 <p>SCS Forest Products Inc.</p>	<p>Transverse Non-Contact System User Manual</p>	<p>Doc #: 07092013.001 Rev #: 09/07/2013</p>
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SCS Transverse System

MC Pro 2400

USER MANUAL

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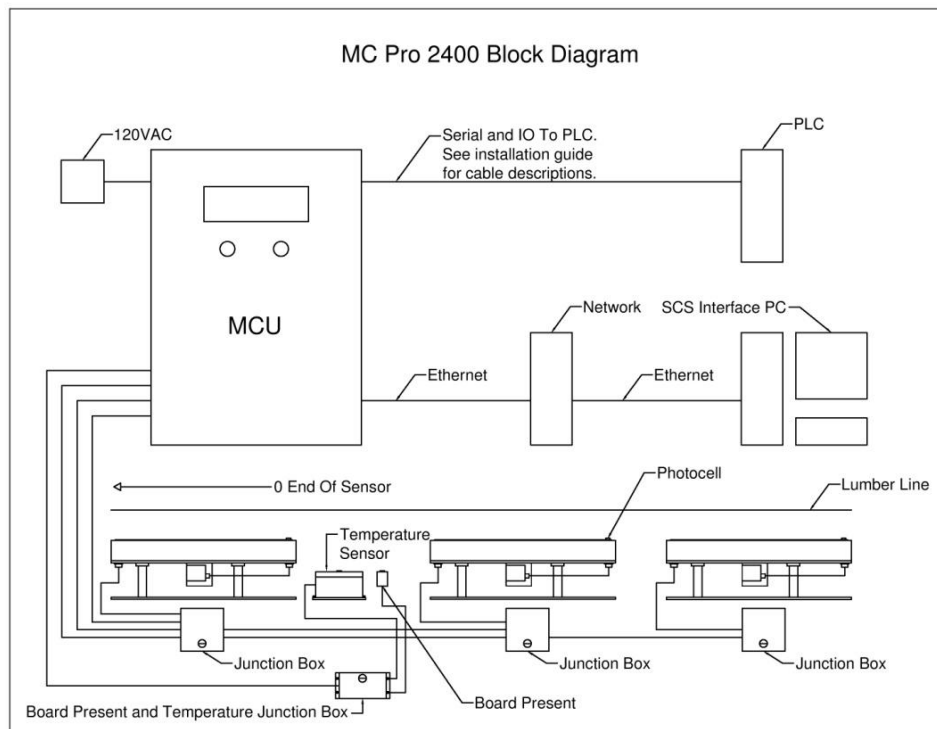
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SYSTEM HARDWARE GUIDE

System Description

The Transverse Non-Contact system consists of 3 main components: Transverse sensor(s), the main control unit (MCU), and a Windows software package.



Sensor(s)

The transverse sensors are mounted on a lugged chain prior to the sorter in the planer or Sawmill. Each sensor consists of a sensing plate, a distance sensor and a photocell. Inputs from each sensor are connected to an individual sensor box located below the sensor mounted on the beam. These signals are carried to the Main Control Unit (MCU) positioned on the end of the beam near the zero end of the lumber via 8 conductor cat5 tech cable.

A laser distance sensor is mounted under each sensor and looks up through the plate to determine the distance from the lumber to the sensor plate. This distance sensor makes it possible to compensate for warp along the length of the lumber.

The Transverse Non-Contact system also includes an optional temperature sensor which relays the temperature of the lumber to the MCU where it is used in the moisture content calculations.

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Main Control Unit (MCU)

The system uses a network compatible embedded microprocessor (located in the MCU, Figure 3) as the main processing and control unit. The embedded microprocessor uses the readings from the sensor(s) to determine the moisture content of the lumber using proven oven dry formulas. It also performs tasks such as sensor calibration, controlling the IO for communication and painters, and tallying the data from the sensor(s). Histograms and tally data can be viewed using the Windows software package.



Figure 3: Main Control Unit (MCU)

Included in the MCU are the system wiring, system power, and I/O. The power supply provides +12Vdc, -12Vdc, +5Vdc, and +24Vdc to power the various components of the system. +12Vdc provides power for the main sensor(s) and all photocells. +24Vdc is an optional output power that can be used to operate painters. The I/O carrier board acts as an interface to the system and is used to drive the painter and/or outputs to your PLC or auto grader, as well as interface with the photocells.

A liquid crystal display (LCD), and two small buttons are located on the door panel of the MCU. The LCD and buttons are used in conjunction to view system parameters, status, and to configure the system.

System Power-up

The MCU power supply must be connected to a 120VAC or 240VAC source. This provides power for the sensor as well as the embedded processor unit. Upon powering up, the LCD Screen should become backlit and instruction text will appear on the screen.

MCU LCD Display

The MCU display has a number of functions to assist with the operation, and diagnostics of the system without requiring the user to use the windows software package to access the system. The functions in the MCU screen are accessed by using the "Mode" and "Select" buttons on the front of the MCU. The "Mode" Button advances the user through the menus and the "Select" Button allows the user to make a selection or change a value.

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The menu functions on the MCU display are as follows:

Board Monitor

This selection allows a user to see the readings generated by the system in real time.

Distance Cal

The distance cal selection will allow a user to perform the distance calibration for all of the sensors. Pressing select will begin the calibration. Simply follow the on screen prompts.

Static Mode

This is a function that will allow a user to view the readings from the sensors and related devices in real time. *Entering this mode will cause the system to stop sorting.* Data from the moisture sensors, photocells, temperature sensor and distance sensors will be available in this screen.

View Errors

This will tell the user if there are any errors counted on the various system devices. Pressing the select button will clear the errors.

View Net Info

In this selection information about the MCU network configuration can be viewed and changed. The IP address and subnet mask are displayed and are changeable in this screen. If an IP address change is made, the MCU should be reset by pressing the reset button on the controller card located inside the cabinet.

Change Stock

Here the user can change which stock (dimension) that the system is set on manually. This should only be changed while the system is not operating and is typically only used in a planer environment where the dimension remains constant.

Photocells

The Transverse Non-Contact system has two photocells that detect the presence of the piece being sensed.



Figure 5: Photocells

There is a photocell embedded inside the unit at the end of each sensor which is used to detect lumber. If the sensor does not detect a board during the lug, the sensor's reading will not be used.

The next photocell is a displacement sensor which is mounted under each tranverse moisture sensor. This sensor must be calibrated using the calibration block provided. If this sensor is out of a user-defined minimum and maximum range, then the reading will not be used.

Temperature Sensors

The Transverse Non-Contact system has one (optional) temperature sensor that measures the temperature of the wood for compensating the measurements due to temperature variations. It is typically



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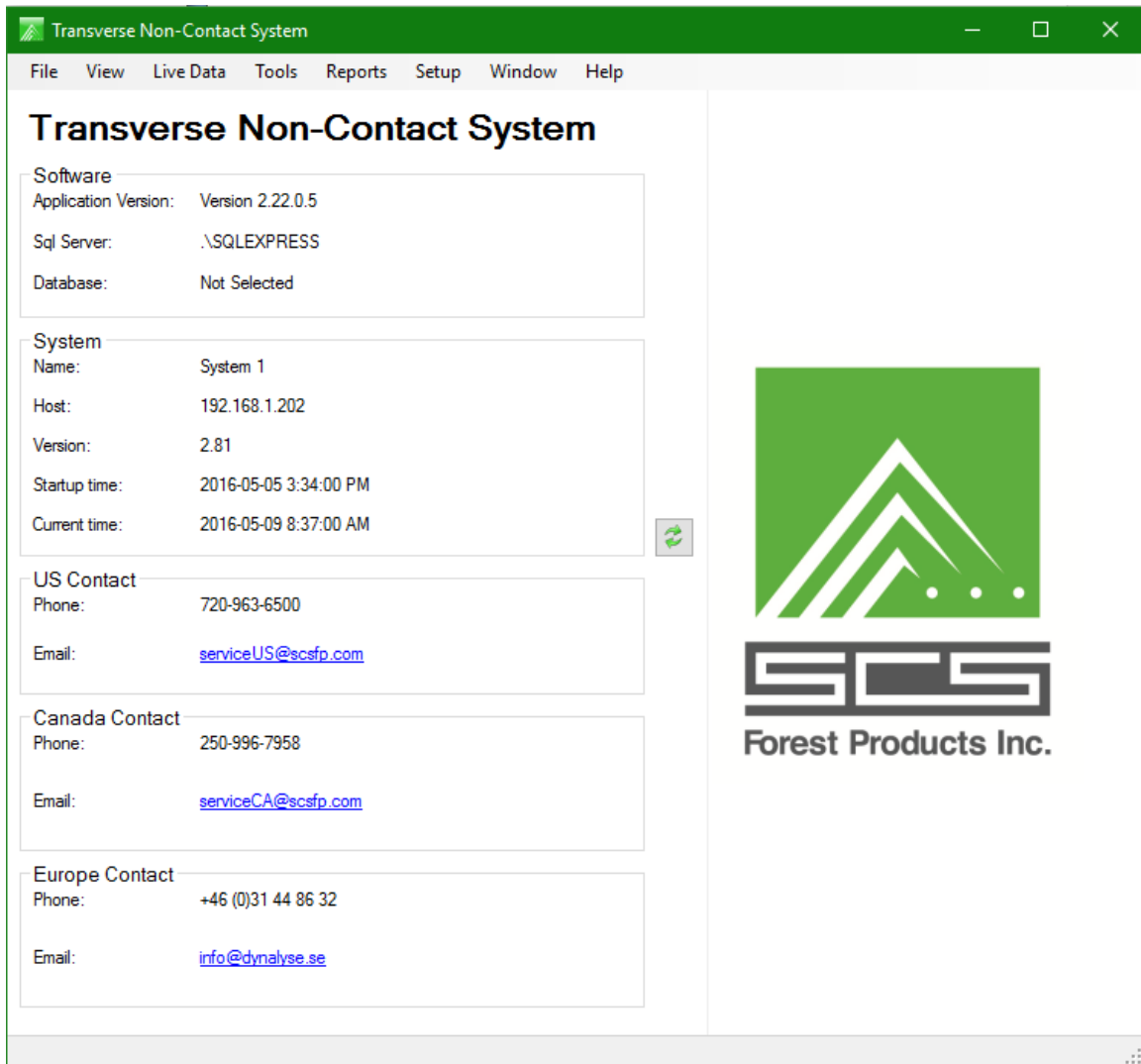
WINDOWS SOFTWARE GUIDE

Starting the Program

The program is started in the programs section of the start menu of windows. It should be listed under the "SCS Forest Products" group. There may also be a shortcut on the desktop.

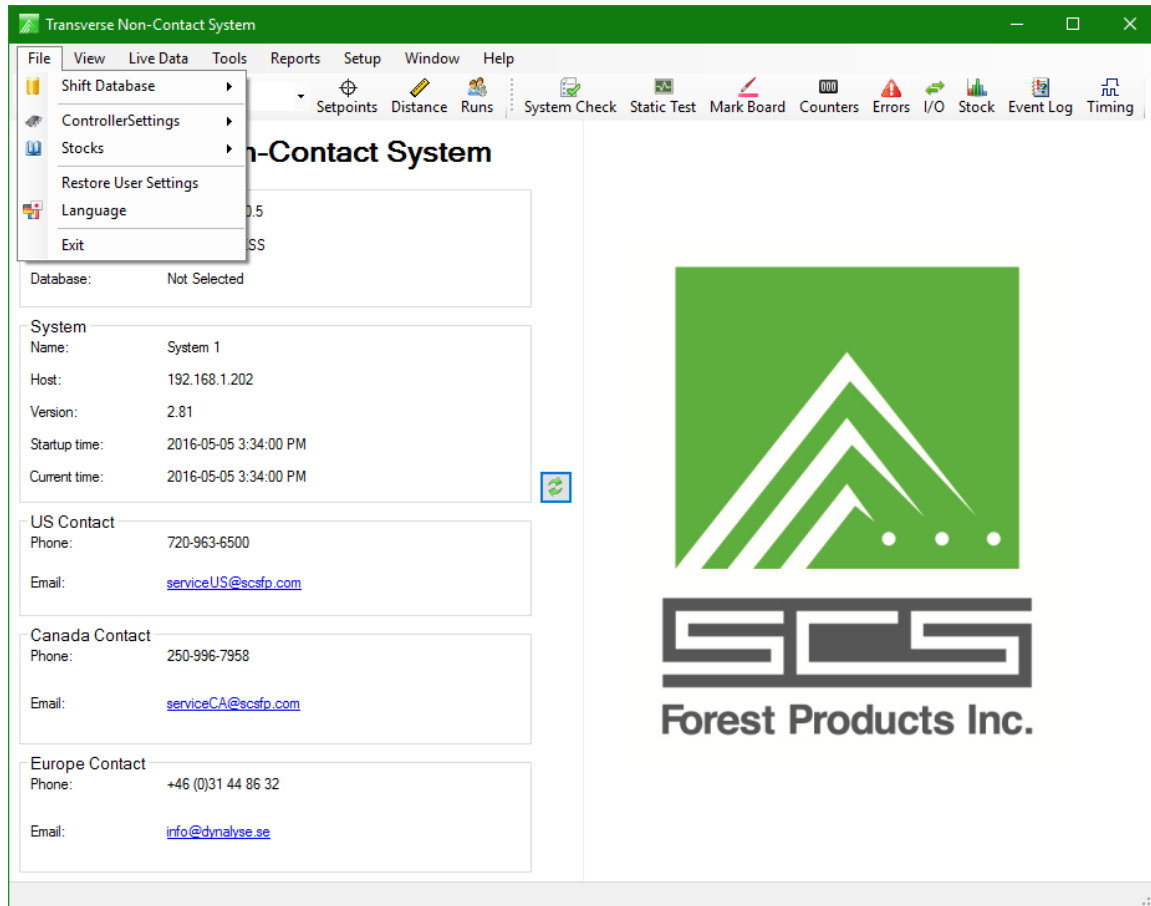
Home Screen

When the software is started the Home screen will be the first screen that is displayed. Information such as the system version, IP address, windows application version and key contact information, is located on the home page for easy reference.



