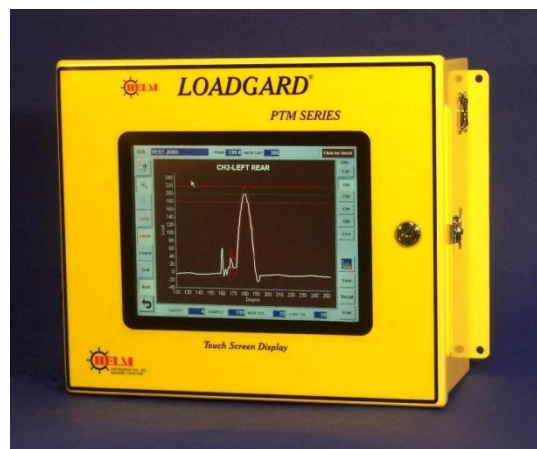# HELM

PTM - LOADGARD Series

USER MANUAL

Rev.   5.9

Aug 20 2015

HELM INSTRUMENT CO., INC.

LIMITED WARRANTY

Helm Instrument Co., Inc. ("HELM") hereby warrants that the instruments and sensors (collectively the "Product") manufactured by it and sold to customer, are free from defects in material and/or workmanship under normal use subject to the following conditions. This warranty shall not apply to any Product which has been subjected to improper installation, misuse, negligence, accident, alteration, where service has been performed by other than an authorized Helm serviceman, or where the serial number has been defaced or altered. This warranty shall extend for the one (1) year period from date of shipment from our factory or authorized dealer, provided that the product is returned, freight prepaid, to Helm within the one (1) year warranty period within specific written authorization to perform repairs. Helm's obligations and the exclusive remedy of customer under this warranty are limited to repairing or replacing any defective Product at no additional charge and returning Product to customer freight paid. Repair parts and replacement Products shall be furnished on an exchange basis and shall be either new or reconditioned. All replaced parts and Products shall become the property of Helm.

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CUSTOMER SERVICE
361 WEST DUSSEL DRIVE
MAUMEE, OHIO 43537
(419) 893-4356

EXPLANATION OF SYMBOLS

~   Alternating Current

Earth (ground) TERMINAL

| On (Supply)

O   Off (Supply)

Caution, risk of electric shock

Caution (refer to accompanying documents)

INTRODUCTION

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 and transfer or progressive tooling. 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.

ABOUT PTM LOADGARD SERIES

PTM LOADGARD series is one of the most advanced load monitoring systems Helm can offer. Sophisticated features such as smart sampling, adaptive learning, SPC(Statistical Process Control) Charts, etc. help monitoring the operation of your machine and protect them from faulty operation.

BENEFIT

- **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 PTM LOADGARD uses force monitoring for both press protection and parts quality control. If an excessive force that could potentially damage the press machine or a variation in force occurs during the part making process are detected, the PTM LOADGARD triggers an "alarm" and stops the press. This allows the press operator to correct the potential problem ahead.

PTM (PEAK TONNAGE MODULE)

- PTM is a single channel strain gage sensor input module to process the signal of the strain gage to analog output.

- PTM provides Auto-Zero® feature (patented by Helm Instrument Co., Inc.). The Auto-Zero® feature automatically keeps the zero balance of the load signal between every load cycles to compensate the tonnage variation affected by any environmental conditions changes such as temperature.

MAIN FEATURES

OPERATING MODES
PTM LOADGARD Series has three function modes controlled by an operator.

- **Setup Mode** – Used for system setup, Job setup or new job download.
  Capacity alarms are active. Trend Alarms are active if the Trend Alarm in Setup option is enabled from Server Setup screen. Target value is used for monitoring the Trend alarm conditions as a reference point.

- **Learn Mode** – Learns new sample value.
  Capacity alarms are active. Trend alarms are active if the Trend Alarm in Setup option is enabled from Server Setup screen. Target value is used for monitoring the Trend alarm conditions as a reference point.

- **Monitor Mode** – Adaptive learning can be active in this mode.
  Capacity alarms are active. Trend alarms are active. Sample value is used for monitoring the Trend alarm conditions as a reference point.

LOOK WINDOW TIME (ms) - Only applicable to none Resolver Model
PTM LOADGARD monitors tonnages between the "critical" time of the press stroke called the look window. 224 points (tonnage readings) per channel are recorded during the look window time from the look window start trigger point. These points are displayed as a "wave" or "signature" in the Signature Analysis screen.

SAMPLING (also referred to as "Learning" or "Trending" cycles)

Samples for pre-determined number of press strokes, defined as sample counts in *Alarm Setup* screen.

When the sampling is completed, PTM LOADGARD takes an average peak tonnage and / or tonnage signature per channel (while sampling), and stores as a *Sample peak value* and/or *Sample Signature* per channel and uses it as a reference point for Trend / Tracking Alarm conditions.

- **Sample –** Sample is the value learned automatically from Learn mode or Monitor mode by adaptive learn feature. The Sample value is used to calculate the Trend and Tracking Alarm condition in Monitor mode.

- **Target** – When you create a new job, Target values need to be entered manually. These values can be copied from the Sample values when Leaning process is completed for the job. The Target is used during Setup or Learn mode to monitor the Trend Alarm conditions before new Sample values are available.

ALARMS
In normal operation, the Alarm relay is closed for fail safe. When the tonnage alarm(s) condition is detected, the system opens the TOP STOP relay

- **High/Low Capacity –** Normally set at machine capacity. This provides the protection for the Machine. This alarm is active in all modes.

- **High/Low Trend** – creates high and low tolerance for peak load based on Target or Sample tonnage. The tolerance values are the allowable tonnage deviation above and below Sample or Target tonnage. This provides the means to maintain the quality of the part making. Trend alarms are available in all modes. There is an option to disable the Trend alarm during Setup or Learn mode.

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- **High/Low Tacking** – creates high and low tolerance bands around the sample tonnage signature for monitoring the alarm condition through out the stroke. Tracking alarm is only available in Monitor mode

- **Press Curve** (only available for Resolver based model) **–** 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 both setup and Monitor mode.

OTHER FEATURES

- **Signature Analysis** – Displays the forming force signature for each channel. You can zoom, read the tonnage value at angle, overlay multiple channels, view multiple peak tonnage value in bar graph, and more to help you analyzing the force signature.

- **Alarm History** – You can view last 500 alarm messages with time stamped.

- **Peaks History** – You can view a peak tonnage history graph of last 10000 strokes.

- **SPC (Statistical Process Control)** – You can view statistical charts of peak tonnage variation from selected peak history. Avail SPC charts are Individual & Moving Range, *Average & Range, *Median & Range, *Average & Std. Deviation, and Histogram

- **Jobs Recipe** – You create alarm settings per job base and store to Job Recipe for later quick download to setup the system.

- **Adaptive learning** – While the system is in Monitor mode, you can enable an Adaptive Learning option to continuously learn new sample tonnage while monitoring. This will allow the system to adapt any small gradual variances of the tonnage through time when requires

- **Multi-Level Password Protection** – you can restrict certain functions or screens of the system from being accessed by unauthorized personnel or prevent from unauthorized changes of the system settings. Different level of passwords gives more secure and effective protection for the system.

TOUCH SCREEN INTERFACE

MAIN MENU

Main menu allows you to access different area of the system. The PTM LOADGARD™ features a touch screen display for easy navigation and operation of the system. Click or touch on the button you wish to access.

MAIN MENU

PRESS MONITOR   ADTSERVER SETUP

RECIPE MANAGER   PASSWORD EDIT

Window Explorer

SHUT DOWN
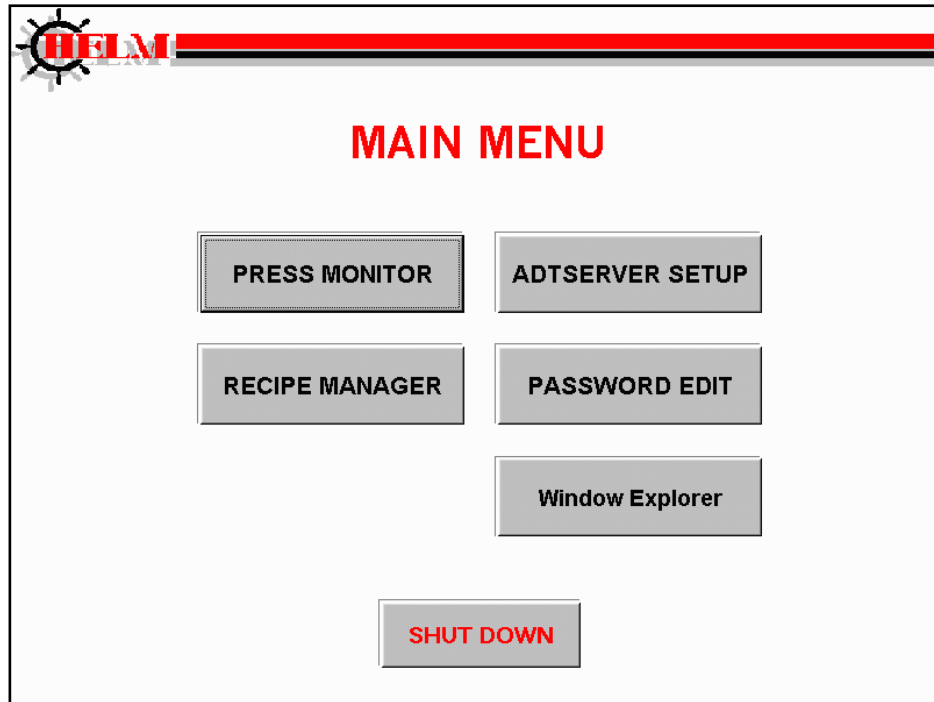
PRESS MONITOR – This is where you can monitor the peak tonnage values, tonnage signatures, change Alarms setting, view Alarm Messages, SPC and more.

RECIPE MANAGER – You can create a new job, edit or delete existing jobs, and download a job settings to the system.

PASSWORD EDIT – set or change the passwords.

ADTSERVER – helps to diagnose the system status for the trouble shooting purposes. Initial and system setup is done here.

SHUTDOWN – prepares the system to be powered down safely. This is protected by operator password. Use "4356123" as password to exit out to Windows Desktop screen without shutting down the system.

Warning: We recommend to use SHUTDOWN button before powering down the system. Improper shutting down of the system may cause an abnormal system operation.

PTM LOADGARD Series   Operators Manual

PRESS MONITOR
TONNAGE DISPLAY SCREEN

PRESS MONITOR provides the screens to view peak tonnage load, Tonnage signatures, ,peak tonnage history, and SPC charts, You can change Alarm settings and view Alarm Messages as well.

