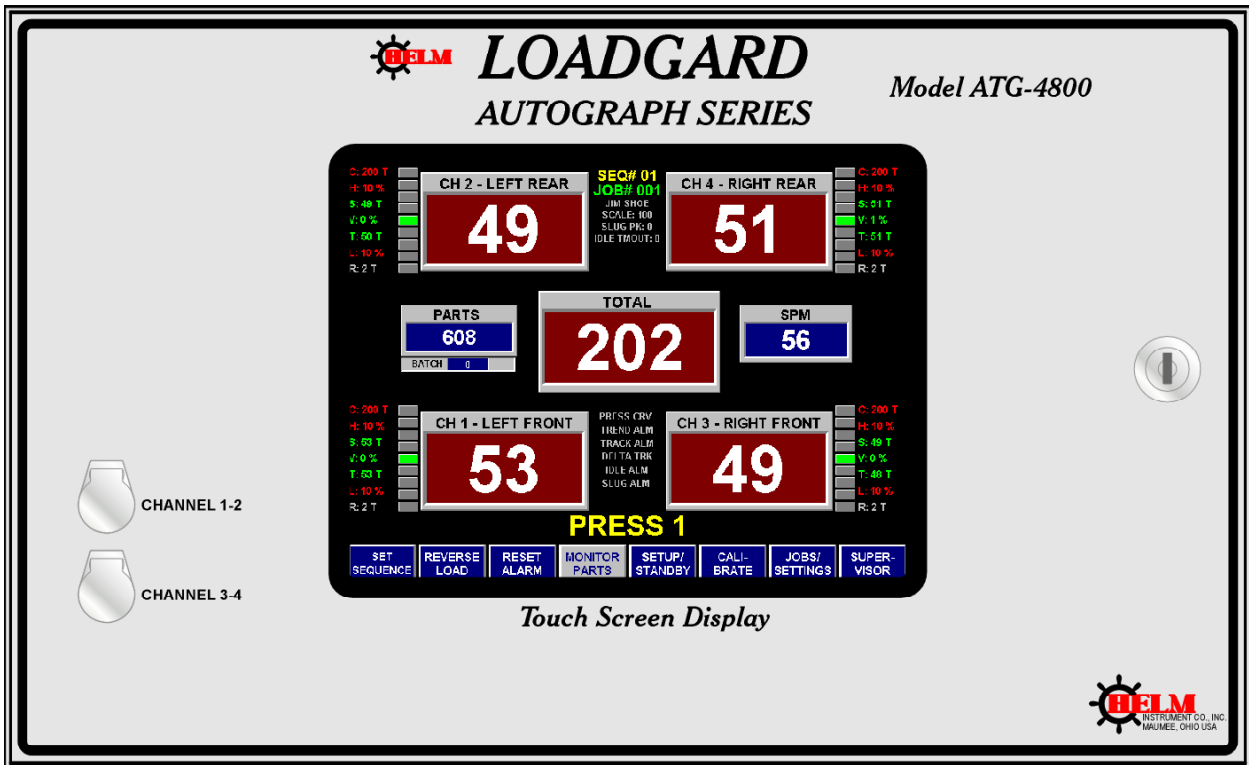


HELM SCM AUTOGRAPH

Operators Manual



ATGSCM MANUAL VERSION 1.22
7/11/02



HELM INSTRUMENT COMPANY, INC.
361 WEST DUSSEL DRIVE
MAUMEE, OHIO 43537
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LIMITED WARRANTY







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EXPLANATION OF SYMBOLS

	Alternating Current
	Earth (ground) TERMINAL
	On (Supply)
	Off (Supply)
	Caution, risk of electric shock
	Caution (refer to accompanying documents)

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INTRODUCTION

You have just purchased the most advanced load monitoring system available. In addition to this system, HELM INSTRUMENT CO., INC. manufactures a complete line of load monitoring control systems for use on metal stamping, forging, compaction and assembly presses; cold forming, cold heading, injection molding and die cast machines.

Standard or custom transducers and load cells are available for in-die monitoring or transfer or progressive tooling. Easy to use software systems designed for your specific plant wide SPC programs are also available.

At HELM, quality is inherent not only in the design of our products but in the attitudes of our employees as well. We're working together to give you the best. After all, that's what our business is all about - providing innovative instrumentation to help make your manufacturing process more productive and your operation more effective.

AUTOGRAPH (Operator Interface)

- Computer contains touch screen LCD display, Pentium 266Mhz, 120 MB solid state disk, 32 Meg RAM, Ethernet and 4 communication serial ports.
- Software Operator interface program contains several "screens" to control, process, display and set SCM information.

SCM (SIGNAL CONDITIONING MODULE)

- SCM is an electronic module to process readings from sensors (transducers), which are press-mounted to measure force.
- The number of sensors (usually 2, 4 or 8) correlates to the number of *channels* on the SCM(s).
- Each SCM can process a maximum of 4 channels, so an 8-channel system requires the use of two SCMs.
- At installation, each SCM is assigned a *sequence* number (0-31). A hardware jumper setting defines the SCM sequence number. "Sequence number" in the Autograph software, is selected in the *monitor* screen. It must correspond to the hardware setting, for proper communication between the Autograph and SCM.

SCM PURPOSE

- **Press Protection** – protect press components including dies from costly damage
- **Parts Quality Control** – ensure parts are being made (stamped) as specified

Variations in the mechanical press and the part making process have the costly potential of press damage, waste of material, and downtime. The SCM uses force monitoring for both press protection and parts quality control. If a large force is detected that could potentially damage the press, or if a variation in force occurs during the part making process, the SCM triggers an “alarm” and stops the press. This allows the press operator to correct potentially costly problems.

SCM FUNCTIONS

- **MODES** - THREE POSSIBLE MODES OF FUNCTIONING CONTROLLED AT THE AUTOGRAPH BY THE OPERATOR.
 1. **Calibrate** – initial hardware installation to get calibration numbers.
 2. **Setup** – initial job setup, press protection alarms active
 3. **Monitor Parts** – parts quality control alarms active
- **Look Window** - SCM monitoring occurs between the “critical” angles of the press stroke called the look window (selectable, usually 60-284 degrees). 224 points (tonnage readings) per channel are recorded between the start angle and end angle. These points are displayed as a “wave” or “signature” in the *Wave* screen.
- **Sample Cycle** (also referred to as “Learn” or “Trend” cycles)
 - Occurs immediately after entering monitor-parts mode from setup mode.
 - SCM “samples” for a pre-determined number of press strokes, defined as trend counts (2, 4, 8, or 16) in the *Other Settings* screen of Autograph
 - After sampling is complete, SCM takes the average peak tonnage per channel (while sampling), and stores it into a *Sample value* per channel. In addition, SCM stores a *Sample Wave* by taking the average tonnage per channel per point.
- **SCM Alarms** -when an SCM alarm is triggered, a relay stops the press from running.

PRESS PROTECTION ALARMS

- **Capacity** – Set at or below press capacity divided by number of channels. For example, a 500-ton capacity press with four channels should have each capacity channel alarm set at 125 tons or less.
- **Press Curve** – Since a press may have different force capacities at different angles, the press manufacture may provide a “through the stroke press-curve and motion curve” set of data points. This alarm is valid in setup mode only.

PARTS QUALITY ALARMS

- **Trend** – Selectable high and low tolerance values create limits of the peak load, are based off the sample peak load value. The limits may be a percentage (1-50) or a tonnage above and below the sample per channel. These alarms are valid only in monitor-parts mode.

- **Tracking** – Same as trend alarms, except tracking provides “through the stroke” protection based off of a quality “learned” sample wave.

OTHER ALARMS

- **Parts Batch** – stops press after designated number of parts has been made.
- **Idle Alarm** – requires operator to enter downtime reason, if press stays idle for more than a designated number of minutes (1-250).

OTHER AUTOGRAPH FEATURES

- **Jobs/Settings** – database for retrieval and activation of up to 250 job settings.
- **Wave/Signature screen** – displays “through the stroke” force per angle, or force per distance.
- **Historical Storage** – stores data for future analysis.
- **Overlay Wave** – analyze up to five waves (historical wave, press curve, job wave, live wave). Compare an outer slide wave to inner slide wave, overlay any press curve to the live wave, or compare alarm waves to known “good” job waves.
- **Supervisor** – lock out screens and modes (pass code protected) from operator use if necessary.

INSTALLATION GUIDELINES

TREND LOADGARD INSTALLATION



WARNING

If this unit is modified in a manner not specified by the manufacturer, protection provided may be impaired. Repair or calibration of this equipment is to be done by authorized personnel only. This unit contains no serviceable parts other than those outlined in this manual. Return unit to manufacturer for repair.

For purposes of safety, this unit is to be permanently installed. Electrical lines will be housed in conduit so that wiring is not subject to mechanical stress. A means of electrical disconnect (switch or circuit breaker) shall be included in the permanent power installation. This disconnect device will be in close proximity to the equipment and within easy reach of the operator. The device will be clearly marked as the disconnect for the equipment.

For best results, mount the SCM Loadgard at eye level and within operators' reach. Use the supplied rubber shock mounts to isolate the unit from vibration. Care should be taken to insure that the instrument chassis ground \perp is the same potential as the machine ground. See Mounting Detail Illustration in Appendix A.



ENVIRONMENTAL CONDITIONS

This unit is designed for indoor use only. Operating temperature range is from 5°C up to 55°C.



STRAIN GAIN INSTALLATION AND WIRING

Specific sensor location and mounting instructions are described in the “Installing Strain Gain Transducers” manual. Refer to this manual for proper location and installation. Sensor nominal resistance values should check out in accordance with HELM drawing number T-2344-51 in Appendix A. For proper wiring, use separate conduit or sealtite for transducer cables and avoid running these cables with any press control or high power motor circuits. Transducer cables should never be run near high voltage (220VAC, 440VAC) circuits.

STRAIN GAIN TRANSDUCER OPERATION

The basic function of the HT-400 Strain Gain is to detect the amount of the deflection imposed on the press as parts are being formed. All Strain Gain sensors are matched to within 1% and therefore can be replaced without re-calibration of the machine.

The HT-400 Strain Gain sensors are mounted to strategic high stress areas of the machine frame. Signals from these sensors are routed to the TREND Loadgard for processing. The HT-400 is capable of measuring either a tension or a compression signal.

SENSOR WIRING CONNECTIONS

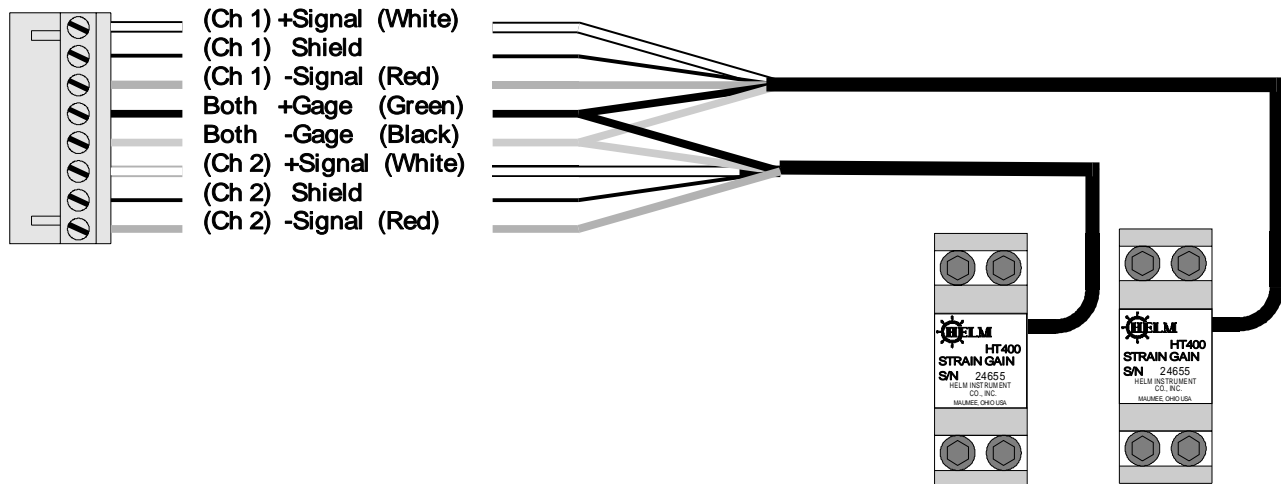
The Sensor Connectors Strips are located inside the box, at the top edge of the SCM board.

NOTE: *Always route power and sensor cables through proper holes, as designated, inside the LOADGARD enclosure.*

WIRING CONNECTIONS

SENSOR CONNECTIONS ON MOTHER BOARD

The module contains two 8-pin orange connectors for wiring strain gage transducers. One connector accepts up to two (2) transducers.



Notes:

1. For channel 3 and 4 connections, follow diagram shown above substituting channel 4 for channel 2, and channel 3 for channel 1. Channel 3 and 4 connections are made at the upper mating connector of load module (see page 2 and 3).
2. Helm model HT-400 "Strain-Gain" bolt-on transducers are used for illustration. For Helm Load Cells, +Gage (Green) and -Gage (Black) wires should be reversed at the connector to yield positive output.
3. Transducer cables must maintain a minimum distance of 24 inches (61cm) from any power or load lines.
4. Use only factory-approved wire for cable extensions.

SYSTEM CALIBRATION

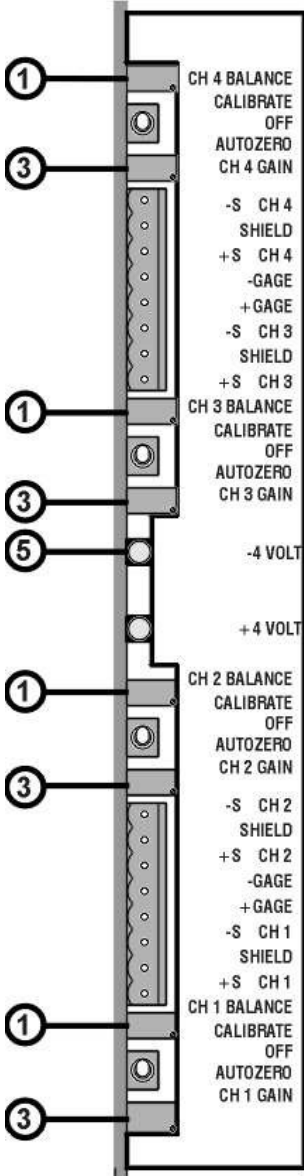
USING HELM HT-400 TRANSDUCERS

1. Verify a no load condition for all transducers.
2. Press the CALIBRATE button on the MONITOR SCREEN to bring up the CALIBRATION SCREEN. (Note: The CALIBRATE button must be enabled by means of the SUPERVISOR SCREEN. See page 35.)
3. Locate SCM module inside unit (refer to page 12).
4. Set the Toggle Switches to middle position, Auto-Zero Off. Adjust the MANUAL ZERO BALANCE potentiometers until the corresponding channels read zero on front display.
5. Move the Toggle Switches to CALIBRATE (up) position. Adjust the CHANNEL GAIN potentiometers to desired calibration number (Note: If press has not been calibrated with load cells, adjust each CAL number to 50.
6. Move the Toggle Switches to Auto-Zero On (down) position.
7. Reestablish normal screen settings if any changes were made in the "SUPERVISOR SCREEN". (Note: The "SCAN" button is preferred for normal operations. See page 34.)
8. Touch icon on front display to return to MONITOR mode. Tonnage values will now be displayed when machine is cycled.

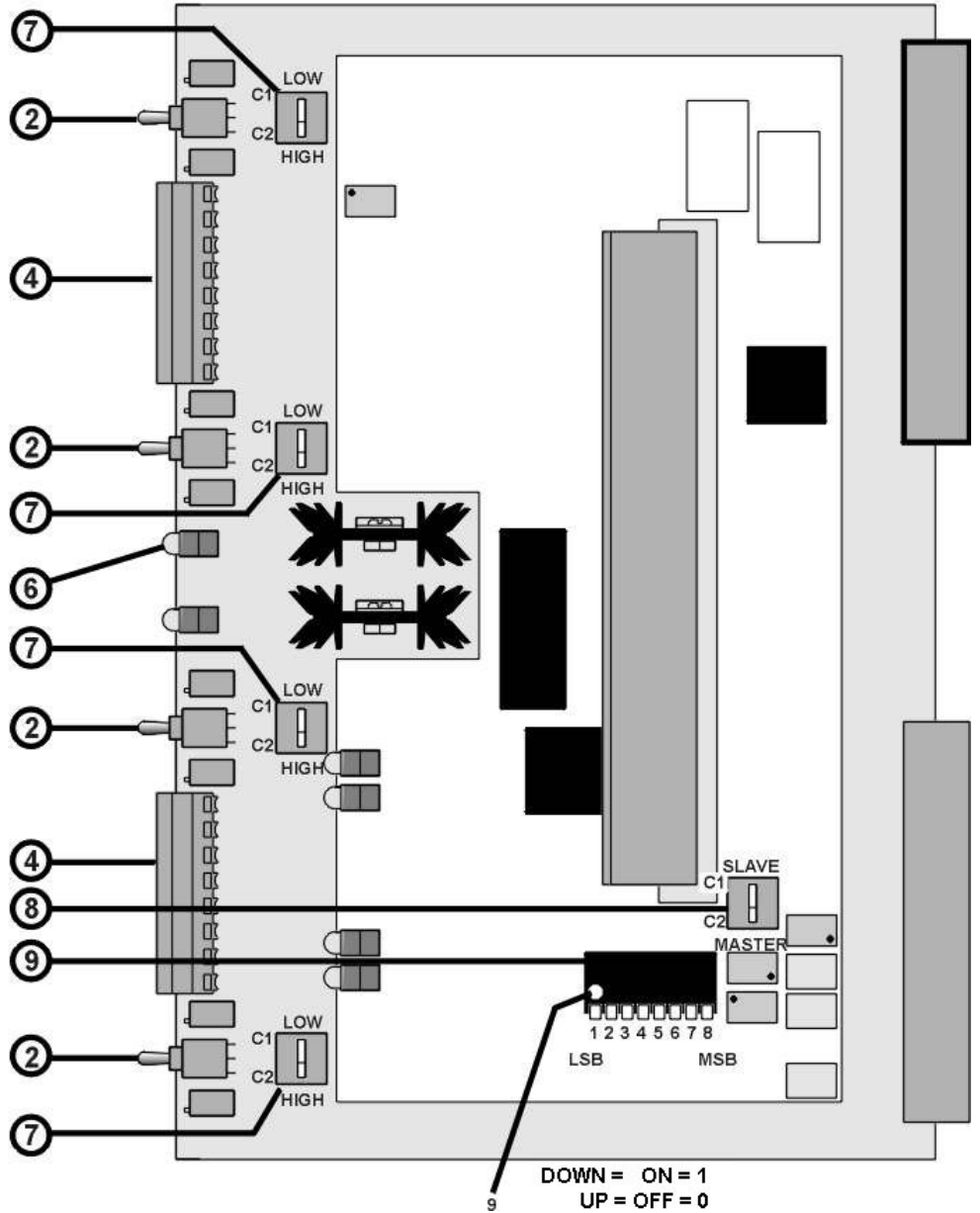


SCM 4 CHANNEL SIGNAL CONDITIONING BOARD
COMPONENT LAYOUT

Front View



Side View



DESCRIPTION OF CONTROLS AND COMPONENT FUNCTIONS

- 1) **Manual Zero Balance** - Screwdriver adjustable potentiometer used to adjust the transducer bridge for zero balance under a no load condition.