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FILE

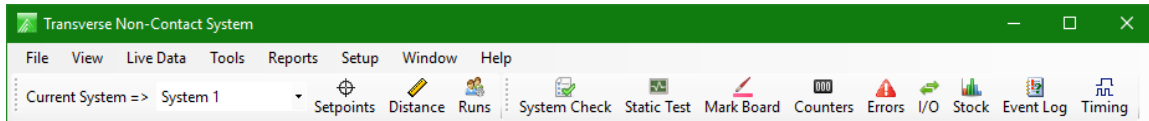


- Shift Database:** User can create a new shift database or select an existing database in which all shift data is stored.
- Controller Settings:** Settings can be imported and downloaded to the controller or exported from the controller to a file on the local computer.
- Stocks:** Stocks can be imported and downloaded to the controller or exported from the controller to a file on the local computer.
- Restore User settings:** These are the settings that can be restored when updating from one version of the Transverse Tally Software to a newer version.
- Exit:** Close the program.

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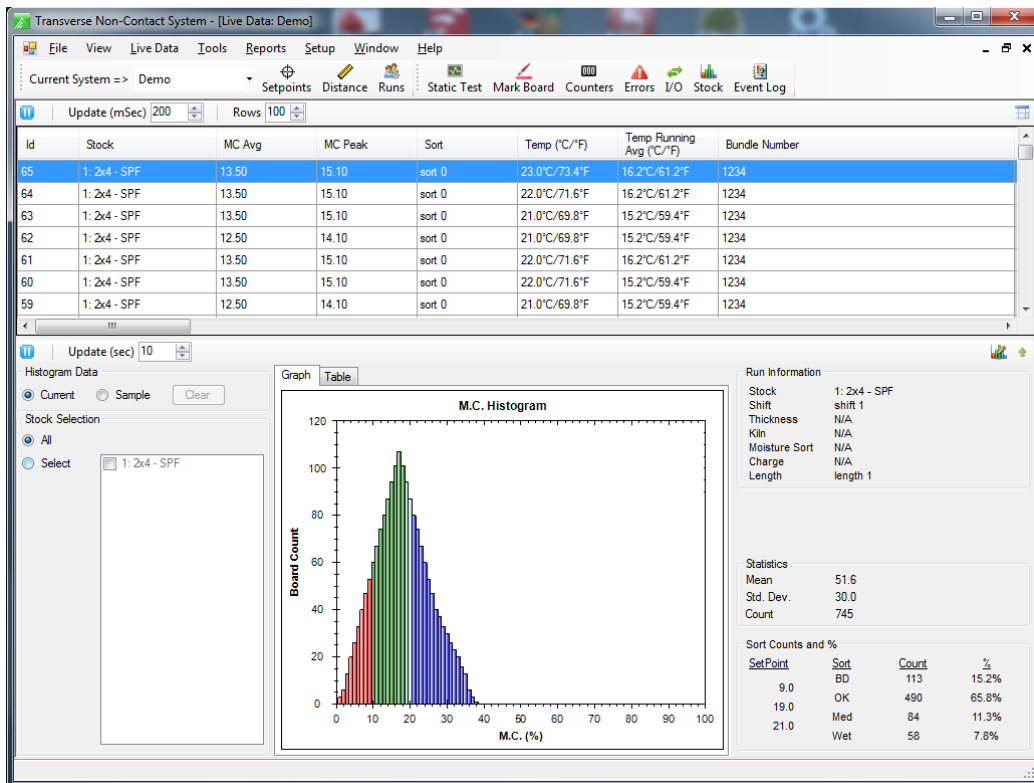
VIEW

Toggles on/off the toolbar displayed below.



LIVE DATA

The Live data Monitor displays current operating selections and conditions.



The Information included on the screen is as follows:

Scroll Data:

ID	Board count number.
MC	Average moisture content of the board
Peak	Peak reading recorded
Sort	Assigned sort based on peak or average readings
PCStat	Sensor Photo cell status (If the checkbox is check, PC has been blocked.)
S1-S5	Peak moisture content from each sensor
D1-D5	Distance reading for each sensor

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Configure Columns (icon):

User can choose which items to display in the Scroll Data. Default items are reviewed here

Stock Selection:

Current stock as well as the marker status.

Histogram/Table:

Description of graph and table

Mean	Average moisture content of the current run
SD	Moisture content standard deviation
# of Pieces	Number of pieces in the current run
Update Interval	How often (interval = number of boards) the system will ping the controller to update the screen. Low intervals can cause network issues.

Run Information:

Summary of optional data

Shft	Shift label
Lgth	Lumber length label
Kiln	Kiln label
MS	Moisture sort label (category assigned by the green lumber sort system)
Bundle	Current bundle number
PulseW	Pulse width setting for current stock. This is edited in stock setup forms.

Statistics:

Peak or average moisture content of the previous piece of lumber

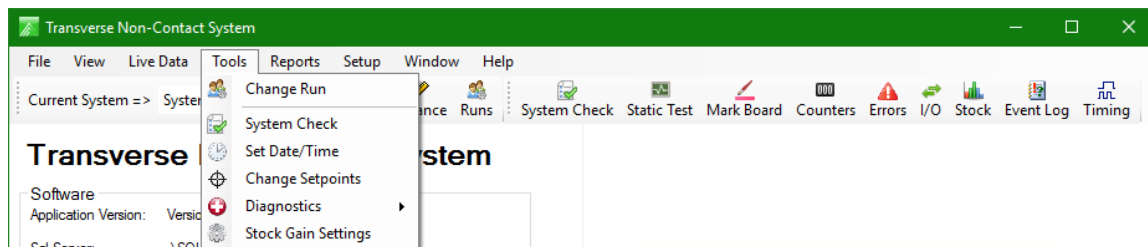
Sort Counts and %:

Summary of moisture results

SP	Set-point percentages
Sort	Set-point labels
Count	Number of pieces

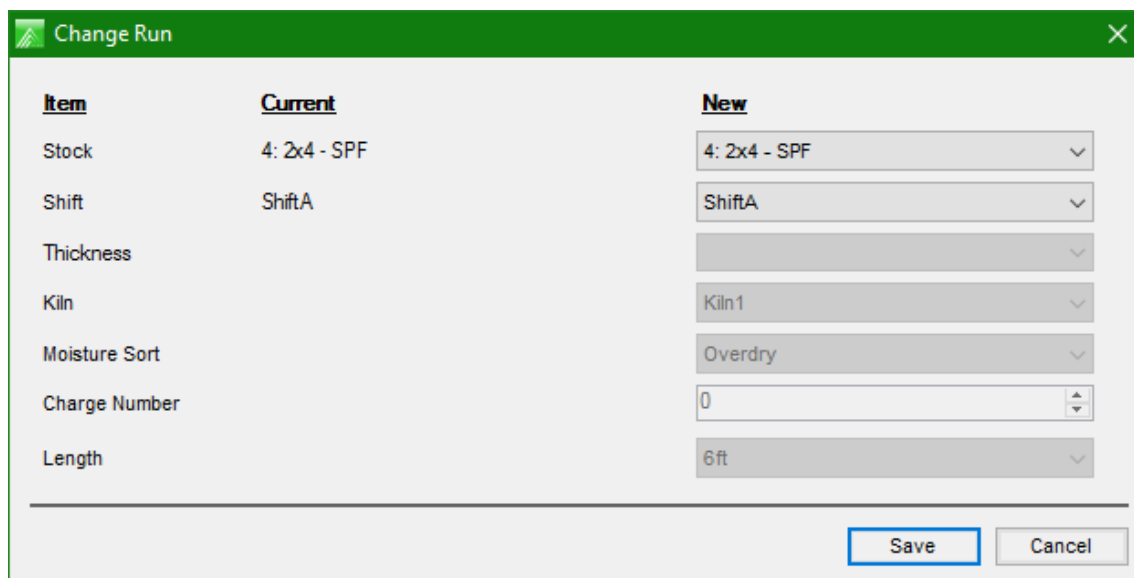
TOOLS

This section allows users to configure the system for their specific needs. Users can set the Date/Time for the processor, change setpoints and check diagnostics of the system.



Change Run

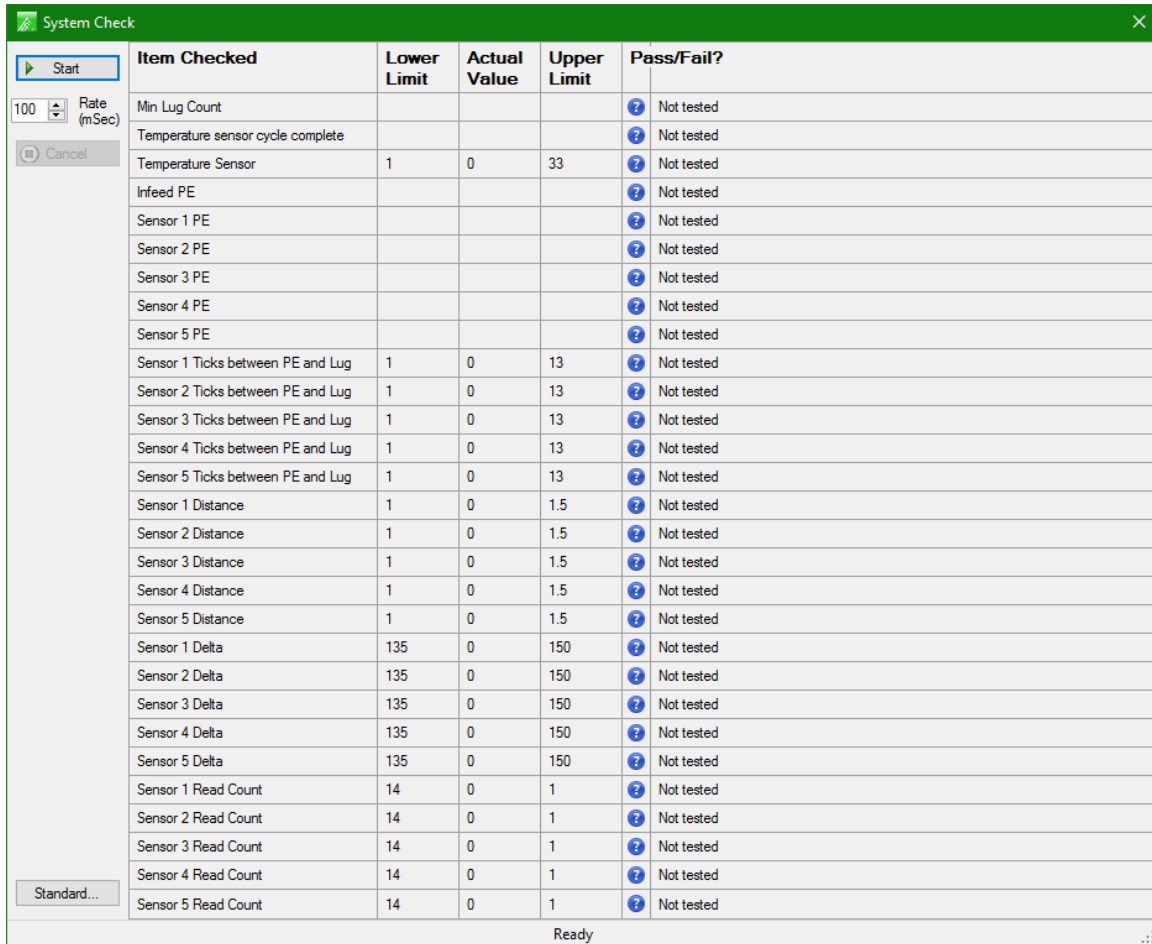
This screen allows the operator to change Run parameters such as stock, and shift. Changing an option in the menu will cause a report to be taken, and the tally will be cleared.



Item	Current	New
Stock	4: 2x4 - SPF	4: 2x4 - SPF
Shift	ShiftA	ShiftA
Thickness		
Kiln		Kiln1
Moisture Sort		Overdry
Charge Number		0
Length		6ft

System Check

This screen allows the user to perform a full diagnostic test of all physical components in the sensor. It will test the photocells, displacement sensors, and the read counts of each individual sensor. It will also test any auxiliary photocells as well as the temperature sensor (if this option was purchased with your system).



