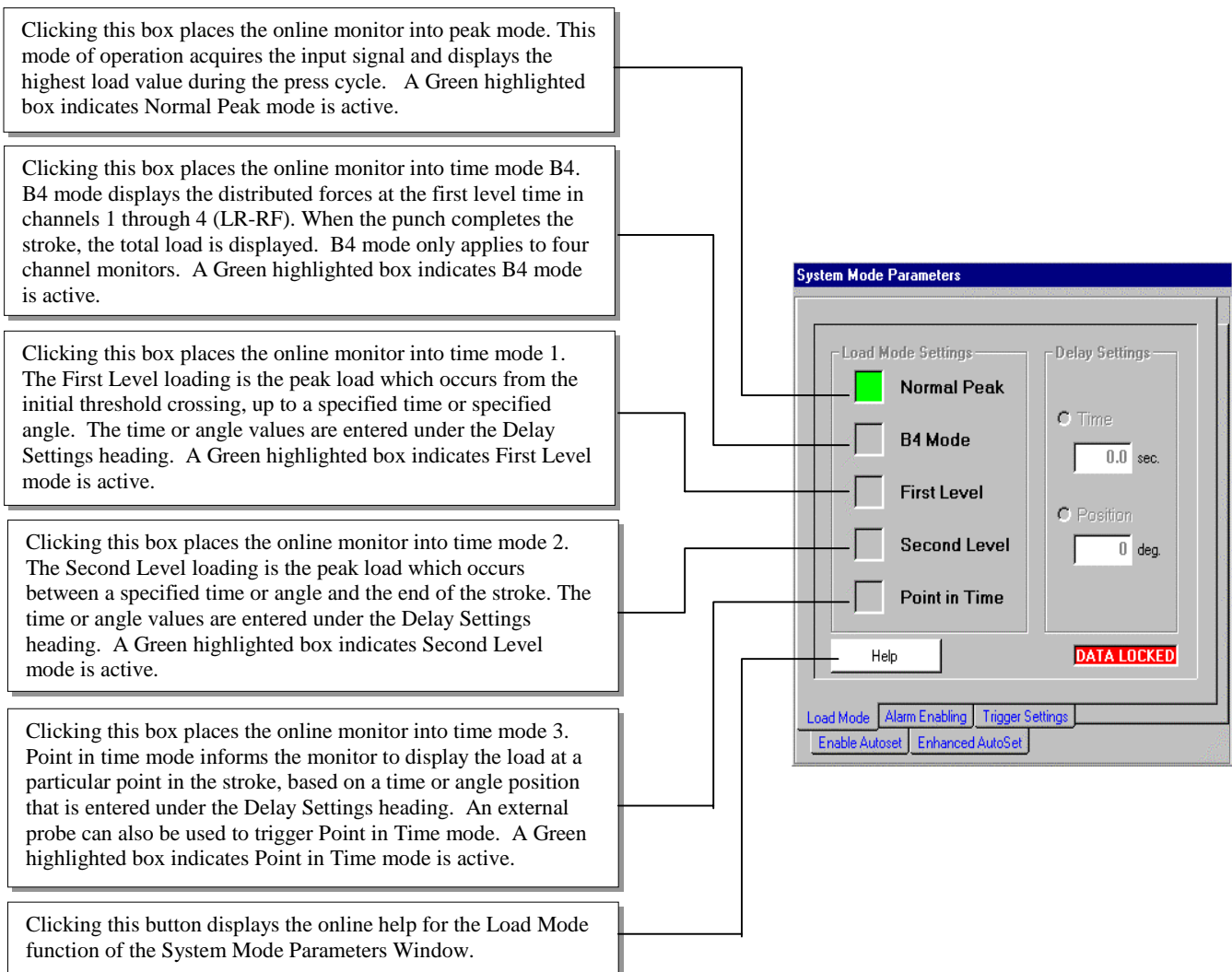


Figure 7.3 - System Mode Parameters Window - Load Mode Details

7 Mode ToolBar Function - continued



System Mode Parameters Window - Alarm Enabling

The **Alarm Enabling** sub-function allows specified alarm types of the online Slim load monitor to be enabled or bypassed. When an alarm type is enabled, any setpoint violation for that alarm type will cause the online Slim's shutdown relay to be activated. If an alarm type is bypassed, setpoint violations for that alarm type are ignored. Figure 7.4 details the Alarm Enabling sub-function of the System Mode Parameters window.

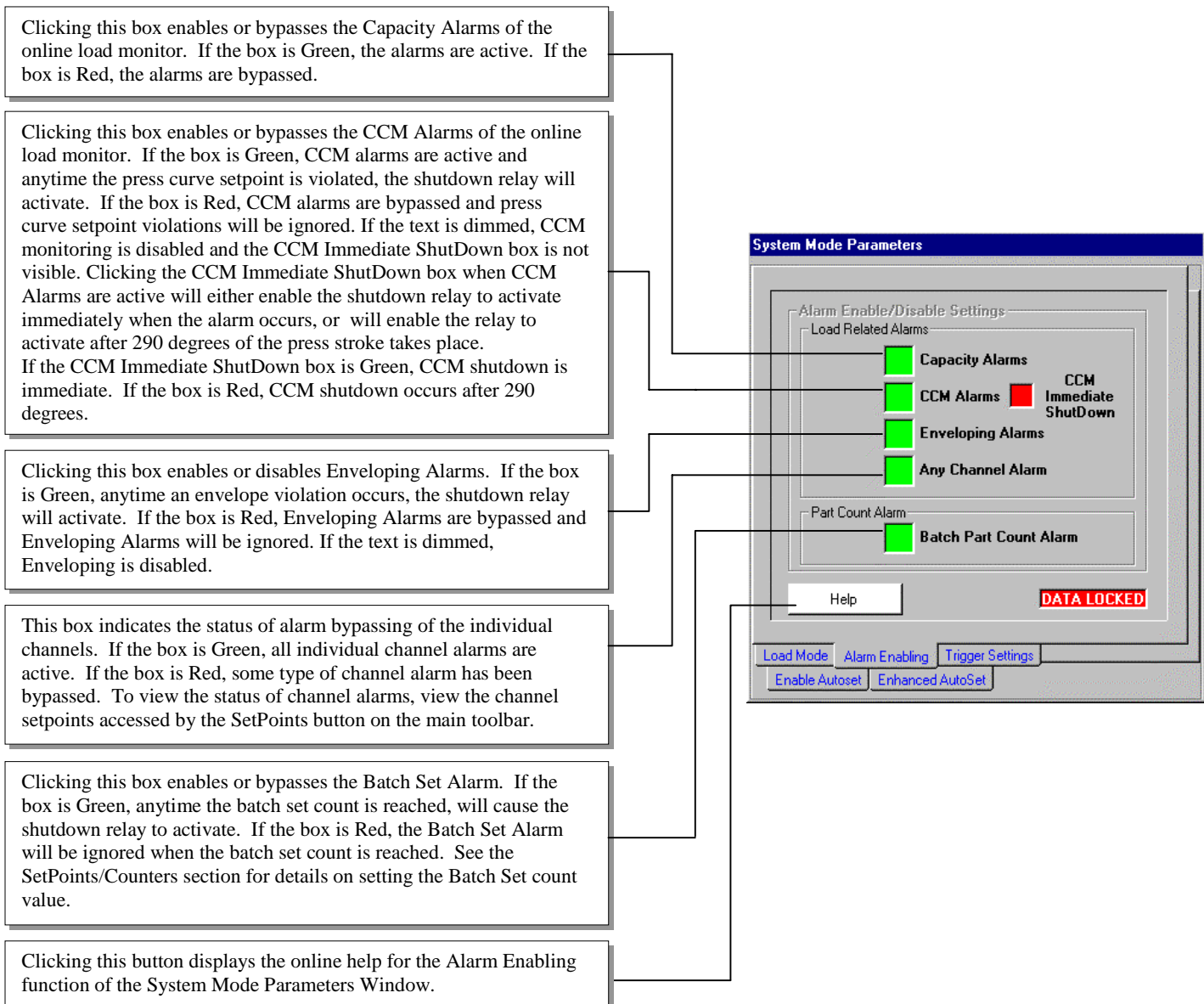


Figure 7.4 - System Mode Parameters Window - Alarm Enabling Details

7 Mode ToolBar Function - continued



System Mode Parameters Window - Trigger Settings

The **Trigger Settings** function controls how the online Slim load monitor is triggered. There are currently three modes for trigger and each is detailed in Figure 7.5.