MAIN PEAK LOAD SCREEN FOR VARIATY PTM MODELS

This screen displays peak tonnage values, alarm settings, and alarm indicators for all channels.
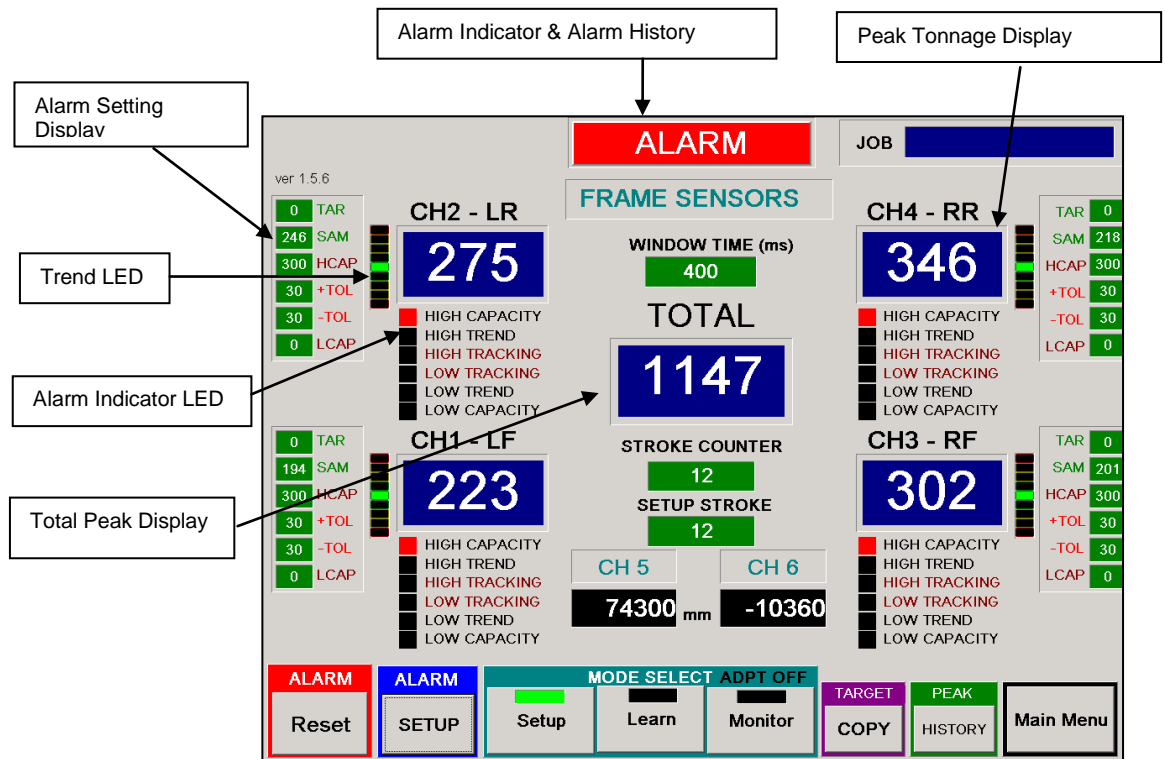
Main Tonnage screen from PTM-4500L2
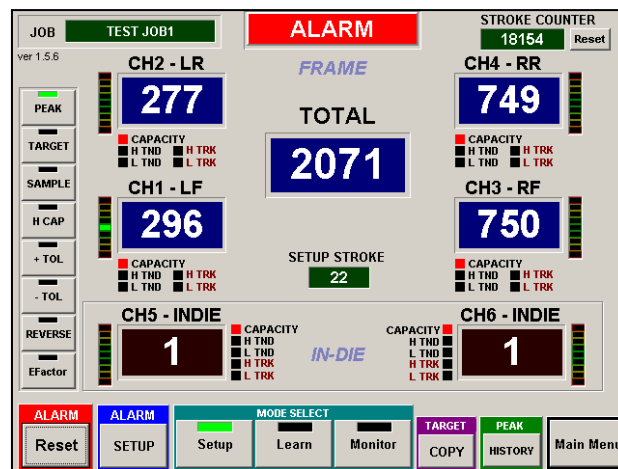
Main Tonnage screen from PTM-6700TSM

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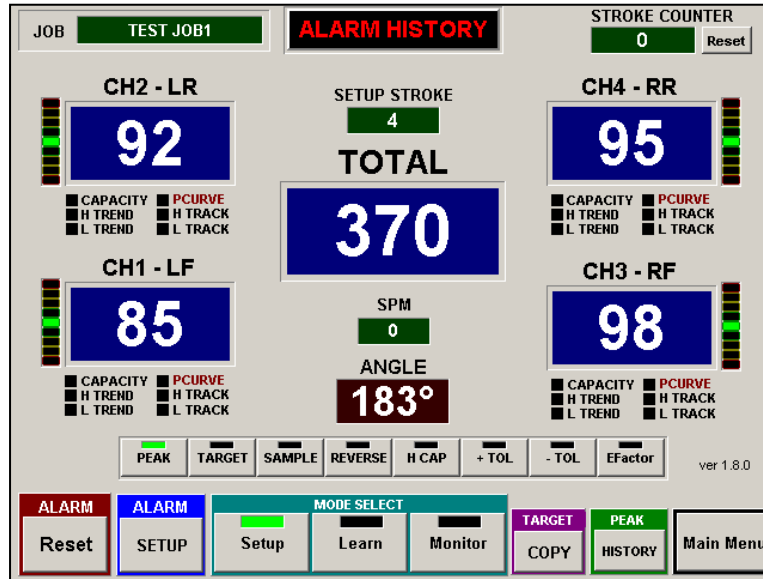
Main Tonnage screen from PTM-4500TSM
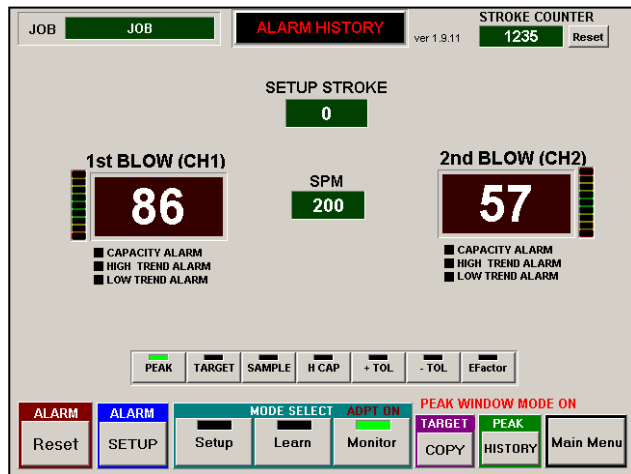
Main Tonnage screen from PTM-2300PG
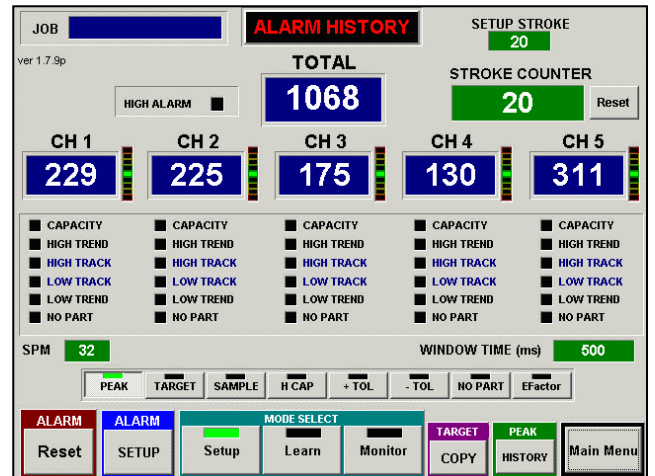
Main Tonnage screen from PTM-5600P

FOR DOUBLE ACTION PRESS MACHINES
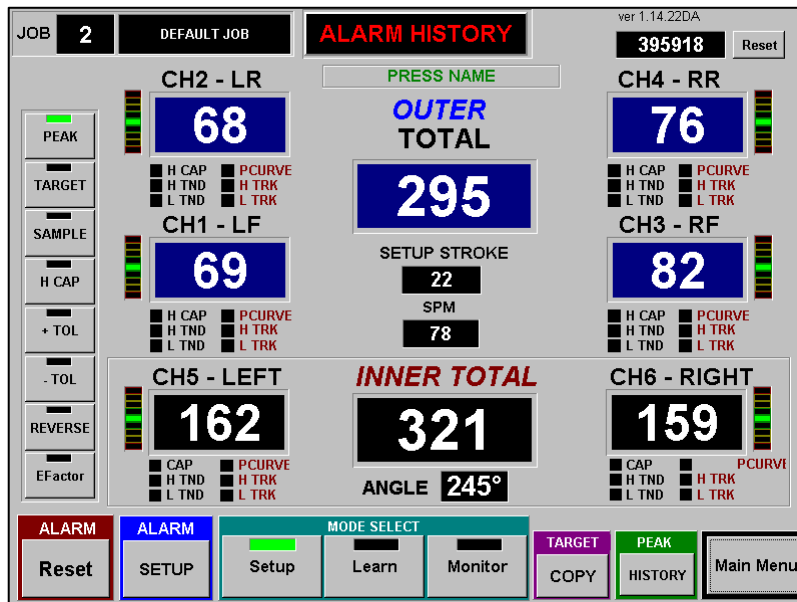
Main Tonnage screen from PTM-6600TSM-DA
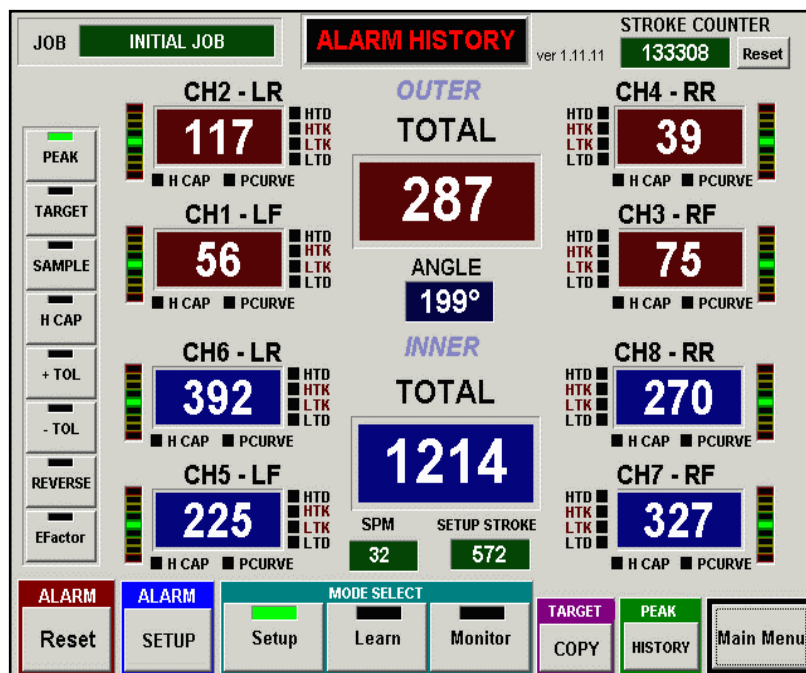
Main Tonnage screen from PTM-8800TSM-DA

CURRENT JOB DISPLAY

JOB	VISTEON1

Shows current Job name. Job name can be edited from RECIPE MANAGER screen

ALARM INDICATOR & HISTORY

ALARM HISTORY

ALARM

Click Here for Detail

This ALARM INDICATOR button has two functions, It indicates any alarms tonnage condition and lets you view alarm history. When the machine is running within normal parameter, the message on the button shows ALARM HISTORY. The message ALARM with red color background indicates there is an alarm condition(s). In this case, it will flash the message "Click Here for Detail". To view the detail message of the alarm, click on the display to open ALARM HISTORY screen. You can click on this display to view previous alarm messages at anytime.

ALARM HISTORY

Click on ALARM WARNING DISPLAY button to view ALARM HISTORY.

ALARM HISTORY

DATE	TIME	DESCRIPTION
07/13/2001	09:00:45 AM	CH10 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH11 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH12 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH13 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH14 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH15 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH16 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH17 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH18 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH19 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH20 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH21 HIGH CAPACITY
07/13/2001	09:00:45 AM	CH22 HIGH CAPACITY

Clear　　　　Ok

You can view up to last 500 alarm messages that have date and time stamp. Use the scroll bar on the right side of the list box or arrow buttons on the bottom to scroll up and down the history list. Use *Clear* button to empty all messages.

Note: you need administrator or higher level of password to clear the alarm history.

TOTAL PEAK DISAPLY FOR FRAME

TOTAL

411
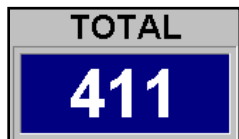
TOTAL displays the summation of the four corner peak tonnages . This value is the actual peak tonnage load that the press is taking in each cycle.

PEAK TONNAGE DISPLAY FOR FRAME (Ch1 – 4)

This peak display shows the peak tonnage load of each channel within the look window from each cycle of the press.

TREND LED

The vertical bar meter next to the peak display box is a Trend Display bar. It shows the visual reference of a peak tonnage variation comparing to TARGET or SAMPLE tonnage for Trend Alarm. The center green light indicates 0% variance within the tolerance of the Trend Alarm. The green light, one above the center, indicates 25% variance. Toward to the red light on the top, the yellow light shows 50% and 75%. Once the tonnage reaches 100% of the tolerance or beyond, all the bars from the center to top light up and it indicates the High Trend Alarm condition. This applies to Low Trend Alarm as well. Only difference is the negative percentage (-25%, -50%, -75% and –100%) and opposite instead.

ALARM INDICATOR LED FOR FRAME CHANNEL

When alarm(s) occurred, ALARM INDICATOR LED displays the cause of the alarm.

H CAP (HIGH CAPACITY ALARM)
When the peak tonnage of an individual channel reaches the high limit of the setting for Capacity alarm, the black rectangle next to the description will turn red to indicate that High Capacity alarm is triggered. Refer to ALARM SETUP SCREEN for details.

H TND (HIGH TREND ALARM)
When the peak tonnage of an individual channel reaches the high limit of the setting for Trend Alarm, the black rectangle next to the description will turn red to indicate that a High Trend alarm is triggered. Refer to ALARM SETUP SCREEN for details.

L TND (LOW TREND ALARM)
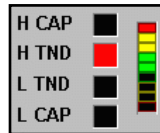When the peak tonnage of an individual channel reaches the low limit of the setting for Trend Alarm, the black rectangle next to the description will turn red to indicate that a Low Trend alarm is triggered. Refer to ALARM SETUP SCREEN for details.