Start	Item Checked	Lower Limit	Actual Value	Upper Limit	Pass/Fail?
100 Rate (mSec)	Min Lug Count				? Not tested
Cancel	Temperature sensor cycle complete				? Not tested
	Temperature Sensor	1	0	33	? Not tested
	Infeed PE				? Not tested
	Sensor 1 PE				? Not tested
	Sensor 2 PE				? Not tested
	Sensor 3 PE				? Not tested
	Sensor 4 PE				? Not tested
	Sensor 5 PE				? Not tested
	Sensor 1 Ticks between PE and Lug	1	0	13	? Not tested
	Sensor 2 Ticks between PE and Lug	1	0	13	? Not tested
	Sensor 3 Ticks between PE and Lug	1	0	13	? Not tested
	Sensor 4 Ticks between PE and Lug	1	0	13	? Not tested
	Sensor 5 Ticks between PE and Lug	1	0	13	? Not tested
	Sensor 1 Distance	1	0	1.5	? Not tested
	Sensor 2 Distance	1	0	1.5	? Not tested
	Sensor 3 Distance	1	0	1.5	? Not tested
	Sensor 4 Distance	1	0	1.5	? Not tested
	Sensor 5 Distance	1	0	1.5	? Not tested
	Sensor 1 Delta	135	0	150	? Not tested
	Sensor 2 Delta	135	0	150	? Not tested
	Sensor 3 Delta	135	0	150	? Not tested
	Sensor 4 Delta	135	0	150	? Not tested
	Sensor 5 Delta	135	0	150	? Not tested
	Sensor 1 Read Count	14	0	1	? Not tested
	Sensor 2 Read Count	14	0	1	? Not tested
	Sensor 3 Read Count	14	0	1	? Not tested
	Sensor 4 Read Count	14	0	1	? Not tested
	Sensor 5 Read Count	14	0	1	? Not tested

Standard... Ready

Setup and use of the system check is as follows:

1. Locate a sustainable Calibration piece, preferably the piece the mill uses in order to calibrate their scanners. (Ex. 2x4 aluminium tubing)
2. With the sensors empty, locate the diagnostic screen **Static Test**. First set the burst length value to 2 then click update, followed by force background to zero out the sensors.
3. Place the test piece centered above and covering all sensors. Observing the diagnostic screen, you are looking for an ideal delta reading of about 150. If the delta reading is significantly out from that of 150 first remove the piece, then lower the burst length to lower your delta value and increase it to increase the value.

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4. Once you have the ideal reading be sure to press update and Force background before exiting the screen.
5. Under tools locate the **System Check** page and open the Standard tab.
6. Set the burst length to the value derived in the static test screen.
7. If the system uses a photoeye for board present then select **Use Infeed PE**, if an input from the PLC is used for board present then leave as deselected.
8. Set the high and low range for the temperature sensor. This will be the temperature of the calibration piece keep in mind so the values will be approximately 5°C for the low and 30°C for the high.
9. Save the values.
10. Run the line empty.
11. Press the start tab, and then yes to confirm. Observe the bottom of the System Check screen.
12. Wait until it displays *****waiting for standard board***** then pass the test piece through the sensors.
13. In order for the test to be conducted correctly you will need to run a number of empty lugs after the piece has passed the sensors until the bottom of the screen displays **System check complete**.
14. Observe the results.
15. Open the standard tab so you are able to view the results while adjusting the values.
16. Ste up your values and repeat steps 10-14 until all **Items Checked** applying to your system have passed.

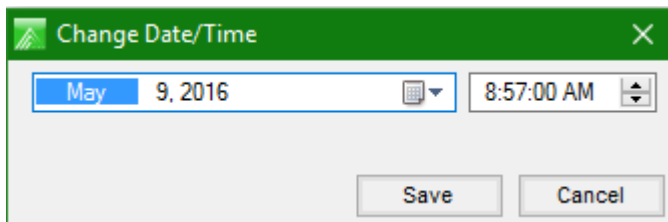
Standard Setup:

- The Reading Count min-max should be set to +/-15 of its value.
- The Delta min-max should be set to +/-15 of its value
- Observing Sensor Distance 1-5, the low for Distance should be set to .100" lower than the lowest distance reading and the max to .100" higher than the greatest reading.
- Ticks between PE and Lug should be between 10 and 20 if the line has been timed correctly. The min-max for the test piece should be set to +/-5 of its value.

Note: If you find that you have one or more sensors reading differently than the others, in the standard tab, check the **Override** box above that sensor(s) and you are able to adjust the parameters separately for said sensor.

Set Date / Time

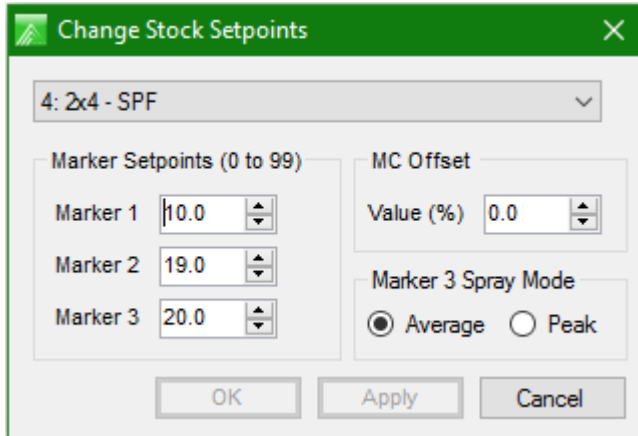
The 'Change Date and Time' screen allows the user to change the time in the embedded system. This will not change the local computer's clock.



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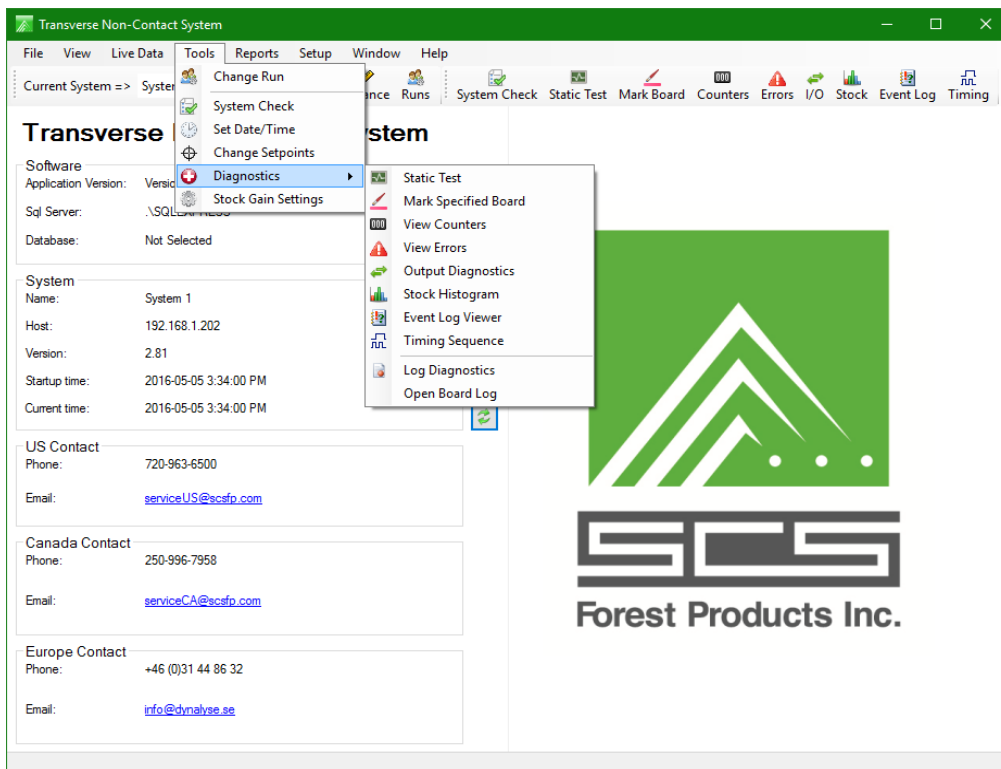
Change Set-points

This is an abbreviated version of the Edit Stocks form. It allows the user to modify three marker set-points. It also allows the user to toggle between average and peak spray mode for marker 3. The MC Offset is a bias to either increase or decrease moisture content results of the selected stock.



Diagnostics

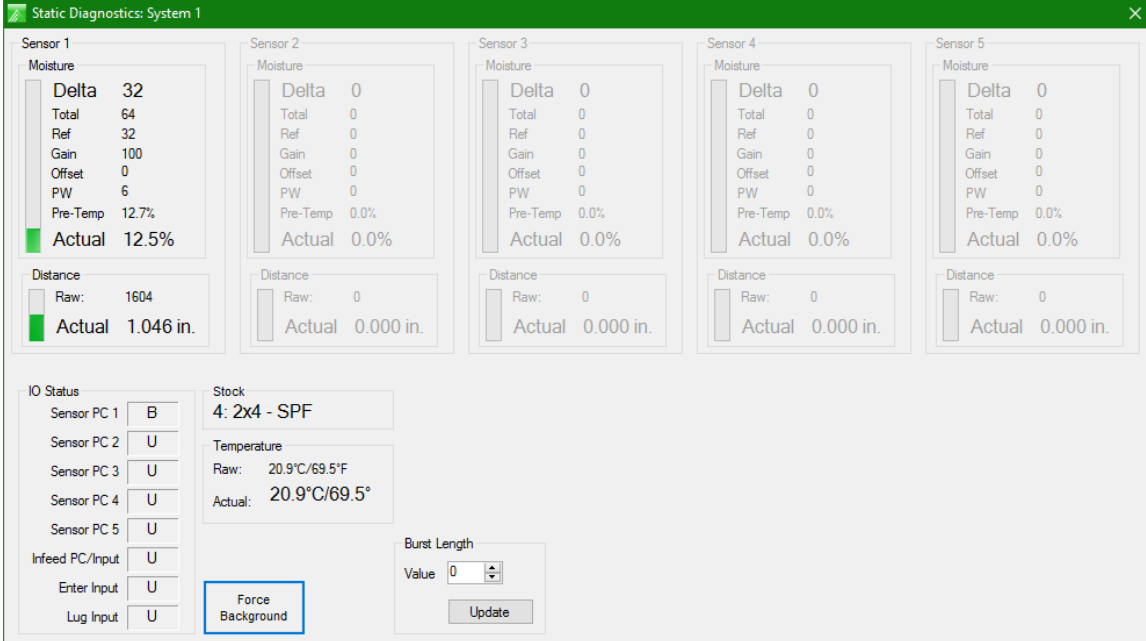
The diagnostics section allows the user to check the status of the system; Static test, Mark specified board, view counters, view errors, out diagnostics, stock histogram, event log viewer and log diagnostics.



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Static Test

The Static Test form allows the user to view the status of the sensor/s. (Caution: this test will stop the sensor from calculating and outputting) The Force Background button causes the system to take a reference.



The information shown on this screen is as follows:

Moisture:

Delta	Difference between the background reading and the current reading
Total	
Reference	
Gain	
Offset	
Pulse Width	Sensitivity of the sensor (can be adjusted in stock setup)
Pre Temp MC	Moisture content of the board before temperature adjustments
Actual MC	Calculated moisture content
Pre Temp MC	Moisture content of the board before temperature adjustments
IO Status	This section displays various IO components of the system including all photocells and the lug input from the users PLC.

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Distance:

Raw Un-calibrated, raw reading of the sensor
 Actual Actual distance from sensor (inches)

Temperature:

Raw Un-adjusted, raw temperature reading
 Actual Actual temperature reading

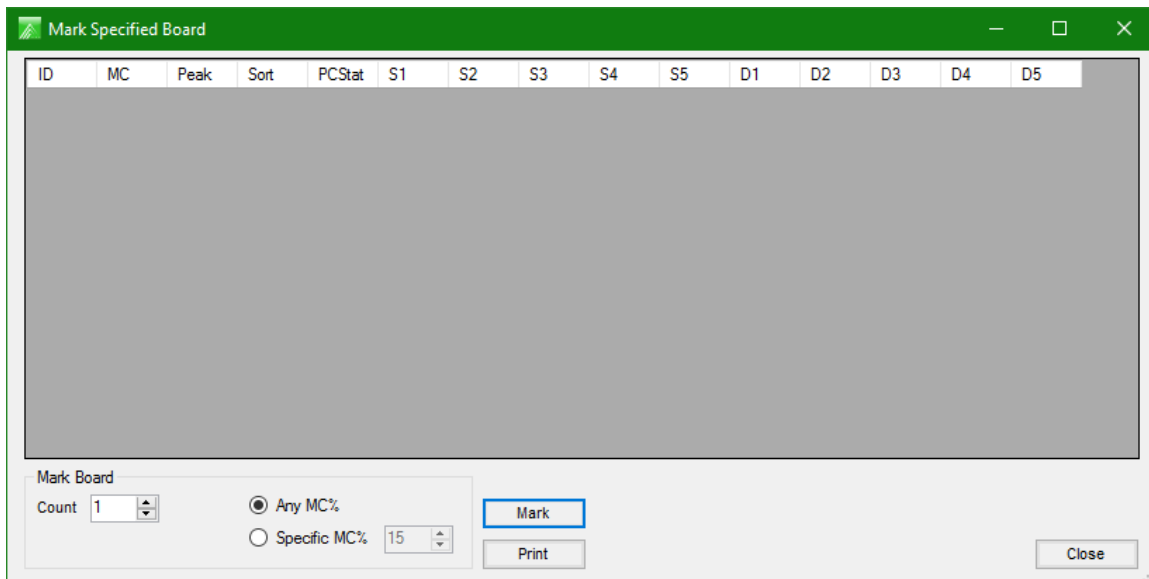
Burst Length:

Here you are able to adjust the sensitivity of all sensors in your system.