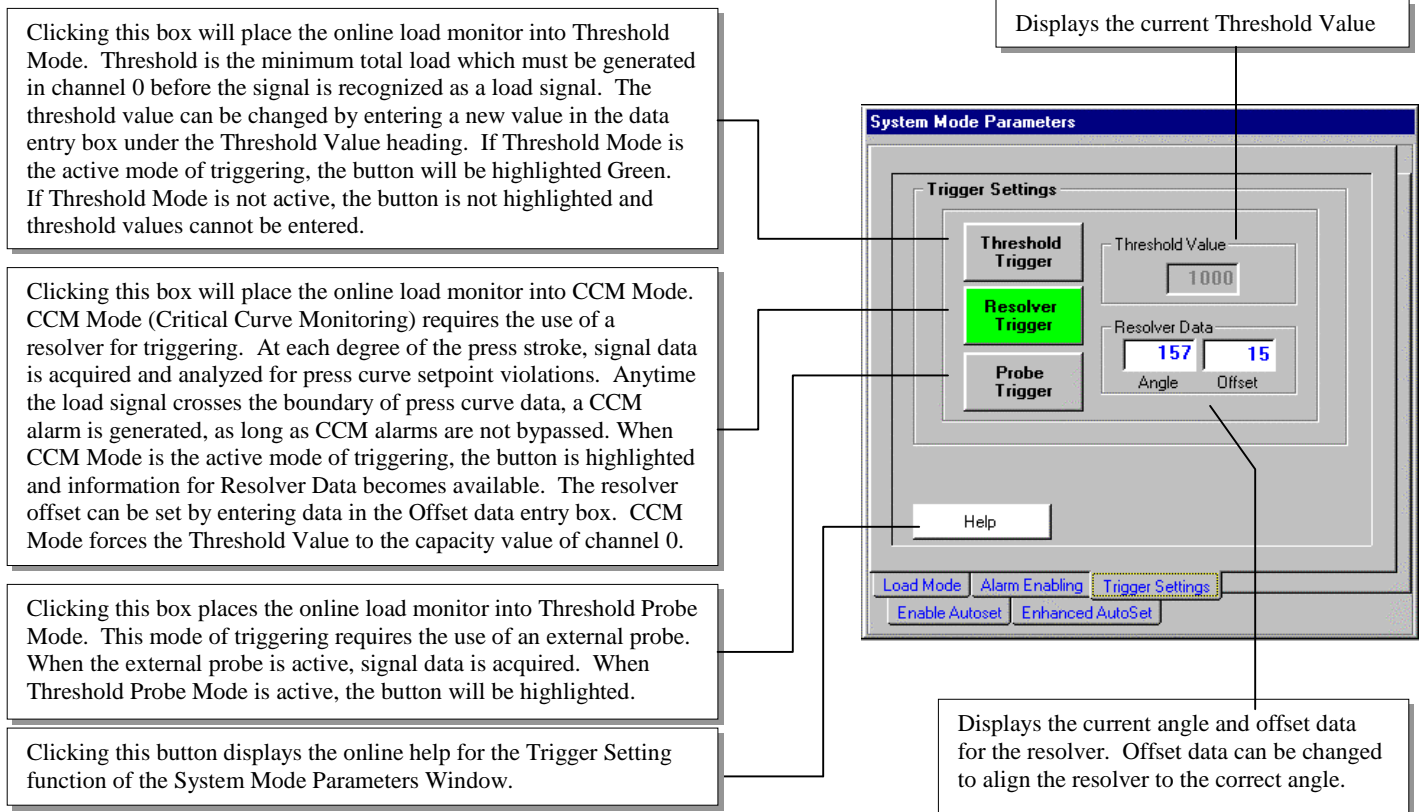


Figure 7.5 - System Mode Parameters Window - Trigger Setting Details

7 Mode ToolBar Function - continued



System Mode Parameters Window - Enable Autoset

The **Enable Autoset** function controls how the online Slim load monitor will calculate automatic setpoint values. Two modes of Autoset are available. These modes are standard Autoset, and Envelope Autoset. When standard Autoset is enabled, the online load monitor will calculate a benchmark value after eight strokes of the press cycle have occurred. Once the benchmark is established, high and low alarm limits are then calculated, based on a specified percentage value. The calculation of the high and low alarm limits can either be based upon a percentage of the capacity of the press, or as a percentage of the benchmark value. If Autoset is disabled, high and low alarm limits can be entered manually. See the "SetPoints ToolBar Button" for a detailed explanation on how to enter high and low alarm limits and the specified percentage value for use in Autoset modes.

The Enable Envelope Autoset function operates in much the same manner as standard Autoset except the high and low alarm limits are calculated at each degree of the input signal, beginning at 35 degrees and ending at 290 degrees. In order for this function to operate correctly, a resolver must be used as the triggering device to the online load monitor. This function must be enabled in order to view enveloping with signature.

Refer to Figure 7.6 for a detailed explanation of Autoset functions.

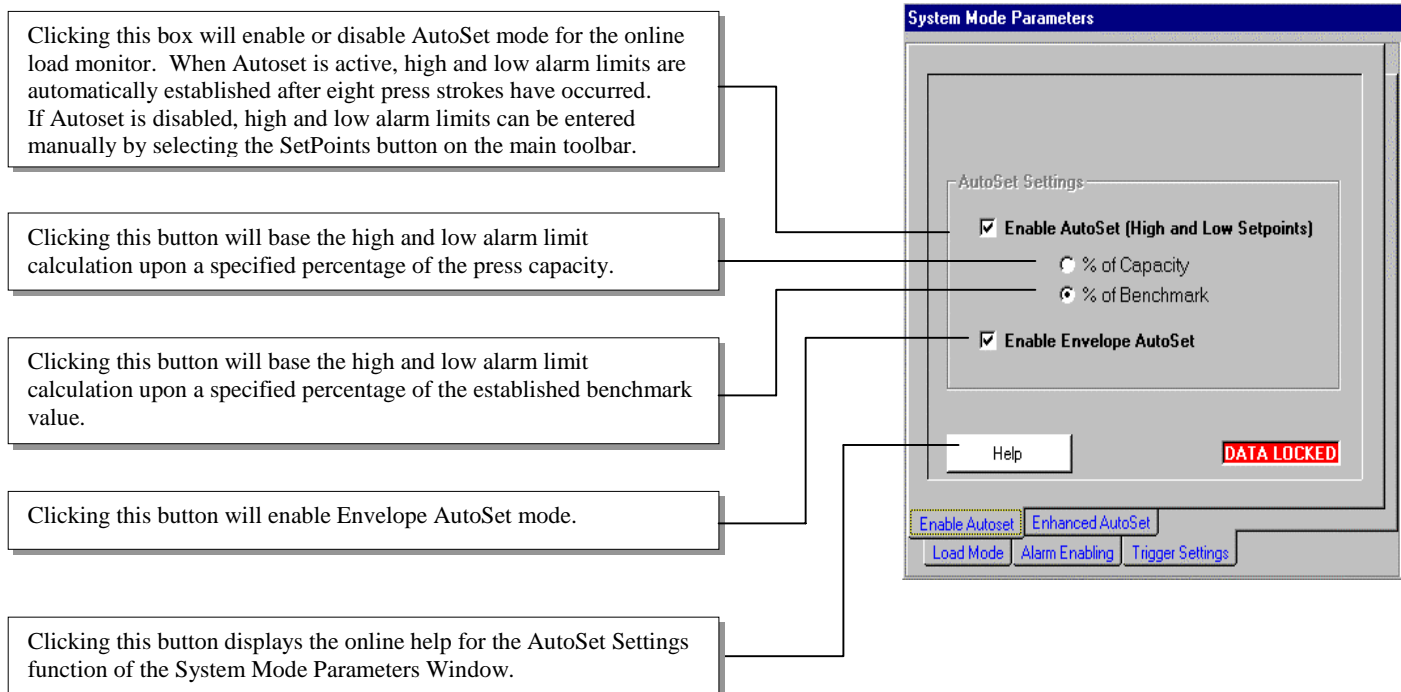


Figure 7.6 - System Mode Parameters Window - Enable Autoset Details

7 Mode ToolBar Function - continued



System Mode Parameters Window - Enhanced AutoSet

The **Enhanced AutoSet** sub-function is used in conjunction with Toledo Integrated Systems' PressNet program. In order for this sub-function to operate correctly, users must have the cookbook feature of PressNet installed on their main PC server. Enhanced AutoSet has been implemented for future compatibility with PressNet. If you do not have PressNet's cookbook feature, the Phase 1 and Phase 3 parameters should be set to zero. See the PressNet user's manual for details on the functionality of Enhanced AutoSet. Select SlimWare's Enhanced AutoSet's online help button for a detailed explanation of this feature.

Refer to Figure 7.7 for a view of the Enhanced AutoSet page.

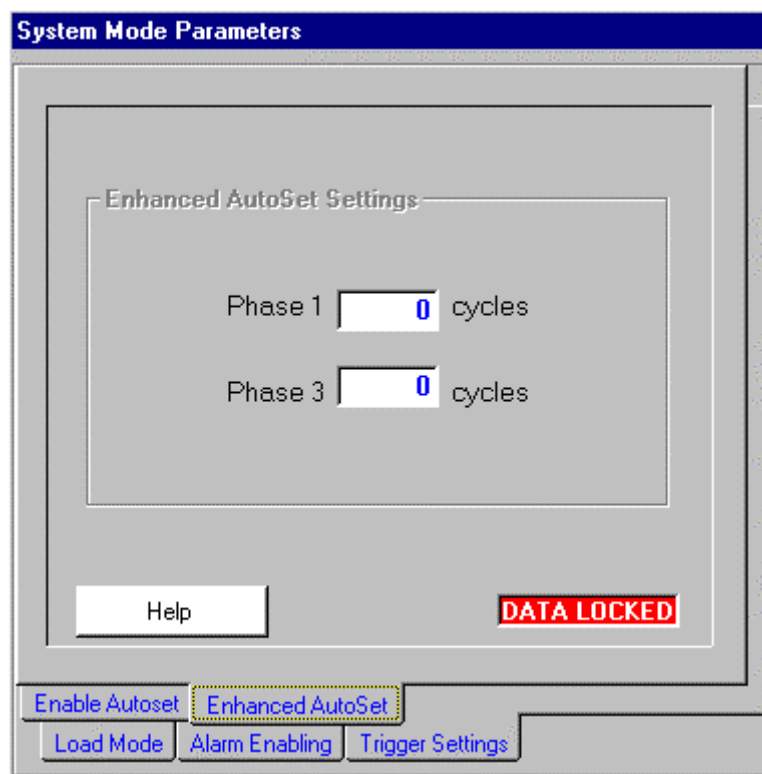


Figure 7.7 - System Mode Parameters Window - Enhanced AutoSet

8 SetPoints ToolBar Function



The **SetPoints** toolbar function will enable the Tonnage Monitor window and the System SetPoints window as shown in Figure 8.1. The Tonnage Monitor window displays the latest load data, while the System SetPoints window is used to display and change alarm limits, benchmark percentage values, and counter parameters. The System SetPoints window is divided into five sub-functions. These sub-functions are **Capacity, High Setpoints, Low Setpoints, Benchmark, and Counters**. When a sub-function is selected, the parameters of that sub-function become available to the user. You must enter a password before parameters on the System SetPoints window can be changed. See the **Lock Data** toolbar function for password entry instructions. The details of the System SetPoints sub-function follows.