NOTE: Panel Function Toggle Switch must be in the OFF position when adjusting the Manual Zero Balance.

- 2) **Panel Function Toggle Switch** - Up: Calibrate, Middle: Off (Auto-Zero OFF), Down: Auto-Zero On.

NOTE: The middle (OFF) and down (ON) positions are the normal positions for monitoring transducer output during machine operation.

- 3) **Channel Gain** - Screwdriver adjustable potentiometer used to adjust transducer signal gain amplification under a no load condition when Function Toggle Switch is in the Up: Calibrate position.
- 4) **Transducer Input Connector** - Eight (8) pin connector accepts input from two (2) transducers (one (1) transducer per channel).
- 5) **Minus 4 volt LED** - Verifies presence of (-4) VDC gage supply voltage for transducer.
- 6) **Plus 4 volt LED** - Verifies presence of (+4) VDC gage supply voltage for transducer.
- 7) **High/Low Gain Switch** - Selects high (1 Meg ohm shunt resistance) or low (140K Ohm shunt resistance) gain range for required transducer signal amplification.
C1: Low, C2: High Gain
- 8) **Resolver Master / Slave Switch** - C1: Slave, C2: Master.
- 9) **Sequence Number Switch** - For card ID in binary 0: Off, 1: On. Range 0 to 31, 5-bits.

SCM CARD ID SWITCH U34 SETTINGS

SEQUENCE# SWITCH SETTING

1	1000	0000
2	0100	0000
3	1100	0000
4	0010	0000
5	1010	0000
6	0110	0000
7	1110	0000
8	0001	0000
9	1001	0000
10	0101	0000
11	1101	0000
12	0011	0000
13	1011	0000
14	0111	0000
15	1111	0000
16	0000	1000
17	1000	1000
18	0100	1000
19	1100	1000
20	0010	1000
21	1010	1000
22	0110	1000
23	1110	1000
24	0001	1000
25	1001	1000
26	0101	1000
27	1101	1000
28	0011	1000
29	1011	1000
30	0111	1000
31	1111	1000
0	0000	0000

0: OFF; 1: ON

AUTOGRAPH SCREENS

MONITOR SCREEN

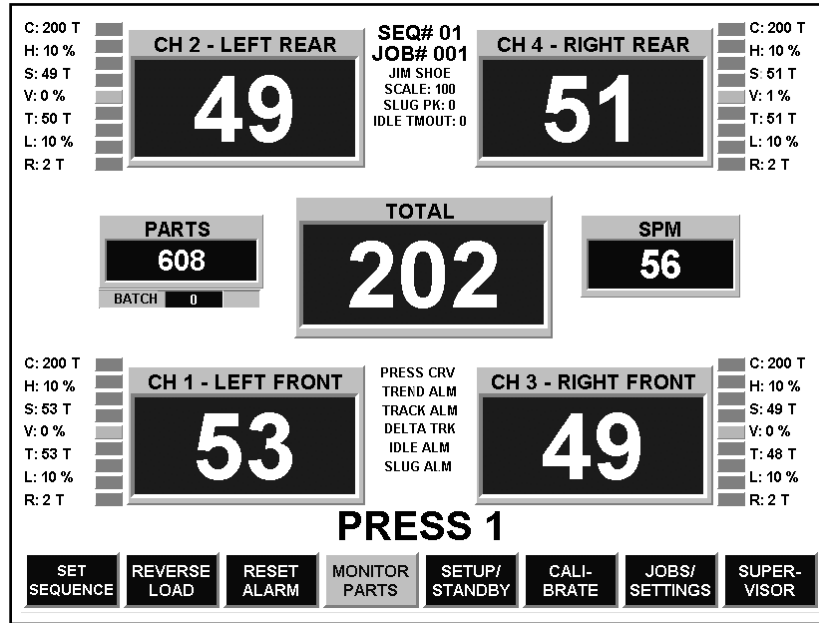


Figure B1 – 4 CHANNEL MONITOR SCREEN

The monitor screen displays the tonnages, strokes per minute, parts count, alarm status, and alarm settings.

Variations of the monitor screen include the two, four, six, and eight channel screens.

The four-channel screen (Figure B1) contains five red meter displays. Each corner meter displays the tonnage reading corresponding to the channel, and the center meter displays the sum of the four channels.

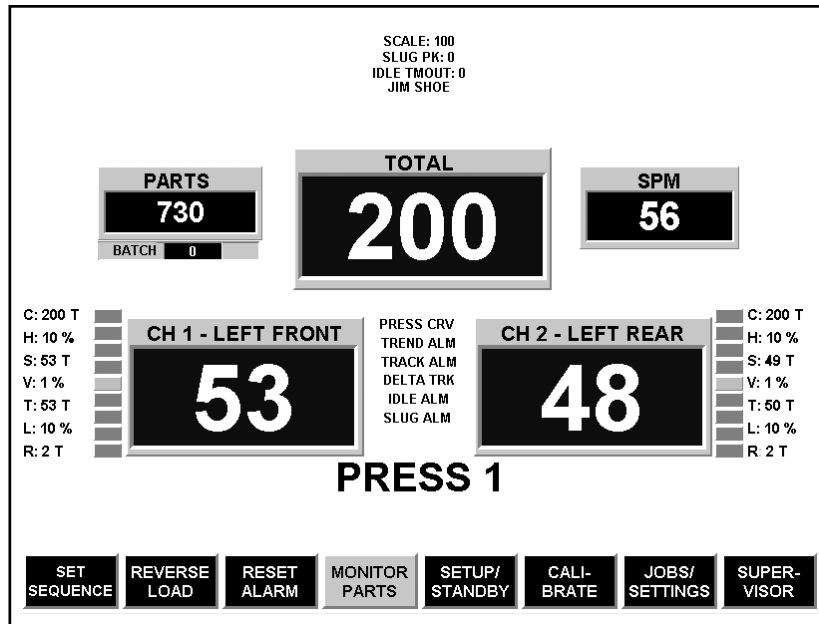


Figure B2 – 2 CHANNEL MONITOR SCREEN

The two-channel screen (Figure B2) contains two tonnage meters and a total tons meter.

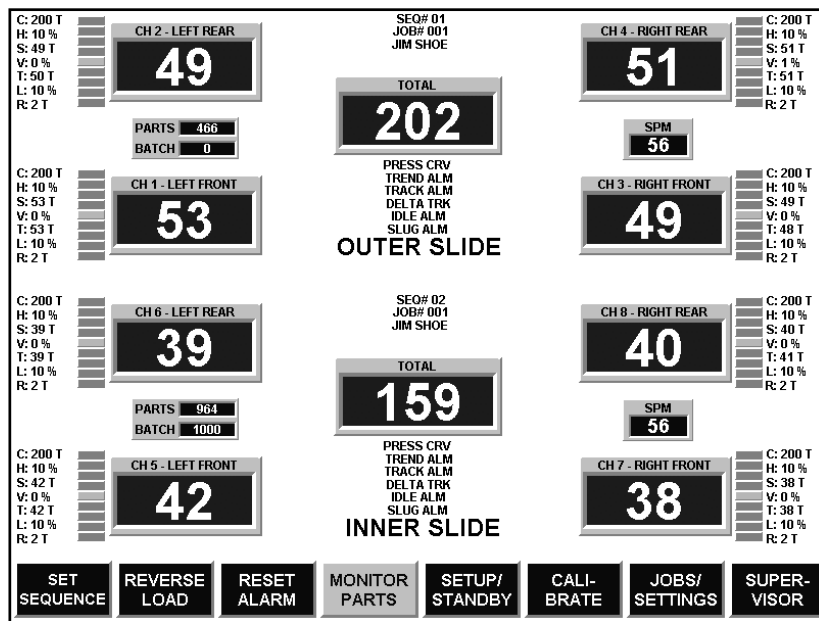


Figure B3 – 8 CHANNEL MONITOR

The eight-channel screen (Figure B3) combines two sets of four-channel screens. Eight channel screens must be assigned to two consecutive sequences: outer slide to the odd numbered sequence, and inner slide to the even numbered sequence.

TREND LIGHTS

All monitor screens contain a set of nine “LED display trend lights” located to the left or right of each tonnage meter. These lights give the following alarm indications corresponding to that particular channel:

Capacity Alarm: Top LED red

Press Curve Alarm: Top LED purple

Hi Tolerance (Track or Trend) Alarm: Top four LED's

Lo Tolerance (Track or Trend) Alarm: Bottom four LED's

The trend lights also give an indication of peak tonnage variation during the part making process. Tonnage values changing too high (or low) over (or under) the sample value, cause the LED lights to light up above (or below) the center green LED. If the peak tonnage reaches the tolerance limits, a trend alarm will be triggered. Trend lights step (from center green, green, yellow, yellow, and red) in 25% increments of the difference between the sample and the tolerance limit. The tolerance limits are the boundaries set by the operator (high and low tolerance settings in the jobs screen) as the percentage (or tons) above and below the sample value to provide part quality control.

MONITOR SETTINGS/READINGS

Each monitor screen displays the strokes per minute (SPM), and parts count. Parts Batch is a value (set in jobs/settings screen) that stops the press when the parts count value reaches the parts batch value.

The following settings are displayed adjacent to each tonnage meter:

- C:** Capacity alarm value in tons
- H:** High Tolerance (Trend/Track Alarm) setting in tons or percent.
- S:** Sample Value – “learned” during trending in tons
- V:** Variance value - Value varying from sample, a more exact numerical value than the trend lights. For example, when variance value equals tolerance setting, trend alarm is triggered.
- T:** Target Value – set in jobs/settings screen for value
- L:** Low Tolerance (Trend/Track Alarm) setting in tons or percent
- R:** Reverse Load in tons

At the top of the monitor screen, the corresponding sequence number, present job number, and present badge ID are displayed. At the bottom of the screen is a label description such as “PRESS 1” or “OUTER SLIDE”. This label may be changed per sequence in the jobs/settings screen.

ALARM SWITCHES

Alarm labels (Press Curve Alarms, Trend Alarms, Tracking Alarms, Delta Track, Idle Alarm, and Slug Alarm) are displayed below the Total Meter. Enabled settings are indicated with a green label color, disabled settings are indicated with a white label color, and triggered alarms are indicated with a red label color. These switches are enabled in the jobs/settings screen per sequence.

BUTTONS

At the bottom of the monitor screen are eight buttons activated when pressed. The left seven buttons may be “locked out” in the Supervisor screen to prevent operator use.

Set Sequence Button - Press button to activate sequence selection box that will appear in the middle of the screen. The operator may select active sequences 0-31 for monitor viewing. To change sequence selection, use one of four “increment/decrement buttons”, which represent the following values to change sequence: -5, -1, +1, +5. Press “DONE” button to close sequence box and activate new sequence selection. In general, each sequence represents one press of up to four channels. The eight-channel screen requires using two sequences because each sequence can handle a maximum of four channels.

Reverse Load Button – Press to display reverse loads in red meter boxes. White button indicates button on, blue button indicates button off.

Reset Button – Press button to reset any alarms, which caused the relay to trip and stop the press.

Mode Buttons (Calibrate, Setup/Standby, Monitor Parts) – Press button to change mode. System will be in one of the three modes: Calibrate, Setup, Monitor Parts (white button indicates present mode). More than one white button is an illegal mode (except in eight-channel screen, it is possible to have sequences in different modes, this would give two white buttons), press a button to activate desired mode.

Jobs/Settings Button – Press to view Jobs/Settings Screen.

Supervisor Button – Press to view Supervisor Screen

HIDDEN BUTTONS

The monitor screen contains hidden buttons behind labels and meters, which the operator may press to activate.

Meter Buttons – The red tonnage meters, when touched, will change to the Wave Screen. When the “Total” meter is pressed, the four-channel wave screen appears, and when a “Channel” meter is pressed, the one-channel wave screen appears.

Job Nr. Button – Displays job message in press label position highlighted in green. This button toggles with Seq. Nr. Button.

Seq. Nr. Button – Displays press name in press label position highlighted in yellow.

Badge Name Button – Badge name just below Job Nr. activates Badge-ID box (Figure B4). When badge name is activated (one name per sequence), a “user name” is held for historical data storage, so a supervisor can keep track of operator and downtime. To activate name, select name from badge list, and press “Activate Name” button. “Add Name” button brings up a keyboard screen to add a new name to the list. Delete names using “Delete All” and “Delete Name” buttons. Press “Done/Close” button to close Badge-ID box



Figure B4 – MONITOR SCREEN WITH BADGE ID MODE

JOBS/SETTINGS SCREEN

<input type="checkbox"/> JOB# 001		<input type="checkbox"/> SEQ# 01		JOB RUNNING: 001																
<< < > >>		<< < > >>		PRESENT PARTS CNT 216																
CH 2 - LEFT REAR PEAK LOAD 60 T <input type="checkbox"/> TARGET 102 T <input type="checkbox"/> CAPACITY 200 T <input type="checkbox"/> HI TOL. 25 % <input type="checkbox"/> LO TOL. 25 %		CH 4 - RIGHT REAR PEAK LOAD 63 T <input type="checkbox"/> TARGET 104 T <input type="checkbox"/> CAPACITY 200 T <input type="checkbox"/> HI TOL. 25 % <input type="checkbox"/> LO TOL. 25 %		<input checked="" type="checkbox"/> ACTIVATE PARTS ON <input type="checkbox"/> PARTS PRESET 0 <input type="checkbox"/> PARTS BATCH 0																
CH 1 - LEFT FRONT PEAK LOAD 58 T <input type="checkbox"/> TARGET 101 T <input type="checkbox"/> CAPACITY 200 T <input type="checkbox"/> HI TOL. 25 % <input type="checkbox"/> LO TOL. 25 %		CH 3 - RIGHT FRONT PEAK LOAD 58 T <input type="checkbox"/> TARGET 103 T <input type="checkbox"/> CAPACITY 200 T <input type="checkbox"/> HI TOL. 25 % <input type="checkbox"/> LO TOL. 25 %		<input type="checkbox"/> TRACK ALMS <input type="checkbox"/> PRESS CRV. <input type="checkbox"/> DELTA TRK. <input checked="" type="checkbox"/> TREND ALMS <input type="radio"/> PERCENT <input type="radio"/> TONS																
PRESS 1 NEW JOB				<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td></tr> <tr><td>.</td><td>CLEAR</td><td colspan="3">ENTER</td></tr> </table>		1	2	3	4	5	6	7	8	9	0	.	CLEAR	ENTER		
1	2	3	4	5																
6	7	8	9	0																
.	CLEAR	ENTER																		
<input type="button" value="SELECT"/>		<input type="button" value="SELECT OFF"/>		<input type="button" value="LOAD TARGETS"/>																
<input type="button" value="ACTIVATE"/>		<input type="button" value="ADVANCED SETTINGS"/>		<input type="button" value="RETURN"/>																

Figure B5 – JOBS/SETTINGS SCREEN

This screen (Figure B5) allows the operator to store settings including alarm settings, parts, and switches per sequence per job. In addition, settings from the “Advanced Settings” screen are included per sequence per job.

KEYPAD

The keypad allows the operator to enter numerical values into job number, sequence number, target values, capacity values, high and low tolerance values, parts preset value, and parts batch value.

Before entering values, select particular items (by touching word). Selection is indicated with a checkmark in the box next to the word, and the value will be highlighted in red. Valid entries may then be entered in the keypad and transferred to the selected item.

JOB NUMBER

Select job number (top left of screen) using one of four arrow buttons (increment or decrement -5, -1, +1, +5) below job number. Alternatively, directly select “JOB#” (highlighting job number in red) and enter value 1-250 in keypad. As job number is changed, all corresponding settings from job database are loaded.

SEQUENCE NUMBER

Select sequence number in the same fashion as job number. Sequence selection (values 0-31) may be limited in the “Sequence Configuration” screen, since there is no need to select unused sequences.

EDITING LABELS

The five labels (i.e. Figure B5- CH1 LEFT FRONT, CH2 LEFT REAR, CH3 RIGHT FRONT, CH 4 RIGHT REAR, OUTER SLIDE) per sequence may be changed. Select label with touch, and the “Keyboard” screen will appear for changing label name. In addition, the job message (i.e. Figure B5 – DOOR PANEL) may be edited per job.