Mark Specified Board

This is only used in systems that have a paint system connected. Screen provides two functions. The first is to mark "Any MC" to adjust spray nozzles and check that the delay counter is correct to mark a board in a desired location. Selecting, "Specified MC", helps the operator verify the moisture model.


Mark Board Count: Marks the next specified number of boards
 Print: Prints this screen to ease MC calibration.



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View Counters

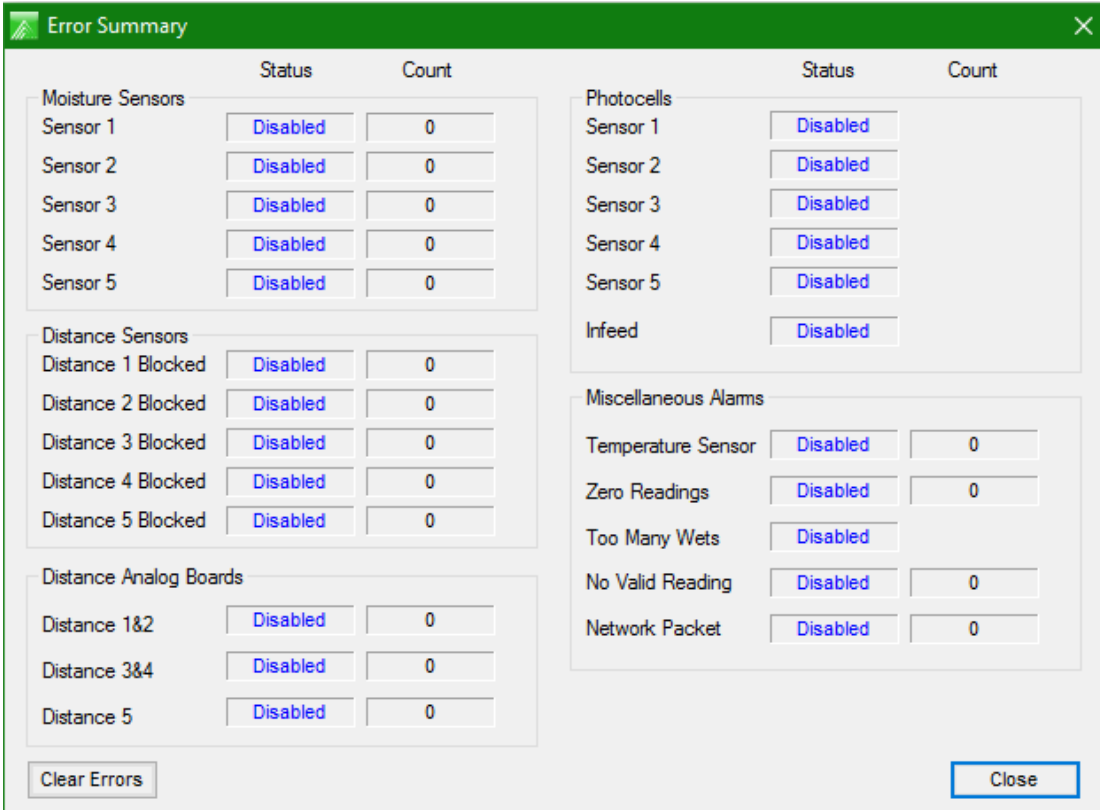
This screen allows the user to reset bundle and shift pointers. Pressing the reset button clears the data in the controller. These values do not need to be cleared unless direct by an SCS technician.



Counter	Start	End	
Primary Run	0	12	<input type="button" value="Reset"/>
Secondary Run	0	12	<input type="button" value="Reset"/>
Primary Bundle	0	12	<input type="button" value="Reset"/>
Secondary Bundle	0	12	<input type="button" value="Reset"/>

View Errors

This will display the status of the system and notify the user of any errors.

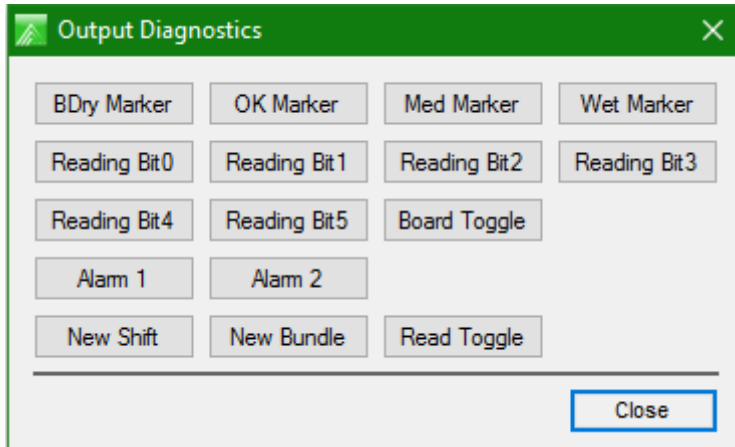


	Status	Count		Status	Count
Moisture Sensors			Photocells		
Sensor 1	Disabled	0	Sensor 1	Disabled	
Sensor 2	Disabled	0	Sensor 2	Disabled	
Sensor 3	Disabled	0	Sensor 3	Disabled	
Sensor 4	Disabled	0	Sensor 4	Disabled	
Sensor 5	Disabled	0	Sensor 5	Disabled	
Distance Sensors			Infeed	Disabled	
Distance 1 Blocked	Disabled	0	Miscellaneous Alarms		
Distance 2 Blocked	Disabled	0	Temperature Sensor	Disabled	0
Distance 3 Blocked	Disabled	0	Zero Readings	Disabled	0
Distance 4 Blocked	Disabled	0	Too Many Wets	Disabled	
Distance 5 Blocked	Disabled	0	No Valid Reading	Disabled	0
Distance Analog Boards			Network Packet	Disabled	0
Distance 1&2	Disabled	0	<input type="button" value="Clear Errors"/>		
Distance 3&4	Disabled	0	<input type="button" value="Close"/>		
Distance 5	Disabled	0			

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Output Diagnostics

This screen allows the user to force the various IO bits on or off to ensure that they are operating correctly. This feature is mainly used when initially configuring the system. The line should not be running for this diagnostic, as the system will stop sorting when you enter this screen.



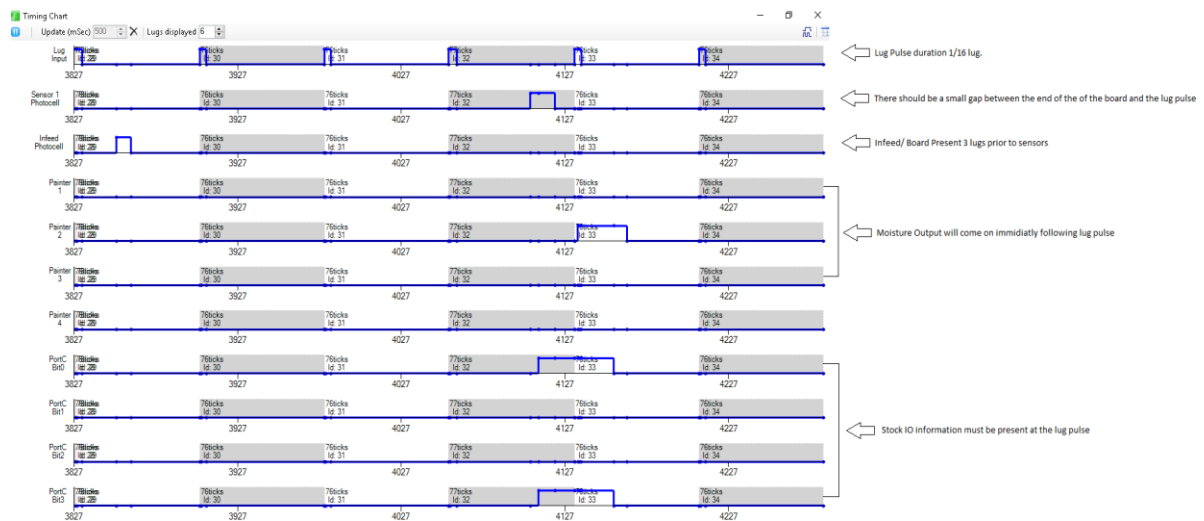
Stock Histogram

A reference histogram configuration screen. Do not change without consulting an SCS technician.

Event Log Viewer

A display for PC related events or errors.

Timing Sequence



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Log Diagnostics

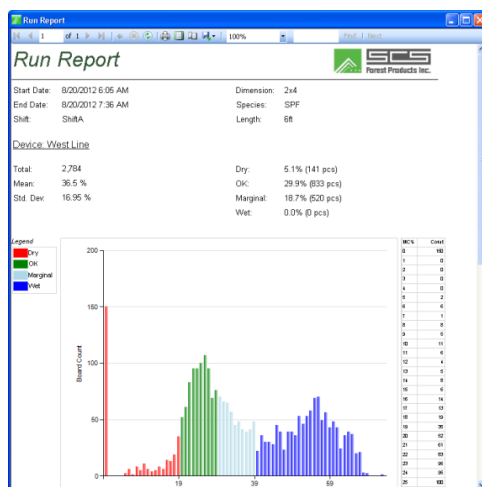
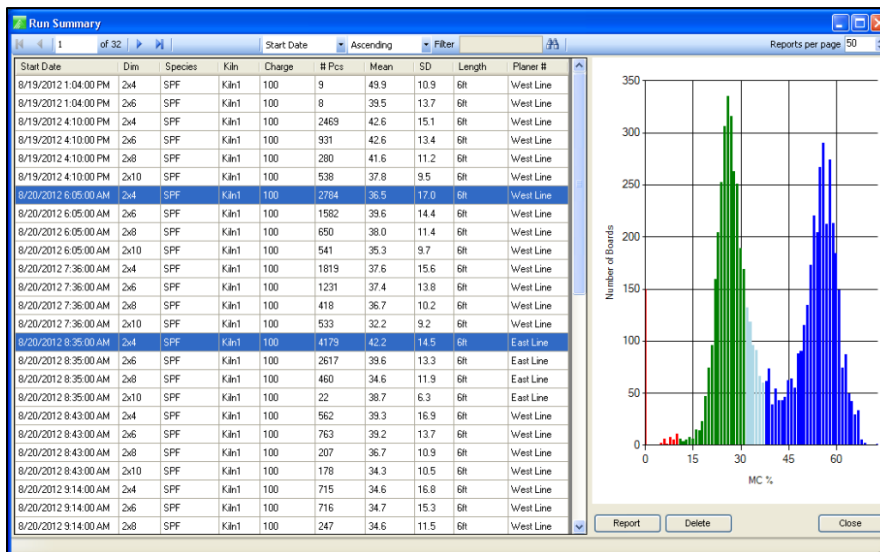
Records internal system communications.

Open Board Log

Allows the user to open and view recorded files from the live data board monitor.

REPORTS

A list of all available shift reports in the database. Users can view or delete records. Data can be sorted by selecting a column header at the top. Multiple selections can be made.

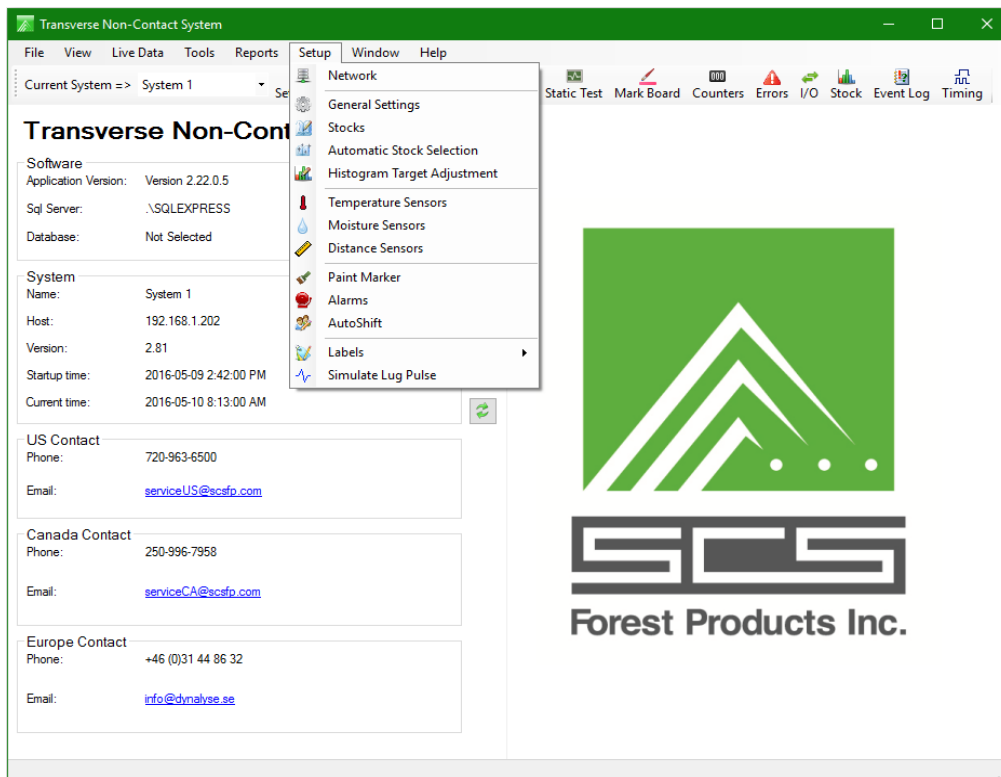


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Sample run report.