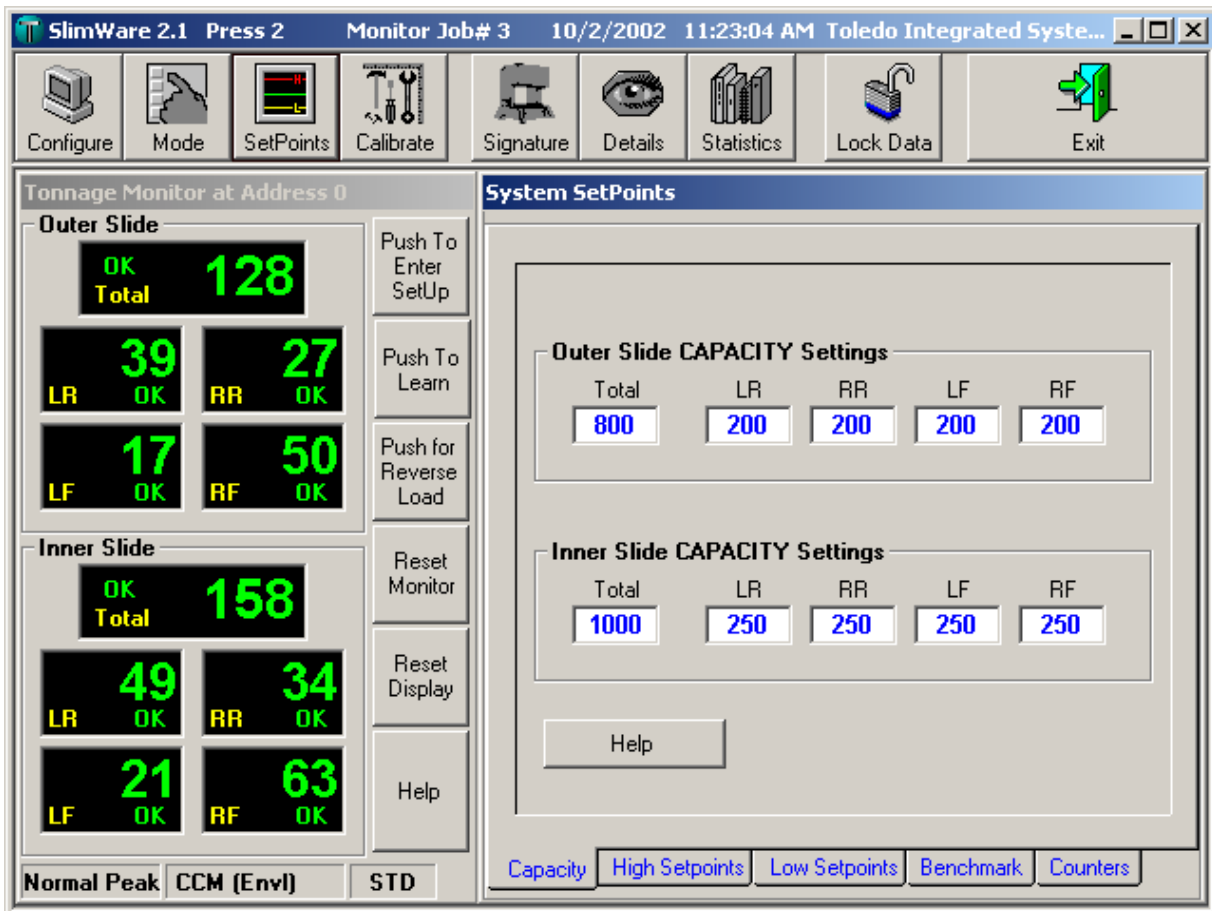


Figure 8.1 - SlimWare's Tonnage Monitor and System SetPoints Windows.

8 SetPoints ToolBar Function - continued



System SetPoints Window

The **System SetPoints** window is used to display or set the various alarm limit values and operating parameters of the online Slim load monitor. Figure 8.2 details the Capacity sub-function. Capacity values cannot be changed from this window. Capacity values can only be changed from the Configuration window. See the **Configuration ToolBar Function** for instructions on how to enter Capacity values.

System SetPoints Window - Capacity

Displays the Capacity setpoint values for the Total, LR, RR, LF, and RF corners of the press being monitored. If the online monitor has more than four channels, the Outer Slide Capacity values are displayed.

Displays the Capacity setpoint values for the Inner Slide of the press being monitored. If the online monitor has four channels or less, the Inner Slide Capacity values are not visible.

Clicking this button displays the online help for the Capacity Settings function of the System Setpoints Window.

System SetPoints

North CAPACITY Settings

Total	LR	RR	LF	RF
1000	250	250	250	250

South CAPACITY Settings

Total	LR	RR	LF	RF
1000	250	250	250	250

DATA LOCKED

Capacity
High Setpoints
Low Setpoints
Benchmark
Counters

Figure 8.2 - System SetPoints Window - Capacity

8 SetPoints ToolBar Function - continued



System SetPoints Window - High SetPoints

The **High SetPoints** sub-function allows the high alarm limits of the online Slim load monitor to be displayed or changed. Individual channel alarms can be disabled by simply clicking the alarm enable/disable box directly above the channel of interest. The occurrence of high alarms are ignored in those channels that have their high alarm monitoring disabled. To re-enable a high alarm for a particular channel, simply re-click the alarm enable/disable box that is associated with the channel of interest. Figure 8.3 details the High SetPoint sub-function of the System SetPoints Window.

Clicking any of the boxes above a channel data box will enable or disable a high alarm setpoint on the associated channel. A check mark in the box indicates the alarm has been disabled. To enable an alarm that has been disabled, click the box again. A "clear" box indicates the alarm is

Displays the High Alarm Setpoint values for the Total, LR, RR, LF, and RF corners of the press being monitored. Also displays if the alarm is enabled or disabled. If the online monitor has more than four channels, the Outer High Alarm Setpoint values are displayed. To change a high alarm setpoint value, click the data box of the channel of interest, type in the new value, then select the "Enter Key" to complete the task. Values entered into the Total data box will be equally divided amongst the other channels.

Displays the High Alarm Setpoint values for the Inner Slide of the press being monitored. If the online load monitor has four channels or less, the alarm setpoints for the Inner slide are not visible. To change a high alarm setpoint value, click the data box of the channel of interest, type in the new value, then select the "Enter Key" to complete the task. Values entered into the Total data box will be equally divided amongst the other channels.

Clicking this button displays the online help for the High Alarm Setpoints function of the System Setpoints Window.

Figure 8.3 - System SetPoints Window - High Setpoints

8 SetPoints ToolBar Function - continued



System SetPoints Window - Low SetPoints

The **Low SetPoints** sub-function allows the low alarm limits of the online Slim load monitor to be displayed or changed. Individual channel alarms can be disabled by simply clicking the alarm enable/disable box directly above the channel of interest. The occurrence of low alarms are ignored in those channels that have their low alarm monitoring disabled. To re-enable a low alarm for a particular channel, simply re-click the alarm enable/disable box that is associated with the channel of interest. Figure 8.4 details the Low SetPoint sub-function of the System SetPoints Window.

Clicking any of the boxes above a channel data box will enable or disable a low alarm setpoint on the associated channel. A check mark in the box indicates the alarm has been disabled. To enable an alarm that has been disabled, click the box again. A "clear" box indicates the alarm is

Displays the Low Alarm Setpoint values for the Total, LR, RR, LF, and RF corners of the press being monitored. Also displays if the alarm is enabled or disabled. If the online monitor has more than four channels, the Outer low alarm setpoint values are displayed. To change a low alarm setpoint value, click the data box of the channel of interest, type in the new value, then select the "Enter Key" to complete the task. Values entered into the Total data box will be equally divided amongst the other channels.

Displays the Low Alarm Setpoint values for the Inner Slide of the press being monitored. If the online load monitor has four channels or less, the alarm setpoints for the Inner slide are not visible. To change a low alarm setpoint value, click the data box of the channel of interest, type in the new value, then select the "Enter Key" to complete the task. Values entered into the Total data box will be equally divided amongst the other channels.

Clicking this button displays the online help for the Low Alarm Setpoints function of the System Setpoints Window.

Figure 8.4 - System SetPoints Window - Low Setpoints

8 SetPoints ToolBar Function - continued



System SetPoints Window - Benchmark

The **Benchmark** sub-function displays or changes the percentage values that are used in conjunction with the AutoSet mode of the online Slim load monitor. Benchmark values established in AutoSet mode are also shown. The percentage values are used to establish automatic high and low alarm limits if the online Slim load monitor has been placed in AutoSet mode. The alarm limit result, is a value that is a specified percentage above and below the benchmark mark value, or the capacity value of the press. As an example, entering 20% in the High% and Low% data boxes will produce high and low alarm limits that are 20% above and 20% below the established benchmark.

If the monitor is not in AutoSet mode, the tolerance values are meaningless. For details on how to place the online load monitor into AutoSet mode, refer to the **Mode ToolBar Function**. Figure 8.5 details the Benchmark sub-function of the System SetPoints Window.

Displays or changes the percentage values used in AutoSet alarm limit calculations. If the online load monitor has four channels or less, the Benchmark values for the Inner Slide will not be visible. To change a percentage value, select the channel of interest. After the selection is made, the percentage data box for the selected channel will be highlighted.

The Tolerance DataEntry keypad will appear immediately after selecting a percentage value data box. Click a key on the Tolerance DataEntry keypad to change the percentage of the selected channel. If the selected channel is the Total, percentage values for all channels will update at the same time. After the percentage value has been chosen, click the "Send Tolerance Data to Monitor" key to download the percentages to the monitor. You may exit the Tolerance DataEntry keypad by clicking the "Exit Tolerance Data Entry" key.

Clicking this button displays the online help for the Benchmark function of the System Setpoints Window.