L CAP (LOW CAPACITY ALARM)
When the peak tonnage of an individual channel reaches the low limit of the setting for Capacity alarm, the black rectangle next to the description will turn red to indicate that a Low Capacity alarm is triggered. Refer to ALARM SETUP SCREEN for details.
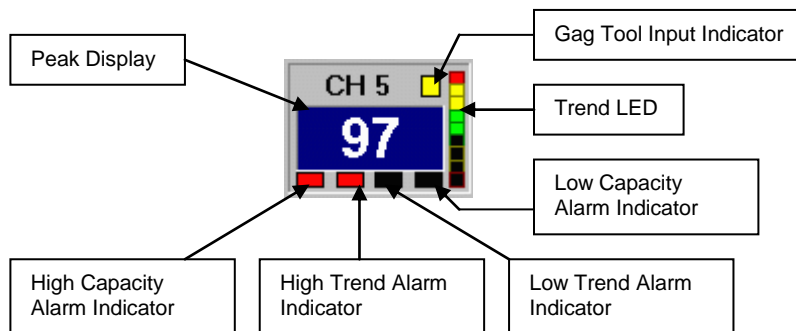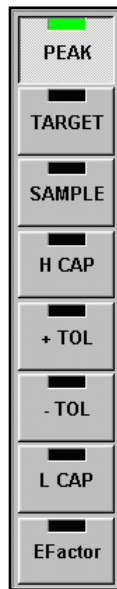
PEAK DISPLAY FOR IN-DIE & ALARM INDICATOR (In-Die Screen Only)

Peak Display

Gag Tool Input Indicator

CH 5

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Trend LED

Low Capacity Alarm Indicator

High Capacity Alarm Indicator

High Trend Alarm Indicator

Low Trend Alarm Indicator

VIEWING CURRENT ALARM SETTINGS (In-Die Screen Only)

Click on one of the buttons to view current alarm setting values. The values will be displayed in the Peak tonnage display boxes for 20 seconds and change back to PEAK automatically.

The TOTAL PEAK display box shows the viewing mode currently selected.

PEAK		Current peak tonnage value.
TARGET	(TARG)	Target tonnage value.
SAMPLE	(SAMP)	Sample tonnage value.
HIGH CAP	(HCAP)	High Capacity tonnage limit
+TOL	(+TOL)	High tolerance tonnage limit above the Sample or Target value.
-TOL	(-TOL)	Low tolerance tonnage limit below Sample or Target value
LOW CAP	(LOW)	Low capacity tonnage limit
EFACTOR	(EFAC)	Expanded Factor which is tolerance multiplier to increase the tolerance band in Setup & Learn Mode

ALARM RESET

Once the Alarm output relay is disengaged by an alarm condition(s), click on the RESET button to clear all alarm indication and alarm relay output.

ALARM SETUP
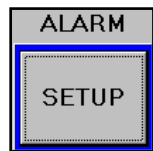
Click on ALARM SETUP button to bring up CURRENT ALARM SETTING screen where you can set or change the current alarm settings and download the new settings to the system to take effect. You can also stores any change you made in this screen to Recipe database easily. Refer to CURRENT ALARM SETTING for details.

OPERATING MODE
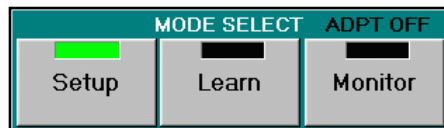
Operating mode can be switched by clicking one of the CURRENT MODE buttons. While in LEARN mode, the mode always changes to MONITOR mode automatically after LEARN cycle is completed.

Setup Mode – Used for system setup, Job setup or job download.
Capacity alarms and Trend alarms are available. The tolerance band for Trend alarm is calculated by Target value + (±TOL x Expand Factor). You can enable or disable the Trend Alarm from System Setup screen.

Learn Mode – In LEARN mode, system averages the peak values for each channel during the predefined learning cycle. Once the learning cycle is completed, the each average value is stored as sample value for each channel and the operating mode automatically switches to Monitor mode. Capacity alarms and Trend alarms are available during Learn mode. The tolerance band for Trend alarms is calculated by Target value + (±TOL x Expand Factor). You can enable or disable the Trend Alarm from System Setup screen.

Note: you can define the number of Learn Cycle and store it as a part of job recipe item in Job Setup screen.

Monitor Mode –   In Monitor mode, you have the option to enable or disable the Adaptive Learning feature which is part of job recipe item. When the Adaptive Learning is active, the system continuously re-learns sample values while monitoring for any alarm condition. You can change the number of Adaptive Learning cycle by changing the Learning Cycle from Alarm Setup screen.

ADPT ON/OFF - This indicates whether Adaptive Learning feature is turned on or off.
Once the Adaptive Learn is active, you should see that the green LED on the mode select button flashes.

COPYING SAMPLE TO TARGET
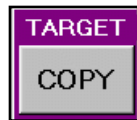
Use COPY button to replace the TARGET value with the SAMPLE value. It is useful when you have to arbitrary set the Target value for a new job for the first time. After the Learning procedure is completed for a new job, click on the COPY button to update the Target values with the Sample values. When making a copy, it prompts with a message to give you the option to update the new TARGET values to the Recipe database for a current job.

VIEW PEAK HISTORY

Click this button to open PEAK TONNAGE HISTORY screen where you can view a recorded peak tonnage graph up to previous 1000 hits in one screen. Also, you can select the range of the peak history to display SPC (Statistical Processor Control) charts. Refer PEAK HISTORY & SPC for details.

PEAK HISTORY & SPC(STATISTICAL PROCESS CONTROL) CHARTS
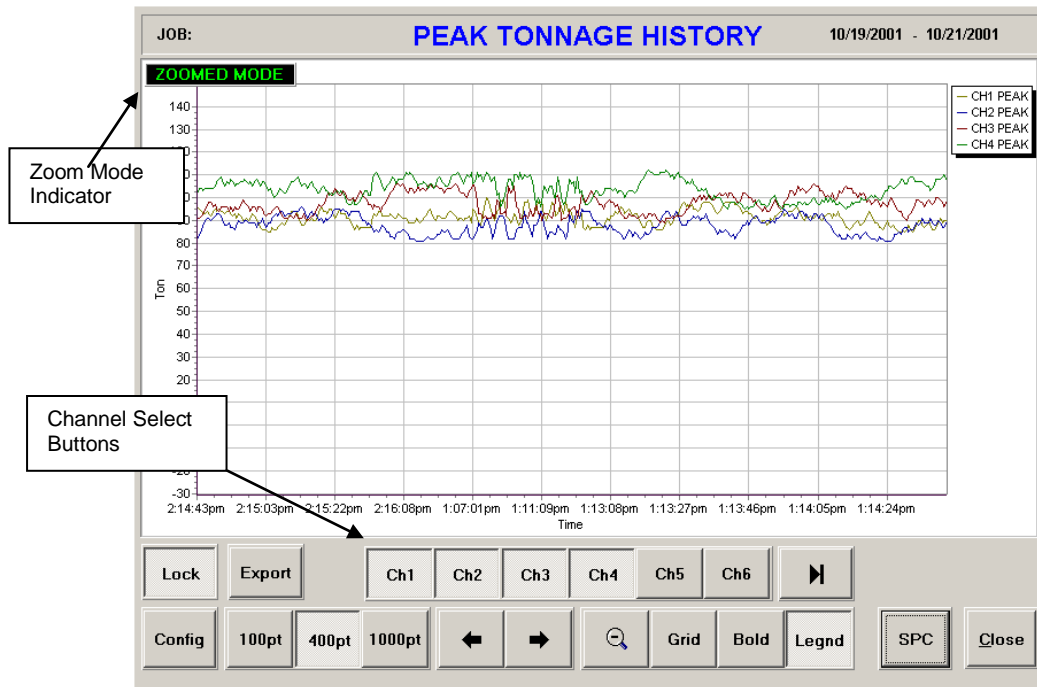
ZOOMED MODE

This indicates that the current history graph has been zoomed. To zoom the graph, point to the area on the screen where you want to start zooming and drag the point down right to create a zoom rectangle. Once the inside of the zoom rectangle covers the area where you want to zoom in, release the point from the screen. You can repeat this to continue zooming within the area.

CHANNEL SELECT BUTTONS

Toggle the buttons to add or remove the peak graph of the channel from the history graph.

CONFIG

You can define how often the peak values need to be recorded into the peak history. Set the Update Frequency value and click Save to take effect the new setting.

CHANGE GRAPH RESOLUTION

The Peak history records up to 10,000 previous peak values. You can change the number of viewable peak points on a graph by choosing one of the options

100pt – to display 100 peak points at a time
500pt – to display 500 peak points at a time
1000pt – to display 1000 peak points at a time

SCROLL

These buttons let you scroll left or right to view rest of the peak points outside the graph. Click left arrow button to scroll left, right arrow button to scroll right.

UNZOOM

Click this button to reset the zoomed graph and return to original size.

GRID

Click this button to show or hide vertical and horizontal grid lines on Peak Graph screen.

BOLD

Click this toggle button to make the width of the peak graph line bold.

LEGEND

Click this button to show or hide the legend of the graphs displayed on the screen.

SPC

Click this button to generate SPC charts within the peak data displayed on the history graph. Use Zoom or Scroll to select the range of the peak history to generate SPC chart you want to see.

If more than one channel is displayed in the history graph, SPC averages them to generate the charts.

CURRENT ALARM SETTING

Resolver TSM model: PTM 2300/4500/6600DA/6700TSM

None Resolver model: PTM-4500

In CURRENT ALARM SETTING, you can view / edit the current alarm settings and also save the change to current job database and download the change to ADTServer.

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Group Select
Select Group Select option if you want all channels to have same settings.

HIGH CAPACITY
HIGH CAPACITY is the limit for the maximum peak tonnage allowed to operate the machine. Normally the value is set at or below the scale value which is the capacity of the machine divided by the number of frame sensor channels. HIGH CAPACITY alarm is available in all modes.
Note: You need to enable the Edit mode by using Administrator or higher level of password in order to make any changes from this screen.

LOW CAPACITY
LOW CAPACITY is the limit of the minimum peak tonnage allowed to operate the machine. Normally the value is set for 0 (disabled) unless there is a special need. LOW CAPACITY alarm is available in all modes.

TARGET
The concept of TARGET is to provide a Trend alarm protection for SETUP and LEARN modes. Normally, Trend Alarm requires a sample tonnage to compare the current peak tonnage to monitor the alarm condition. However, the Sample value is only available when the system has completed its Learning cycle and the operating mode has been changed to Monitor mode. In typical load monitoring system, the Trend alarm is not available during Setup and Learn mode. In this system, the TARGET feature is to gives you the full protection of Trend Alarm by letting you manually enter the expected tonnage value for the job before running the press. Once the machine has started and acquired new Sample values by Learning procedure, you can update the Target values with them by clicking the Target COPY button in the main Tonnage screen. In case that you try to run a new job and are not sure where the Targets need to be set at, you can set each Target value to zero. This will disable the Trend Alarm on a channel by channel basis. After system learns the new sample values, you can use the Target Copy command to update the Target values.

Note: While the system is in Setup or Learn mode, adjust Expand Factor to increase the tolerance band to avoid unnecessary Trend alarm warning. Refer to Expand Factor for details.

+ TOL
This is the upper tolerance tonnage limit for a High Trend alarm of each channel. This limit prevents the current peak tonnage load from exceeding the +TOL tonnage setting above the Target (In Setup or Learn mode) or Sample (In Monitor mode) value.

Note: Depending on EXPAND FACTOR value, actual tolerance may differ from the value that was set while the system is in Setup or Learn mode. Refer to EXPAND FACTOR for detail.

- TOL
This is the lower tolerance tonnage limit for a Low Trend alarm of each channel. This limit prevents the current peak tonnage from exceeding the -TOL tonnage setting below the Target (In Setup or Learn mode) or Sample (In Monitor mode) value.

Note: Depending on EXPAND FACTOR value, actual tolerance may differ from the value that was set while the system is in Setup or Learn mode. Refer to EXPAND FACTOR for detail.

EXPAND FACTOR
These are the multipliers for the + and -TOL values to increase the range of the tolerance bands so that the system has less chance to fire Trend alarms while the press is running in SETUP or LEARN mode. Once the system is in Monitor mode, This EXPAND FACTOR does not affect the tolerance for Trend and Tracking alarm band in PLM model. However, in TSM

model(with Resolver), this expand factor still applies to the Tolerance setting for Trend alarm, but not Tracking alarm.