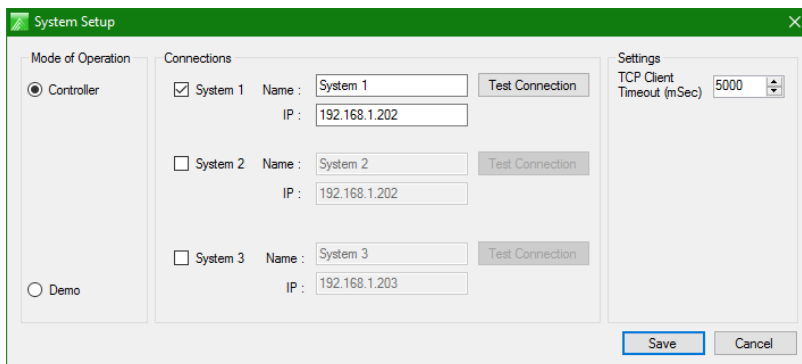
SETUP

Allows the operator to configure general system settings.



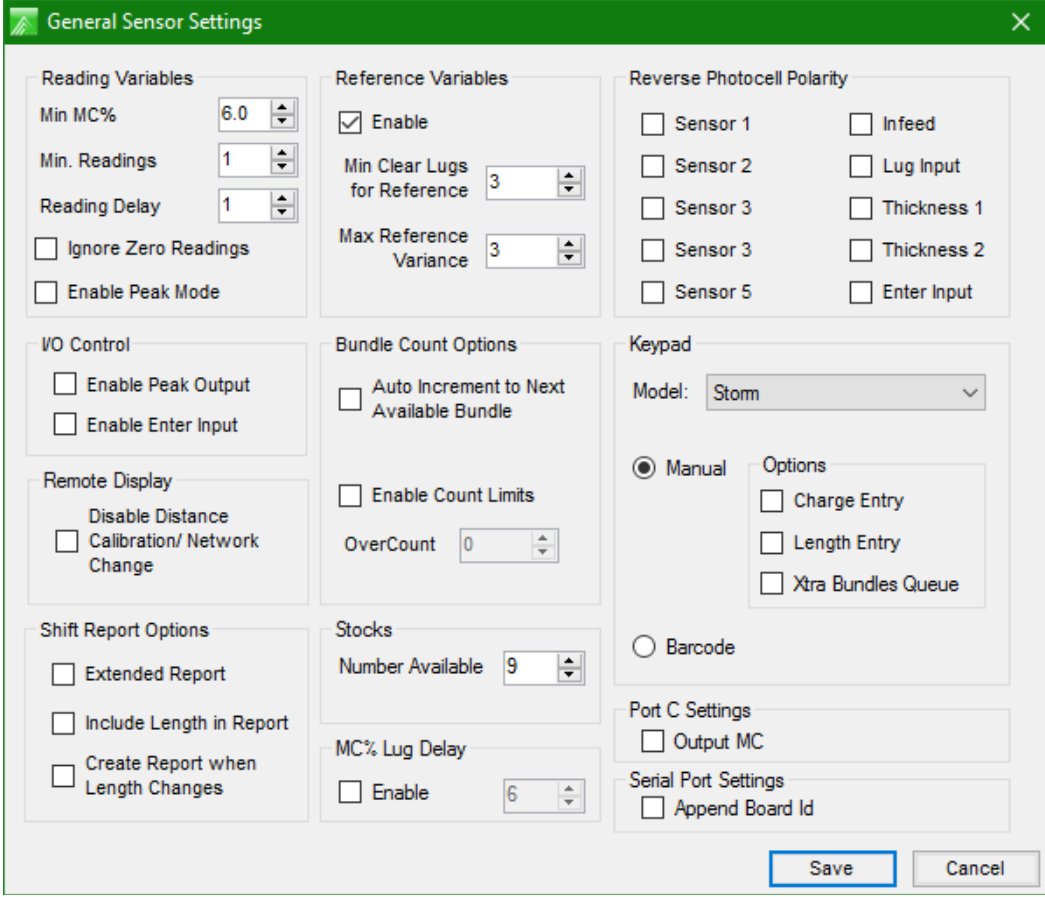
Network

Up to 3 systems can be controlled from the software. To setup a system, simply select the checkbox in an available system. Next, provide a system name. Finally, input the MCU IP address.



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General Settings



Reading Variables

- Min MC%** Minimum moisture content the system will allow, causing anything below to be called zero and will not be counted.
- Min. Readings** Minimum number of readings required per board. If fewer readings are recorded, then the system assumes there was no board.
- Reading Delay** This feature should only be used with slower planers to set a delay between readings, thereby reducing the total number of readings recorded per board to a maximum of 90. The range is 1-4. The default is 1 and this sets the readings at 16ms. Increasing to 2, reduces readings to every 32ms (3=48ms, etc).
- Ignore Zero Readings** Control whether the zero reading error is enabled or not.
- Enable Peak Mode** Changes the MC output from Average to Peak reading

Reference Variables

- Reference Enable** Turns on/off background readings.

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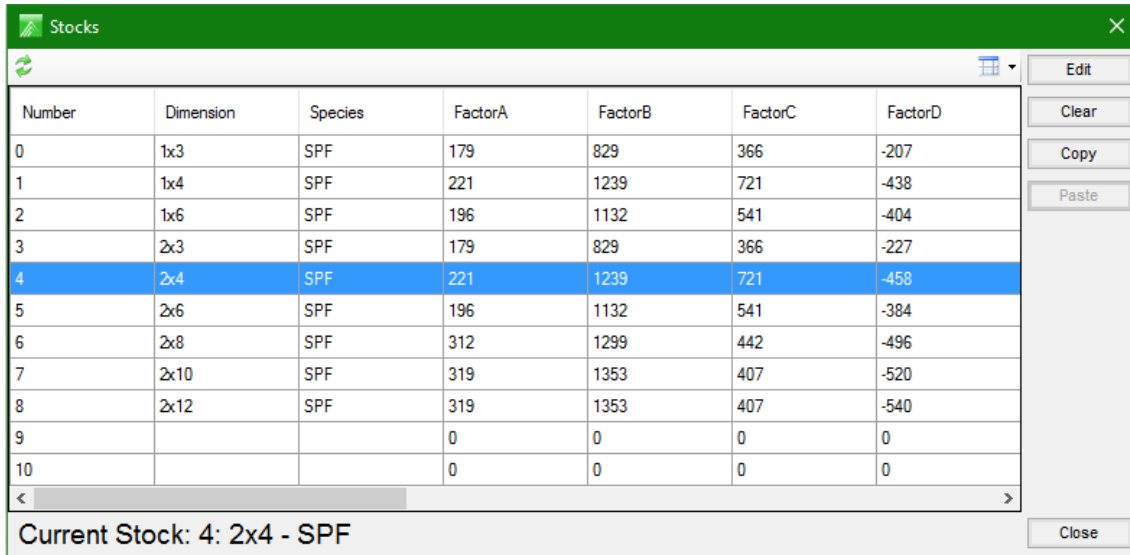
Min clear lugs for	The amount of clear lugs required before the system will take a reference reading.
Max Reference Variance	The maximum tolerance between the old reference value and the new zero reading. If the difference exceeds this value, the system will store the new reference number.
Reverse Photocell Polarity	The polarity for each detector is: unselected = active low, selected = active high.
I/O Control	
Enable Peak Output	Only the peak reading is output through discreet I/O.
Enable Enter Input	Explanation required. Allows the customer to install a remote enter button near the operator who will be tracking bundles.
Bundle Count Options	
Auto Increment to Next Available Bundle	Refer to keypad setup.
Enable Count Limits	
Keypad	
Model	Allows user to select model of keypad (should always be set to Storm).
Manual	Manual entry from the keypad enclosure.
Barcode	Automatic entry using a barcode scanner.
Remote Display	When enabled, allows the user to perform distance calibrations and network adjustments (IP address), from the MCU cabinet.
Shift Report Options	
Extended Report Enable	Allows the user to edit Kiln, Moisture Sort, and Charge. If enabled, they can be accessed via View/Change Shifts.
Enable Length In Report	Allows the user to change the length of the lumber. The lengths are then used for shift reporting.
Create Report when Length Changes	If a length change is made on the keypad, a shift report will be taken, causing the tally to clear.
Stocks	Number of stocks that can be viewed in Setup/Stocks.
MC% Lug Delay	
Port C Settings	
Serial Port Settings	

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Stocks

This form allows the user to configure the stock information on the system. The user can add, edit, and delete stocks. Current stocks are shown in the list. A backup of this list can be saved by selecting "File" → "Stocks" → "Export" option.

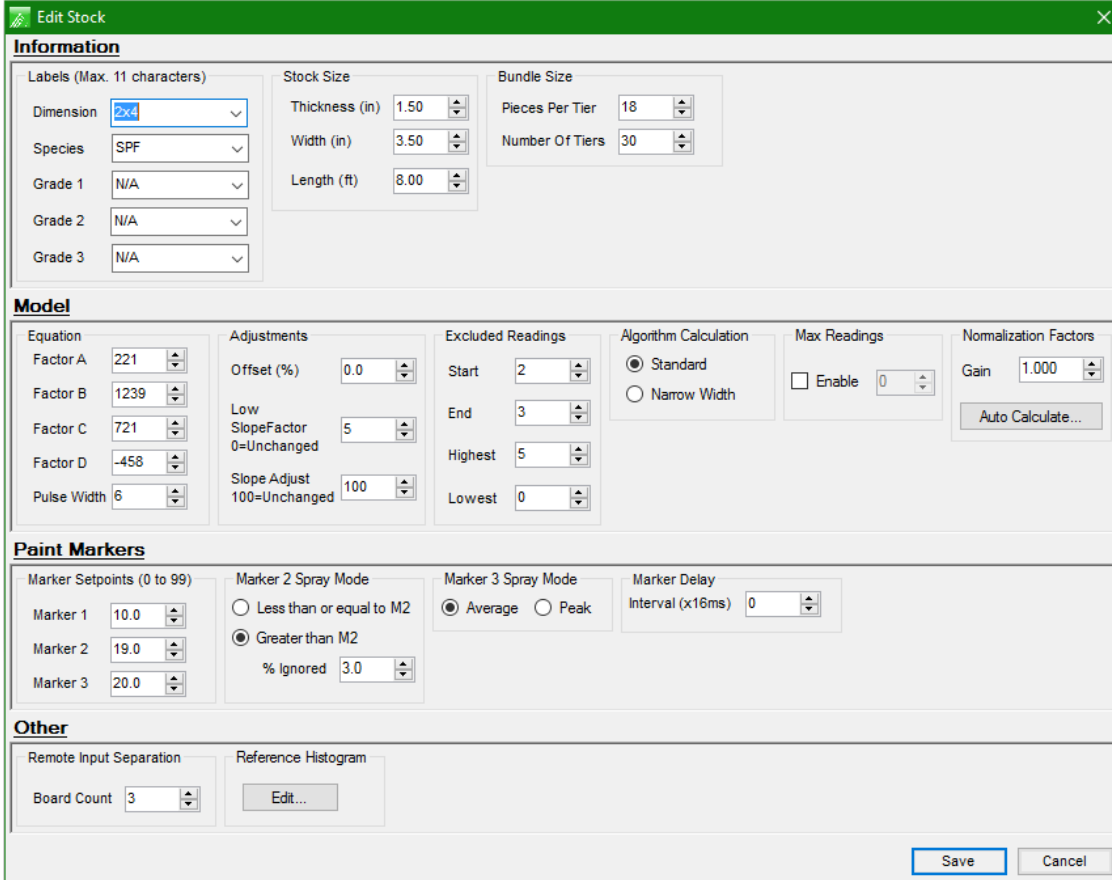
To add or edit a stock you will open this screen. To select a stock, simply highlight the specified stock.