	Total	LH	RH	LF	RF
HIGH%	10	10	10	10	10
Benchmark	127	38	28	17	51
LOW%	10	10	10	10	10

	Total	LH	RH	LF	RF
HIGH%	10	10	10	10	10
Benchmark	150	48	34	22	63
LOW%	10	10	10	10	10

Figure 8.5 - System SetPoints Window - Benchmark

8 SetPoints ToolBar Function - continued



System SetPoints Window - Counters

The **Counter** sub-function displays or changes the values associated with the stroke and batch counters of the online Slim load monitor. Figure 8.6 details the Counter sub-function of the System SetPoints Window.

This value represents the lower load level that the monitor will use to validate part counts. If the load force falls below this limit, the part counting will stop until it rises above this limit. To enter a new value for the Lower Count Limit, click the associated data entry box, type in a new value, then depress the Enter key to accept the new value.

This value represents the upper load level that the monitor will use to validate part counts. If the load force exceeds this limit, the part counting will stop until it falls below this limit. To enter a new value for the Upper Count Limit, click the associated data entry box, type in a new value, then select the Enter key to accept the new value.

This value represents the batch counter and ranges from 0 to 99,999,999. Entering data into this field will activate the batch count function. When the number of parts produced matches the value in this field, the online monitor will produce a batch count alarm. If this alarm is enabled, the shutdown relay will open. Setting this value to zero will disable the batch count function. To enter a new Batch Set value, click the associated data entry box, type in a new value, then select the Enter key to accept the new value.

This value represents the stroke count of the press and is a designation of how many parts have been made. It can be reset to zero by selecting the "Clear Parts Count" button. Data cannot be entered into this field.

This value represents how many parts remain in the batch set. It is the running difference between the batch set and part count values. Setting the Batch Set data to zero disables this count.

The screenshot shows the 'System SetPoints' window with the 'Counter Settings' section. The fields are: Upper Count Limit (2000), Lower Count Limit (0), Batch Set (99999), Part Count (6), and Parts to Go (99957). A 'Clear Parts Count' button is next to the Part Count field. A 'Help' button is at the bottom left of the settings area. A red 'DATA LOCKED' indicator is at the bottom right. At the very bottom, there are tabs for 'Capacity', 'High Setpoints', 'Low Setpoints', 'Benchmark', and 'Counters'.

Clicking this button displays the online help for the Counter function of the System Setpoints Window.

Figure 8.6 - System SetPoint Window - Counters

9

Calibration ToolBar Function



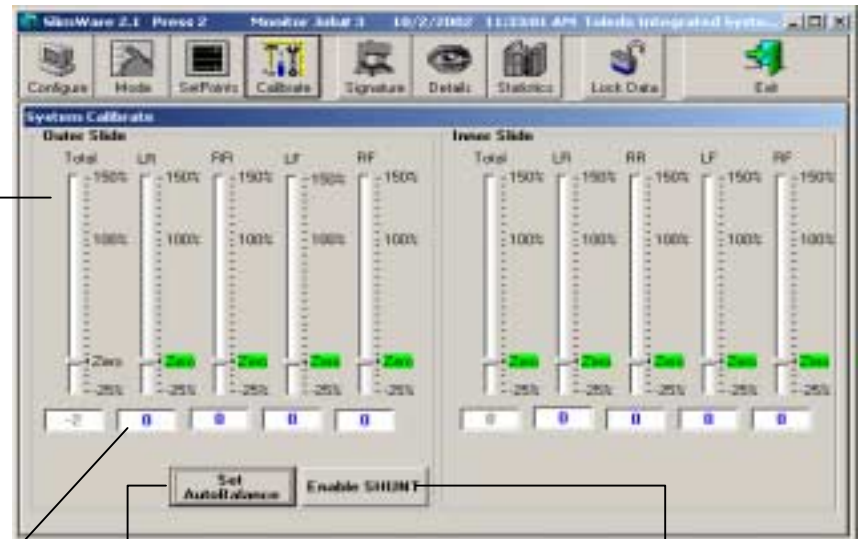
The **Calibration** toolbar function will enable the System Calibrate window as shown in Figure 9.1. The System Calibrate window is used to display or change the current sensor balance and gain levels of the online Slim load monitor. The System Calibrate window is explained in detail below. Accompanying the explanation, is an outline of the calibration steps needed to successfully interface the online Slim load monitor to loadcells or strain link sensors.

Displays the current Calibration Data for the Outer and Inner Slides (Ch0 through Ch9). Each channel's data is displayed as a percentage of its capacity value. If the online load monitor has four channels or less, the Inner Slide data is not visible. When AutoBalance is active, the information displayed represents the zero balance level of the monitor's sensor inputs. When the sensors are balanced, the "Zero" prompt is highlighted in Green. When the Shunt is engaged, the information displayed represents the current gain number of the associated channel.

If AutoBalance and Shunt are not active, the information displayed represents the current load data.

Displays the current load level, zero balance level, or gain number of the associated channel. Gain numbers for the Total of the Outer and Inner slides cannot be entered. To change the gain number of a specified channel, click the Enable SHUNT button. The Shunt button will highlight to Yellow and the button prompt will change to Disable SHUNT. Select the channel of interest by clicking the associated data entry box. Type in the new gain number, then select the Enter key to accept the new value. Because of round off errors, the gain number may have to be entered several times until the desired value is achieved.

See "Calibration of Slim Load Monitors" in this section, for complete details on the calibration procedure.



Clicking this button will automatically establish the zero balance level of the attached sensors. When AutoBalance is active, this button will be highlighted in Yellow, and the button prompt will change to "Auto Balance On".

Clicking this button will engage a shunt resistor across the sensor input. When this mode is active, the button will be highlighted in Yellow and the prompt will change to "Disable Shunt". This mode allows the current gain number per channel, to be viewed or changed.

Figure 9.1 - SlimWare's System Calibration

9

Calibration ToolBar Function - continued**Calibration of Slim Load Monitors****Load Cell Calibration**

When a precalibrated load cell is used as the input sensor for a particular channel, the calibration number has been previously determined at the factory. The value of this number is dependent upon the value of the shunt resistor used during the load cell's calibration procedure. The number is normally included in a specification sheet that is shipped with each load cell. If the calibration number was derived from a shunt resistor other than one megohm, a mathematical conversion must be made. When the calibration number has been determined, the Balance and Gain values of the online load monitor, must be adjusted to match this number in order to obtain the correct results from the load cell.

To obtain the new calibration number, perform the following steps.

- If the calibration number of the load cell is based upon a one-megohm resistor, the number will correlate directly with the online monitor's internal one megohm shunt resistor. This number can be used without modification as the gain number of the selected channel.
- If the calibration number of the load cell is not based upon a one megohm resistor, a new number must be calculated by using the following formula:

$$\text{New Cal Number} = \frac{\text{Old Cal Number} \times \text{Load cell's calibration shunt resistor value}}{1,000,000}$$

This new number will be used as the gain number of the selected channel. Refer to Figure 9.1 for details of the System Calibrate window.

9

Calibration ToolBar Function - continued



Calibration of Slim Load Monitors

Strain Link Calibration

- Connect the sensors to the correct channel (Left Rear sensor to Left Rear channel, etc.). Refer to the Slim user's manual for correct sensor installation.
- Set the press capacity of the press (rated maximum load) by proceeding to the System Configuration window (select Configure on the main toolbar). Refer to the **Configuration ToolBar Button** section of this manual for instructions to enter capacity values. After the capacity value(s) have been entered, return to the System Calibration window (select Calibrate on the main toolbar).
- Torque each sensor while watching SlimWare's System Calibrate window. Verify that the sensor and the online monitor's channel position correlate (Left Rear sensor equals Left Rear channel). If the channels do not correlate, they must be moved to the correct channel before proceeding.
- Set the trigger mode of the monitor by proceeding to the System Mode/Trigger Settings window. Refer to Figure 7.5 for details. When the trigger mode has been selected, return to the System Calibration window by selecting the Calibrate button on the main toolbar.
- Adjust the zero balance of each sensor by clicking the "Set AutoBalance" button. SlimWare will inform the Slim monitor to automatically adjust the zero balance of each channel. The AutoBalance button will highlight to Yellow. When AutoBalance completes, the button will return to Grey.
- Determine the correct shut height of the press.
- Place Toledo Transducer's AutoCells on to the bed of the press. Make sure all AutoCells are properly positioned and equally spaced from side to side, and from front to rear. AutoCells are typically placed at each corner of the press's bed. Place cardboard on top of, and beneath the AutoCell (**Please refer to Toledo Transducers AutoCell User's Manual for details**).
- Select Details from the main toolbar to display the Tonnage Monitor window. Place the online Slim load monitor into Setup Mode by selecting the **Push To Enter Setup** button. Enter the current password when requested. When the monitor enters Setup Mode, the button will highlight to Yellow. Once the monitor enters Setup Mode, cycle the press and hit the AutoCells. Take notice of the AutoCell's displayed value. This is the load value of the press corner. Take note of the values displayed on SlimWare's tonnage monitor, then return to the Calibration window.
- Enable the online load monitor's shunt by selecting the Enable SHUNT button. The button should highlight to Yellow. Select the data entry box of the channel of interest. Take note of the displayed values in the data entry boxes. The values displayed are the current gain numbers.
- Use the following formula to determine the new gain number:

$$(\text{AutoCell reading}/\text{Load Monitor reading}) \times \text{Current Gain Number} = \text{New Gain Number}$$
 Type in the new gain number value into the selected channel's data entry box. Select the Enter key on the PC's keyboard when complete. If SlimWare's virtual keyboard is enabled, use its Enter key when gain number data entry is complete.
- Re-adjust the zero balance of the sensors by selecting the "Set AutoBalance" button.
- This completes a typical calibration of a strain link based system. Contact Toledo Integrated Systems Service Department for assistance if needed. Our Service Department can be reached at 419-867-4170, Monday through Friday, 8:00 AM to 5:00 PM.

10

Signature ToolBar Function



The **Signature** toolbar function will enable the Tonnage Monitor window and the System Process window as shown in Figure 10.1. The Tonnage Monitor window displays the latest load data, while the System Process window is used to display current or archived load signatures and enveloping. If the online load monitor is not operating with resolver triggering, the Signature Toolbar function is unavailable.