Example: Target = 60 , Sample = 64, +Tol = 10, -Tol =15, Exp Factor = 2.0
          In Setup or Learn mode
               Actual High Trend limit =   60 + (10 * 2.0) = 80
               Actual Low Trend limit =   60 - (15 * 2.0) = 30
          In Monitor mode
               Actual High Trend limit =   60 + 10 = 70
               Actual Low Trend limit =   60 - 15 = 45

DELTA TRACK EX

Delta Track feature pertains to the filtering of tracking alarms, and help avoid "nuisance" type alarms. The filtering occurs during sudden force change through the press stroke. Delta Track filtering can be seen in the signature screen, where high slopes area of the sample signature (along with the tracking bands) are filtered out during relatively small portion of the stroke.

Filter level can be adjusted. Enter a value between 1 and 99 to determine how much of the slope rate area to be filtered. 99 filter the least and 1 will filter the most out of the slope area.

Enter '0' to disable Delta Track filtering.

Enter "100" to enable Perpendicular Tolerance(PT) tracking bands.
PT Tracking generates the tracking bands that envelop around the sample signatures evenly throughout the alarm window area. This Tacking gives you the ability to monitor tracking alarm in very tight tolerance setting without cause "nuisance" alarm by any minimal horizontal shiftiness of the force signature.
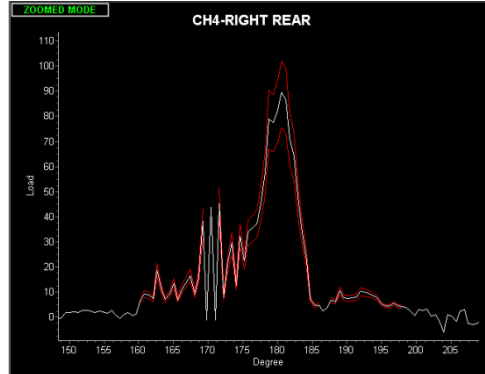
Standard Tracking at 15% Tolerance
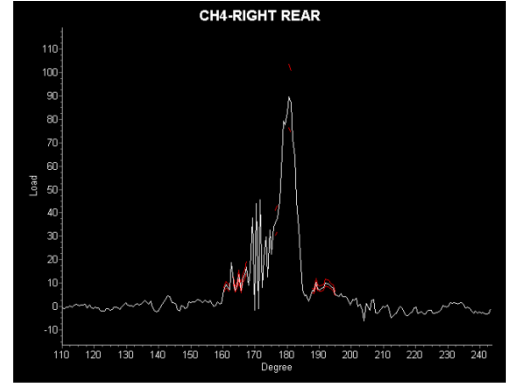
Delta Track Enabled & set at 80
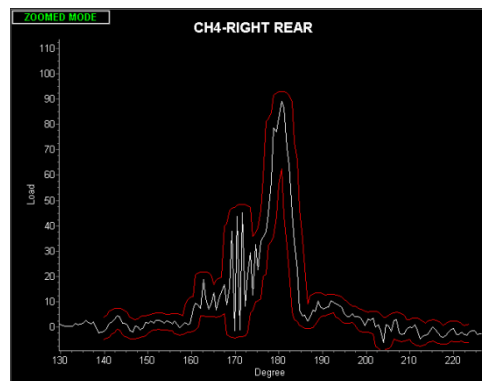
P.T. Tracking at 3% Tolerance

LEARNING CYCLE

Enter the number of cycles to take to learn new Sample values in LEARN mode. In MONITOR mode, Adaptive Learning feature uses this cycle to learn new Samples when it is enabled. In TSM Model, enter 0 to use Target values as Sample for Trend alarm in Monitor mode without going through learning process for new sample. Note that Learn Cycle set to "0" disables Tracking alarm.

ADAPTIVE LEARNING ENABLE/DISABLE

You can enable or disable Adaptive Learning feature in MONITOR mode. By enabling the Adaptive Learning, the system continuously learns new sample values while it is in Monitor mode and applies the new Sample values to monitor Trend alarm conditions as soon as available. This will allow the system to adapt any small gradual variances of the tonnage load through the time which are caused by environmental change such as temperature. If any tonnage load that causes an alarm, the reading is excluded from Adaptive Learning process.

ALARM WINDOW (ms)

Set alarm window to adjust the area of the force signature to monitor for tracking alarm. If PEAK WINDOW is enabled, this ALARM WINDOW determined the area of the signature to capture the peak tonnage instead of from entire signature. Enter start and stop Alarm Window times in msec within Window Time.
Note: In Resolver model, enter the range of the angle value instead of time.

(LOOK) WINDOW TIME (ms) - Only applicable to none Resolver Model

Look Window Time is the duration of time when the force signature and peak tonnage is captured. The WINDOW TIME need to be adjusted based on the speed of the machine to capture optimal force signature.

ENABLING EDIT

Before you are able to make any changes on the settings in this screen, you have to enable Edit mode first. To do so, click on Edit button and enter a password to enable the Edit mode. Depending on the password clearance level, restrictions will apply.

Default Password:
Operator password = "123"
Administrator Password = "123456"
Master Password = "1968"

Here is the table for editable contents based on the password type.

Functions	Operator Password	Administrator Password	Master Password
Scale Value change	X	X	O
High/Low Capacity Setting	X	X	O
Window Time Setting	X	O	O
Tracking Threshold Set	X	X	O
High/Low Tolerance Setting	O	O	O
Target/ EXP Factor	O	O	O
Tracking On/Off	O	O	O
Learn Cycle Count	O	O	O
Alarm Window Setting	O	O	O
RECIPE Job Download	O	O	O
RECIPE Job Add/Edit/Delete	X	O	O

DOWNLOAD

Click this button to download new alarm settings to system. Downloading is only allowed in Setup mode. If the system is currently in LEARN or AUTOMATIC mode, it will prompt with a message that will ask if you want to switch back to SETUP mode.
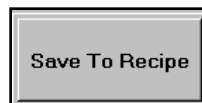
Note: Any change of settings you make in this screen will take effect after Download is completed.

JOB RECIPE

Click this button to go to RECIPE MANAGER screen.

SAVING TO RECIPE DATABASE

Click this button to update current job stored in Recipe database with the new settings made from this screen.
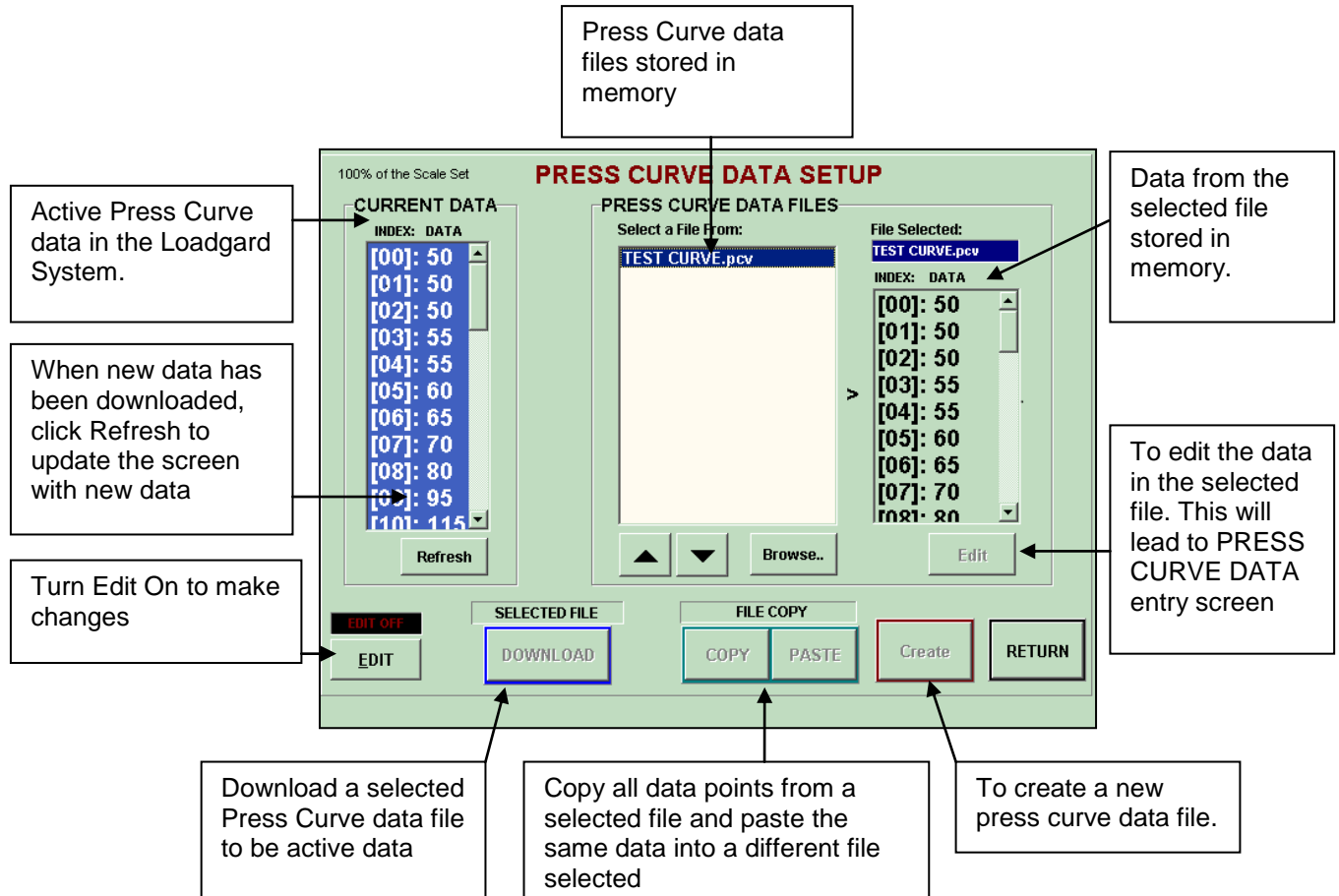
MAIN MENU

Click this button to return to main tonnage screen

PRESS CURVE ALARM

The resolver based PTM Loadgard system allows the operator to enter the specified 36 press curve points in the Press Curve Data Setup screen for Press Curve Alarm. Multiple press curve data can be saved. Select a press curve data file and click download to active it.

PTM LOADGARD PRESS CURVE SETUP PROCEDURE

Press Curve data files stored in memory

Active Press Curve data in the Loadgard System.

When new data has been downloaded, click Refresh to update the screen with new data

Turn Edit On to make changes

Data from the selected file stored in memory.

To edit the data in the selected file. This will lead to PRESS CURVE DATA entry screen

PRESS CURVE DATA SETUP

100% of the Scale Set

CURRENT DATA
INDEX: DATA
[00]: 50
[01]: 50
[02]: 50
[03]: 55
[04]: 55
[05]: 60
[06]: 65
[07]: 70
[08]: 80
[09]: 95
[10]: 115

Refresh

PRESS CURVE DATA FILES
Select a File From:
TEST CURVE.pcv

File Selected:
TEST CURVE.pcv
INDEX: DATA
[00]: 50
[01]: 50
[02]: 50
[03]: 55
[04]: 55
[05]: 60
[06]: 65
[07]: 70
[08]: 80

▲ ▼ Browse..

Edit

EDIT OFF

EDIT

SELECTED FILE
DOWNLOAD

FILE COPY
COPY   PASTE

Create   RETURN

Download a selected Press Curve data file to be active data

Copy all data points from a selected file and paste the same data into a different file selected

To create a new press curve data file.

A. How to edit existing Press Curve data file
1. Select the file you created from the list then click Edit button to enter date points
2. Edit the value in 36 points to match Press Curve data. starting 0 degree in degree, enter data every 10 degree. The data is a percent value x 10 of total capacity of the machine.
3. For example, if the press capacity is 500t and the press is rated as 250t at 90 degree crank angle according to the press curve chart, then enter 500 (50% x 10 = 500) for 9th data entry point. The formula is:

 Press Curve Data Value = (Capacity @ angle / Press Capacity) * 1000
(250 / 500) x 1000 = 500

PRESS CURVE DATA ENTRY

ENTER PRESS CURVE DATA

1	2	3	4	5	6	7	8
10	20	30	40	50	0	0	0

9	10	11	12	13	14	15	16
0	0	0	0	0	0	850	900

17	18	19	20	21	22	23	24
1000	1000	1000	0	0	0	0	0

25	26	27	28	29	30	31	32
0	0	0	0	0	0	0	0

33	34	35	36				
0	0	0	0				

Save   Cancel

B.   How to Create a new Press Curve data file.
1.   First you need 36 data points from Angle vs. Tonnage capacity graph.
2.   Turn Edit On.
3.   Click Create button and name your data file using the pop-up keyboard.
4.   Select the file you created from the list then click Edit button to enter date points
5.   Enter 36 points for Press Curve date. starting 10th degree, enter data every 10 degree.
   The data is a percent value x 10 of total capacity of the machine.