Number	Dimension	Species	FactorA	FactorB	FactorC	FactorD
0	1x3	SPF	179	829	366	-207
1	1x4	SPF	221	1239	721	-438
2	1x6	SPF	196	1132	541	-404
3	2x3	SPF	179	829	366	-227
4	2x4	SPF	221	1239	721	-458
5	2x6	SPF	196	1132	541	-384
6	2x8	SPF	312	1299	442	-496
7	2x10	SPF	319	1353	407	-520
8	2x12	SPF	319	1353	407	-540
9			0	0	0	0
10			0	0	0	0

Current Stock: 4: 2x4 - SPF

Edit Stock



Information

Labels (Max. 11 characters)

Dimension: 2x4

Species: SPF

Grade 1: N/A

Grade 2: N/A

Grade 3: N/A

Stock Size

Thickness (in): 1.50

Width (in): 3.50

Length (ft): 8.00

Bundle Size

Pieces Per Tier: 18

Number Of Tiers: 30

Model

Equation

Factor A: 221

Factor B: 1239

Factor C: 721

Factor D: -458

Pulse Width: 6

Adjustments

Offset (%): 0.0

Low SlopeFactor: 5

Slope Adjust: 100

Excluded Readings

Start: 2

End: 3

Highest: 5

Lowest: 0

Algorithm Calculation

Standard

Narrow Width

Max Readings

Enable

Normalization Factors

Gain: 1.000

Auto Calculate...

Paint Markers

Marker Setpoints (0 to 99)

Marker 1: 10.0

Marker 2: 19.0

Marker 3: 20.0

Marker 2 Spray Mode

Less than or equal to M2

Greater than M2

% Ignored: 3.0

Marker 3 Spray Mode

Average

Peak

Marker Delay Interval (x16ms): 0

Other

Remote Input Separation

Board Count: 3

Reference Histogram

Edit...

Save Cancel

The settings are as follows:

Information

Labels

Dimension: Dimension label

Species: Species label

Grade 1/2/3: Three grades labels

Stock Size

Thickness: Thickness of lumber (in)

Width: Width of lumber (in)

Length: Length of lumber (ft)

Bundle Size

Pieces: Number of pieces in the width of a tier

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Number of Tiers Number of pieces in the height of a load.

Model

Equation

Factor A - Factor D This variable should only be changed by an SCS technician.

Pulse Width This variable should only be changed by an SCS technician.

Adjustments

Offset (%) Offsets the calculated moisture content.

Low Slope Factor This adjusts the slope of the formula used to calculate the MC of pieces 10% and lower. This should not be adjusted without contacting an SCS technician.

Slope Adjust Adds a multiplier to the sensor reading so the higher readings are affected differently than the lower readings. (eg. sensor reading is 15. Slope is 100: reading is 15. Slope is 110: reading is 11.5). This number can make a large change on how your system reads and should not be adjusted without consulting an SCS technician.

Excluded Readings

Start Number of readings taken at the start of the board to disregard.

End Number of readings taken at the end of the board to disregard.

Highest Number of highest readings to disregard.

Lowest Number of lowest readings to disregard.

Algorithm Calculation

Standard

Narrow Width

Max Readings

Enable Turns on/off maximum readings per board function

Normalization Factors

Gain

Paint Markers

Marker Setpoints (0 to 99)

Marker 1 - Marker 3 Thresholds at which various markers will start to spray boards.

Marker 2 Spray Mode

Less than or equal to M2

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Greater than M2 When selected, a certain percentage of boards will be allowed into the higher moisture content grade. Percent Based Marker 2, in Setup/Paint Marker, must also be enabled for this function to work properly.

Marker 3 Spray Mode

Average Sprays based on the average reading of the board.
 Peak Sprays based on the peak reading of the board.

Marker Delay

Interval (x16ms) Time delay for painter to spray, x16ms.

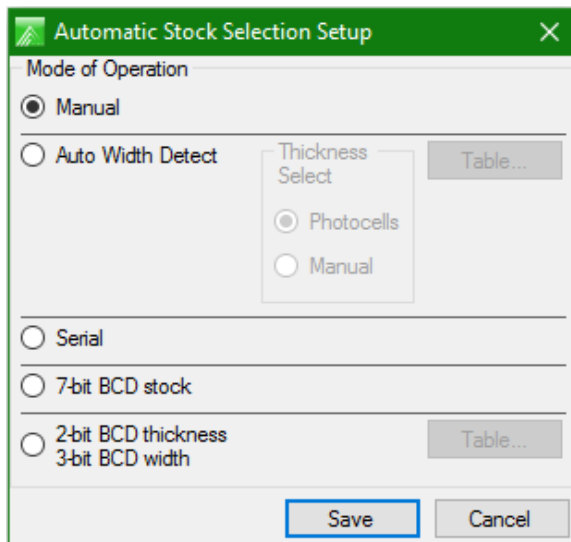
Other

Remote Input Separation

Board Count Number of boards that are read before next package automatically increments

Automatic Stock selection

This section allows you to choose what mode of stock selection the system will run on. This should be setup at the installation of the system by an SCS technician, and should not be adjusted unless instructed by an SCS employee.



Mode of Operation

Manual Manual stock selection will require the user to manually change between stocks, either from the PC or the MCU display.

Auto Width Detect Allows automatic width detection of lumber, uses #1 PC to determine the percentage of lug fill. Use table to select stock based on width.

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Thickness Select

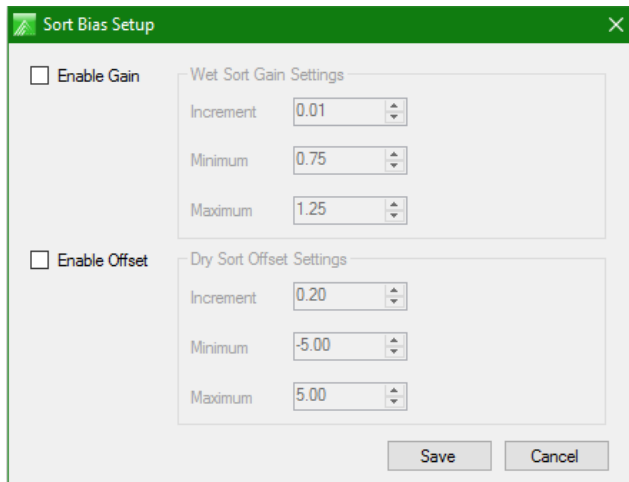
Photocells Automatically select thickness using photocells.
 Manual Manually select stock in Tools/Change Run.

Serial Serial stock selection, stock codes passed from the PLC.

7-bit BCD stock Use inputs to pass us the stock code for each piece of lumber.

2-bit BCD thickness Use inputs to pass 2 bit thickness code and 3 bit width code. Use table
3-bit BCD width to select stock based on thickness and width.

Histogram Target Adjustment



Enable Gain

Wet Sort Gain Settings

Increment
 Minimum
 Maximum

Enable Offset

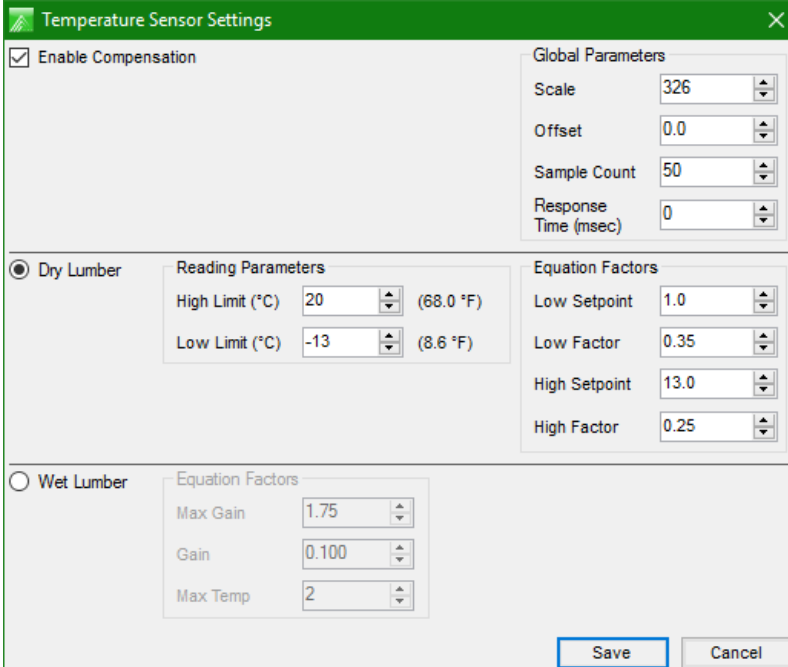
Dry Sort Offset Settings

Increment
 Minimum
 Maximum

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Temperature Sensors

Not all systems have temperature sensors installed. Please talk to your technical advisor to determine if you have purchased this option.



Note: these variables should not be changed without consulting an SCS employee.

Enable Compensation Enables temperature compensation.

Global Parameters

- Scale** This factor should be adjusted until the temperature displayed on the sensor and the temperature displayed in the Static Test screen match each other.
- Offset** A bias to increase or decrease the temperature sensor reading.
- Sample Count** The sample count is the number of pieces that the temperature average is based on. Default: 50.
- Response Time (msec)** The speed at which the temperature sensor takes readings. This factor will vary depending on what model of temperature sensor you have with your system.

Dry Lumber

Reading Parameters

High Limit Maximum acceptable temperature reading.

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Low Limit Minimum acceptable temperature reading.

Equation Factors

Low Set-point Variable for the adjustment of the temperature compensation formula. Do not adjust.

Low Factor Variable for the adjustment of the temperature compensation formula. Do not adjust.

High Set-point Variable for the adjustment of the temperature compensation formula. Do not adjust.

High Factor Variable for the adjustment of the temperature compensation formula. Do not adjust.

Wet Lumber

Equation Factors

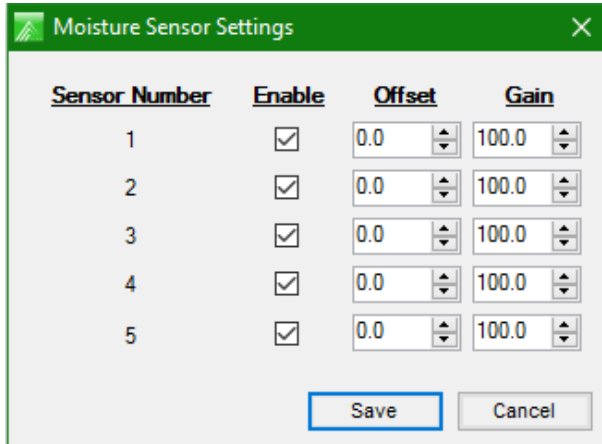
Max Gain Maximum multiplier applied to stock based on temperature.

Gain Multiplier increment.

Max temp Warmest temperature that temperature compensation will be activated.

Moisture Sensors

Screen to enable moisture sensors and adjust readings. The gain should not be adjusted without consulting an SCS technician.

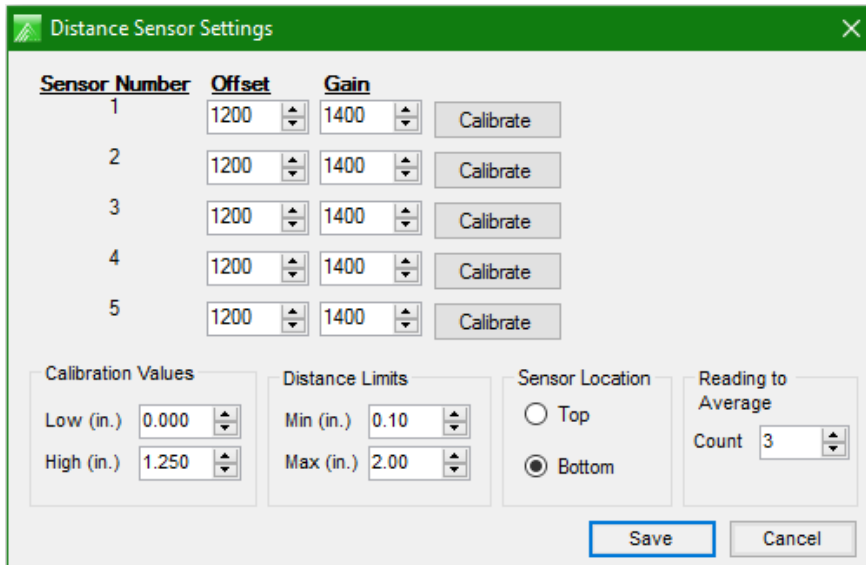


The dialog box titled "Moisture Sensor Settings" contains a table with the following data:

Sensor Number	Enable	Offset	Gain
1	<input checked="" type="checkbox"/>	0.0	100.0
2	<input checked="" type="checkbox"/>	0.0	100.0
3	<input checked="" type="checkbox"/>	0.0	100.0
4	<input checked="" type="checkbox"/>	0.0	100.0
5	<input checked="" type="checkbox"/>	0.0	100.0

Buttons: Save, Cancel

Distance Sensors



The dialog box titled "Distance Sensor Settings" contains the following configuration options:

Sensor Number	Offset	Gain	Calibrate
1	1200	1400	Calibrate
2	1200	1400	Calibrate
3	1200	1400	Calibrate
4	1200	1400	Calibrate
5	1200	1400	Calibrate

Additional settings:

- Calibration Values: Low (in.) 0.000, High (in.) 1.250
- Distance Limits: Min (in.) 0.10, Max (in.) 2.00
- Sensor Location: Top, Bottom
- Reading to Average: Count 3

Buttons: Save, Cancel

Offset

Used to calculate true distance from the sensor readings. This variable is determined in the distance calibration process and should not be manually adjusted.