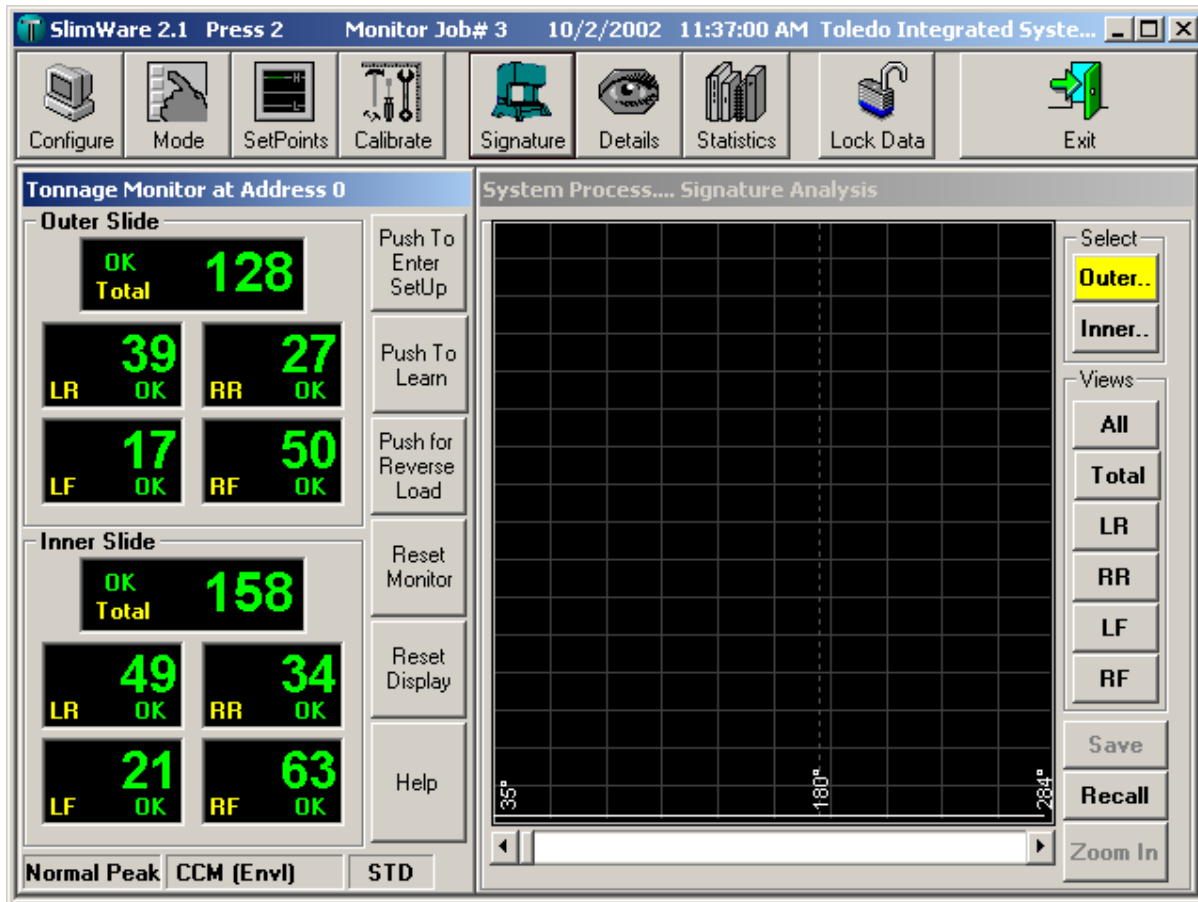


Figure 10.1 - Tonnage Monitor and System Process Windows

10

Signature ToolBar Function - continued



System Process Window

The **System Process** window is used to view a current or archived load signature. Note: Enable Envelope Autoset must be turned on (enabled) to view enveloping with signature. Figure 10.2 details the functionality of the System Process Window. Refer to **How to Retrieve a Signature** and **How to Save a Signature** immediately following Figure 10.2.

Enables signature viewing of the Outer or Inner Slides of the press. A highlighted button indicates which slide has been selected. If the online monitor has four channels or less, the Select box is not visible. In this case, the default view for signatures will be channels 0 through channels 4.

Selecting buttons within the Views Control Bar will enable various views of the active signature to be displayed. An explanation of each button follows.

All - Displays all four corners of signature. Click the All button again to bring up signatures from each channel stacked on top of one another. Continue to select the All button to bring the signature of the channel of interest to the foreground.

Total - Enables the Total view of the active signature.

LR - Enables the Left Rear view of the active signature.

RR - Enables the Right Rear view of the active signature.

LF - Enables the Left Front view of the active signature.

RF - Enables the Right Front view of the active signature.

Save - Signatures which are currently displayed can be saved to a file by selecting this button. The **Save** button only becomes active if a signature has been recalled.

Recall - Recalls a signature from the online monitor, or from an archived file.

Zoom In - Enlarges the displayed signature for easier viewing. Zoom In only becomes active after a signature has been recalled. Once Zoom In is active, the signature can be scaled to the Capacity of the press, or to the highest peak. To return to the tonnage monitor window, select Restore. (The Zoom In button turns into the Restore button when the zoom window appears.)

The signature data bar allows information of the displayed signature to be viewed in table format. Signature data begins at 35 degrees and ends at 284 degrees. Moving the data bar slide button to the right increments the degree pointer value. Moving the data bar slide button to the left, decrements the degree pointer value. Selecting the left and right arrows of the signature data box, accomplishes the same task as the slide button. The signature data table may also be displayed by clicking any point on the signature that is being viewed.

Figure 10.2 - The System Process Functionality



How to Retrieve a Signature

Signature Retrieval from an online Slim load monitor

- Select the **Signature** button from SlimWare's main toolbar. The Tonnage Monitor window and the System Process window will be displayed as shown in Figure 10.3.

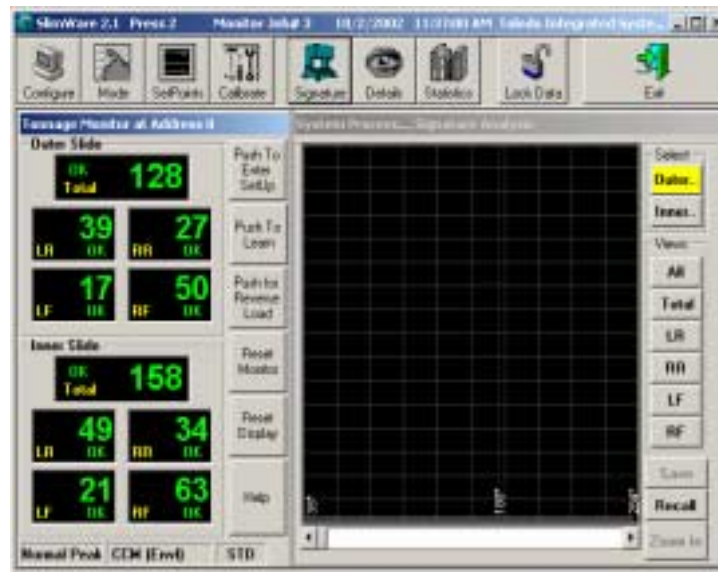


Figure 10.3 - Tonnage Monitor and System Process Windows (Monitor Signatures)

- Select the **Recall** button on the System Process window. The **Recall Signature** prompt box will be displayed as shown in Figure 10.4. Click the button **From Monitor** to begin downloading a signature from the online Slim load monitor.

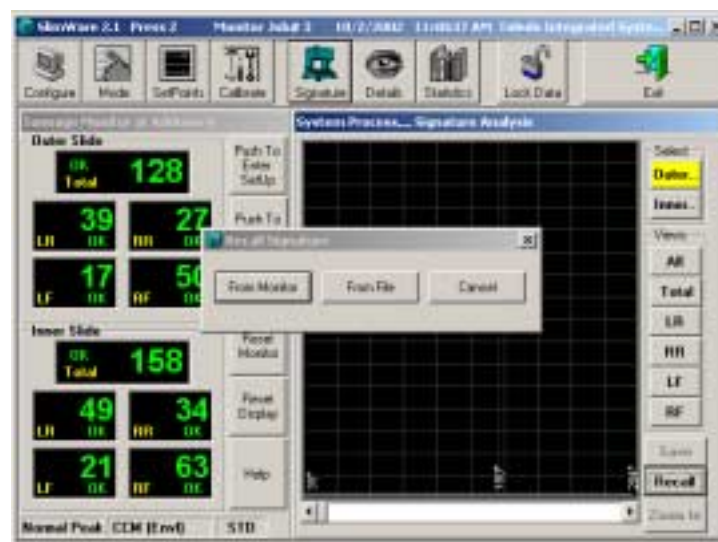


Figure 10.4 - Recall Signature Prompt Box (Select From Monitor)

10

Signature ToolBar Function - continued



How to Retrieve a Signature - continued

Signature Retrieval from an online Slim load monitor

- The **Signature Download in Progress** prompt box will appear, showing the active progress of the signature data download (refer to Figure 10.5).



Figure 10.5 - Signature Download in Progress Prompt Box

- After the signature download completes, the progress prompt box will close and the retrieved signature will be displayed (refer to Figure 10.6). You may now look at other views of the signature by selecting a button within the Select and Views control bars. If the online Slim load monitor has four channels or less, the Select control bar is not visible.



Figure 10.6 - Downloaded Signature from Online Load Monitor



How to Retrieve a Signature - continued

Signature Retrieval from an Archived File

- Select the **Process** button from SlimWare's main toolbar. The Tonnage Monitor window and the System Process window will be displayed as shown in Figure 10.7.