PEAK LOADS

Present peak loads of displayed sequence number are updated in corresponding boxes per channel. These values may be transferred to the corresponding channel target loads with the “LOAD-TARGETS” button.

TARGET LOADS

The operator may store target loads (known good peak loads) per job for future reference, usually to compare to peak loads on initial start up of a job. Target loads may either be manually entered through the keypad, or transferred directly using the "LOAD-TARGETS" button.

CAPACITY ALARM VALUES

Capacity alarms (enter values through keypad) are active in setup and monitor-parts modes (not calibrate) usually for press protection. The typical values entered are press capacity divided by number of channels. For example, on a 500 Ton press using four channels, capacities are set at 125 tons per channel.

HI / LO TOLERANCE ALARM VALUES

Tolerance alarm settings correlate to both trend and tracking alarm settings. Select and enter valid range (0-50) through keypad. These alarms are active in "monitor parts" mode only and are based off the "learned" sample value. Entering a "0" into the keypad turns the tolerance (high or low) off for that particular alarm.

PRESENT PARTS COUNT

Displays the present parts count value.

ACTIVATE PARTS COUNT

If activate parts count switch is on, the parts preset value will be set during activation. If the operator wants to keep the same parts count, yet change other settings, the activate parts count switch should be set off.

PARTS PRESET

This value is transferred to the parts count during activation. Usually during a job change, the operator wants to reset the parts to zero; however, this option allows the operator to set the parts count to any value (0-9999999) when activated.

PARTS BATCH

This value allows the operator to make a set amount of parts before stopping the press. When the parts count reaches the parts batch value, the parts batch alarm is triggered.

TREND ALARMS

Trend alarms, are valid in "monitor-parts" mode only, and are base off the "sample peak" taken during the "learn cycle". Trend alarms provide a "parts quality" type of feature, triggering alarms if the peak tonnage goes out of range of the tolerance.

TRACK ALARMS

Track alarms, are valid in "monitor-parts" mode only, and are based off the "sample curve" taken during the "learn cycle". Track alarms provide a thorough "parts quality" type of feature, because monitoring continues throughout the press stroke (based on the look window settings in the "Other Settings" screen).

DELTA TRACK

The delta track feature pertains to the filtering of tracking alarms, and helps to avoid “nuisance” type of alarms. The filtering occurs during sudden force change within the press stroke. Delta track filtering can be seen in the wave screen, where high slopes of the sample signature (along with the tracking bands) are filtered during relatively small portions of the stroke.

PRESS CURVE

Press Curve alarms are valid in “setup” mode only, and provide press protection. Data points are retrieved from the press manufacture, and activated in the “press curve” screen. These points represent tonnage limitations per angle of the press stroke. During the part process, if the tonnage exceeds the press curve limitation at any specific angle, a press curve alarm is triggered. Press curve may be viewed in the “wave” screen.

TONS/PERCENT

Tolerance alarms run in either tons or percent, which is selected in the jobs screen. At loads less than peak (throughout the stroke), tolerance in the percent mode is less than tons mode. This can be seen in the “wave” screen when comparing tons to percent.

JOBS/SETTINGS BUTTONS

Select - Consecutively pressing this button causes all Capacity values, High Tolerance values, or Low Tolerance values to be selected (highlighted). This allows the operator to quickly set common values to all capacities, high tolerances, or low tolerances.

Select Off - Turns off all selected items (highlights are off).

Load-Targets - Transfers and stores peak loads readings into target values. Operator may use the target loads for future reference on a particular job.

Activate - Activates all settings pertaining to the job (including “Advanced Settings” screen) into the SCM (signal conditioning module) for monitoring. More than one sequence may be activated base on the configuration set in the “Sequence Configuration” screen.

Advanced Settings - Displays “Advanced Settings” screen, an advanced screen containing more settings per job per sequence.

Return - To “Monitor” screen.

KEYBOARD SCREEN

The Keyboard Screen allows the operator to enter names or labels throughout the SCM Autograph program.

Figure B6 displays the keyboard screen being used to enter a job message in the Jobs Screen.

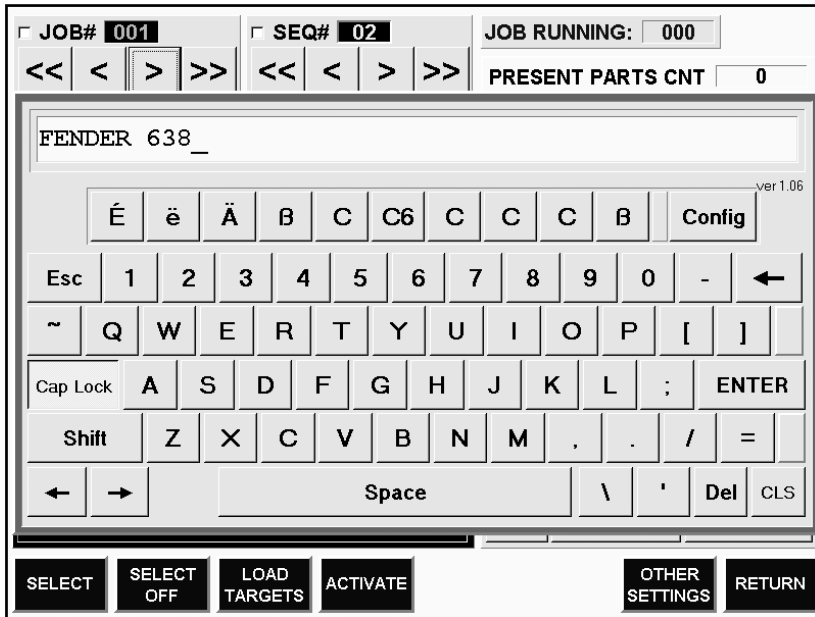


Figure B6 – KEYBOARD SCREEN EXAMPLE, ENTER A JOB MESSAGE IN THE JOBS SCREEN

KEYBOARD SCREEN USES

- Job Message set in Jobs Screen
- Monitor/Wave Screen Channel Labels (CH 1 – LEFT FRONT), and Press Name (PRESS 1) set in Jobs Screen
- Badge Name set in both Monitor Screen and Other Settings Screen
- Overlay File Names set in Overlay Screen
- Press Curve File Name set in Program Press Curve Screen and Archive Press Curve (Supervisor Screen)

ADVANCED SETTINGS SCREEN

The “Advanced Settings” screen (Figure B7) is an extension of the “Jobs/Settings” screen. This screen contains special settings, usually set once during installation.

The job and sequence numbers are set the same as in the Jobs/Settings screen.

The screenshot shows the 'OTHER SETTINGS SCREEN' with the following fields and controls:

- JOB#**: 001
- SEQ#**: 01
- JOB RUNNING:** 001
- TREND COUNTS**: Radio buttons for 2, 4, 8, 16. 4 is selected.
- LOW ALARM INHIBIT COUNTS**: 1
- SCALE SETTING**: 30
- SYSTEM DECIMAL**: Radio buttons for 0.01, 0.10, 1.00. 0.10 is selected.
- RESOLVER OFFSET**: 0.0°
- LOOK WINDOW START ANGLE**: 60.0°
- SELECT END ANGLE:** Buttons for 104.8°, 149.6°, 194.4°, 239.2°, 284.0° (highlighted in green), 328.8°.
- TRACKING ALARM START ANGLE**: 60.0°
- TRACKING ALARM END ANGLE**: 284.0°
- OUTER DP (8 CHANNEL)**: OFF
- HIGH SPEED (200+ SPM)**: OFF
- BADGE ID**: JUSTIN TIME
- IDLE ALARM**: OFF
- IDLE ALARM TIMEOUT**: 10
- SLUG ALARM**: OFF
- SLUG TOLERANCE**: 20
- SLUG TREND COUNT**: 10
- Keypad**: Numbers 1-0, CLEAR, ENTER.
- Bottom Buttons**: ALL JOBS, RESET RESOLVER, ACTIVATE, RETURN.

Figure B7 – OTHER SETTINGS SCREEN

TREND COUNTS

The trend counts (selectable 2, 4, 8, or 16) are the number of counts taken during the “sample” cycle of the system. Sampling occurs when the operator enters monitor-parts mode from setup-mode. After the number of press strokes reaches the set trend counts, the SCM takes an average tonnage (and wave) per channel. This average tonnage is referred to as the sample value, the benchmark value that the high and low limits are calculated.

RESOLVER OFFSET

The resolver is physically attached to the press and sends a code to the SCM, and indicates the angle of the press stroke. To set resolver angle to a desired value, stop press and determine actual physical angle of press stroke, select resolver offset, and enter angle value into keypad. Before pressing the activate button, press the *RESET RESOLVER* button.

LOOK WINDOW

The look window includes the start and end angles of the press, where alarm monitoring is active. The optimal settings are to start the look window at die contact with the stock, and end the look window at stock release. View the waveform screen to verify desired look window settings (default settings are 60-283 degrees). To change start angle, select look window start angle and enter 30-285. Select end angle (1-6 choices depending on start angle value) below start angle reading, which is highlighted in green.

TRACKING ALARM START/END ANGLE

The operator may choose to confine the track alarm “window” to avoid possible nuisance alarms. Start and end track angles must be within the look window. Select and enter values in keypad.

BADGE ID

A badge ID name may be stored and given per sequence per job. Selecting this box will activate Badge ID box. Refer to operation of this box in monitor screen.

OUTER DP

Use this option for the eight-channel double-action press. Outer slides are conventionally assigned to the odd number sequence, and inner slides assigned to the even number sequence; therefore, this box is visible only when viewing/setting odd numbered sequences.

SCALE SETTING

Set the scale based on total press capacity divided by number of channels. For example, when using a four- channel sensor system on a 500-ton maximum capacity press, set the scale to 125.

SLUG DETECTION

Slug detection requires special hardware for monitoring slugs (scrap metal). Leave these options off unless special slug feature is provided.

IDLE ALARM

Enable idle alarm to require the operator to enter a downtime reason, if the press has stopped for a time longer than the idle timeout value.

IDLE ALARM TIMEOUT

Enter value (1-250) for idle alarm in minutes.

HIGH SPEED (200+ SPM)

The SCM processes data different in special applications, when the press runs faster than 200 strokes per minute. Select this option for optimizing the SCM when running at speeds in excess of 200.

JOBS/SETTINGS BUTTONS

ACTIVATE - Activates all settings pertaining to the job (including “Advanced Settings” screen) into the SCM (signal conditioning module) for monitoring. More than one sequence may be activated base on the configuration set in the “Sequence Configuration” screen.

RESET RESOLVER – Press this button before activating any new resolver offset setting. After resetting the resolver, the “resolver offset” checkbox must be selected to activate the job’s resolver offset value. A message box will appear on the screen requesting confirmation to activate resolver. Select the “Yes” button to activate the new resolver setting.

ALL JOBS – All Jobs button sets jobs 2-250 to the same settings as the present Job 1 settings per sequence. The purpose of this button is to select initial default settings for all jobs per sequence. This button is used for convenience because several settings usually are the same for all jobs per sequence. These common settings include Look Window, Resolver Settings, Scale Settings, High Speed, and Decimal Setting. It is recommended to set all these common values to all jobs upon installation.

WAVE SCREEN

The wave (also called signature) screen (Figure B8) is reached by touching the tonnage meters in the monitor screen.

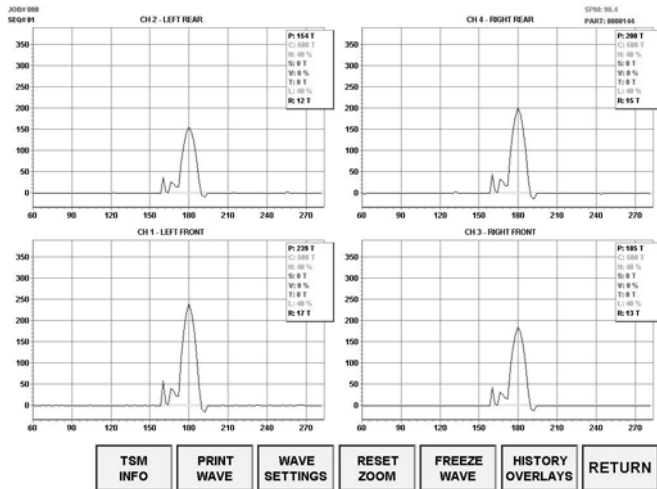


Figure B8 – WAVE SCREEN (4 CHANNELS)

The waves display the force (tons) versus the position of the press (usually in degrees) per channel. Variations of force per angle with each press stroke give an indication of problems in the part making process.

Pressing the “Total” meter in the monitor screen allows the operator to view all four channels (two channels in two channel system) of waves. Pressing any of the “Channel” meters in the monitor screen, or pressing the wave in the four channel wave screen, displays the corresponding wave in a single wave format (Figure B9). This allows the operator to view a particular wave in a higher resolution.

The drawn waveform is based on the tonnage scale shown at the left axis, and the angle (or distance) shown at the bottom axis.

Readings are given at the top left and right corners: Job Number (JOB#), Sequence Number (SEQ#), Strokes Per Minute (SPM), and Part Number (PART).

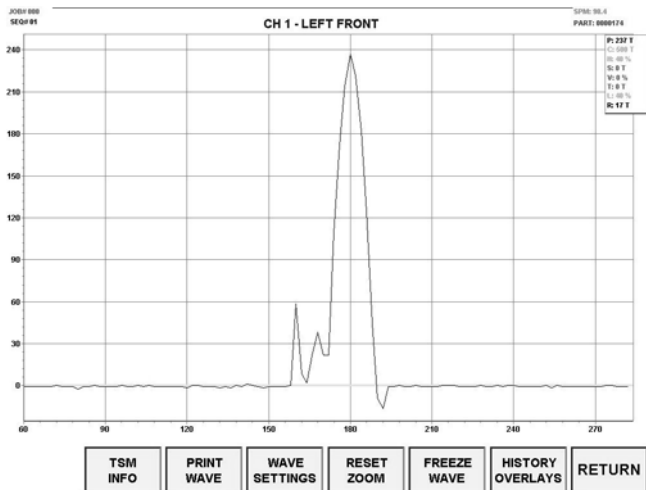


Figure B9 – WAVE SCREEN (SINGLE CHANNEL)

Settings and values are displayed in a box at the top right of the wave box. This display may be turned on/off with the *DISPLAY SETTINGS* button at the bottom of the screen.

The following key is given for the settings and values per channel.

P: Peak, C: Capacity Alarms Setting, H: High Tolerance Setting, S: Sample Peak Value, V: Variance Value, T: Target Value, L: Low Tolerance Setting, R: Reverse Load Value.

More details on these values and settings are given in the monitor screen section of this manual.

WAVE COLORS

Blue - Zero Tons Reference Line

White - Present Live Wave (black in figures for this manual) represents the most recent press through the stroke

Green - Sample Wave

Red - High and Low Tolerance Tracking Bands

Bright Green – Horizontal Peak Sample Band or Overlay

Pink – Horizontal Peak High and Low Trend Bands

Purple - Press Curve or Overlay

Yellow - Overlay

Cyan – Overlay

PRESS CURVE

The press curve (Figure B10) shows the press tonnage limitations throughout the press stroke. If a potentially damaging force exceeds the press curve at any point, then a press curve alarm triggers and stops the press. Press curve alarms are valid in the setup mode of the SCM only. In the monitor parts mode, tolerance alarms are valid if activated in the Jobs screen.

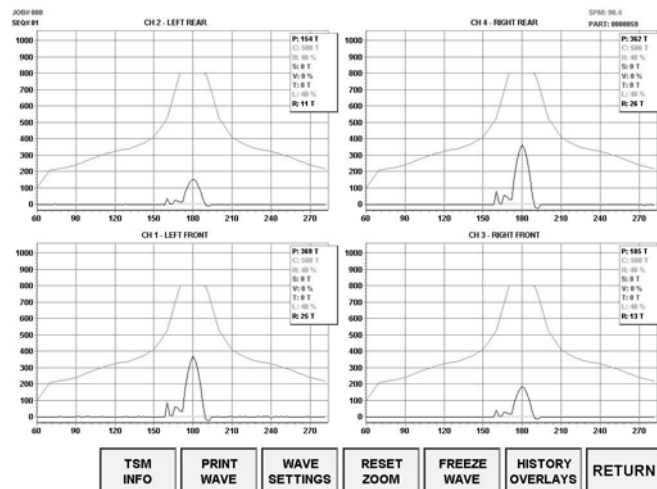


Figure B10 – WAVE SCREEN WITH PRESS CURVE

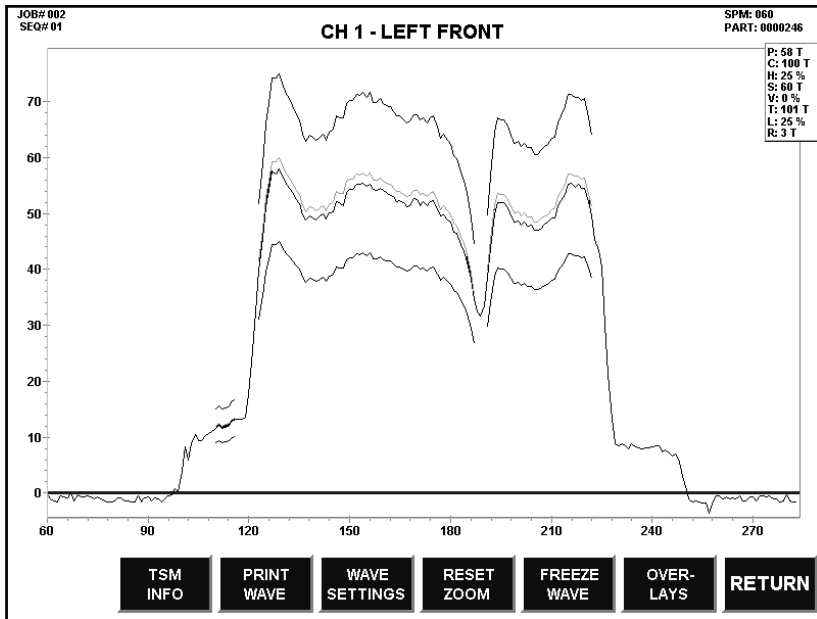


Figure B11 – WAVE WITH TRACKING BANDS

SAMPLE WAVE

The green sample (Figure B11) wave is the “learned” sample wave drawn when the SCM went into Monitor Parts mode (described in Monitor Parts Screen). Hundreds of “points” are stored during the learn mode to give the “thru the stroke” sample wave.