     Please refer to the table below for example how to calculate the data points for each degree.
     Press Capacity: 500t

Crank Angle (Degree)	Capacity@Angle (t)	Press Curve Data (% x 10)
10	100	200
20	110	220
30	120	240
40	140	280
50	180	360
60	200	400
70	225	450

     Press Curve Data Value = (Capacity @ angle / Press Capacity) * 1000
     For example, if the press capacity is 500t and the press is rated as 250t at 90 degree crank angle
     according to the press curve chart, then enter 500 (50% x 10 = 500) for 9th data entry point.
   (250 / 500) x 1000 = 500
C.   How to Download A Press Curve Data File to be Active .
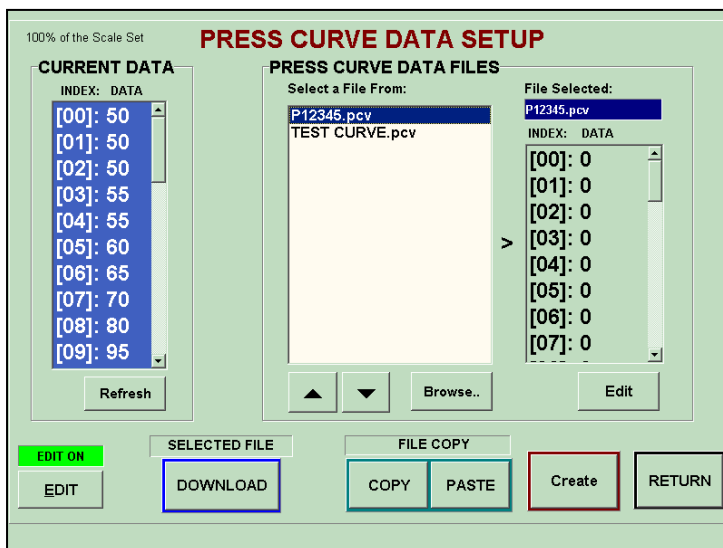
1.   Select a Press Curve data file created in PRESS CURVE DATA FILES list and click DOWNLOAD button.

2.   Click Refresh button to update the CURRENT DATA list screen with the recently downloaded data.

3.   Click Return to go back to Alarm Setup screen and enable Press Curve feature for each Channel.

Signature (Wave) Display Screen

The Signature Display screen displays real-time force signatures for individual channels. The overlaying with other signatures or graphs help you to monitor the operating status of the machine or verify the alarm conditions easier.
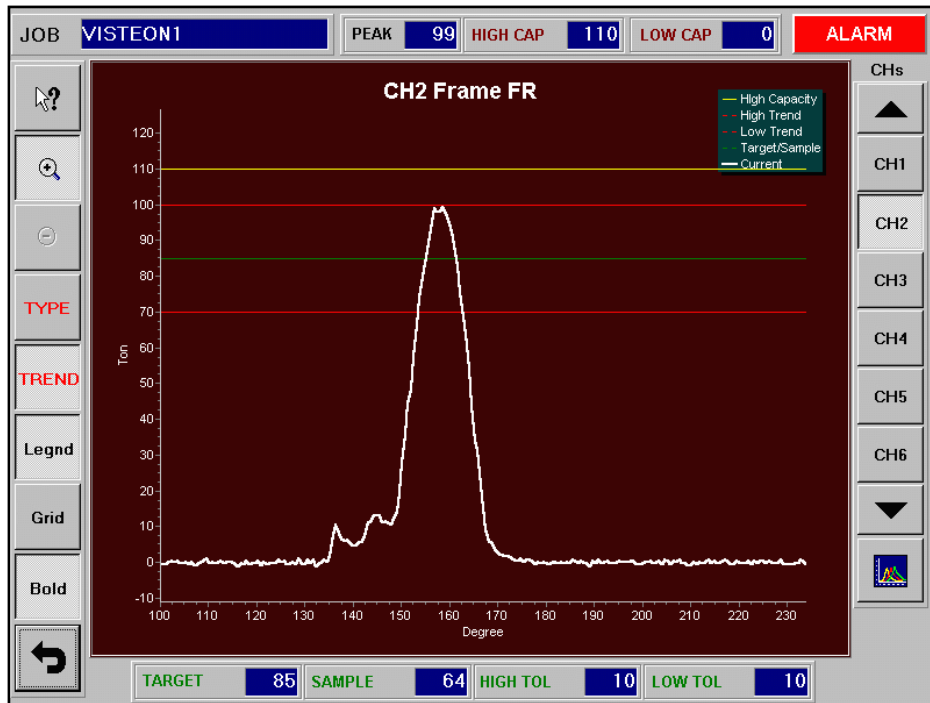
JOB
This is the current job name downloaded from RECIPE MANAGER.

PEAK
Current peak tonnage value for the channel currently displayed.

HIGH CAP
High Capacity Alarm setting value in tons for the channel currently displayed.

LOW CAP
Low Capacity Alarm setting value in tons for the channel currently displayed.

TARGET
TARGET setting value in tons for the channel currently displayed.

SAMPLE
SAMPLE value in tons for the channel currently displayed.

HIGH TOL
+ TOLERANCE setting value in tons for the channel currently displayed.

LOW TOL
- TOLERANCE setting value in tons for the channel currently displayed.

WAVE VIEWING WINDOW
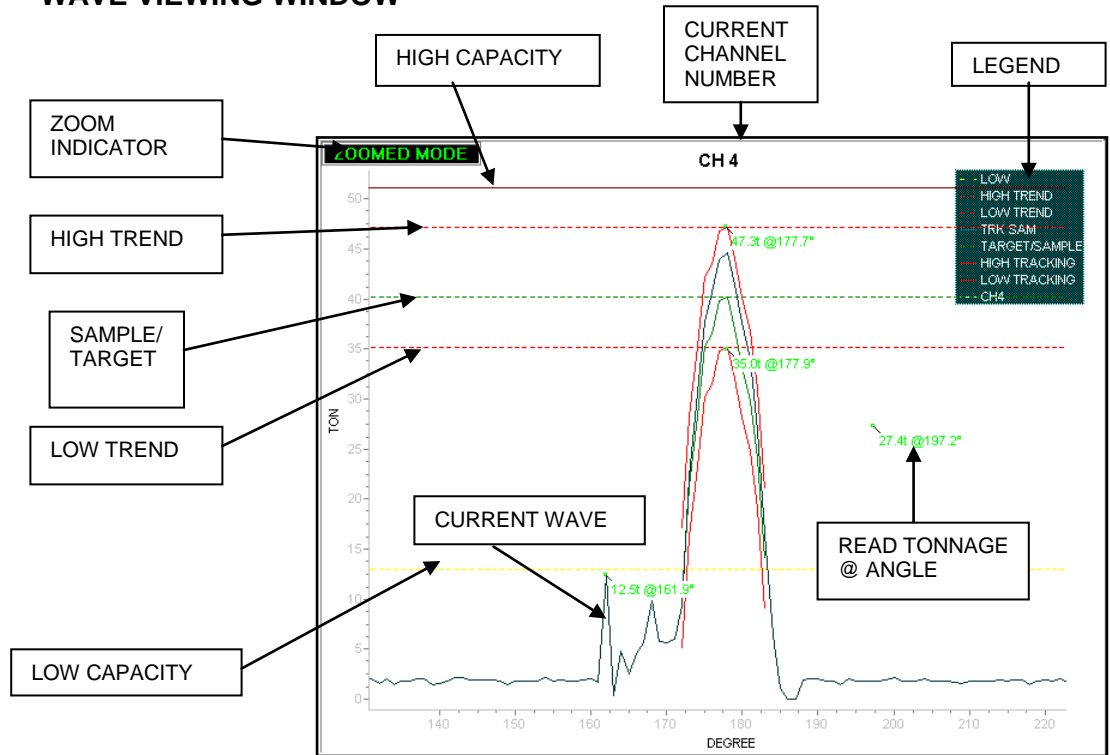
ZOOM INDICATOR:	This message indicates that the graph is currently zoomed.
HIGH CAPACITY:	High Capacity limit
HIGH TREND:	Upper limit of trend alarm band
LOW TREND:	Lower limit of trend alarm band
SAMPLE/TARGET:	In SETUP and LEARN mode, it displays the Target line.
	In AUTOMATIC mode, it displays the Sample line.
LOW CAPACITY:	Low Capacity limit
CURRENT WAVE:	Current tonnage signature read from sensor.

READ TONNAGE AT ANGLE

Click on this button to enable the Read Tonnage at Angle feature. To view the tonnage at angle, click on the coordination you want to read from the signature screen. You can view up to 20 readings on a screen simultaneously. Use Back or Clear button at the top-right corner to delete unwanted readings.

To delete last reading on the screen

To clear all readings on the screen
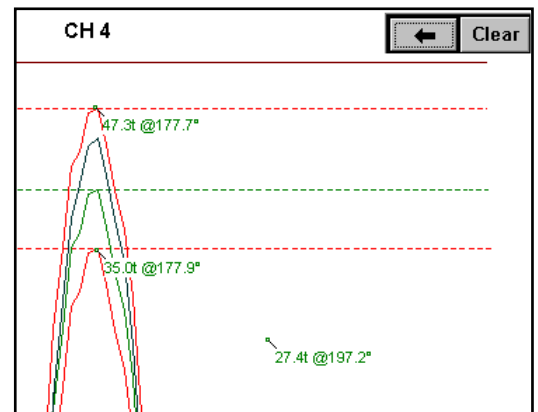
ZOOM IN

The Zoom feature allows the user to "zoom in" on a selected area of the signature for analysis at a higher resolution. Click this button to put the signature screen in zoom mode.

Note: Once the wave is zoomed, a message "ZOOMED" shows up on the top-left corner of the Signature View Window to indicate that signature is currently in zoomed mode.
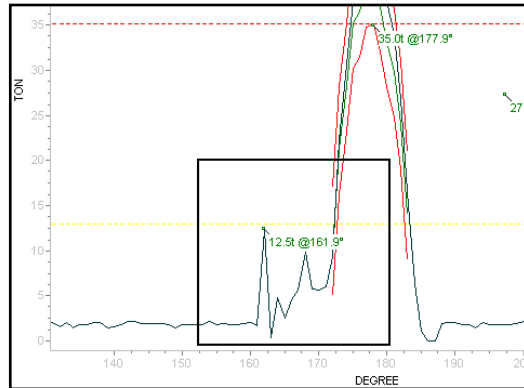
To select an area to zoom in: Press touch screen (and keep pressed) at top left area of desired part of wave to zoom in, and drag finger at a diagonal down and to the right. A box will be drawn and finger followed as the touch screen is pressed. Release touch screen to draw zoomed-in part of the wave.

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

RESET ZOOM

Click this button to return full view(unzoom)

TREND TYPE

Click this button to open the SELECT TREND GRAPH TO SHOW screen where you can
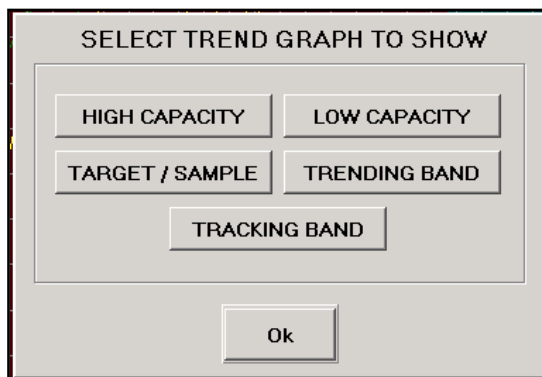
You can add/remove different types of trend graphs you desire to overlay on the signature screen. To add, click on the button you want to view. When the button is pushed in, the option for the graph is added. Click again to remove it.

Note: This option only works with TREND button.

TREND

Toggle this button to show or hide the trend graphs selected from TREND TYPE option. This will give the visual references of the alarm settings and forming force related to the Sample.

GRID

Click this button to show or hide vertical and horizontal grid lines on the wave screen.

BOLD

Click this toggle button to make the current signature graph line bold.

LEGEND

Click this button to show or hide the legend of the graphs displayed on the screen.