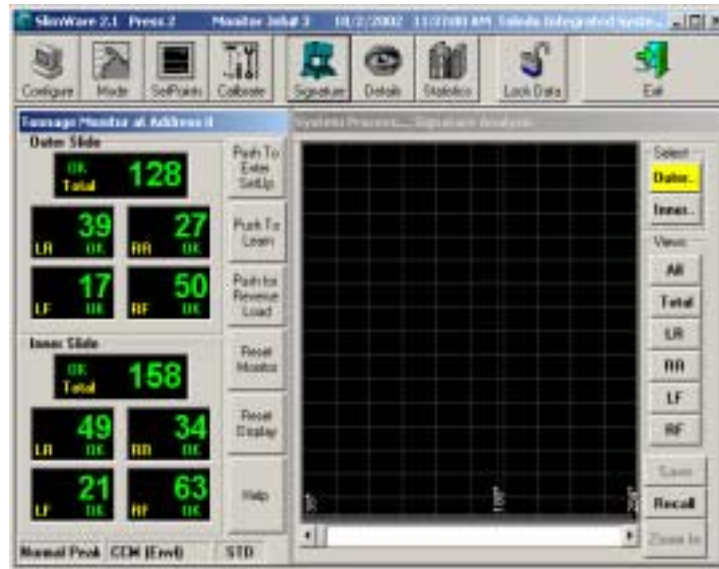


Figure 10.7 - Tonnage Monitor and System Process Window (File Signatures)

- Select the Recall button on the System Process window. The **Recall Signature** prompt box will be displayed as shown in Figure 10.8. Click the button **From File**.

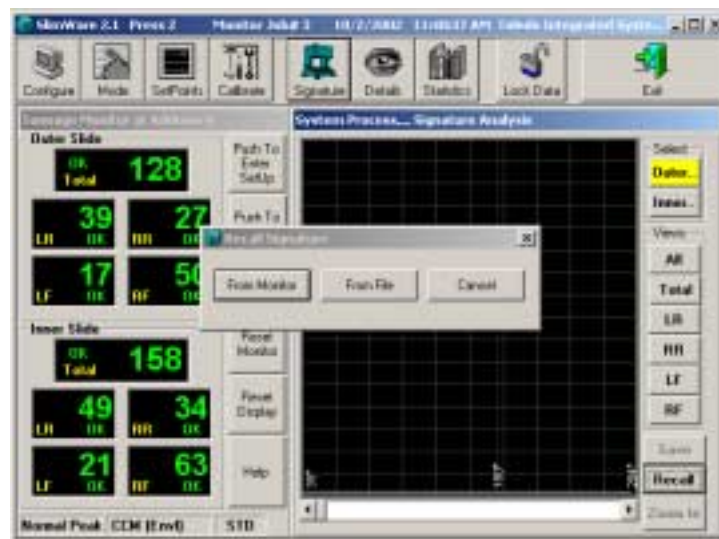


Figure 10.8 - Recall Signature Prompt Box (Select From File)



How to Retrieve a Signature - continued

Signature Retrieval from an Archived File

- The **Recall Signature From File** prompt box will be displayed as shown in Figure 10.9. Signatures that were produced and saved using SlimWare, will have the extension **sws** (SlimWare Signature). Select the signature file you wish to open from the **Select File** list box.

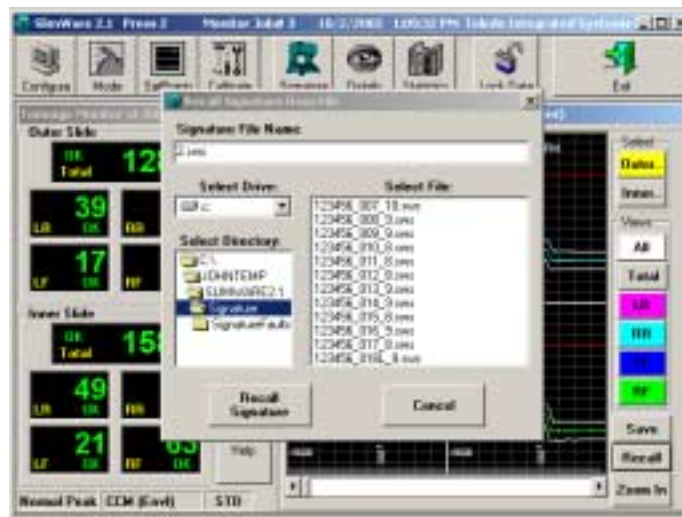


Figure 10.9 - Recall Signature From File Prompt Box

- After the signature has been retrieved from the file, the file box will close and the requested signature will be displayed (refer to Figure 10.10). You may now look at other views of the signature by selecting a button within the Select and Views control bars.



Figure 10.10 - Signature Retrieved From File



How to Save a Signature - continued

- Download a signature from the online Slim load monitor. When the download is complete, select the **Save** button on the System Process window. The **Save Signature to File** prompt box will be displayed as shown in Figure 10.11.

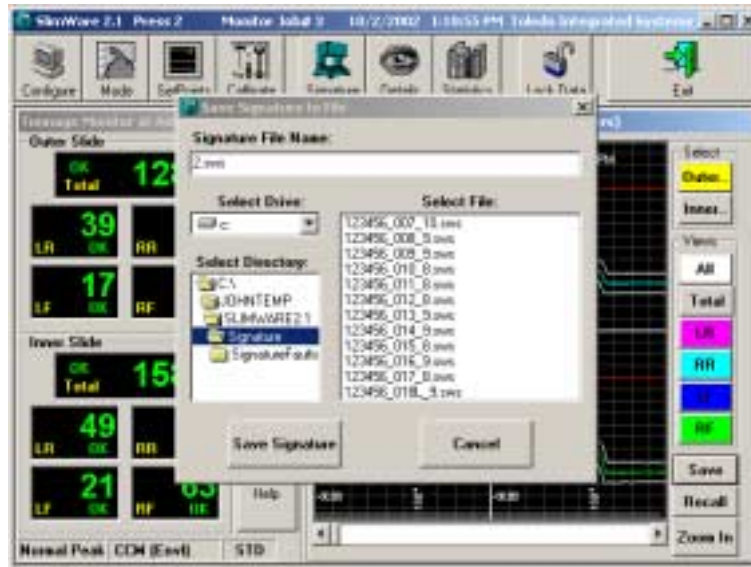


Figure 10.11 - Save Signature to File Prompt Box

- Click the **Signature File Name** data entry box. Type in a file name that will describe the signature you want to save. You may use up to thirty-two characters. If the signature already exist, simply click the name of the file in the **Select File** list box.
- Click the **Save Signature** button to save the signature to the file. If the signature file already exist, you will be prompted and given a choice to overwrite the file.

Automatic Signature Retrieval File Name Format

SlimWare files are typically saved in the "Signature" folder. A maximum of 100 signatures can be saved per part number using 'Automatic Signature Retrieval' and 'Automatic Save'. Signature files contain the following format:

Part Number_Signature Count(Range = 001 to 100)_Strokes since last signature saved. Signature Extension (".sws")

Ex.: File Name = 7654321_001_10.sws

Part Number = 7654321

Signature Count = 001

Strokes Since Last Signature Saved = 10

File Extension = .sws (On All Saved Signatures)

Note: "L" at the end of 'Signature Count' denotes the last signature saved.

11

Details ToolBar Function



The **Details** toolbar function will enable the Tonnage Monitor window and the System Details window as shown in Figure 11.1. The **System Details** window displays the current parameters and setup values of the online Slim load monitor. If the online Slim load monitor is in CCM mode, the active angle of the resolver is also shown. If the online Slim load monitor has four channels or less, data for the Inner Slide is not shown. The **System Details** window is password protected. See the **Data Lock** toolbar function for password entry instructions. Figure 11.2 on the following page highlights the functionality of the **System Details** window.

The screenshot displays the SlimWare 2.1 software interface. The top toolbar includes icons for Configure, Mode, SetPoints, Calibrate, Signature, Details, Statistics, Lock Data, and Exit. The main window is divided into two sections: Tonnage Monitor and System Details.

Tonnage Monitor at Address 0

Outer Slide

OK Total 128

LR OK 39 RR OK 27

LF OK 17 RF OK 50

Inner Slide

OK Total 158

LR OK 49 RR OK 34

LF OK 21 RF OK 63

Normal Peak CCM (Envl) STD

System Details

Press # 2 Part # 123456

Die # 48 Description Panel-Front

Monitor Job # 3 Down Time: 00:01:57 SPM: 65

Part Count: 106 Parts To Go: 0

Outer Slide	Total	LR	RR	LF	RF
Capacity	800	200	200	200	200
High Setpoint	207	59	47	37	71
Low Setpoint	48	19	8	0	31
Benchmark	127	39	28	17	51
Benchmark High%	10	10	10	10	10
Benchmark Low%	10	10	10	10	10
Threshold	800				
Inner Slide	Total	LR	RR	LF	RF
Capacity	1000	250	250	250	250
High Setpoint	259	74	59	47	88
Low Setpoint	60	24	9	0	38
Benchmark	159	49	34	22	63
Benchmark High%	10	10	10	10	10
Benchmark Low%	10	10	10	10	10
Monitor Program	5121				
Press Angle	337				

Figure 11.1 - Tonnage Monitor and System Details Windows

11

Details ToolBar Function - continued



Press# - Displays or sets the current number of the press that SlimWare is monitoring. To enter a press number, click the associated data entry box. Type in a number (or description) up to ten characters in length. Select the Enter key when complete.

Part# - Displays or sets the current number of the part that is being produced. Type in a number (or description) up to twenty characters in length. Select the Enter key when complete.

Help - Clicking this button displays the online help for the System Details window.

Die# - Displays or sets the current number of the die that is installed in the press. Type in a number (or description) up to ten characters in length. Select the Enter key when complete.

Description - Displays or sets the current description of the part that is being produced. Type in a description up to twenty characters in length. Select the Enter key when complete.

Monitor Job# - Displays or sets the current job number of the online Slim load monitor. Changing this number will cause the Slim load monitor to retrieve operating parameters that were previously saved. To change the current Slim job number, click the associated data entry box, type in a number from 0 to 99, then select the Enter key when complete. You will then be given a choice to retrieve previously saved parameters or cancel job change.