TRACKING BANDS

The red tracking bands are based off the sample wave point by point. The bands give a visual representation of the allowed variances of the present live wave. If the live wave exceeds the boundaries of the tracking bands, a tracking alarm is triggered. The high and low tolerances set the “Band Gap” between the sample and tracking bands, and may be set in percentage or tons in the Jobs screen.

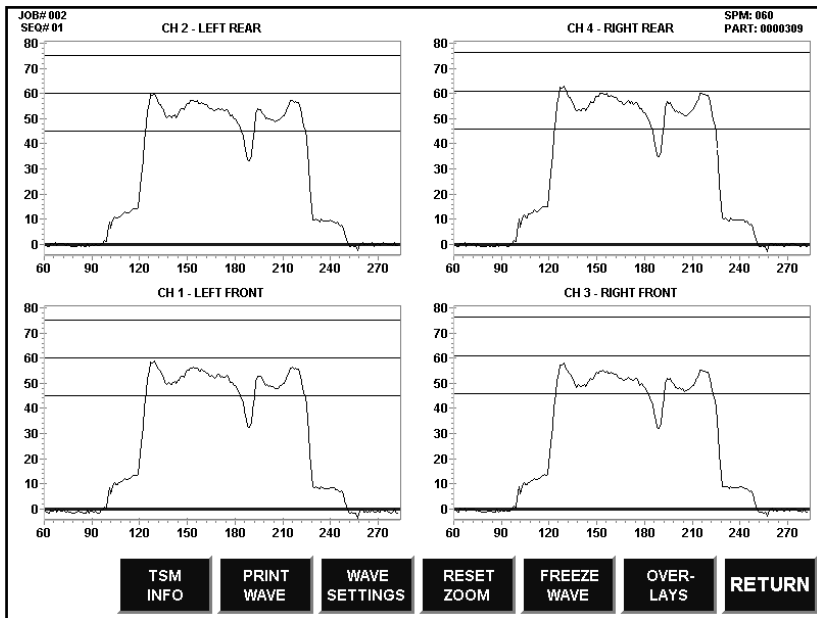


FIGURE B12 – WAVEFORM SCREEN WITH TREND BANDS

in the zoom feature section.

TREND BANDS

Trend bands (Figure B12) are like tracking bands, but are based only off the peak sample value. A horizontal green sample peak band and horizontal pink bands display high and low peak limits. A trend alarm triggers if trend bands are exceeded by the peak live value.

FOUR-CHANNEL WAVE TO SINGLE WAVE HIDDEN BUTTONS

- If viewing four or two channel wave screen, touching the channel wave box displays the single wave screen of corresponding channel.

SINGLE WAVE BOX HIDDEN BUTTON

- Touching the single wave box (freeze mode off) automatically turns the freeze mode on. Touching the single wave box (freeze mode on) begins the zoom mode feature described

WAVE BUTTONS

RETURN - Returns a single wave screen to the four-channel wave screen, or returns to monitor screen depending on how present screen was entered.

HISTORY OVERLAYS - Enter Overlay Screen.

FREEZE WAVE - Toggle On/Off button, which stops wave updates. If in single-wave screen, operator may use the zoom in feature, with freeze mode on. Touching the single wave screen within the wave box forces the freeze wave mode on, thus allowing zooming in.

RESET ZOOM - Resets wave to normal parameters (tons versus degrees), after the zoom feature has been used.

WAVE SETTINGS – Displays wave settings window discussed on following pages.

PRINT WAVE – Prints present screen waves to an attached inkjet or laser printer. Printer drivers must be loaded on the windows software. Attach printer cable to parallel printer port (25 pin connection) on Autograph.

TSM INFO – (Thru-Stroke Monitoring) Displays some general help screens pertaining to through the stroke signature analysis. Figure B13 shows one of the screens.

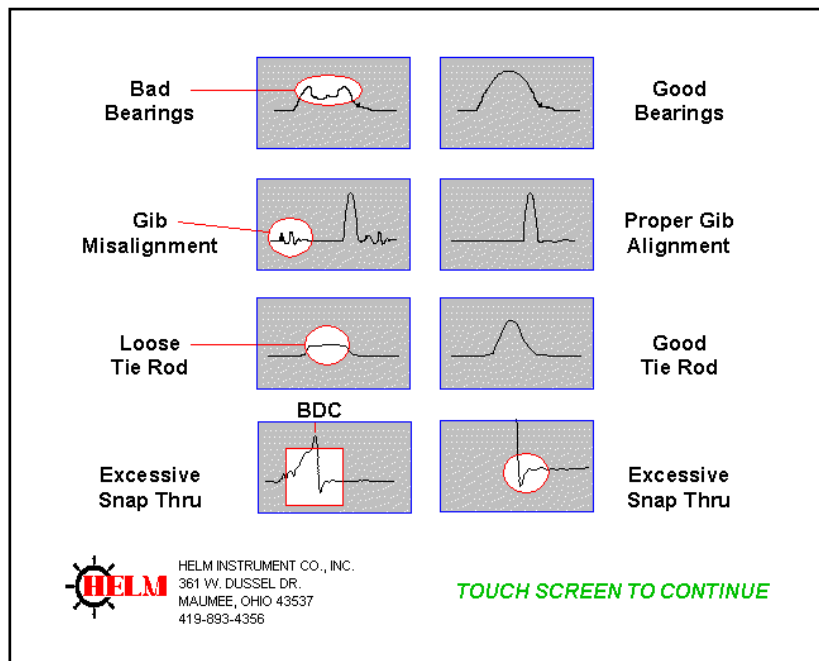


Figure B13 – TSM INFO SCREEN (ANALYZING SIGNATURES)

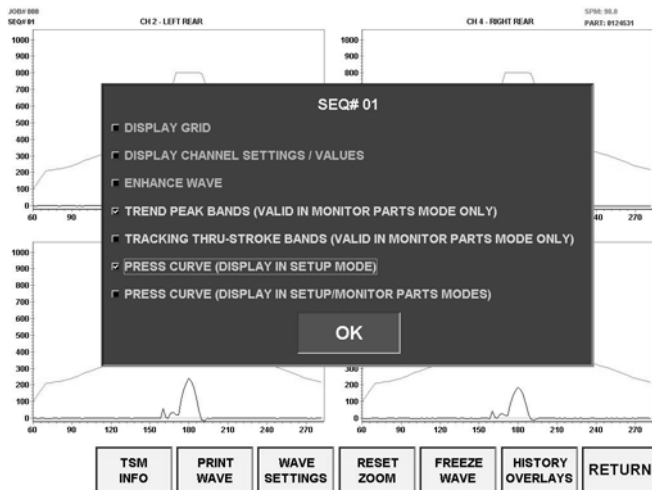
WAVE SETTINGS – Displays wave settings window (see figure B14). These settings are set per sequence.

DISPLAY GRID - Toggle On/Off button, which displays a square grid per waveform box.

DISPLAY CHANNEL SETTINGS - Toggle On/Off button, which displays values and settings per channel in a small box at the top right of the wave box.

ENHANCE WAVE - Toggle On/Off button, which increases resolution (width) of all drawn waves.

TREND PEAK BANDS (VALID IN MONITOR PARTS ONLY)- Enabling this gives the operator a view of the trend bands based on peak value only. Note that disabling these waves pertains to the display, and does not affect the actual alarms of the SCM.



TRACKING THRU-STROKE BANDS (VALID IN MONITOR PARTS ONLY)- Enabling this gives the operator a view of the tracking bands when tracking alarms are enabled. Note that disabling these waves pertains to the display, and does not affect the actual alarms of the SCM.

PRESS CURVE (VALID IN SETUP MODE ONLY)- Enabling this allows the operator to view the press curve when the SCM is loaded with a valid press curve with the feature enabled in the jobs/setting screen.

PRESS CURVE (DISPLAY IN ALL MODES)- Operator may view Press Curve in both Setup and Monitor Parts even though the press curve alarm will not trigger in Monitor Parts.

Figure B14 – *WAVEFORM SCREEN WITH WAVE SETTINGS WINDOW OPENED*

ZOOM FEATURE

The Zoom feature allows the operator to “zoom in” on a selected area of a wave for analysis at a higher resolution.

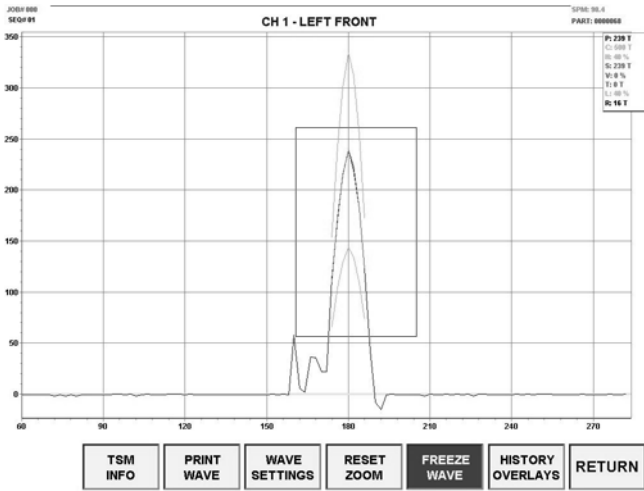


Figure B15 – SINGLE WAVE SCREEN, DRAWING ZOOM BOX

The “freeze-wave” mode must be on.

To select area to zoom in: Press touch screen (and keep pressed) at top left area of desired part of wave to zoom in, and move finger at a diagonal down and to the right. A box will be drawn (Figure B15) and finger followed as the touch screen is pressed. Release touch screen to draw zoomed-in part of the wave (Figure B16).

Repeat Zooming is permitted to continuously zoom in on a particular area of a wave.

The zoomed-in area will stay with the parameters even after turning the freeze mode off.

To return the wave parameters back to full view (un-zoom), press the *RESET ZOOM* button.

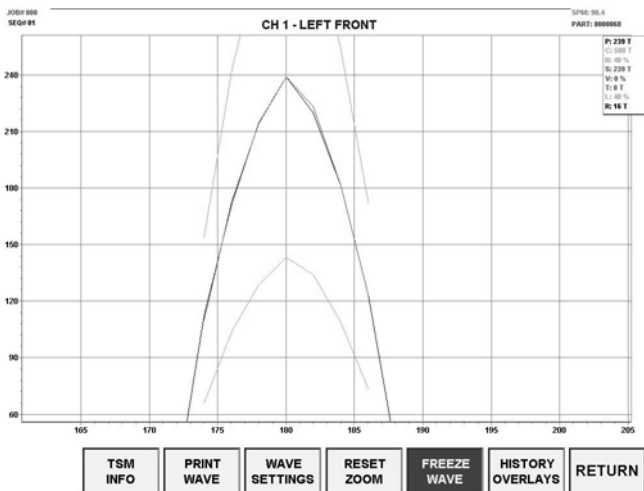


Figure B16 – SINGLE WAVE SCREEN, ZOOMED

OVERLAYS SCREEN

The Overlays Screen (viewed by pressing the “Overlays” button in the wave screen) allows the operator to manage various stored waves, and select up to four wave overlays to be displayed in the wave screen.

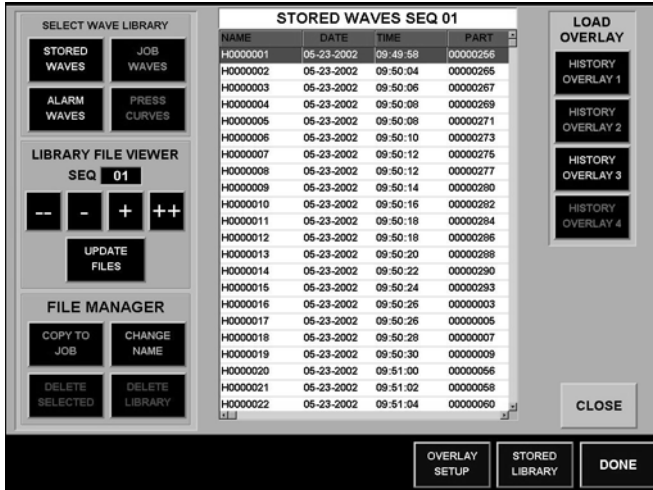


Figure B17 – OVERLAY SCREEN, HISTORICAL LIBRARY WINDOW OPENED, VIEWING HISTORY FILES

The overlay screen contains two different windows for viewing. These windows are viewed by pressing either the *OVERLAY SETUP* button or the *STORED LIBRARY* button at the bottom of the screen.

The library contains libraries for organizing the types of waves stored.

SELECTING HISTORY LIBRARY

The top left four buttons (Stored Waves, Job Waves, Alarm Waves, Press Curves) control the file viewer for each subdirectory. When one of the four buttons are pressed, the viewer (in the center of the screen) displays the files from the corresponding library.

Figure B17 shows the file viewer displaying “Stored Waves SEQ 01” files.

The file viewer displays the file name, date and time created, and part number per file.

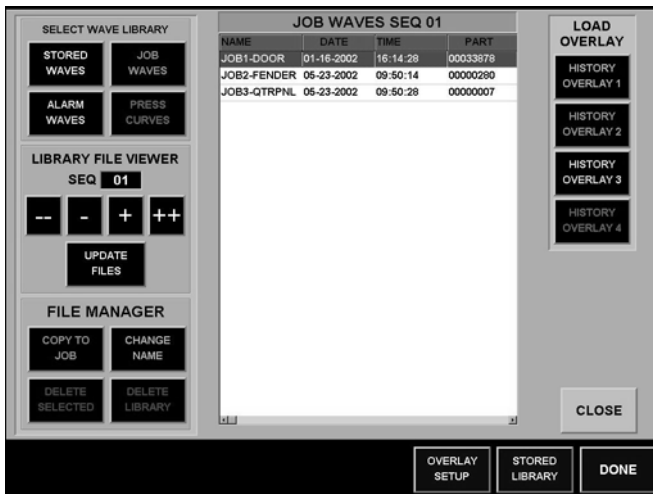


Figure B18 – OVERLAY SCREEN, HISTORICAL LIBRARY WINDOW OPENED, VIEWING JOB WAVE FILES

VIEWER BY SEQUENCE

Stored Waves, Job Waves, and Alarm Waves are stored in directories per sequence. To change viewing sequence, use the --, -, +, ++ buttons. Press the “Update Files” button to view sequence library files.

SELECT HISTORY BUTTONS

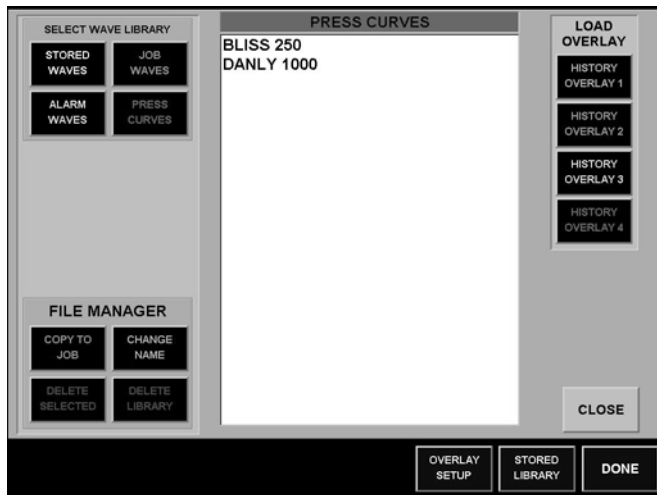


Figure B19 – OVERLAY SCREEN, HISTORICAL LIBRARY WINDOW OPENED, VIEWING PRESS FILES

STORED WAVES - Displays wave files that were stored automatically while running the press, and viewing wave screen. *Store Waves* must be enabled in the supervisor screen. These files may be copied into a historical data base via ethernet, or the operator may use selected files to copy to the *job waves library*. Unused files should be deleted using the *file manager buttons* to keep wave storage from becoming full.

JOB WAVES – Displays job wave files that were copied by the operator for future reference whenever running the job.

ALARM WAVES – Displays alarm wave files that were stored automatically when an alarm was fired.

PRESS CURVES – Displays press curve files that are stored in supervisor screen.

LIBRARY FILE VIEWER BY SEQUENCE

The stored wave, job wave, and alarm wave libraries are all divided into sub-directories by sequence (0-31). History waves and alarm waves are automatically stored into the corresponding sequence directory that the press is running on. Copied job waves are stored to the corresponding sequence of the historical wave.

When viewing library files, the operator may need to change the sequence selection to view the desired library sub-directory. Select sequence number with the “++”, “+”, “-“, “- -“ buttons (Figure B19). The “VIEW” button must be pressed after changing the sequence value.

FILE MANAGER BUTTONS

COPY TO JOB - A strategic method is to have a job wave overlay compared to the live wave each time a job is started. When a historical wave is a known “good” wave, the operator may want to store the file into the job directory for future reference.. The operator will then select the desired historical file and press the *COPY TO JOB* button. The file will be copied to the corresponding job directory, so the next time the job is run, the job wave file may be used.

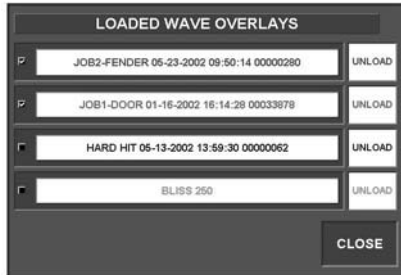
CHANGE NAME – Wave file names are stored with a prefix (“H” for History) and parts number. To change the name, select the *CHANGE NAME* button to bring up the *KEYBOARD WINDOW*. Enter desired name (10 characters maximum).