Gain

A variable used to calculate true distance from the sensor readings. This variable is calculated in the distance calibration process and should not be manually adjusted.

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Calibration Values

Low Lower distance (in inches) used when running the distance calibration process (usually 0”).

Note: Do not change unless immediately calibrating with new calibration piece.

High Upper distance (in inches) used when running the distance calibration process (usually 1.250”).

Note: Do not change unless immediately calibrating with new calibration piece.

Distance Limits

Min Lowest reading allowed before the distance will not be considered valid. If the distance is not valid, a moisture content for that sensor will not be generated in that lug.

Max Highest reading allowed before the distance will not be considered valid. If the distance is not valid, a moisture content for that sensor will not be generated in that lug.

Sensor Location

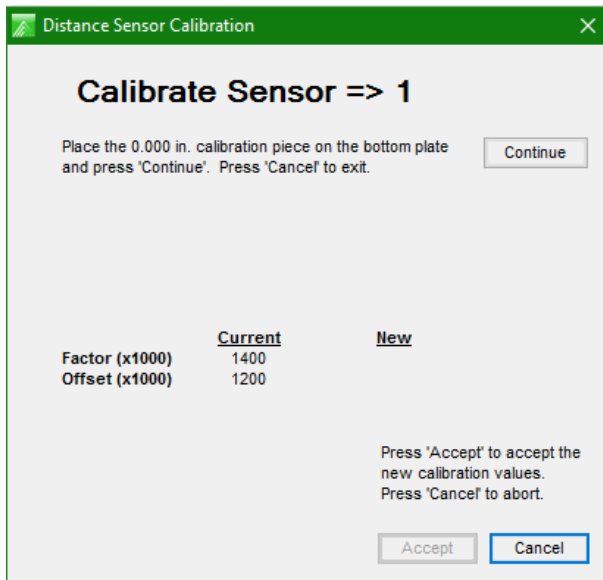
Top Distance sensor is mounted above the board.

Bottom Distance sensor is mounted below the board, under the sensor.

Reading to Average

Count Number of sensor readings taken before the readings are averaged and the display is refreshed in the ‘Static Test’ mode.

Calibrate

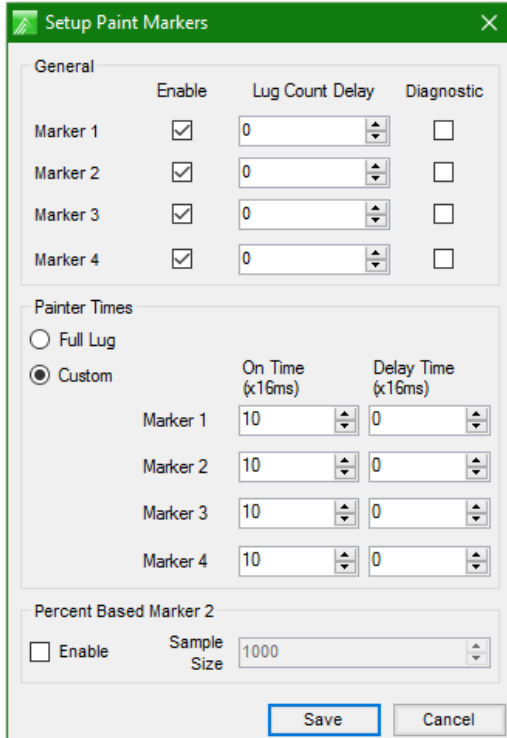


A step by step procedure for calibrating the distance sensor is shown on the screen beside the continue button. The procedure is as follows:

1. Ensure the distance sensors are clean before calibration.
2. Place the calibration piece on the lower arm of the system so the 0.000" side is blocking the distance sensor. The hole for the distance sensor should be completely covered.
3. Press the "Continue" button.
4. Rotate the calibration piece so that the 1.250" section is straddling the distance sensor hole.
5. Press the "Finish" button. New factor and offset values will appear and should be around 1200 and 1400 +/- 200.
6. Compare the old values to the new values. They should not change by much (+/-10 %).
7. If OK, then press Accept.
8. Calibration can be tested by placing a piece over the sensor and viewing distance in static test mode.

Paint Markers

This form allows the user to setup the paint markers. Users can enable a paint marker by checking the appropriate marker label.



General

Marker 1	Activates when an MC value below set-point 1 is measured.
Marker 2	Activates when an MC value above set-point 1 and below set-point 2 is measured.
Marker 3	Activates when an MC value above set-point 2 and below set-point 3 is measured.
Marker 4	Activates when an MC value above set-point 3 is measured.
Lug Count Delay	Number of lugs the painter delays after the board has fully passed the sensor.
Diagnostic	Controls which marker sprays when using the Mark Specified Board function.

Painter Times

Full Lug

Custom

On Time (x16ms) Markers spray duration (x16ms).

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Delay Time (x16ms)

Marker delay time (x16ms)

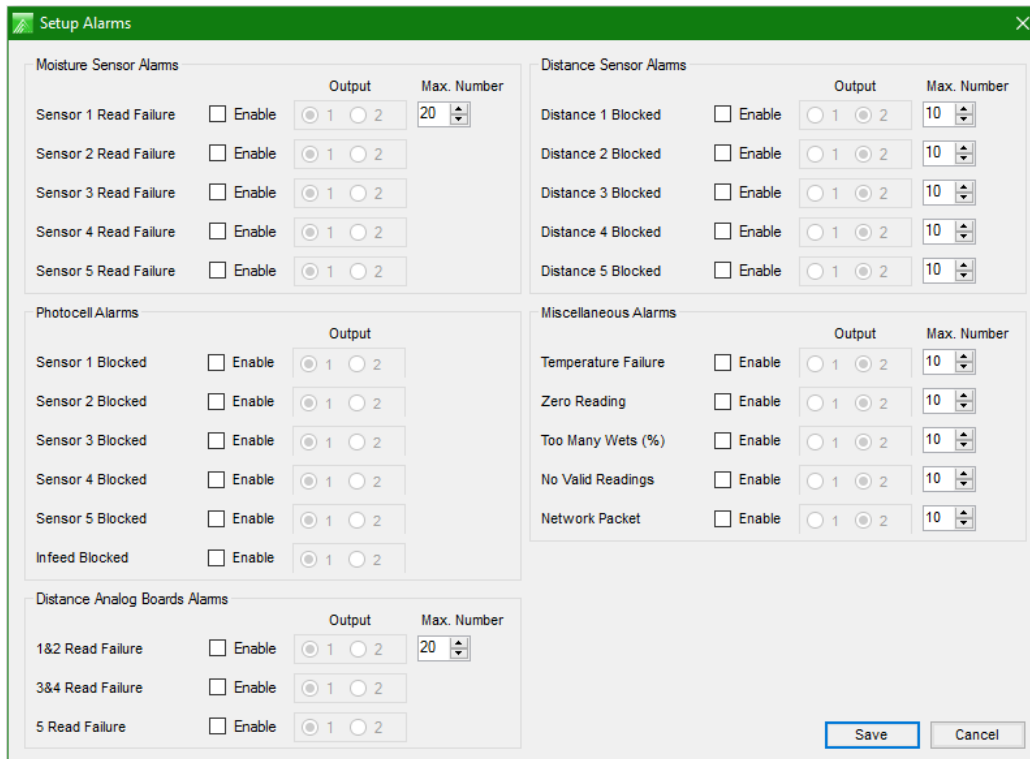
Percent Based Marker 2

If disabled, marker 2 will mark boards less than or equal to set-point 2 and above set-point 1. If this is enabled, a percentage of pieces above set-point 2 will be allowed into the drier sort. (See Edit Stocks)

Sample Size

Alarms

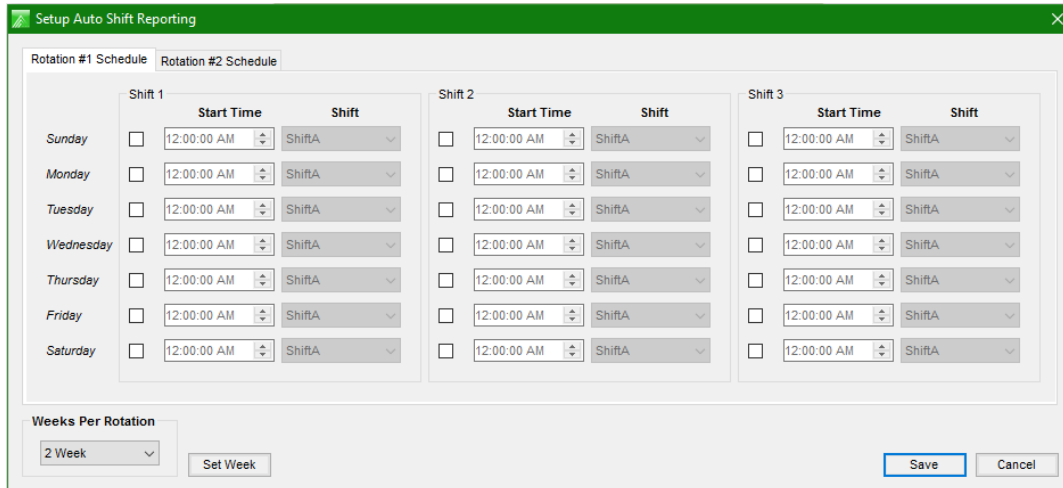
This screen allows for the configuration of the system alarms. The different alarms can be assigned to 2 different outputs. Also, the number of errors that will cause an alarm is adjustable.



Alarm Type	Enable	Output	Max. Number
Moisture Sensor Alarms			
Sensor 1 Read Failure	<input type="checkbox"/>	1 2	20
Sensor 2 Read Failure	<input type="checkbox"/>	1 2	
Sensor 3 Read Failure	<input type="checkbox"/>	1 2	
Sensor 4 Read Failure	<input type="checkbox"/>	1 2	
Sensor 5 Read Failure	<input type="checkbox"/>	1 2	
Distance Sensor Alarms			
Distance 1 Blocked	<input type="checkbox"/>	1 2	10
Distance 2 Blocked	<input type="checkbox"/>	1 2	10
Distance 3 Blocked	<input type="checkbox"/>	1 2	10
Distance 4 Blocked	<input type="checkbox"/>	1 2	10
Distance 5 Blocked	<input type="checkbox"/>	1 2	10
Photocell Alarms			
Sensor 1 Blocked	<input type="checkbox"/>	1 2	
Sensor 2 Blocked	<input type="checkbox"/>	1 2	
Sensor 3 Blocked	<input type="checkbox"/>	1 2	
Sensor 4 Blocked	<input type="checkbox"/>	1 2	
Sensor 5 Blocked	<input type="checkbox"/>	1 2	
Infeed Blocked	<input type="checkbox"/>	1 2	
Miscellaneous Alarms			
Temperature Failure	<input type="checkbox"/>	1 2	10
Zero Reading	<input type="checkbox"/>	1 2	10
Too Many Wets (%)	<input type="checkbox"/>	1 2	10
No Valid Readings	<input type="checkbox"/>	1 2	10
Network Packet	<input type="checkbox"/>	1 2	10
Distance Analog Boards Alarms			
1&2 Read Failure	<input type="checkbox"/>	1 2	20
3&4 Read Failure	<input type="checkbox"/>	1 2	
5 Read Failure	<input type="checkbox"/>	1 2	

Setup Auto Shift Reporting

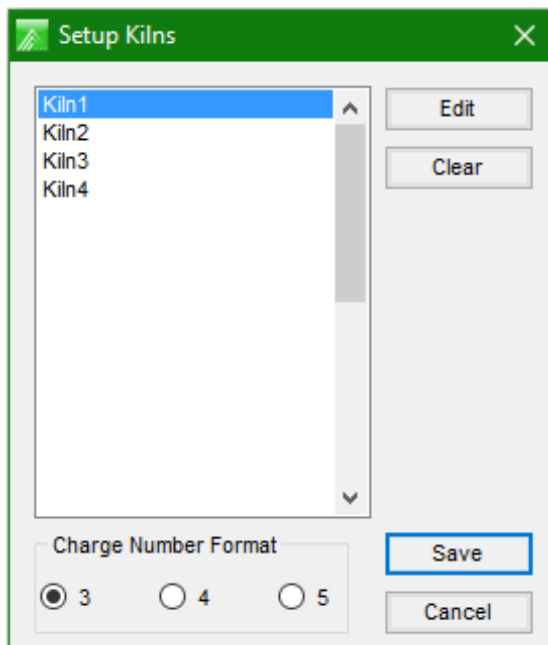
Screen is used to setup shift reporting. The system will automatically assign a shift to a run based on the time of the run. Users can edit the various shifts as required.



Labels

Kilns

Edit kiln labels and set the charge number format.