Note: Items listed below are not displayed when the "Application Hot Key" is selected or enabled (On Configuration Page).

Down Time - Displays the time that has elapsed since a valid load has occurred. The format is days, hours, minutes. This value is reset to zero when a valid load is recognized.

SPM - Displays the operating speed of the press in strokes per minute.

Part Count - Displays the active part count. This value can be reset to zero by clicking the **C** button that is to the immediate left of the part count prompt. (Password Protected)

Parts To Go - Displays the number of parts that remain in the defined batch. If the Batch Set counter is zero, the Parts to Go count will also be zero.

System Details						
Press #	40	Part #	87654321	Help		
Die #	1400	Description	Panel 2	DATA LOCKED		
Monitor Job #	27	Down Time	00:00:07	SPM	65	
	C	Part Count	90	Parts To Go	99873	
North	Total	LR	RR	LF	RF	
Capacity	1000	250	250	250	250	
High Setpoint	592	136	172	194	133	
Low Setpoint	254	58	74	83	57	
Benchmark	423	97	123	138	95	
Benchmark High%	40	40	40	40	40	
Benchmark Low%	40	40	40	40	40	
Threshold	1000					
South	Total	LR	RR	LF	RF	
Capacity	1000	250	250	250	250	
High Setpoint	590	137	168	196	130	
Low Setpoint	252	59	72	84	56	
Benchmark	421	98	120	140	93	
Benchmark High%	40	40	40	40	40	
Benchmark Low%	40	40	40	40	40	
Monitor Program	7721					
Press Angle	319					

The table data of the System Details window displays the current operating parameters of the online Slim load monitor. If the Slim load monitor is in CCM mode, the press angle data will be displayed. This data will change as the resolver angle changes. Inner slide data is not available if the online Slim load monitor has four channels or less.

Figure 11.2 - System Details Functionality

12

Statistics ToolBar Function



The **Statistics** toolbar function will enable the Tonnage Monitor window and the System Statistics window as shown in Figure 12.1. The System Statistics window displays and records load data and all high and low alarm limit violations that take place. If the online Slim load monitor has four channels or less, alarm statistics for the inner slide are not available. System Statistics information is password protected. See the **Data Lock** toolbar function for password entry instructions. See Figure 12.2 on the following page for **System Statistics** details.

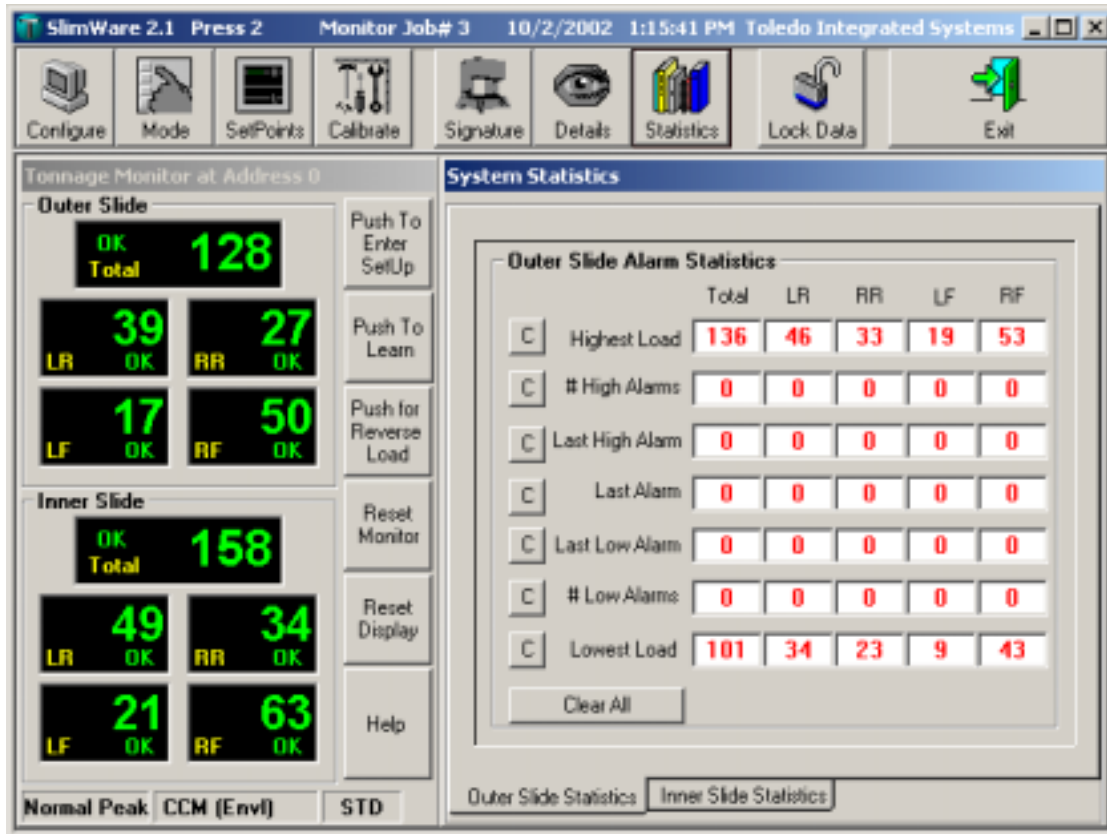


Figure 12.1 - Tonnage Monitor and System Statistics Windows

12

Statistics ToolBar Function - continued

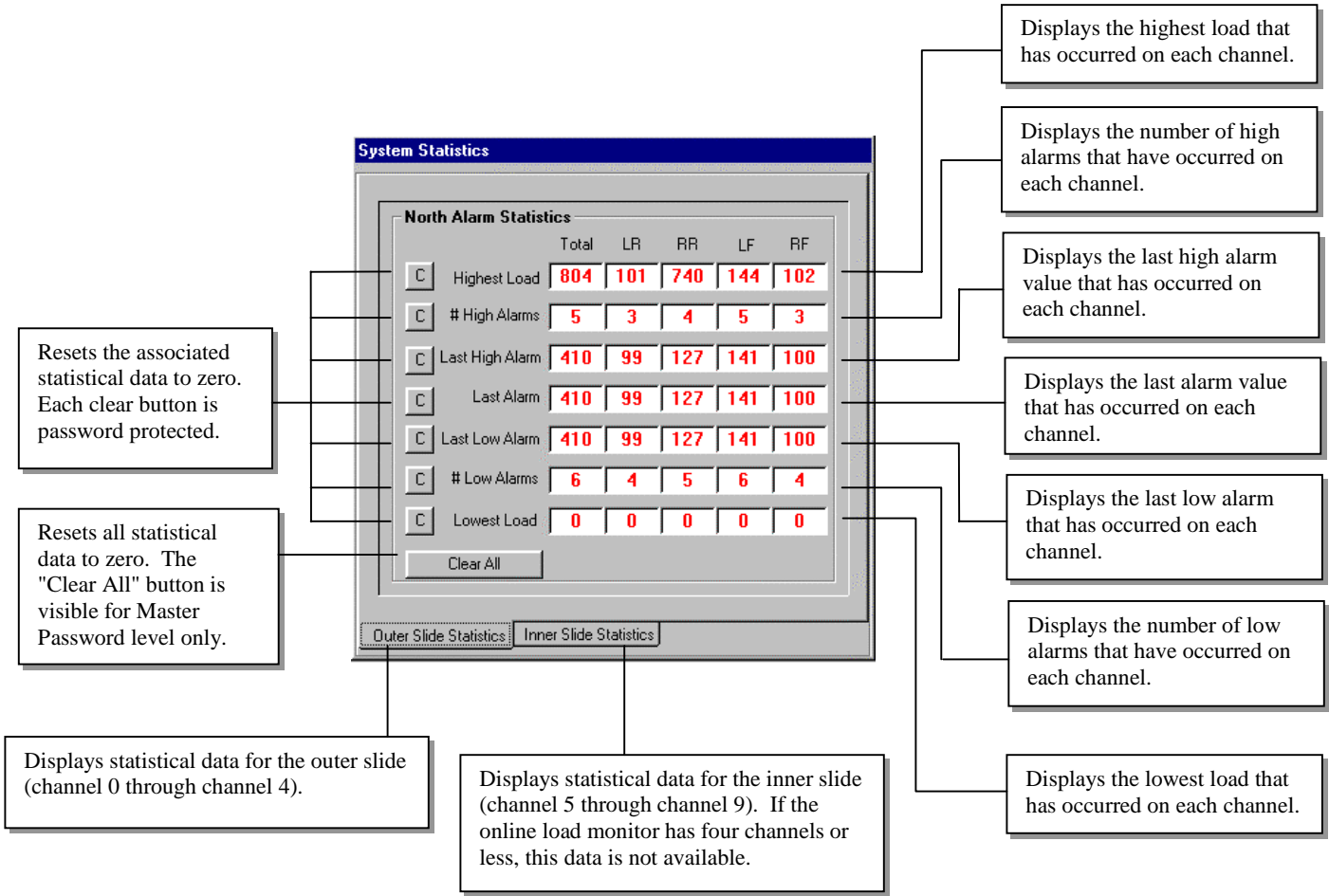


Figure 12.2 - System Statistics Details

13

Virtual KeyPad

The virtual keypad has been developed specifically for touch screen applications that do not have an attached keyboard. However, the virtual keypad can be used with a mouse. Any parameter within SlimWare that can be changed, will automatically call the virtual keypad when the parameter's associated data entry box is clicked or touched. To enable the virtual keypad, click the **Virtual KeyPad Option** on the second page of the Configuration window. A check mark in the option selection box indicates the **Virtual KeyPad** function is active. To disable the function, simply click the **Virtual KeyPad Option** button again. Figure 13.1 shows the numeric keypad while figure 13.2 shows the alphanumeric keypad. Both keypads will display automatically, dependent upon the type of parameter being changed within SlimWare. To clear a data entry, click the clear key of the respective keypad. To close the virtual keypad after use, click the close box (x) in the upper right corner of the title bar.