DELETE FILE – Deletes an individual file. Prompt window requiring yes/no response will check to make sure operator wants to delete file.

DELETE DIRECTORY - Deletes a whole library directory as displayed in file page. Prompt window requiring yes/no response will check to make sure operator wants to delete directory.

LOAD OVERLAYS BUTTONS 1-4

Select wave file in file viewer and press one of the four buttons to load wave file as an overlay. Overlay will drawn in the wave screen corresponding to the color of the overlay button. Overlay 1-4 button colors follow this order: light blue, green, yellow, purple.



UPDATE FILES BUTTON

If files are created while the file viewer is open, the files may not be displayed in the file viewer. Press the *UPDATE FILES* button to display all present files from present library being viewed in the file viewer.

OVERLAY SETUP

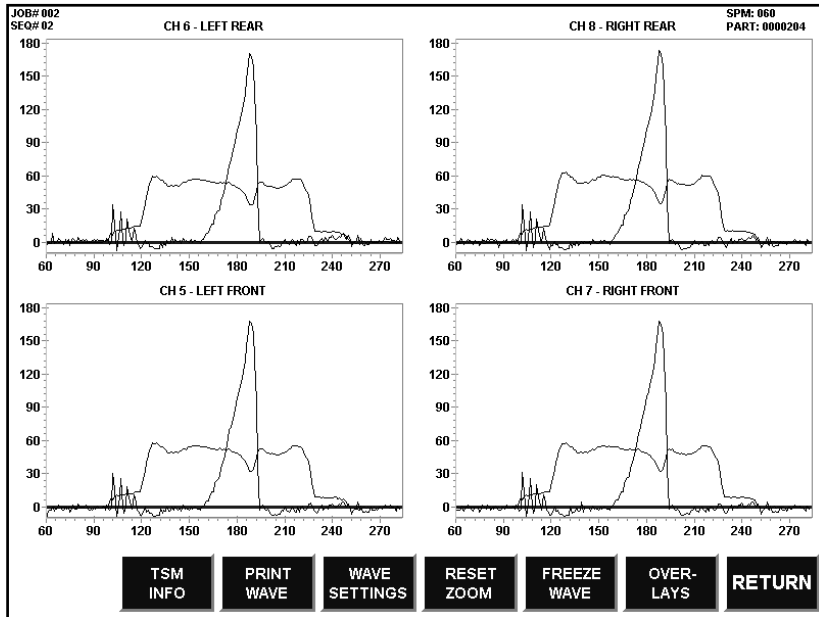
The overlay setup window (Figure B20) is displayed by selecting the overlay setup button. Waves may be quickly turned on/ off with the toggled (on with checkmark) selections.



The window displays each overlay name, along with the corresponding date, time, and part number that is loaded.

Figure B20 – *OVERLAY SCREEN WITH OVERLAY SETUP WINDOW OPENED*

The unload buttons to the right of each labeled overlay allow the operator to unload the overlay files from the data bank.



OVERLAY EXAMPLE

Figure B21 displays an example of using light blue Overlay 1 to compare outer slide to inner slide waveforms. This gives the operator insight of how the outer and inner forces coincide.

Figure B21 – *WAVE SCREEN OVERLAY EXAMPLE, 8 - CHANNEL OUTER SLIDE OVERLAY WITH INNER SLIDE*

SUPERVISOR SCREEN

The Supervisor Screen (Figure B22) contains special setting windows and screens, which require a passcode to view and change settings.

KEYPAD AND PASSCODE

It is important to understand the settings in the supervisor screen before changing selections. The passcode is used not as a high security feature, but to prevent unqualified personell from mistakenly changing important settings.

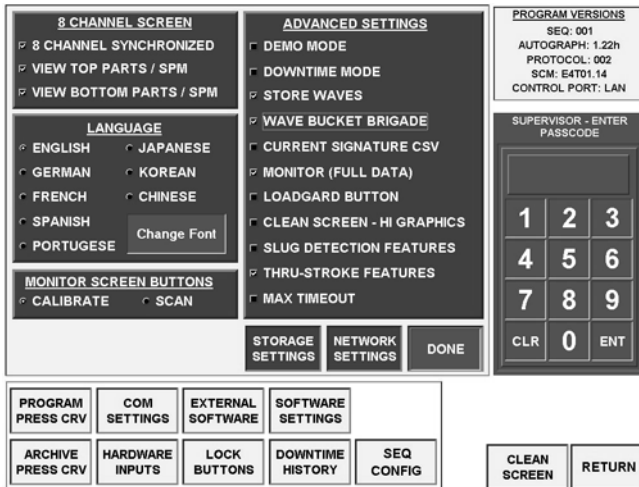
When the operator first enters the supervisor screen, only the keypad, program version box, Clean Screen Button, and Return Buttons are displayed. The supervisor selection buttons at the bottom left are displayed after a passcode is entered into the keypad.

PROGRAM VERSIONS

The top right corner box displays three versions numbers: Autograph, Protocol, and SCM. The operator should have the three version numbers available if Helm service is needed.

SOFTWARE SETTINGS WINDOW

Pressing the Software Settings button opens the software settings window (Figure B22). Selections are displayed with the checkmark (toggled on/off with touch). Option buttons, such as Language Selection, are selected with touch.



8 CHANNEL SYNCHRONIZED – The eight channel system of the Autograph requires communicating with two SCM modules (For example, outer and inner of the same press). To ensure that the data from the same part is displayed, this synchronized selection must be selected. Turn this selection off if the 8 channel screen displays two different 4 channel systems.

VIEW TOP/BOTTOM PARTS/SPM – These selections allow the operator to display parts and spm on/off in the 8 channel screens

LANGUAGE – Select desired language to be viewed in all of the Autograph screens. The proper resource files with translations must be loaded in the Autograph. Asian languages must be run in asian windows.

Figure B22 – SUPERVISOR SCREEN, SOFTWARE SETTINGS WINDOW OPEN

CHANGE FONT – Changes font of all Autograph screens. Default font is *Arial*. It is highly recommended not to change the fonts, because screens may not be readable. Only asian languages may need to change the font to read characters.

MONITOR SCREEN BUTTONS (CALIBRATE/SCAN) - Operator may view only one of these buttons in the monitor screen. Select calibrate during installation setup and change to scan after SCM-Autograph system is setup.

SOFTWARE SETTINGS WINDOW (CONTINUED)**ADVANCED SOFTWARE SETTINGS**

DEMO MODE – Runs the Autograph system as if it is communicating with a SCM module with press information. All screens, including jobs screen work in demo mode.

DOWNTIME MODE – Enables downtime features. When the operator presses the reset alarm button in the monitor screen, the downtime window appears, requiring a downtime entry before alarm can be reset.

STORE WAVES – Autograph automatically stores waves in Wave screen (and Monitor screen if Monitor (Full Data) enabled) while reading wave.

WAVE BUCKET BRIGADE – Autograph will store last 1-???? waves based on value stored in Storage Settings. If wave bucket brigade is disabled, Autograph will continue to store waves until internal memory is full, triggering a DISK FULL message.

CURRENT SIGNATURE CSV – Enabling this setting, forces the SCM AutoGraph to generate a Comma Separated Values (CSV) file containing the signatures for all of the active channels. This file is compatible with most spreadsheet applications like Microsoft Excel and Lotus Notes. (NOTE: In order for this file to be generated all of the time, make sure you enable the MONITOR (FULL DATA) setting. Failure to do so will only permit the AutoGraph to generate this file while in the Signature Screen).

MONITOR (FULL DATA) – This selection enables the monitor screen to read all data including wave data. Use this feature to communicate with Firstmate or to store waves in monitor screen. Keep in mind, the monitor screen runs faster with this setting disabled.

LOADGARD BUTTON – Allows operator to run old Autograph software to view old Loadgard information. This selection will display the Loadgard button for use.

CLEAN SCREEN – Clean screen mode, high graphics windshield wiper movie is active, if installed (based on memory limitations), and if using 12.1" screen.

SLUG DETECTION FEATURES – Special application only, proper hardware must be installed. If enabled, Jobs screen and Monitor screen will contain slug alarm features.

THRU-STROKE FEATURES – Look window, Resolver, Press Curve, and Tracking Alarm features are enabled and viewable in Jobs Settings screens.

MAX TIMEOUT – This setting is generally used only for troubleshooting communications problems with the SCM modules themselves. This should be left as DISABLED.

NETWORK SETTINGS – Brings up Ethernet settings window.

SOFTWARE SETTINGS WINDOW (CONTINUED)

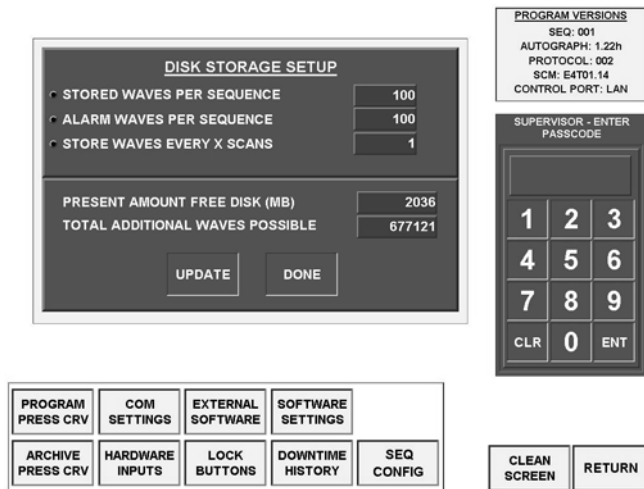


Figure B23 – SUPERVISOR SCREEN, SOFTWARE SETTINGS WINDOW OPEN

STORAGE SETTINGS – Pressing the Storage Settings button brings up the Disk Storage Setup Window (Figure B23). This window allows the operator to choose the number of waves to be stored, whether bucket brigade is enabled or not.

STORE WAVES EVERY X SCANS – This feature allows the user to control how often the information is saved. By changing this setting, you can control how many hits take place until the next one is saved. For example, with a setting of one (1), every hit is stored. With a setting of two (2), every other hit is stored. With a setting of five (5), one out of every five hits is stored. This has no effect on Alarm storage, only to Historical Storage. (DEFAULT VALUE = 1)

STORED WAVES PER SEQUENCE – Set this value for the maximum history waves that get stored per sequence, whether in bucket or not. Most operators will only want to view the last 100 waves or less. Large storage makes for a lot more analysis, when perhaps the last 100 or less are the most important.

ALARM WAVES PER SEQUENCE – Set this value for the maximum alarm waves stored per sequence. Alarm waves are stored automatically with an alarm in either monitor screen or wave screen.

UPDATE BUTTON – The update button sets the latest values of the following based on internal disk memory.

PRESENT AMOUNT FREE DISK (MB) – This value is displayed after the update button is pressed, and will give the operator an idea of memory space available.

TOTAL ADDITIONAL WAVES POSSIBLE – A calculation is made based on internal memory of how many additional waves are possible for storage. The calculation does take consideration of the Minimum disk value setting; however, it does not calculate any waves already stored. Therefore, the operator should clear out all waves in overlays, before using this value to enter in maximum waves per sequence.

OTHER SUPERVISOR SETTINGS

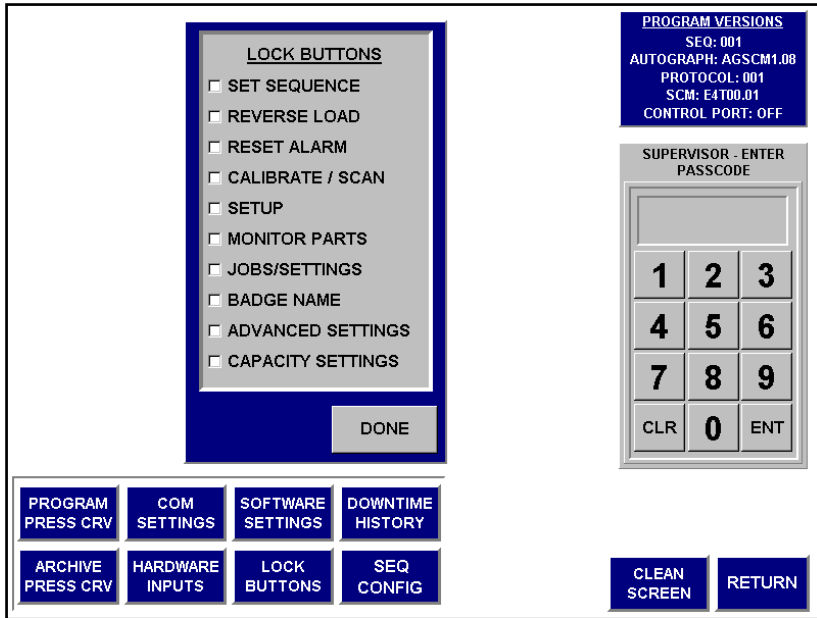


Figure B24 – SUPERVISOR SCREEN, LOCK MONITOR BUTTONS WINDOW OPEN

LOCK BUTTONS The “Lock Buttons” button displays the corresponding window (Figure B24). These selections prevent unauthorized operators from using specific buttons in the monitor screen. If the button is locked when pressed, a message displays “LOCKED BY SUPERVISOR”. If Capacity settings are locked, they are still viewable in the Jobs/Settings screen, but capacity values cannot be changed.

COM SETTINGS BUTTON

The Com Settings button opens the Com Settings Window. Communication settings are set for default at Com 4 and 38.4 K Baud. If these settings are incorrect, communication failure between the Autograph and SCM will occur, and an “OFFLINE” message will be displayed in the monitor screen.

HARDWARE INPUTS BUTTON

The Hardware Inputs button opens the Hardware Inputs Window, which displays on/off indications for Cam and Auxiliaries inputs.

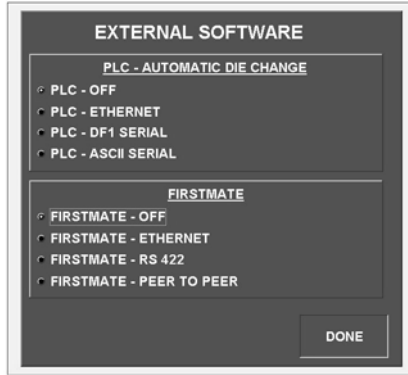
ARCHIVE PRESS CURVE BUTTON

Operator may store the present press curve loaded on the SCM to the Autograph library for overlaying. A prompt will display verifying press curve sequence to store (last sequence viewed in Monitor screen) along with the scale. Press the “Yes” button to continue, a keyboard will appear to name desired press curve file name. After entering a valid press curve name, the file may be viewed as an overlay (see Overlay Screen).

PROGRAM PRESS CURVE, DOWNTIME HISTORY, AND SEQ CONFIG BUTTONS

Program Press Curve Button, Downtime History and Seq. Config. (Sequence Configuration) Button each displays the corresponding screens.

EXTERNAL SOFTWARE



EXTERNAL SOFTWARE BUTTON

The External Software Button opens the configuration screen to configure what external software will be interacting with the SCM AutoGraph. It also specifies how those two software packages will communicate to the SCM AutoGraph.

EXTERNAL SOFTWARE SCREEN

PLC OFF – No PLC will be linked to the SCM AutoGraph (DEFAULT).

PLC Ethernet – If your PLC supports Ethernet communication, you can select this setting to connect to PLC to the AutoGraph. This mode of communication requires the use of the Helm Instrument Ascii PLC Communications Protocol.

PLC DF1 Serial – Standard communications link to the PLC. This communications link requires the use of a RS-422 to RS-232 module.

PLC ASCII Serial – A Serial communications link to the PLC. Similar in setup to using DF1, with the exception that instead of using the DF1 protocol it uses the Helm Instrument Ascii PLC Communications Protocol.

FirstMate OFF – No FirstMate communications will be possible to the SCM AutoGraph (DEFAULT).

FirstMate Ethernet – Using this feature, FirstMate can communicate to the SCM AutoGraph via Microsoft File Sharing. This feature requires that a folder on the SCM AutoGraph be shared so that external programs (like FirstMate) can access the information.

FirstMate RS-422 – Using this feature, FirstMate can communicate to the SCM AutoGraph via an RS-422 serial cable. (NOTE: This feature requires the addition of an RS-422 to RS-232 adapter module. If this SCM AutoGraph was purchased without specifying the additional module, please contact Helm to order one.)

FirstMate Peer to Peer – FirstMate communications to the SCM AutoGraph via raw CP/IP packets on an Ethernet network. Instead of using File Sharing, Peer to Peer communicates over Ethernet using TCP/IP packets. Therefore, no file shares need to exist. (NOTE: For Peer to Peer, we recommend that all SCM AutoGraphs be allocated a Fixed IP Address.)

DOWNTIME HISTORY SCREEN

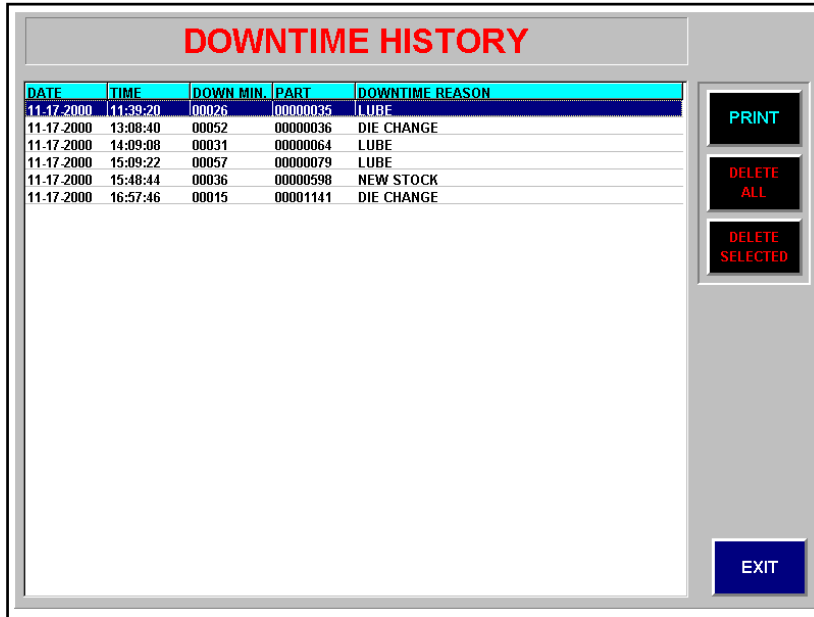


Figure B25 – DOWNTIME HISTORY SCREEN

The Downtime History screen (see Figure B25) stores downtime data entered from the operator.