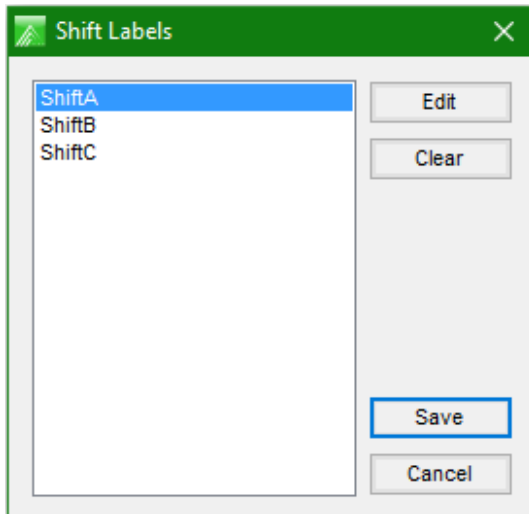


Note: the charge number format will change the number of digits allowed to enter for a charge number.

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Shifts

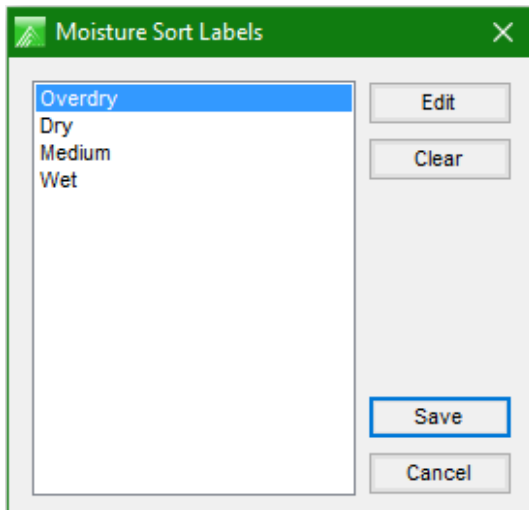
Edit shift labels. You must have at least one shift name in the system.



Shift labels will be used in reporting.

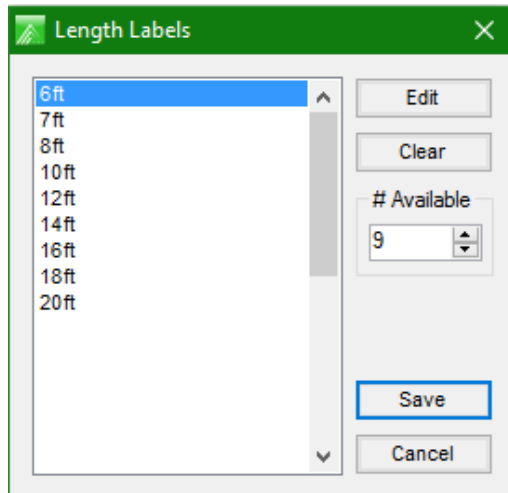
Moisture Sorts

Edit moisture sort labels for reporting.



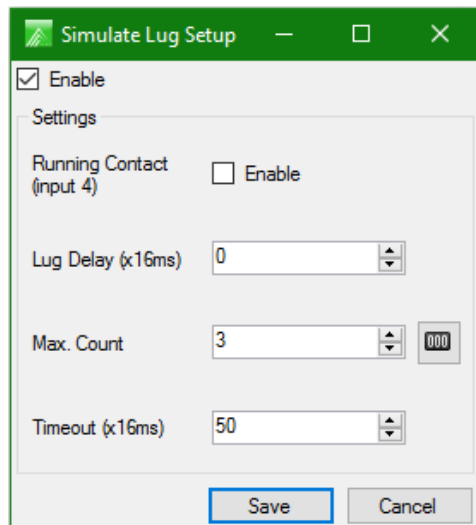
Lengths

Edit lumber length labels for reporting.



Simulate Lug Pulse

This section is used when the mill is unable to pass us a lug pulse or is unable to generate one. It will simulate a lug pulse for you based on the factors listed below.



Settings

Running Contact (input 4)

When enabled allows you to wire in a switch to signal when the chain is running. Using input number 4 on the opto 22 board.

Lug Delay (x16ms)

The delay time after the board has passed the sensor photocell before a new lug pulse is generated.

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Max. Count

The reference allowance. This number should be the number of boards boards that will be in-between the board present PC (infeed) and the sensors at any given time, minus 1 (ex. If there is 3 boards between the photocell and the sensors, set the number to 2).

Timeout (x16ms)


Simulated lug speed. Set to the time taken to generate a board x2.

Window

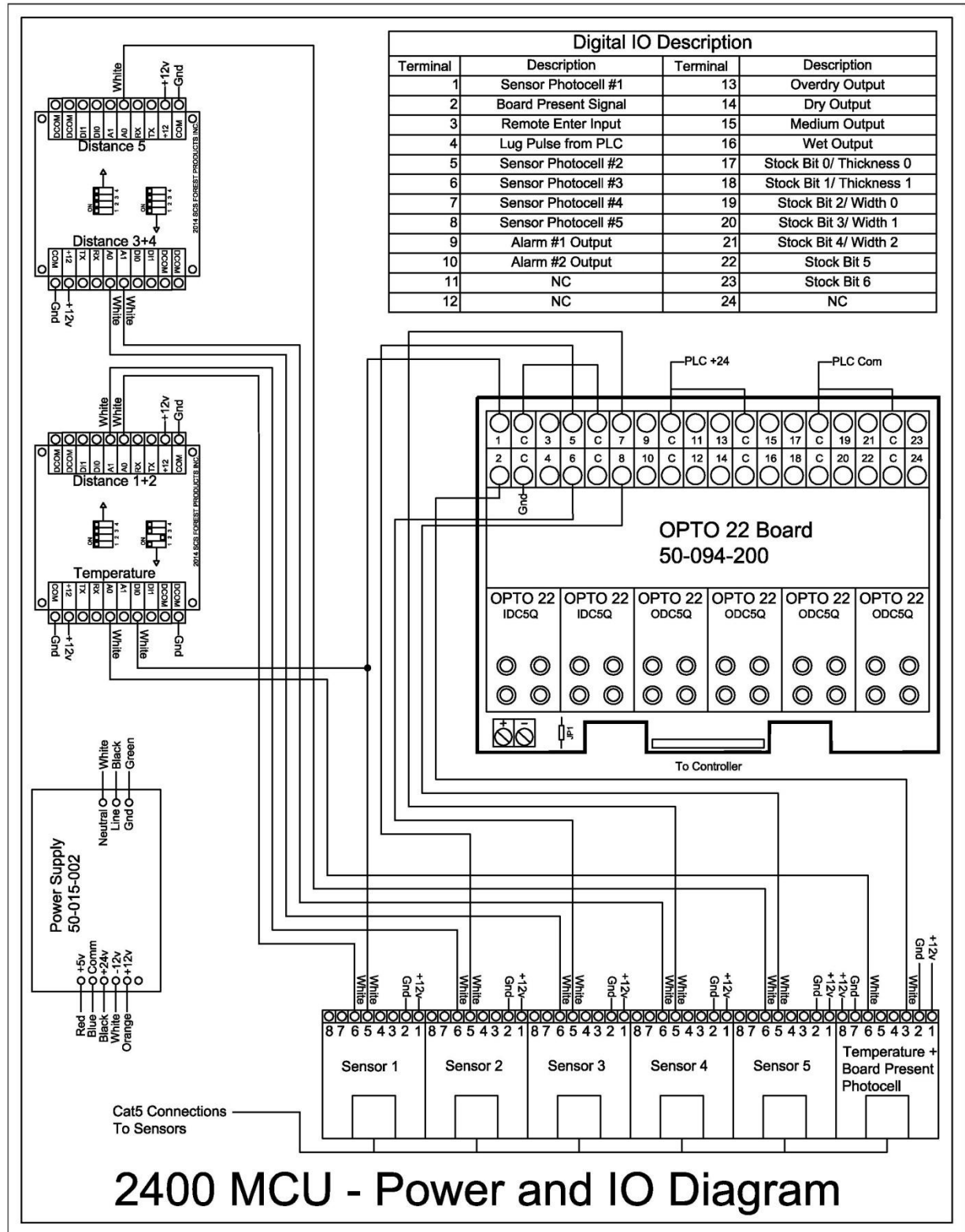
Select the active window.

Help

Check for Updates

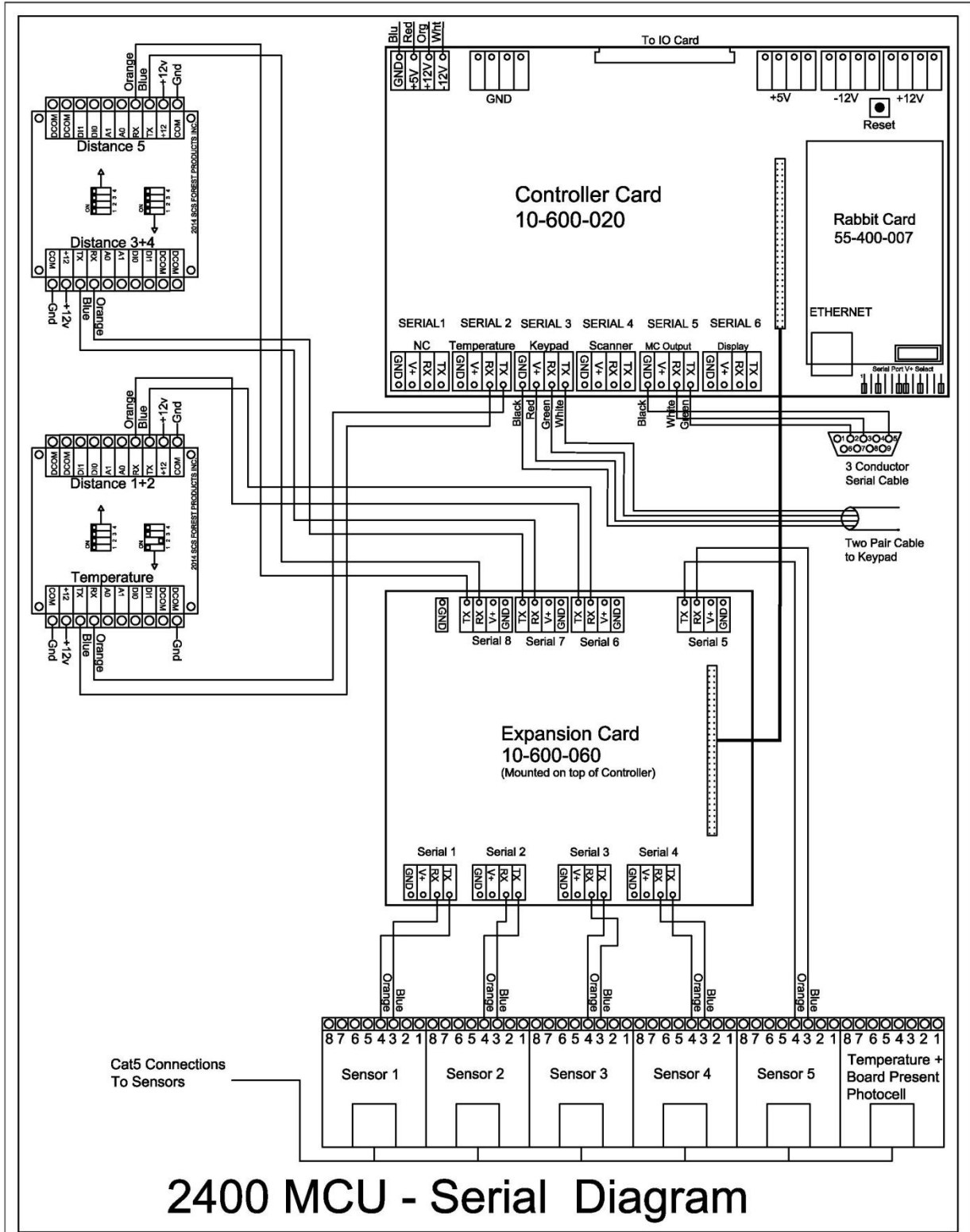
 <p>SCS Forest Products Inc.</p>	<p>Transverse Non-Contact System User Manual</p>	<p>Doc #: 07092013.001 Rev #: 09/07/2013</p>
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2400 MCU - Power and IO Diagram

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2400 MCU - Serial Diagram

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System Calibration and Maintenance

Frequency	Activity
Daily	With clean air, blow down the sensors as well as all related photocells, distance sensors, and temperature sensors if applicable.
Weekly	<p>Update shift report database by entering shifts and clicking “yes” when prompted to update the shift database. This pulls all of the reports off of the controller and stores them on the database on your local PC or network. Once the shifts are stored on the database, they can then be viewed in the shift report viewer.</p> <p>Updating the database can be more frequent than weekly if the user wants to have up to data information in the shift viewer.</p>
Bi-weekly	<p>With clean air, blow down the sensors as well as all related photocells, distance sensors, and temperature sensors if applicable.</p> <p>Take a moist rag (with alcohol or a similar cleaning fluid) and clean all of the system photocells. Also, clean the distance sensors and temperature sensor if the system is equipped with one.</p> <p>Perform a distance calibration. (See calibration procedure in this manual)</p> <p>Visually inspect all components of the system including photocells and distance sensors.</p>