CHANNEL SELECT

**Thru** | CH22 — Select a button to display the corresponding channel signature on the screen.

OVERLAY

Click this button to view the overlay of multiple channels of current signatures. Also, you can select the option to view multi-channel peak bar graph from here. Refer to OVERLAY SCREEN for details

Note: You cannot view Trend graphs while Overlay screen is on. All other features are still available.

OVERLAY SCREENS

You can add/remove multiple channels of signatures to overlay on one screen by clicking the channel buttons from *Select Channels To Overlay* screen.
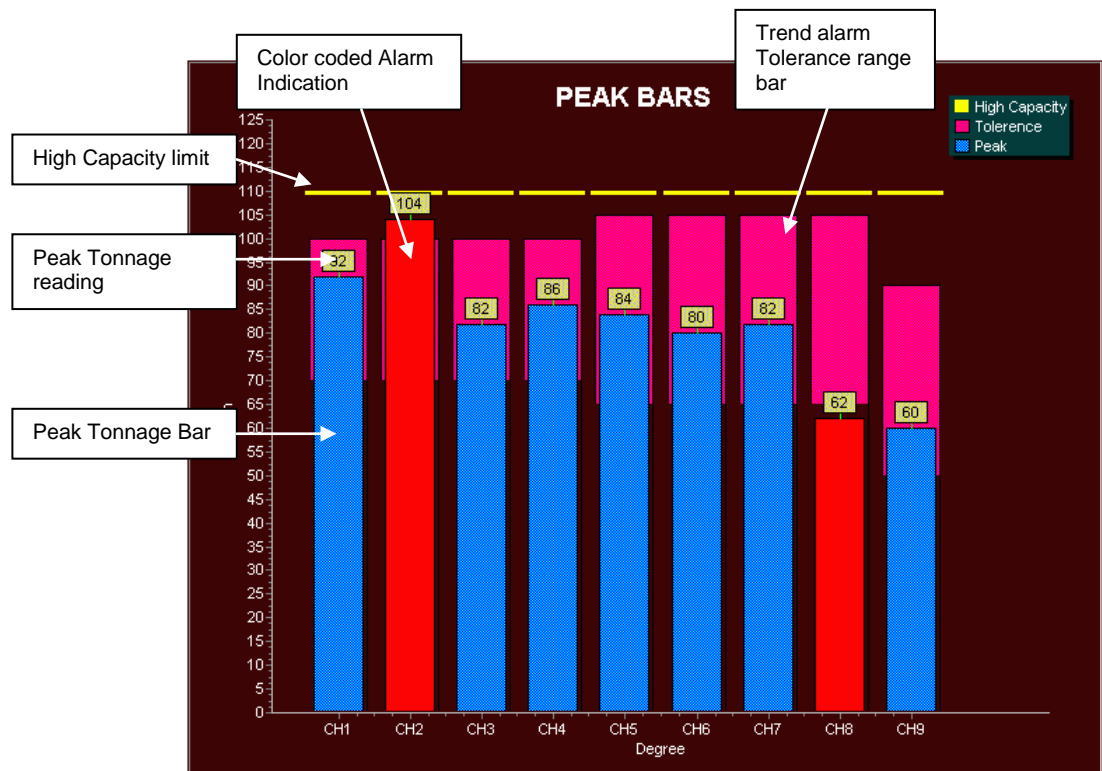Choose the channel(s) you wish to view and click Show button to view Signature Overlay.

Select SHOW AS BAR to view Peak Bars instead.
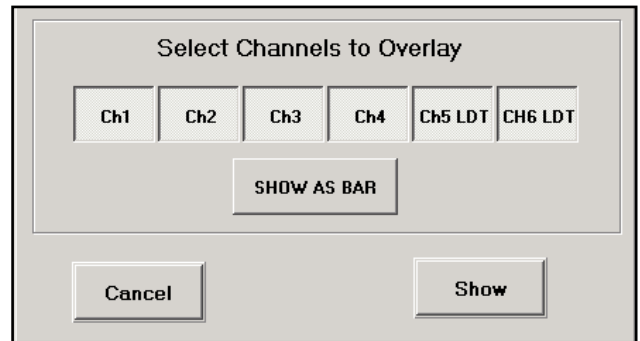
SIGNATURE OVERLAY SCREEN
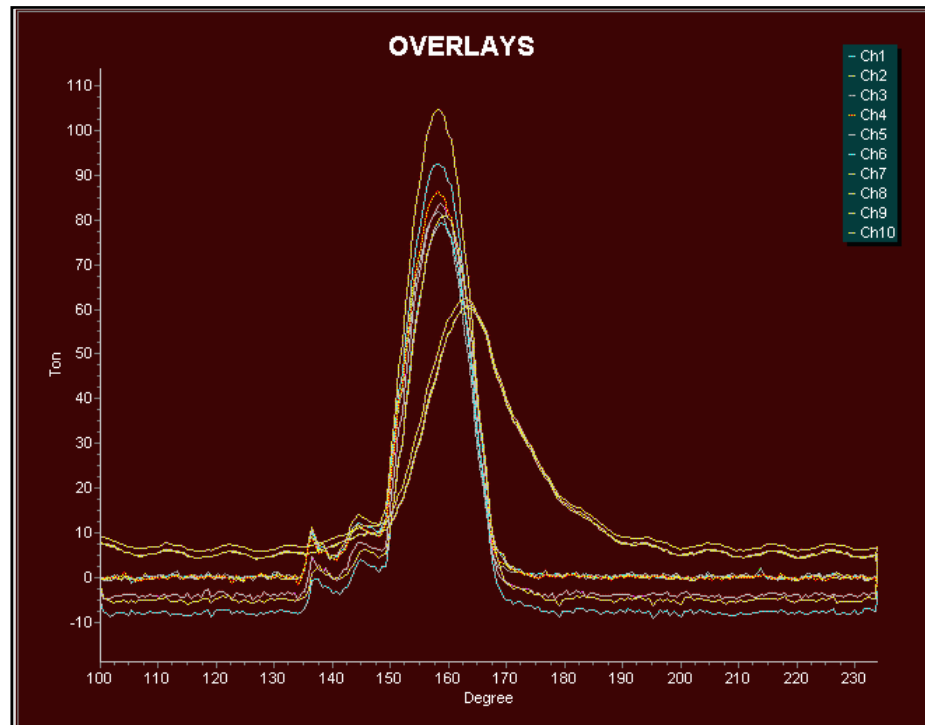
PEAK BARS SCREEN

RECIPE MANAGER

RECIPE MAIN SCREEN

Recipe Manager is where you can create and store new jobs, edit or delete existing jobs, and download the job you want to set the system for. You can store virtually unlimited number of jobs.

JOB SUMMARY DISPLAY

Job Summary Display shows a list of all stored jobs that have been created and saved into a job database. Each job is listed with job name and note. By clicking on one of the jobs from the list, it will highlight the job and make it as an active job. The active job can only be Edited, Removed or Downloaded. You can use navigation bar on the right side of the list box to change the active job.

NAVIGATION BAR

You can select an active job by using navigation buttons. It will help you to navigate through the Job Summary Display to select the job you want by using touch of buttons instead of dragging small scroll bar.

EDIT ON

In order to Add, Edit, Delete, or Download an active job, The Edit button on the bottom-left of the screen must be turned on. This enables Edit, Add, Remove, and/or Download buttons depending on which level of password is entered. Download requires either the Operator level or higher password. Edit, Add and Remove require Administrator level or higher password.

REMOVE

REMOVE button deletes a current active job from the Job Summary Display. Select the job you wish to delete and click on REMOVE button.

EDIT

EDIT button will lead you to JOB SETUP screen where you can make changes of current active job settings such as Job name, alarm settings, etc. In order to edit a job, select the job you wish to edit from Job Summary Display and click on EDIT button.

ADD
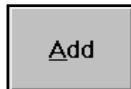
Click *Add* button to bring up JOB SETUP screen. All parameters for alarm settings will be blank except the High Capacity alarm. The High Capacity alarm is predefined by previous job.

COPY
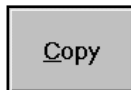
When you create a new job, you can also copy the settings from an existing job from the Job Summary List and paste them into a new job or the existing job. To copy a job, select the job you want to copy and click on COPY button. Once you go to JOB SETUP screen to add or edit a job, you will see that PASTE button is enabled. Click on the PASTE button to paste the settings, you copied, into the alarm settings for the job.

DOWNLOAD

Click DOWNLOAD button to download the current active job to ADTServer to take effect of the new settings. The operation mode has to be in SETUP mode to download the job.

MAIN MENU

Click this button to return to Main menu.

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JOB SETUP SCREEN

This is where you can edit or enter new settings for the job you created.

JOB NAME

Enter a job name for the job you created. This will identify each job in the Job database. You can enter any character up to 20 characters.

HIGH CAPACITY

HIGH CAPACITY is the limit for the maximum peak tonnage allowed to operate the machine. Normally the value is set at or below the scale value which is the capacity of the machine divided by the number of frame sensor channels. HIGH CAPACITY alarm is available in all modes.

Note: You need to enable the Edit mode by using Administrator or higher level of password in order to make any changes from this screen.

LOW CAPACITY

LOW CAPACITY is the limit of the minimum peak tonnage allowed to operate the machine. Normally the value is set for 0 (disabled) unless there is a special need. LOW CAPACITY alarm is available in all modes.

TARGET

The concept of TARGET is to provide a Trend alarm protection for SETUP and LEARN modes. Normally, Trend Alarm requires a sample tonnage to compare the current peak tonnage to monitor the alarm condition. However, the Sample value is only available when the system has completed its Learning cycle and the operating mode has been changed to Monitor mode. In typical load monitoring system, the Trend alarm is not available during Setup and Learn mode. In this system, the TARGET feature is to gives you the full protection of Trend Alarm by letting you manually enter the expected tonnage value for the job before running the press. Once the machine has started and acquired new Sample values by Learning procedure, you can update the Target values with them by clicking the Target COPY button in the main Tonnage screen. In case that you try to run a new job and are not sure where the Targets need to be set at, you can set each Target value to zero. This will

disable the Trend Alarm on a channel by channel basis. After system learns the new sample values, you can use the Target Copy command to update the Target values.

Note: While the system is in Setup or Learn mode, adjust Expand Factor to increase the tolerance band to avoid unnecessary Trend alarm warning. Refer to Expand Factor for details.

+ TOL

This is the upper tolerance tonnage limit for a High Trend alarm of each channel. This limit prevents the current peak tonnage load from exceeding the +TOL tonnage setting above the Target (In Setup or Learn mode) or Sample (In Monitor mode) value.

Note: Depending on EXPAND FACTOR value, actual tolerance may differ from the value that was set while the system is in Setup or Learn mode. Refer to EXPAND FACTOR for detail.

- TOL

This is the lower tolerance tonnage limit for a Low Trend alarm of each channel. This limit prevents the current peak tonnage from exceeding the -TOL tonnage setting below the Target (In Setup or Learn mode) or Sample (In Monitor mode) value.

Note: Depending on EXPAND FACTOR value, actual tolerance may differ from the value that was set while the system is in Setup or Learn mode. Refer to EXPAND FACTOR for detail.

EXPAND FACTOR

These are the multipliers for the + and -TOL values to increase the range of the tolerance bands so that the system has less chance to fire Trend alarms while the press is running in SETUP or LEARN mode. Once the system is in Monitor mode, This EXPAND FACTOR does not affect the tolerance.

Example: Target = 60 ,   Sample = 64,   +Tol = 10,   -Tol =15, Exp Factor = 2.0
           In Setup or Learn mode
                 Actual High Trend limit =   60 + (10 * 2.0) = 80
                 Actual Low Trend limit =   60 - (15 * 2.0) = 30
           In Monitor mode
                 Actual High Trend limit =   60 + 10 = 70
                 Actual Low Trend limit =   60 - 15 = 45

LEARNING CYCLE

Enter the number of cycles to take to learn new Sample values in LEARN mode. In MONITOR mode, Adaptive Learning feature uses this cycle to learn new Samples when it is enabled.

ADAPTIVE LEARNING ENABLE/DISABLE

You can enable or disable Adaptive Learning feature in MONITOR mode. By enabling the Adaptive Learning, the system continuously learns new sample values while it is in Monitor mode and applies the new Sample values to monitor Trend alarm conditions as soon as available. This will allow the system to adapt any small gradual variances of the tonnage load through the time which are caused by environmental change such as temperature. If any tonnage load that causes an alarm, the reading is excluded from Adaptive Learning process.

ALARM WINDOW (ms)

Set alarm window to adjust the area of the force signature to monitor for tracking alarm. If PEAK WINDOW is enabled, this ALARM WINDOW determined the area of the signature to capture the peak tonnage instead of from entire signature. Enter start and stop Alarm Window times in msec within Window Time.
**Note**: In Resolver Model, enter Angle instead of time.