Date and time data was entered, down minutes, parts count, and downtime reason are all given.

PRINT BUTTON – A printer may be attached to Autograph at 25-pin parallel printer port to print out downtime data. Proper printer drivers must be installed to print.

DELETE SELECTED, DELETE ALL BUTTONS – Use these buttons to clear out one entry or all downtime history data. It is a good idea to clear this data on occasion to prevent the memory disk from filling up. Keep in mind that hundreds of downtime entries still don't take up as much memory as a stored waveform.

DOWNTIME ENTRY SCREEN

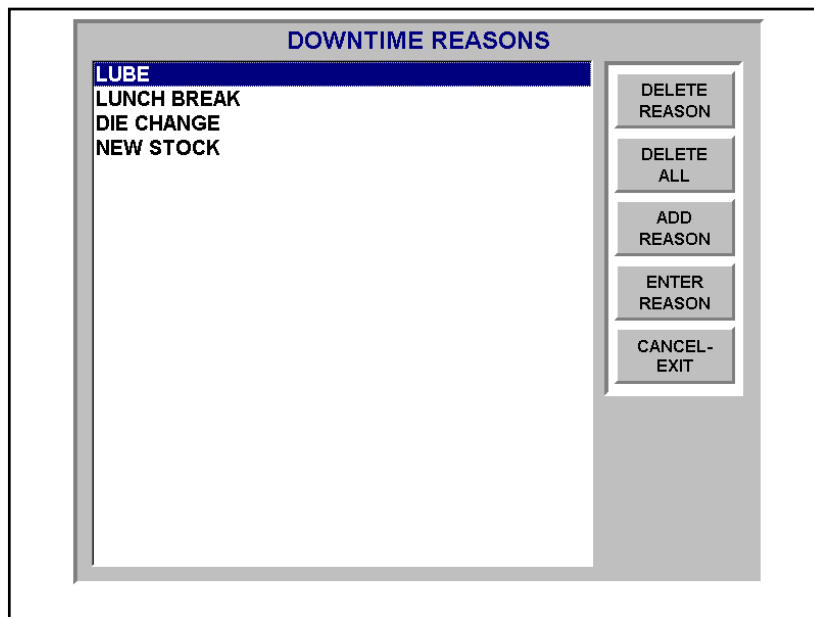


Figure B26 – DOWNTIME ENTRY SCREEN

If Downtime Mode is selected in Supervisor, the Downtime Entry Screen (Figure B26) appears when the operator presses the Reset Alarm button in the Monitor Screen. A reason must be entered before alarm is reset.

A data window contains downtime reasons to select and enter.

DELETE REASON, DELETE ALL BUTTONS – Use these buttons to remove downtime reasons contained in the downtime data window.

ADD REASON – Select this button to add new downtime reasons to the data window. A keyboard screen will appear to enter new reasons.

ENTER REASON – After a downtime reason is selected (highlighted in blue), the Enter Reason button stores the downtime reason in the Downtime History databank, and the alarm reset is now activated.

SEQUENCE CONFIGURATION SCREEN

The sequence configuration screen (Figure B27) is reached through the “Seq Config” button in the supervisor screen.

SEQ	SCAN	JOB	2/4 CH	6/8 CH	SEQ	SCAN	JOB	2/4 CH	6/8 CH
01	OFF	ON	4 CH	ON	17	OFF	OFF	4 CH	OFF
02	OFF	ON	4 CH		18	OFF	OFF	4 CH	OFF
03	OFF	OFF	2 CH	OFF	19	OFF	OFF	4 CH	OFF
04	OFF	OFF	2 CH		20	OFF	OFF	4 CH	OFF
05	OFF	OFF	4 CH	OFF	21	OFF	OFF	4 CH	OFF
06	OFF	OFF	4 CH		22	OFF	OFF	4 CH	OFF
07	OFF	OFF	4 CH	OFF	23	OFF	OFF	4 CH	OFF
08	OFF	OFF	4 CH		24	OFF	OFF	4 CH	OFF
09	OFF	OFF	4 CH	OFF	25	OFF	OFF	4 CH	OFF
10	OFF	OFF	4 CH		26	OFF	OFF	4 CH	OFF
11	OFF	OFF	4 CH	OFF	27	OFF	OFF	4 CH	OFF
12	OFF	OFF	4 CH		28	OFF	OFF	4 CH	OFF
13	OFF	OFF	4 CH	OFF	29	OFF	OFF	4 CH	OFF
14	OFF	OFF	4 CH		30	OFF	OFF	4 CH	OFF
15	OFF	OFF	4 CH	OFF	31	OFF	OFF	4 CH	OFF
16	OFF	OFF	4 CH		00	OFF	OFF	4 CH	OFF

<<	<	>	>>	SCAN DELAY 1-60 SECONDS	60	RETURN
----	---	---	----	----------------------------	-----------	--------

Each sequence (0-31) may be setup in a different configuration.

SCAN

The scan setting may be on/off and correlates to the Scan button in the monitor screen. When the Monitor “Scan” button is on, the screens will change and read data sequence by sequence, based on the scan settings configured. For example, if the operator has three presses (assigned to sequence 1-3), and would like to view these presses’ information in order, the monitor screen will change screens by sequence automatically. The amount of time to change sequences is set with the “Scan Delay” setting (1-60 seconds) at the bottom of the screen.

Figure B27 – SEQUENCE CONFIGURATION SCREEN

JOB

The job setting may be on/off, correlating to the Activation button in the Jobs/Settings screen. So, when the Activation button is pressed, the job is activated for each sequence that is set in the configuration screen.

2/4 CH

The 2 /4 CH setting determines whether the monitor/wave screens will be in two or four channel format per sequence.

6/8 CH

The 6/8 CH setting is set for pairs of sequences, since each sequence pertains to a maximum of four channels. The only screen that is affected is the monitor screen. If the pair of sequences (For example sequence 1-2) are both set to “ON” for 6/8 CH, the monitor screen will display the six or 8-channel screen for the corresponding sequences. Whether the screen is set to six or eight depends on the 2/4 CH setting. For example, if the operator wants sequence 1-2 to be a 6 channel screen, with sequence 1 assigned to the outer two channel slide, the setting would be as follows: Seq1, 2/4 CH: 2 CH; Seq2, 2/4 CH: 4 CH; Seq1&2, 8CH:ON.

PROGRAM PRESS CURVE SCREEN

The SCM Autograph system allows the operator to enter the specified 36 press curve points in the Program Press Curve Screen (Figure B28), reached through the Supervisor Screen.

A file under “PRESS CURVE FILES” must first be selected before entering the press curve point data.

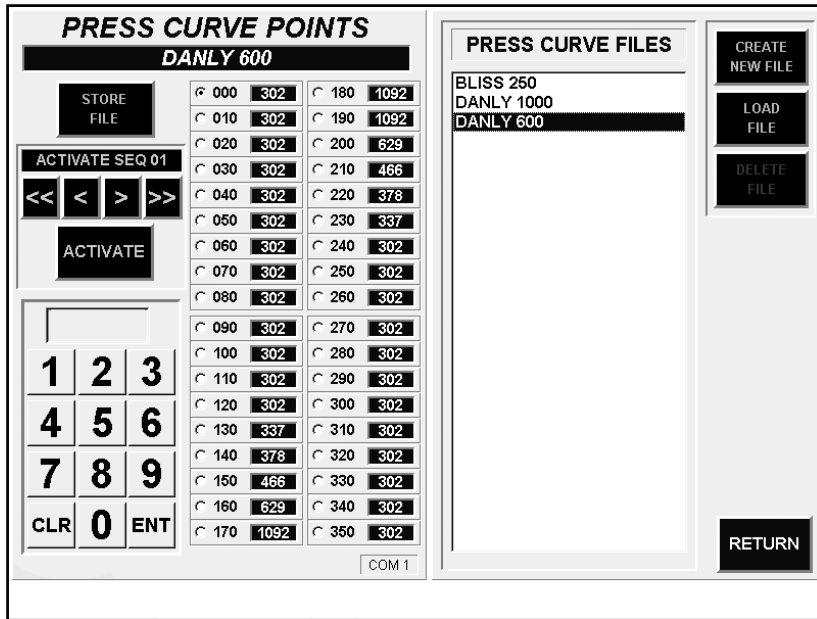


Figure B28 – PROGRAM PRESS CURVE SCREEN

PROGRAM PRESS CURVE BUTTONS

CREATE NEW FILE - After pressing the Create New File Button, the keyboard screen displays, waiting for the operator to enter a press curve file name. After the file has been created, the operator may then select and load the file for editing, storing, or activating.

LOAD FILE - Select the press curve file in the file display box (will highlight in blue), and press the Load File Button. The stored data points will be displayed to the left in each of the 36 points. The filename will be displayed at the top left. Figure B24 shows “DANLY 600” data points after being loaded. The 36 points may then be changed: select the point and enter the desired value (0-1092) in the keypad at the bottom left of the screen.

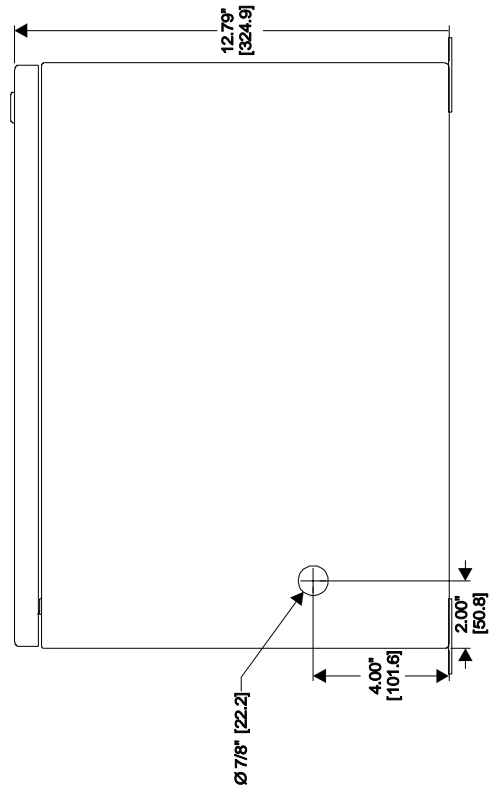
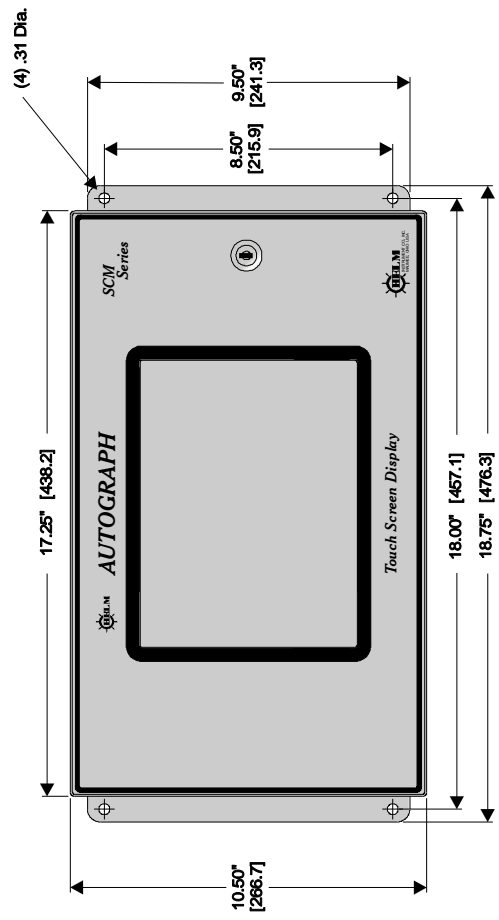
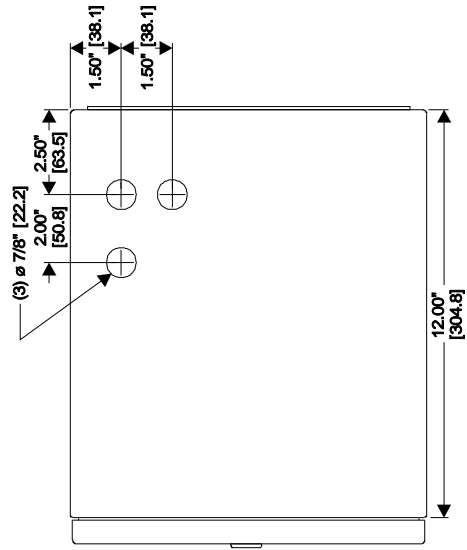
STORE FILE – After changing the data point value, the operator should press the Store File Button for future reference.

ACTIVATE – The press curve file may be activated to any sequence. Select the desired sequence to activate using the up/down arrows. Press Activate to download the press curve points to the corresponding sequence.

DELETE FILE – Select file to remove from file storage before pressing the Delete File Button.