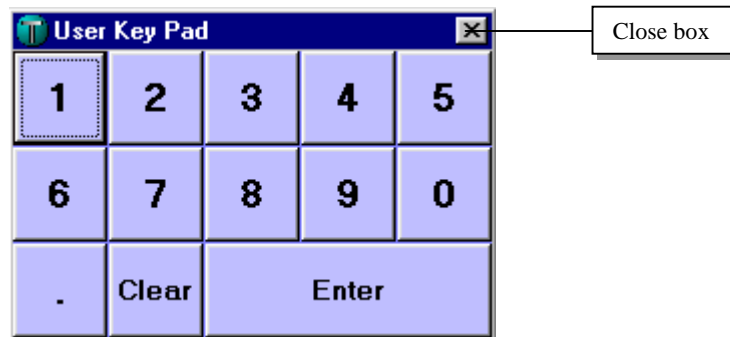


Figure 13.1 - Numeric Virtual Keypad

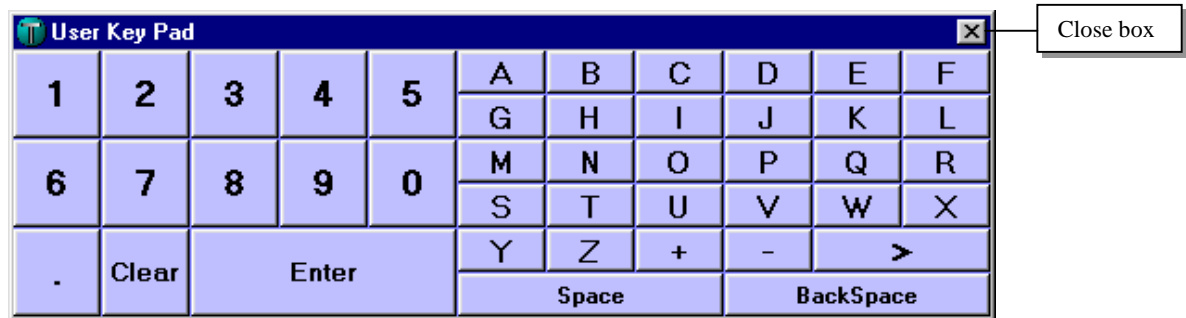


Figure 13.2 - Alphanumeric Virtual Keypad

14

Lock Data ToolBar Function



The **Lock Data** toolbar function controls the locking and unlocking of SlimWare parameters that can be changed. The **Lock Data** function requires a User ID and a valid password before SlimWare operating parameters can be altered. SlimWare functions that have locked parameters will have the **Data Locked** prompt displayed as shown in Figure 14.1. If this prompt is visible, operating parameters cannot be altered. You must unlock the data to gain access.

DATA LOCKED

Figure 14.1 - Data Locked prompt

To gain access to locked operating parameters, select the **Lock Data** button from the main toolbar. The password entry box will display as shown in Figure 14.2. If the **KeyPad** function has been enabled, the virtual keypad will also display. To unlock operating parameters, three levels of password protection are available. The first level is for Supervisory/Master access. The second level is for Setup access. The third level is for Operator access. Select the **Master** User ID option then click the password data entry box and type in the phrase **MASTER** to enable first level access. **MASTER** is the default Supervisor/Master password. To gain second level access, select the **Setup** User ID option then click the password data entry box and type in the phrase **SETUP**. **SETUP** is the default Setup password. To gain third level access, select the **Operator** User ID option (default) then click the password data entry box and type in the phrase **OPERATOR**. **OPERATOR** is the default Operator password. **When entering passwords that contain text, always use capital letters. When the PassWord Entry box displays, the keyboard CAPS function will enable automatically.** Select **OK** to accept the password entry. If the password is validated correctly, the **Data Lock** icon will unlock as shown in Figure 14.3.

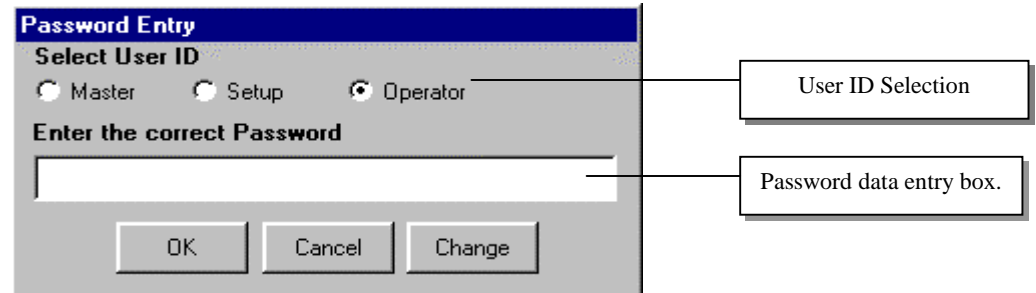


Figure 14.2 - Password Entry Box



Setup/Operator/Master Access

Figure 14.3 - Lock Data icon in Unlocked State

Once the **Lock Data** function becomes unlocked, you will have eight minutes to change operating parameters. When seven minutes have elapsed, the **Lock Data** button will begin to flash Red. This is an indication that the operating parameters will lock automatically in one minute. You must complete your operating parameter changes before this time expires. After the eight minutes have elapsed, the **Lock Data** function will lock all operating parameters from being changed. To regain access to the operating parameters, you must unlock and re-enter the password. The default password can be changed if desired. To change the default password, see the following pages.

14

Lock Data ToolBar Function - continued

**How to change the active Password.**

When SlimWare is started for the very first time, the user password will default to the phrase **MASTER, SETUP OR OPERATOR**. These passwords can be changed if necessary by performing the following steps.

- Click the **Lock Data** button on the main toolbar in order to display the password entry box. (Refer to Figure 14.4)

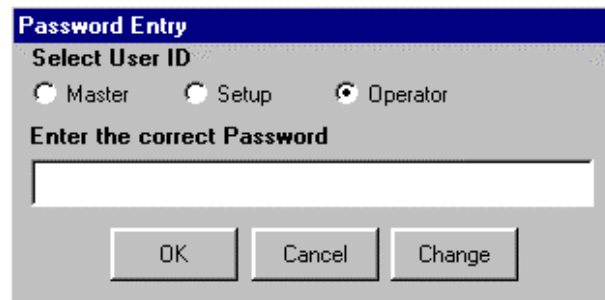


Figure 14.4 - Password Entry Box – How to Change the Active Password

- Click the **Change** button. The **Change User PassWord** box will display as shown in Figure 14.5



Figure 14.5 - Change User Password Box

- Select a User ID: Master, Setup or Operator
- Click the **current User Password** data entry box. Type in the current password. If the default password has not been previously changed, enter the phrase **MASTER, SETUP or OPERATOR**. Remember to use capital letters when entering text for the password.
- Click the **Enter the New User Password** data entry box. Type in the new password, using any combination of numbers and letters. Letter must be entered in upper case only. Characters other than A through Z and 0 through 9 are not valid. When complete, select the **OK** button. The **New PassWord** prompt box will display as shown in Figure 14.6. Select the **OK** button on the prompt box. The new password is now in effect.



Figure 14.6 - New PassWord Prompt Box

15

Application Hot Key Function



Selecting the **Application** hot key, will bring the designated application to the foreground if the application is loaded and active. The designated application must be running in order for this hot key to work. If the designated application is not running and a request is made to bring it to the foreground, the following error message will be displayed as shown in Figure 15.1. See section 6 on details regarding this function.

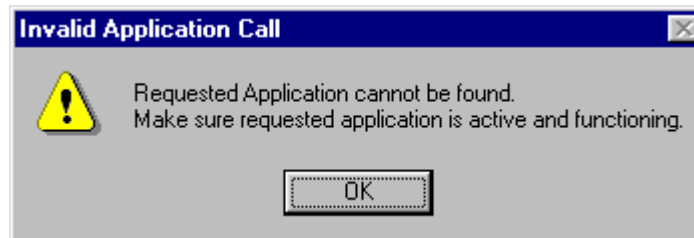


Figure 15.1 - Invalid Application Call Prompt Box

In a multiple application system, SlimWare can be brought to the foreground by using the identification name of **SlimWare** in the calling application's hot key routine.

16**Exit SlimWare Function**



Selecting the **Exit** function from the main toolbar will cause SlimWare to quit. The **Exit** function is password protected. See the **Lock Data** toolbar function for password entry instructions.

17

SlimWare's Alarm Indications

Each time that an alarm condition occurs within the online Slim load monitor, the alarm information is retrieved and processed. The information that is processed determines the type of alarm issued and the channel that caused the alarm. SlimWare produces an alarm indication in response to any type of alarm that occurs within the online Slim load monitor. The alarm condition will remain in effect until it is reset by the user. If the online Slim load monitor is in CCM Mode, the signature that was associated with the alarm condition will automatically be displayed. Simply drag the alarm indication box to one side to view the alarming signature. To reset the alarm condition of the online Slim load monitor, select the Alarm Reset button in the Alarm Active prompt box. Figure 17.1 details the alarm indications of SlimWare.

- The Active Alarm box will display each time an alarm condition occurs within the online load monitor. The type of alarm is referenced in the alarm type box. Valid alarms for this box are Channel Alarm and Part Count Alarm. To reset the active alarm, select the Alarm Reset button.
- Red dot indicates one or more alarms have been bypassed.
- When an alarm condition exist, the channel(s) that caused the alarm, will be highlighted in Red indicating the alarm value and the type of alarm that occurred. Valid alarms are High, Low, and CCM.
- If the online load monitor is in CCM Mode and an alarm occurs, the load signature associated with the alarm will automatically be displayed.



Figure 17.1 - SlimWare's Alarm Indications

18***Resolver Error Box***

If the resolver cable or connection becomes disconnected the following error message will be displayed as shown in Figure 18.1.



Figure 18.1 - Resolver Error Prompt Box

You must restore the resolver connection and then select the "Ok" button to clear the resolver error message box.