**(LOOK) WINDOW TIME (ms) -** Only applicable to none Resolver Model

Look Window Time is the duration of time when the force signature and peak tonnage is captured. The WINDOW TIME need to be adjusted based on the speed of the machine to capture optimal force signature.

PASTE

Paste

Click PASTE button to overwrite the current settings in this screen with the settings you copy from RECIPE MAIN SCREEN. It is very useful when you create a new job by duplicating existing job and making some adjustment from there.

CANCEL
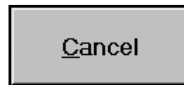
Cancel

Click CANCEL to cancel any changes you made on this screen and return back to RECIPE main screen. If you are creating a new job, Clicking CANCEL button will terminate the creating the job and delete it from the Job Summary Display.

SAVE
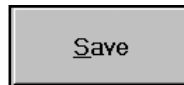
Save

Click SAVE button to save the changes you made in this screen. If you are creating a new job, it will save all settings you entered and add to Job Summary Display as a new job.

PASSWORD CHANGE

In PASSWORD CHANGE screen, you can set and change the different level of the passwords.

MASTER PASSWORD

A master level of password can access any password-protected areas. It overrides the ADMINISTRATOR and OPERATOR level of the passwords and allows you to change their passwords from this screen. Click MASTER button to change the Master password. This requires Master level of password.

ADMINISTRATOR PASSWORD

Administrator level of password can access most of the password-protected areas except for SYSTEM SETUP change in ADTServer. It overrides the OPERATOR level of password and allows you to change it from this screen. Click ADMINISTRATOR button to change the Administrator password. This requires Administrator or higher level of password.

OPERATOR PASSWORD

Operator level of password has limited access areas. With Operator level password, you can change current alarm settings and download the change. However, you cannot alter any existing jobs in the JOB RECIPE database or create a new job. It only allows you to download existing job from RECIPE MANAGER screen. Click OPERATOR button to change the Operator password. This requires Operator or higher level of password.

INITIAL PASSWORD

Master: 1968
Administrator: 123456
Operator: 123

Note: If you forget your passwords, contact HELM INSTRUMENT CO., Inc. at (419) 893-4356

ADTSERVER SETUP SCREEN

ADTServer is the core of the engine for the software of this system. ADTServer receives tonnage signal from SCM module, processes the data, monitors the alarm conditions, and handles I/Os. When the system is installed in a machine for the first time, ADTSERVER requires several initial setups from SYSTEM SETUP screen. Any change of the settings in ADTSERVER is protected by the Master level of password.

MONITOR SCREEN

Here, you can monitor the current operating status of the ADTSERVER for system trouble shooting purpose.
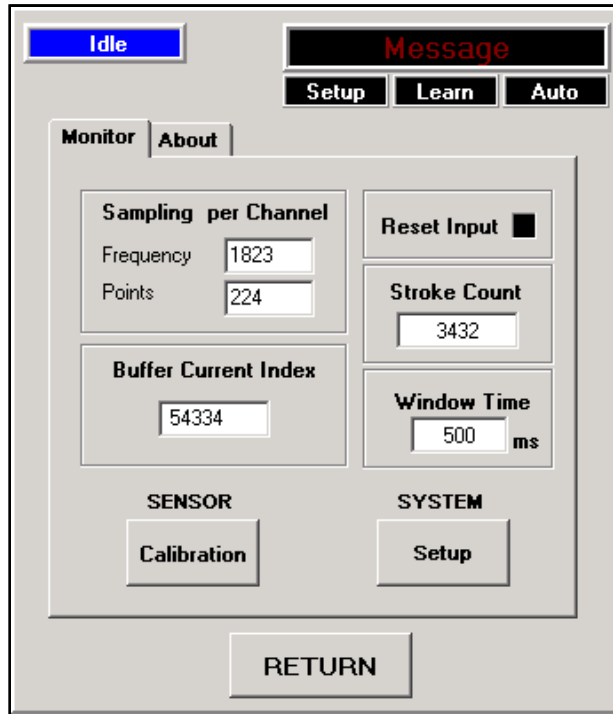
FREQUENCY
Sampling speed rate in Hz per Channel

POINTS
Number of sampled points per cycle.

BUFFER CURRENT INDEX
Total number of data stored in buffer per a cycle.

RESET INPUT
Reset Input Indicator. Turn to red color when there is reset input.

STROKE COUNT
Displays stroke count after the system is powered on.

WINDOW TIME (Only applicable to none Resolver Model)

Displays current Window Time setting.

OPERATING STATUS INDICATOR

IDLE
This indicates that press slide position is out of look window and ADTSERVER is in idle.

READING
This indicates that press slide position is within look window and ADTSERVER is sampling data.

OPERATING MODE INDICATOR

OPERATING MODE INDICATOR indicates the system's current operating mode. Green background color shows the currently active mode.
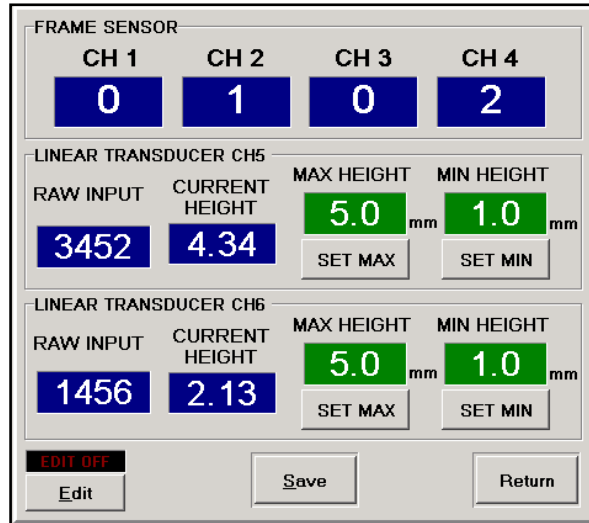Note: Auto means Monitor mode.

SENSOR CALIBRATION SCREEN

Calibration   Click Calibration button to view a Sensor Calibration screen.
Note: To make any changes of the settings, Master level of password is required to turn on the Edit Enable Mode.
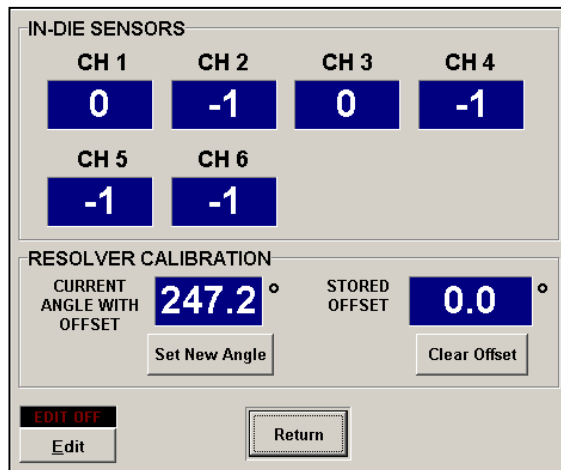
FRAME SENSOR

CH 1	CH 2	CH 3	CH 4
0	1	0	2

LINEAR TRANSDUCER CH5

RAW INPUT	CURRENT HEIGHT	MAX HEIGHT	MIN HEIGHT
3452	4.34	5.0 mm	1.0 mm
		SET MAX	SET MIN

LINEAR TRANSDUCER CH6

RAW INPUT	CURRENT HEIGHT	MAX HEIGHT	MIN HEIGHT
1456	2.13	5.0 mm	1.0 mm
		SET MAX	SET MIN

EDIT OFF
Edit   Save   Return

FRAME SEMSOR screen is to help calibrating a PTM-1 module to get a proper reading from the load sensors connected. Each number is a percentage of the voltage from PTM-1 track out signals for each channel. 100 means 2.67V which is ideal voltage to be set as max scale tonnage for a press. It displays sensor balance numbers if PTM module's function switch is in AZ-OFF position and Cal numbers if the switch is in CAL position.

For details about PTM function switches, Please refer to PTM-1 manual.

LINEAR TRANSDUCER screen is to help calibrating optional Linear Transducer inputs connected to channel 5 and 6. It is 2 points calibration. Move slide to maximum position and enter the measured height to MAX HEIGHT then Click SET MAX button. Then,

CALIBRATION SCREEN FOR PTM4500TSM/6700TSM

IN-DIE SENSORS

CH 1	CH 2	CH 3	CH 4
0	-1	0	-1

CH 5	CH 6
-1	-1

RESOLVER CALIBRATION

CURRENT ANGLE WITH OFFSET	STORED OFFSET
247.2 °	0.0 °
Set New Angle	Clear Offset

EDIT OFF
Edit   Return

RESOLVER CALIBRATION

Current ANGLE WITH OFFSET displays the current position of the resolver with stored offset applied.

If the current resolver angle read out does not match with actual machine slide position, Click Clear Offset to clear any stored Offset value, click **Set New Angle,** then enter the actual angle position of the machine.

This will store new OFFSET value .

SYSTEM SETUP SCREEN

The SETUP screen is where you can configure the initial settings for the system. To make any changes of the settings, Master level of password is required to turn on the Edit Enable Mode.

SYSTEM SETUP

SCALE SET

CH1	CH2	CH3	CH4
200	200	200	200

WINDOWS TIME
500 ms

TREND ALARM
Use Target In Peak Mode
Enabled

PEAK WINDOW
Enabled

TRACKING LOW INHIBIT
10 % of PEAK

LANGUAGE TYPE
○ English ○ Japanese

Font Type
FontName Change

EDIT OFF
Edit   Save   Cancel

SCALE SET

Scale value is usually set for capacity of the press divide by number of channel of the frame sensors

TREND ALARM
Use Target In Setup Mode Enable/Disable

This enables or disables the Trend Alarm feature in Setup and Learn modes.
When enabled, Trend Alarm feature is active in all modes. In Setup and Learn modes, Trend Alarm uses Target value as a reference point to trigger alarm while Sample value is used as the reference point in Monitor mode. When disabled, the Target is no longer used and Trend Alarm feature is only active in Monitor mode after learning cycle is completed.

TRACKING LOW INHIBIT(%)
This is to ignore the tracking alarm from monitoring the area of the load signature below the set percentage of the current peak tonnage. For example, the Tracking Low Inhibit is set to 10% and the current peak load is 90ton, then through out the load signature, any tonnages below 9 ton will not be monitored by tracking alarm.

WINDOW TIME (ms) - Only applicable to none Resolver Model
  Look Window Time is the duration of time in msec when the force signature and peak tonnage is captured. The WINDOW TIME needs to be adjusted based on the speed of the machine to capture optimal force signature.

PEAK WINDOW (Enable/Disable) - Only applicable to none Resolver Model
  If you are interested in monitoring certain part of the signature to capture the peak tonnage instead of the entire signature, enable PEAK WINDOW option.
  When PEAK WINDOW is enabled, you can adjust the monitoring area by using ALARM WINDOW. The Trend alarm and Tracking alarm will only apply to the PEAK WINDOW area. However, High Capacity alarm still looks for the actual peak tonnage of entire signature.

System Setup Screen for PTM-5600P/6700P

SYSTEM SETUP

SCALE SET

CH1	CH2	CH3	CH4	CH5
200	200	200	200	200

WINDOWS TIME
20 - 10,000)
500 ms

TREND ALARM
Use Target In Peak Mode
Disabled

CONSECUTIVE FAULT
DELAY COUNTER (0-99)
0

PEAK WINDOW
Disabled

TRACKING LOW INHIBIT
5 % of PEAK

DIVERTER DURATION
(10 - 10,000)   OUTPUT
10 ms   N.C.

LANGUAGE TYPE
⦿ English   ○ Japanese

Font Type
Arial   Change

EDIT OFF
Edit   Save   Cancel

SCALE SET

Default Scale values for Piezo series are set to 267. We recommend using this value as your scale set. This will scale the peak load output value to match with the sensor voltage output. For example, if Ch1 peak shows 157, it means the sensor peak output from PTM Piezo module is 1.57V.

DIVERTER DURATION
Enter a time in msec to adjust the duration how long the Diverter output stays on. When Trend/ tracking/ capacity alarm condition happen, the diverter output turns on for given duration.
You can choose the Diverter output type to be either Normally Open(N.O.) or Normally Closed (N.C.)
The diverter works for every trend/tracking alarm condition regardless the Fault Delay counter setting.