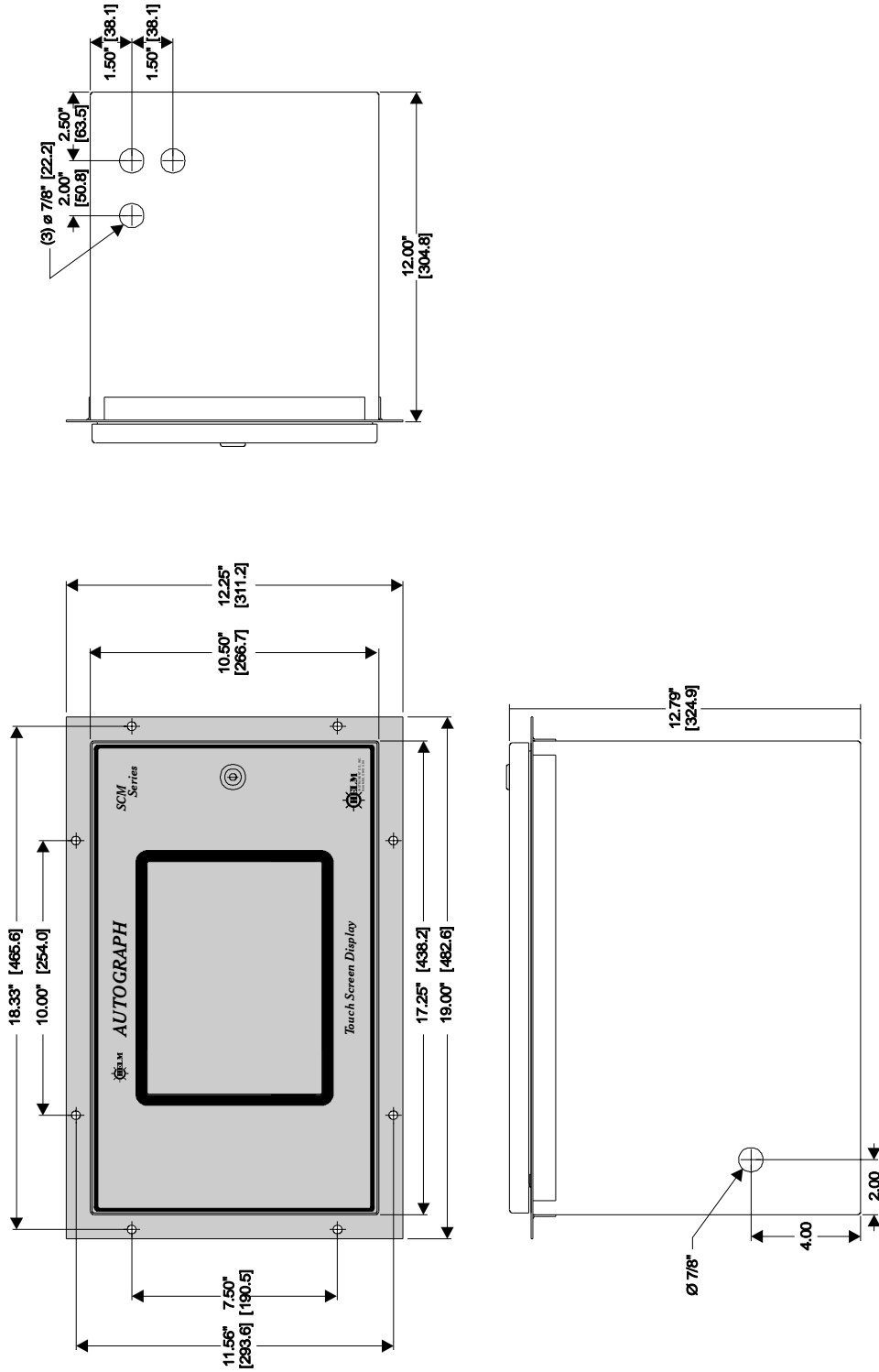
SCM AutoGraph Wall Mount Dimensions

FLAT MOUNT SCM AUTOGRAPH MOUNTING DIMENSIONS

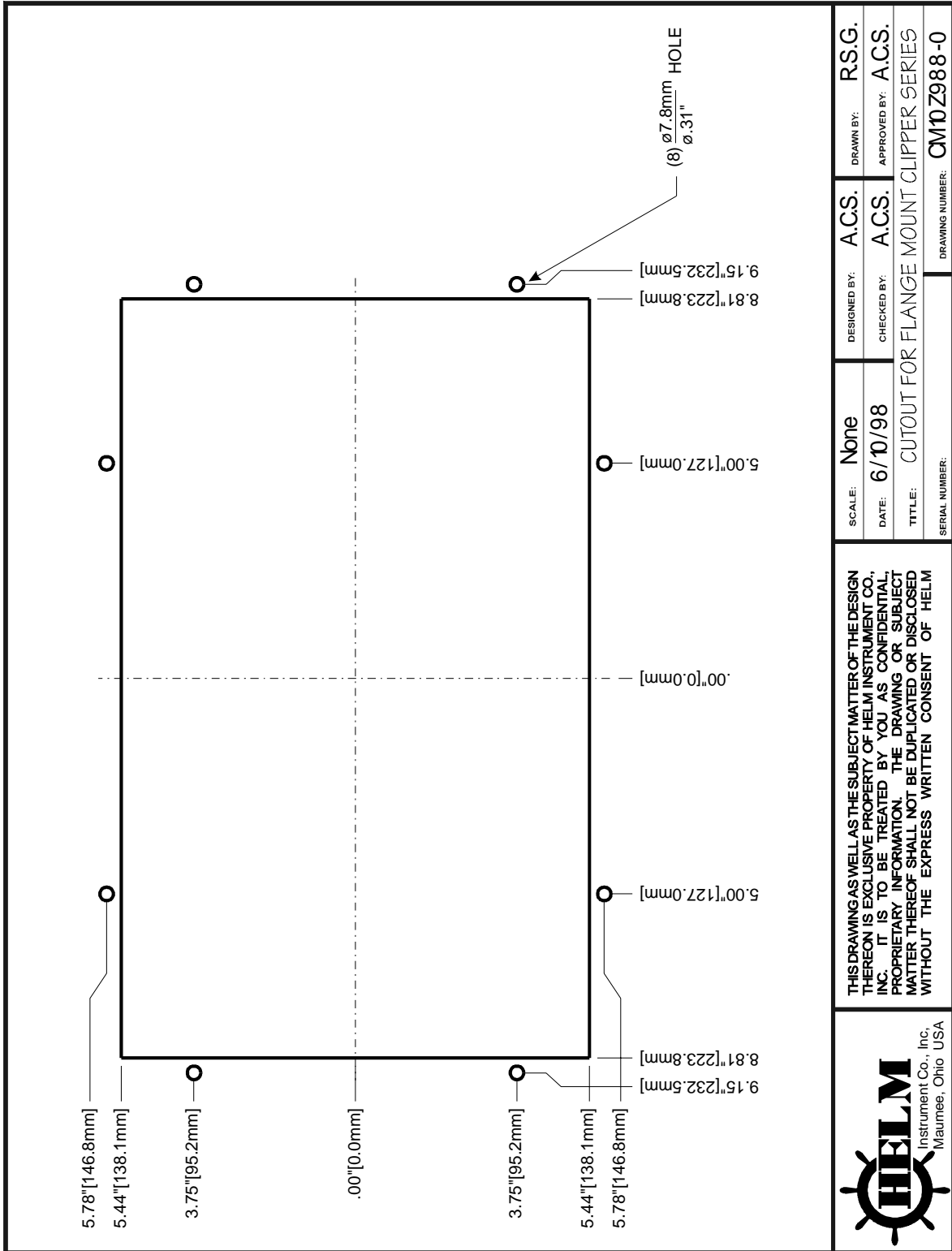


FLANGE MOUNT SCM AUTOGRAPH MOUNTING DIMENSIONS

SCM AutoGraph Flange Mount Dimensions



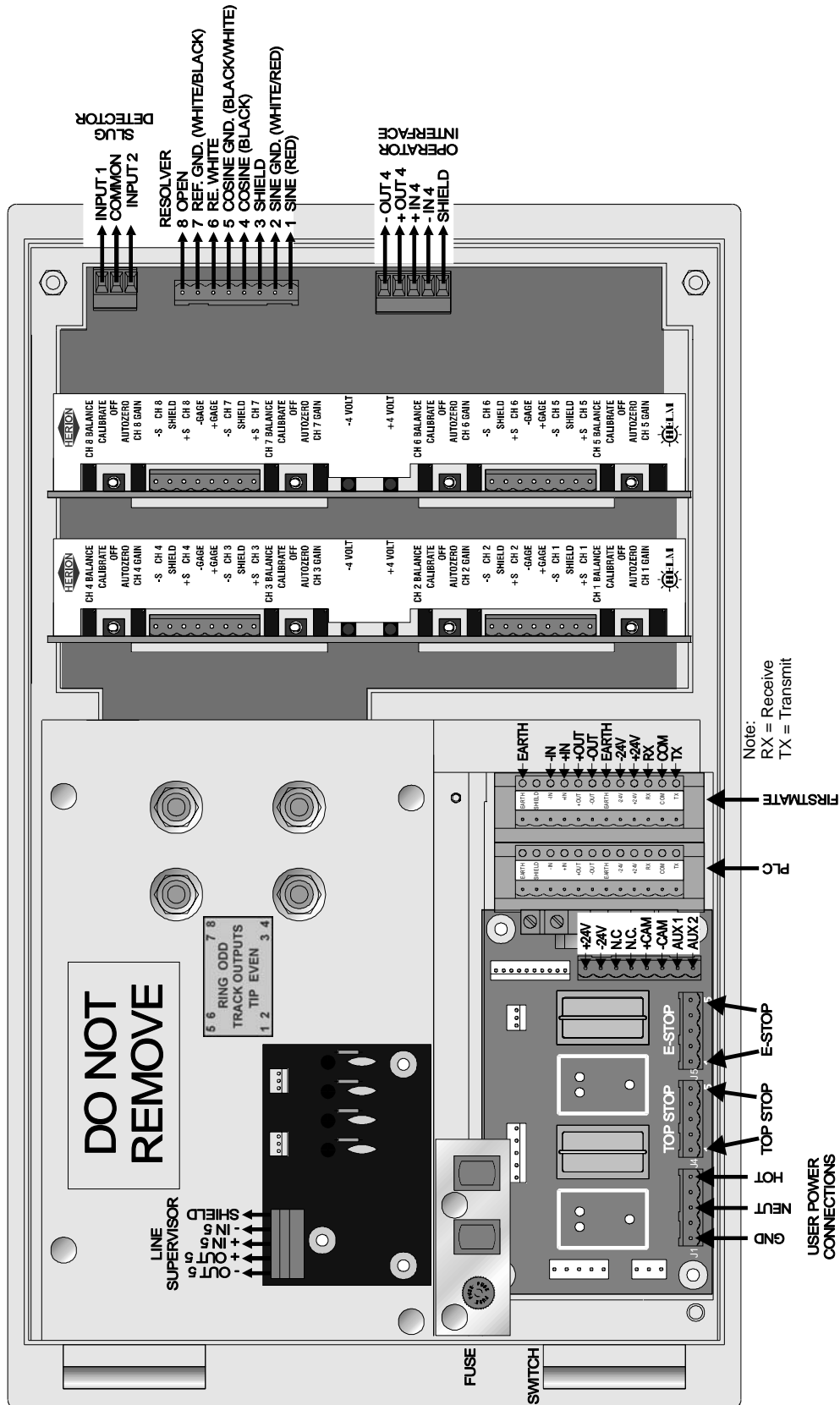
FLANGE MOUNT CUTOUT DIMENSIONS



USER SPECIFICATIONS

1. 90-240 VAC input power source @ 3.125 Amp.
2. Automatic Zero Balance (Auto-Zero)
3. Four-channel load-strain gauge input utilizes 175 ohm, 350 ohm, or 700 ohm nominal bridge resistance.
4. 24VDC-Cam/Prox/PLC input.
5. Hi/Lo Gain Range (1 meg/140K)
6. 24VDC I/O
 - 2 inputs : 10-30 VDC
 - 2 outputs : 10-30 VDC
7. 3 Communication Ports
 - Autograph (422)
 - Line Supervisor (DF1) (RS-422)
 - FirstMate (RS-422)
8. A/D Sampling Rate: 200 μ sec.
9. Resolver Input: Sine/Cosine 12 bit 0.1-degree resolution
10. Speed Range: 0-600 SPM
11. Recorder Output: Track signal from 0-4 volts
12. (2) Optional slug detection analog inputs. 0-10 VDC, 12 bit.
13. 1 Ethernet FirstMate port.
14. Weight 41 pounds

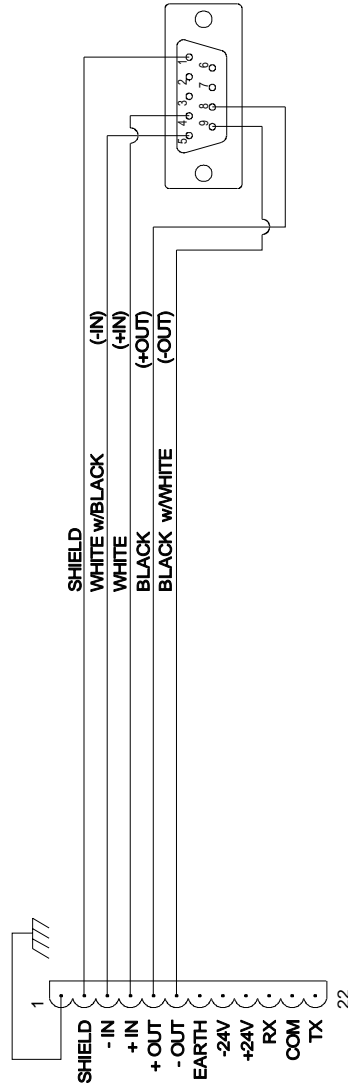
SCM WIRING FIGURE F



SCM/FIRSTMATE RS422 CONNECTIONS

SCM / FIRSTMATE RS422 CONNECTIONS

CABLE WIRES SHOWN
INDIVIDUALLY FOR PURPOSES
OF CLARITY ONLY



FM RS422 CONVERTER CONNECTOR	
PIN #2 =	SHIELD
PIN #3 =	WHITE w/BLACK (-IN)
PIN #4 =	WHITE (+IN)
PIN #5 =	BLACK (+OUT)
PIN #6 =	BLACK w/WHITE (-OUT)

FM 9-PIN CONNECTOR	
PIN #1 =	SHIELD
PIN #4 =	WHITE (Tx+)
PIN #5 =	WHITE w/BLACK (Tx-)
PIN #8 =	BLACK (Rx+)
PIN #9 =	BLACK w/WHITE (Rx-)



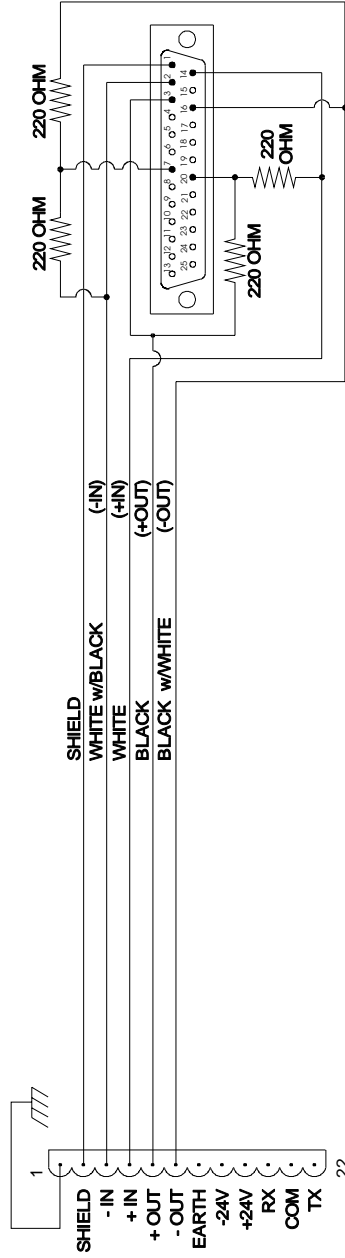
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DATE:	9/8/00	CHECKED BY:	R.S.G.	APPROVED BY:	R.S.G.
TITLE:	SCM/FIRSTMATE RS422 CONNECTIONS				
	DRAWING NUMBER:				E1023103

SCM/AGC - PLC RS422 CONNECTIONS

SCM/ADC - PLC RS422 CONNECTIONS

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FM RS422 CONVERTER CONNECTOR

PIN #2 =	SHIELD	
PIN #3 =	WHITE w/BLACK	(-IN)
PIN #4 =	WHITE	(+IN)
PIN #5 =	BLACK	(+OUT)
PIN #6 =	BLACK w/WHITE	(-OUT)

PLC 25-PIN CONNECTOR

PIN #1 =	SHIELD	
PIN #2 =	WHITE w/BLACK	(Tx-)
PIN #3 =	BLACK	(Rx+)
PIN #7 =	TERMINATION LOW	
PIN #14 =	WHITE	(Tx+)
PIN #16 =	BLACK w/WHITE	(Rx-)
PIN #20 =	TERMINATION HIGH	

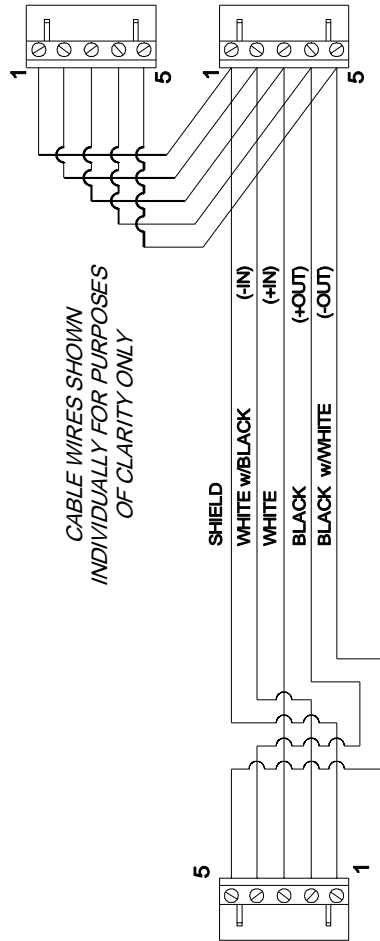


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TITLE:	SCM/AGC - PLC RS422 CONNECTIONS			DRAWING NUMBER:	E1023105

SCM LINE SUPERVISOR RS422 DAISY CHAIN

SCM LINE SUPERVISOR RS422 DAISY CHAIN



SCM-ATG 5-PIN CONNECTOR

PIN #1 =	SHIELD	(-IN)
PIN #2 =	WHITE w/BLACK	(+IN)
PIN #3 =	WHITE	(+OUT)
PIN #4 =	BLACK	(-OUT)
PIN #5 =	BLACK w/WHITE	

TLG 5-PIN CONNECTOR

PIN #1 =	SHIELD	(-IN)
PIN #2 =	WHITE w/BLACK	(+IN)
PIN #3 =	WHITE	(+OUT)
PIN #4 =	BLACK	(-OUT)
PIN #5 =	BLACK w/WHITE	



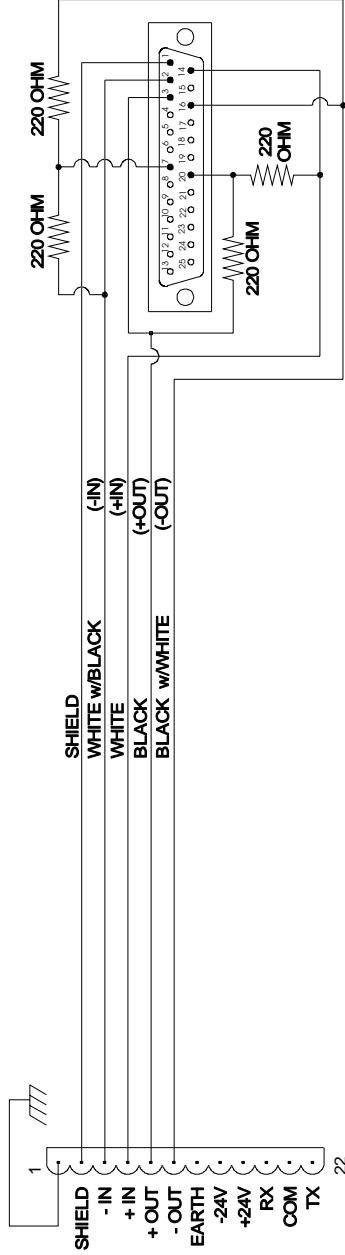
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DATE:	9/8/00	CHECKED BY:	R.S.G.	APPROVED BY:	R.S.G.
TITLE:	SCM LINE SUPERVISOR RS422 DAISY CHAIN				
	DRAWING NUMBER:				E1023102

SCM/AGC - PLC RS422 CONNECTIONS

SCM/ADC - PLC RS422 CONNECTIONS

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FM RS422 CONVERTER CONNECTOR

PIN #2 =	SHIELD	(-IN)
PIN #3 =	WHITE w/BLACK	(+IN)
PIN #4 =	WHITE	(+OUT)
PIN #5 =	BLACK	(-OUT)
PIN #6 =	BLACK w/WHITE	

PLC 25-PIN CONNECTOR

PIN #1 =	SHIELD	(Tx-)
PIN #2 =	WHITE w/BLACK	(Rx+)
PIN #3 =	BLACK	
PIN #7 =	TERMINATION LOW	
PIN #14 =	WHITE	(Tx+)
PIN #16 =	BLACK w/WHITE	(Rx-)
PIN #20 =	TERMINATION HIGH	



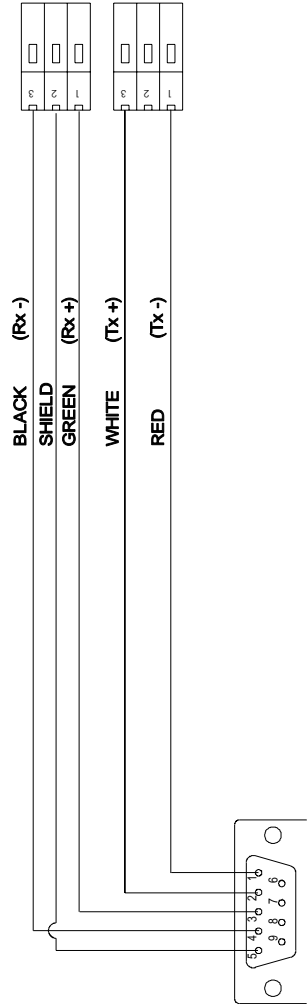
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TITLE:	SCM/AGC - PLC RS422 CONNECTIONS				
DRAWING NUMBER:	E1023105				

SCM LINE SUPERVISOR RS422 COM5 INTER-CONNECTIONS

SCM LINE SUPERVISOR RS422 COM5 INTER-CONNECTIONS

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ATG DISPLAY RS422 COM5 INTER-CONNECTOR	
PIN #2 =	SHIELD
PIN #3 =	WHITE w/BLACK (-IN)
PIN #4 =	WHITE (+IN)
PIN #5 =	BLACK (+OUT)
PIN #6 =	BLACK w/WHITE (-OUT)

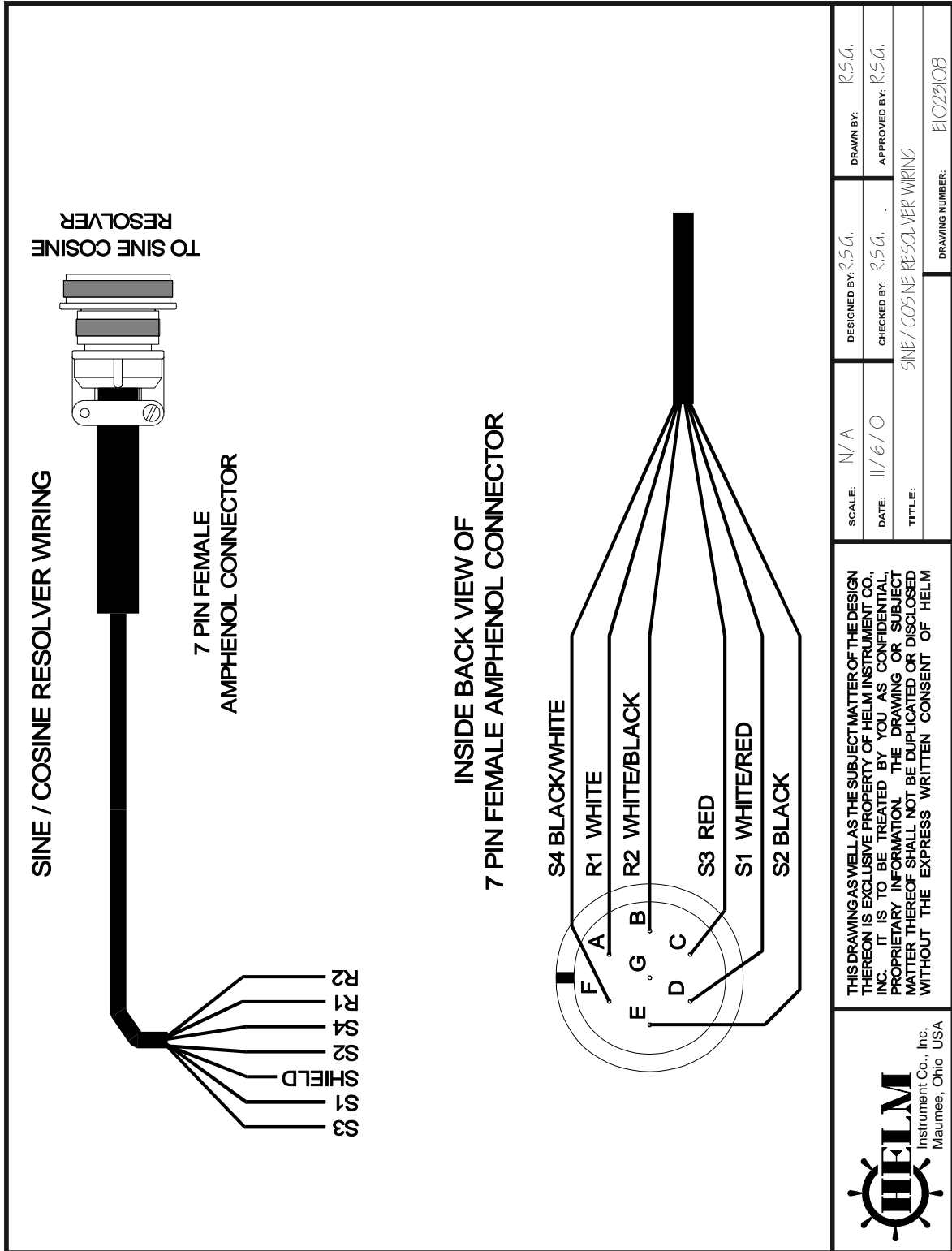
SCM-ATG 3-PIN CONNECTORS	
A	PIN #1 = RED (Tx-)
	PIN #3 = WHITE (Tx+)
B	PIN #1 = GREEN (Rx-)
	PIN #2 = SHIELD (Rx-)
	PIN #3 = BLACK (Rx-)



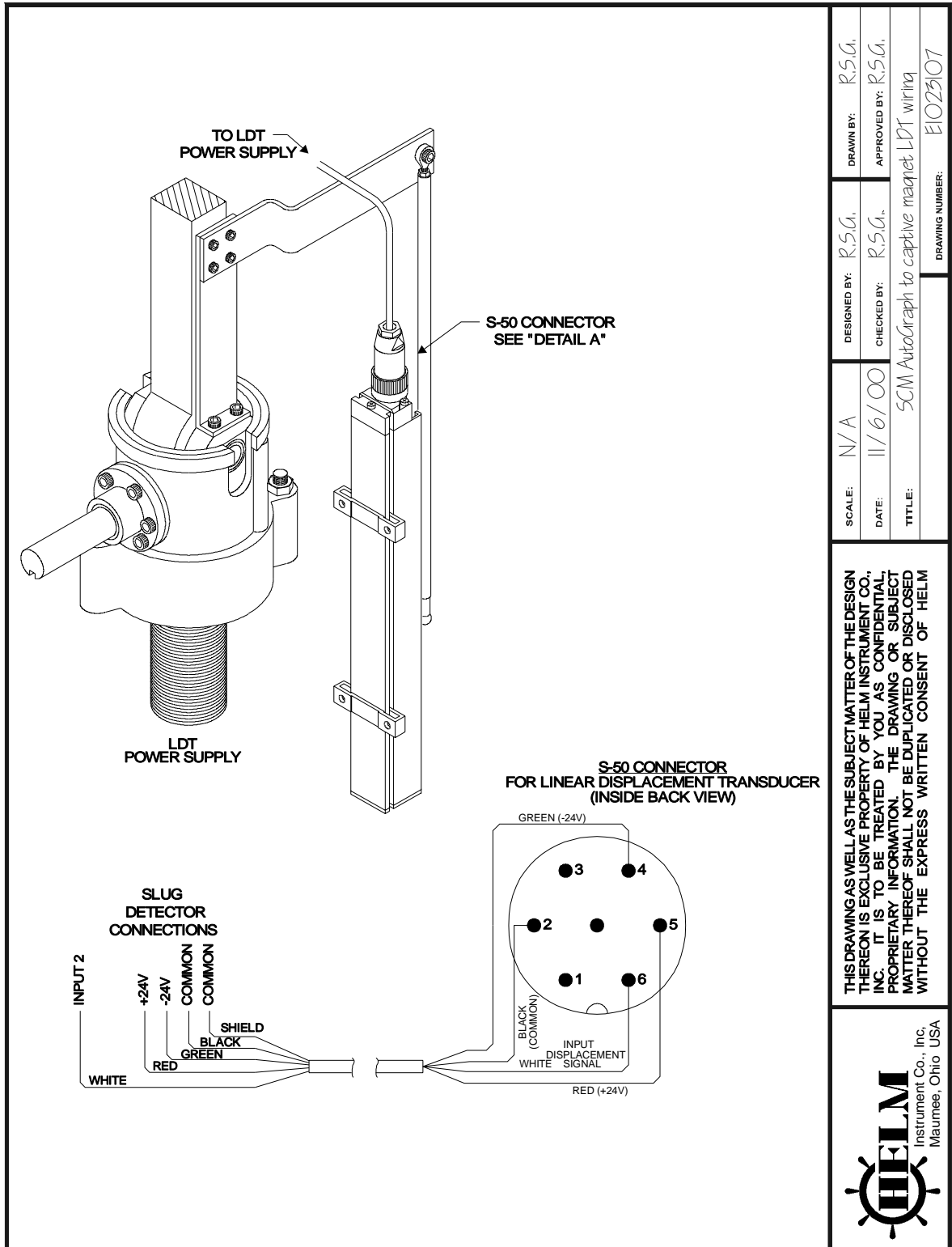
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TITLE: SCM LINE SUPERVISOR RS422 COM5 INTER-CONNECTIONS					
					DRAWING NUMBER: E1023106

SINE/COSINE RESOLVER WIRING



SCM AUTOGRAPH TO CAPTIVE MAGNET LDT WIRING

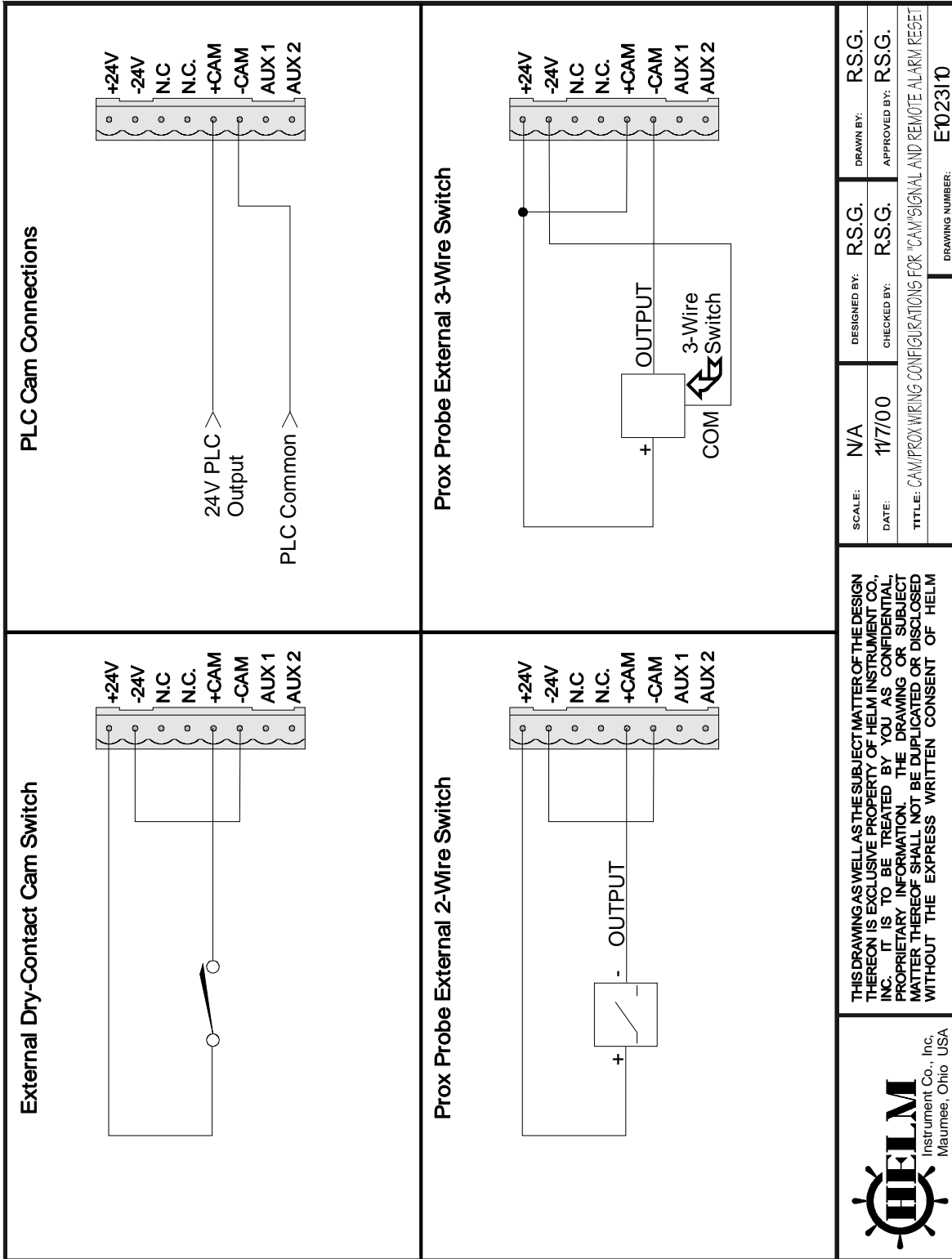


SCALE:	N/A	DESIGNED BY:	R.S.G.	DRAWN BY:	R.S.G.
DATE:	11/6/00	CHECKED BY:	R.S.G.	APPROVED BY:	R.S.G.
TITLE:	SCM Autograph to captive magnet LDT wiring				
				DRAWING NUMBER:	E1023107

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CAM / PROX CONFIGURATIONS

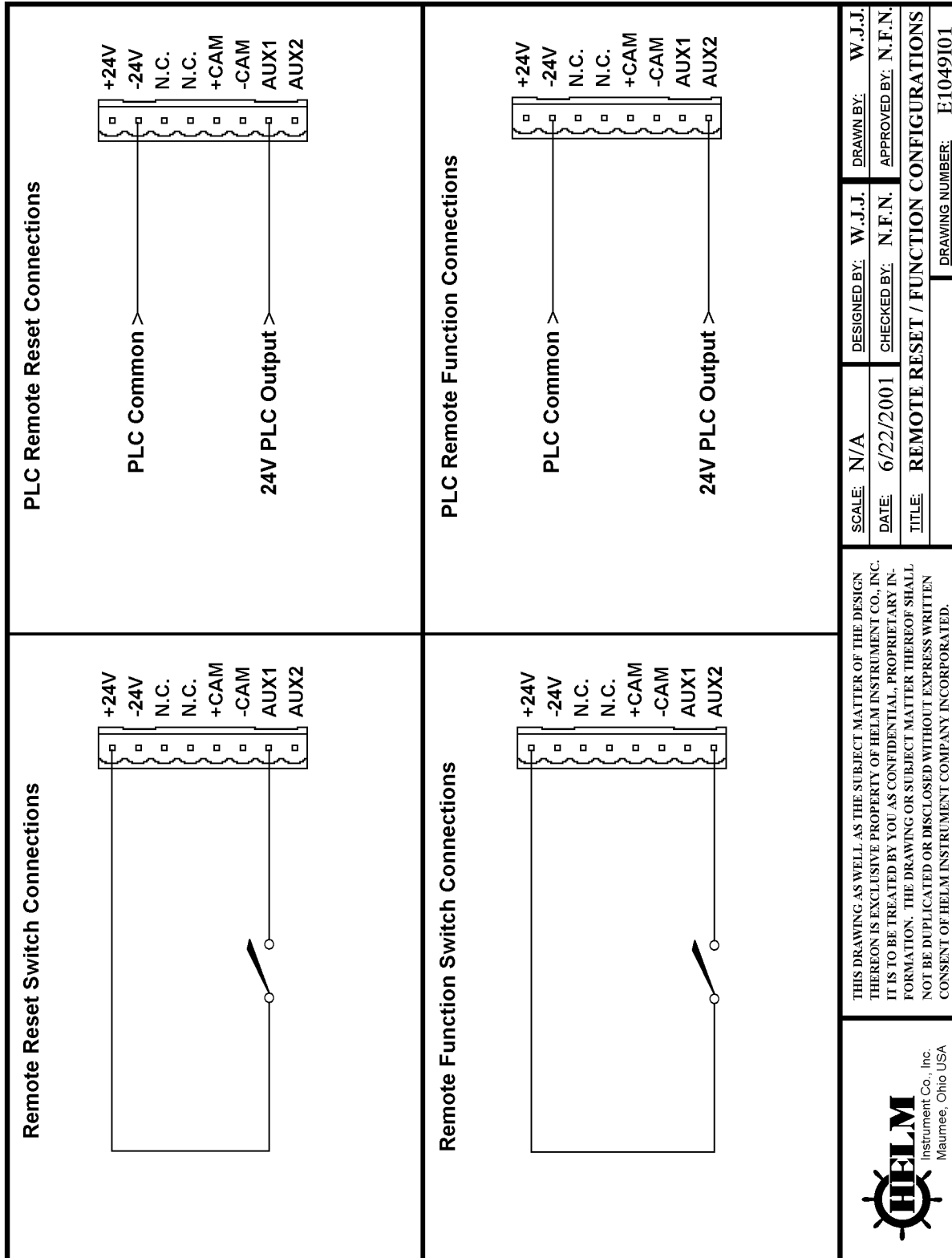


SCALE: N/A	DESIGNED BY: R.S.G.	DRAWN BY: R.S.G.
DATE: 11/7/00	CHECKED BY: R.S.G.	APPROVED BY: R.S.G.
TITLE: CAM/PROX WIRING CONFIGURATIONS FOR 'CAM' SIGNAL AND REMOTE ALARM RESET		
		DRAWING NUMBER: E02310

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REMOTE RESET / FUNCTION CONFIGURATIONS



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<p>DATE: 6/22/2001</p>	<p>CHECKED BY: N.F.N.</p>	<p>APPROVED BY: N.F.N.</p>	
<p>TITLE: REMOTE RESET / FUNCTION CONFIGURATIONS</p>			<p>DRAWING NUMBER: E1049101</p>
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