CONSECUTIVE FAULT DELAY COUNTER
Enter a number of consecutive fault stroke that required to stop the machine.
When Trend and Tracking alarm condition happens, alarm output does not drop out until the alarm condition persists consecutively for the number of set cycle.
For example, if the "Consecutive Fault delay counter " is set to 3, When Trend/tracking alarm condition occurs for 2 continuous strokes and no trend alarm condition in 3rd stroke, the delay counter reset to 0. Therefore, another 3 continuous trend/tracking alarm conditions have to happen to trigger Alarm Stop replay or it will run without stopping machine.

* In case of Capacity alarm, system will drop the Alarm Stop relay right away regardless the Consecutive Fault delay counter setting and turn on diverter for given duration as well.

SYSTEM SETUP SCREEN FOR PTM-4500TSM/6700TSM/6700I-TSM

LOOK WINDOWS

Look Window is the area of the slide position where the force signature and peak tonnage is captured. The LOOK WINDOW needs to be adjusted to capture optimal force signature of the machine.

Enter a start angle(degree) where you want to start to monitor the force. By choosing a multiplier button, it will display the calculated end look window angle automatically.

TREND WARNING OUTPUT LEVEL

Set a percentage of the Tolerance set value where you want to monitor for tonnage warning condition. When current tonnage reaches or exceeds warning level, the Tonnage Warning output relay unlatches. When the tonnage returns to normal, the output relay latches back automatically. For Example, if High Tol is set at 20%, and Trend Warning Level is set at 50% of Tolerance, when current peak tonnage reaches or exceeds 50% of Trend indicator (10% from sample peak tonnage), Loadgard triggers Tonnage Warning output. This gives the way to warn the machine control prior to tonnage Trend alarm without stopping machine's operation.

SAVE
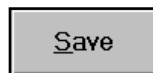
Click SAVE button to save any configuration changes on this screen for ADTSERVER to take effect.

CANCEL
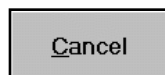
Click on CANCEL button to cancel any configuration changes on this screen and return to previous screen.

PTM LOADGARD ADC SETUP FOR TSM MODEL

- **Go To ADC Manager**
  From Main Menu screen, if you do not see ADC MANAGER menu button, then click on the hidden button located at the left bottom area of the screen to go to SYSTEM SETUP MENU. Use 6534 for password
  Turn ADC MANAGER option ON and click Save then restart the system.
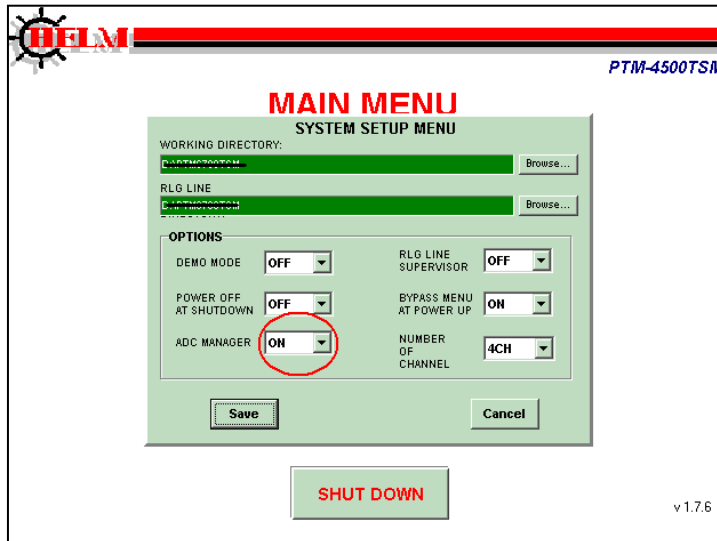
- **ADC Manager Setup**
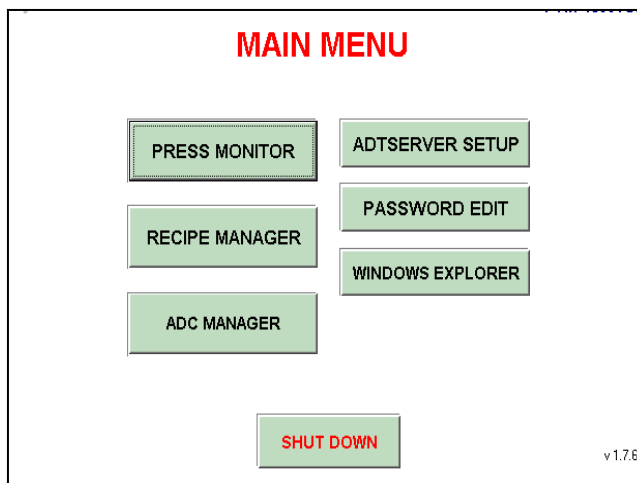
a. To enter into the ADC Manager screen, use master password

(Default mater password "1968")

b. Click SETUP button to go to ADC Setup screen.
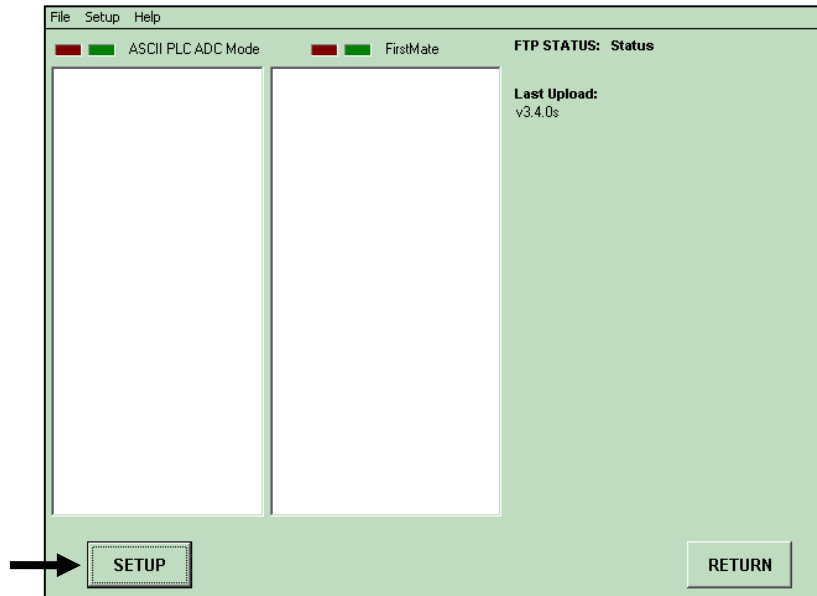
c. In ADC Setup screen, select a SEQ number to 1, select a COMPORT number where the ADC communication cable is plugged in, and select ASCII PLC ADC MODE option.

d. You can also enter a press name as optional
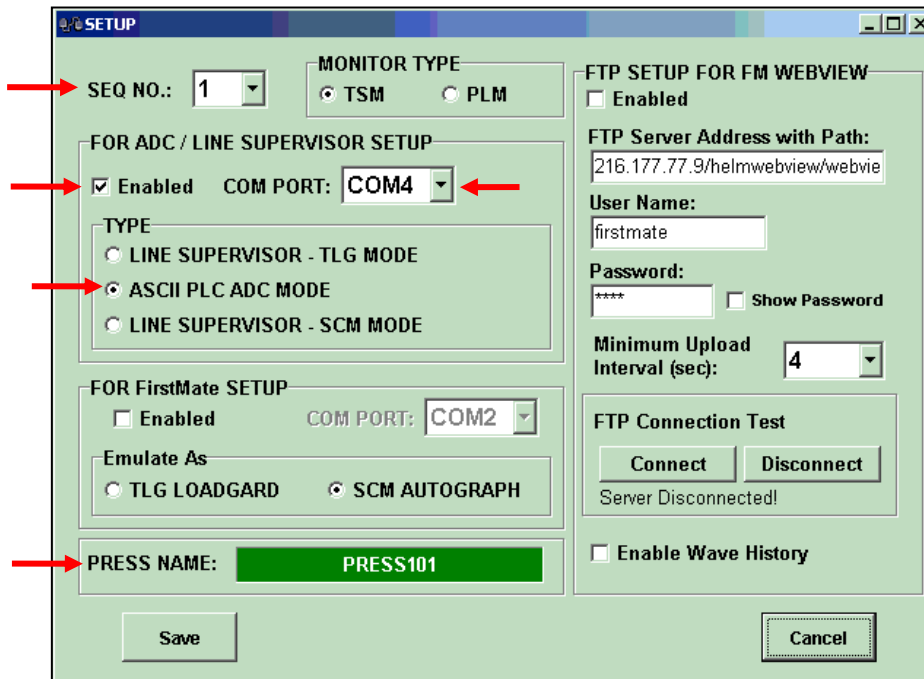
- **ADC RS232 CABLE CONNECTION**
  Direct RS-232 connection is possible with PLC as long as the able length is less than 50feet.

RS-232 Cable connection
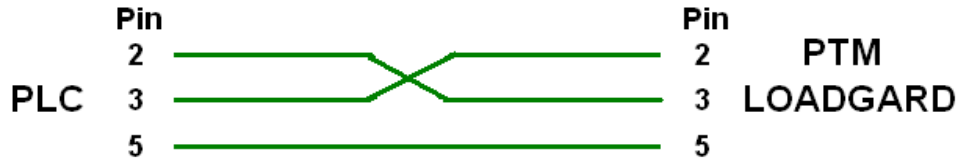
GETTING READY FOR CALIBRATION

1. Make sure proper Look window timing Input is connected to CAM Input of PTM Loadgard. Please refer to the drawing from the Appendix in the manual for connection details. For TSM model, Make sure the Resolver is connected properly instead of CAM input

2. Check sensor balance and gain values from the PTM LoadGard,

a. From main menu screen, go to "ADTSERVER SETUP"
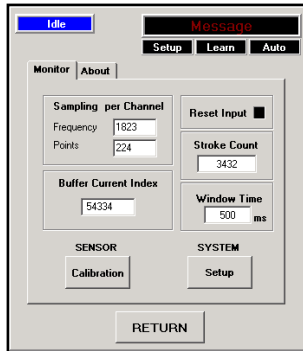
b. Click on Monitor tab, and click on Sensor CALIBRATION button.

In this screen, you can verify the current balance and the gain values of the sensors connected to PTM modules by switching the 3 position toggle switch on the PTM module inside. OFF position displays sensor balance, CAL position displays gain value of the sensor. Please refer to the PTM-1 Module manual for detail.

Depending on the PTM LOADGARD model, you can calibrate Resolver angle position or position of Linear input devices in this screen as well.
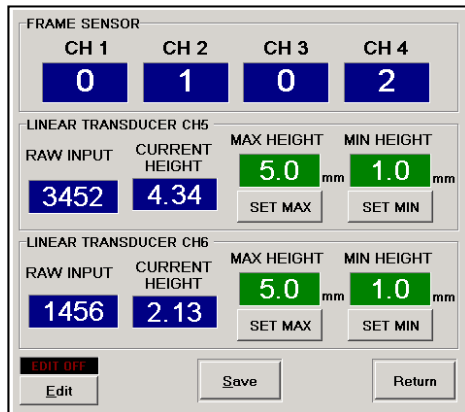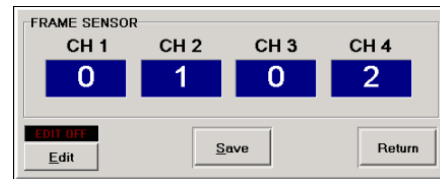
PTM-4500 Model

PTM-4500-L2 Model
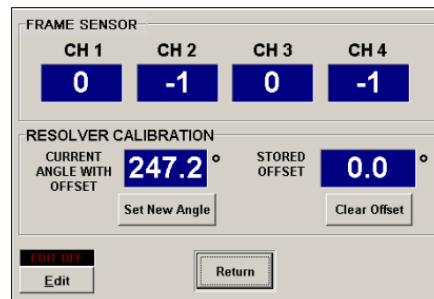
PTM-4500-TSM Model

c. For TSM model, you need to calibrate Resolver angle in this screen as well. If the current resolver angle read out does not match with actual machine slide position, turn Edit option On by entering master level of password (default: 1968), click Clear Offset to clear any stored Offset value, click **Set New Angle,** then enter the actual angle position of the machine. This will store new OFFSET value.

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3. Entering Scale values for each Channel.
    Next thing before the calibration, you need to enter proper scale value for each channel. Scale value is the tonnage that each sensor will measure at full capacity of the machine. For example, if a machine is rated at 800ton as maximum capacity and has total 4 sensors mounted on columns of the machine, then the scale value would be 200 (800 / 4 = 200) per channel.

    To Enter the scale value for each channel,
    a. go to "ADTSERVER SETUP"

    b. Click on Monitor tab, and click on Setup button
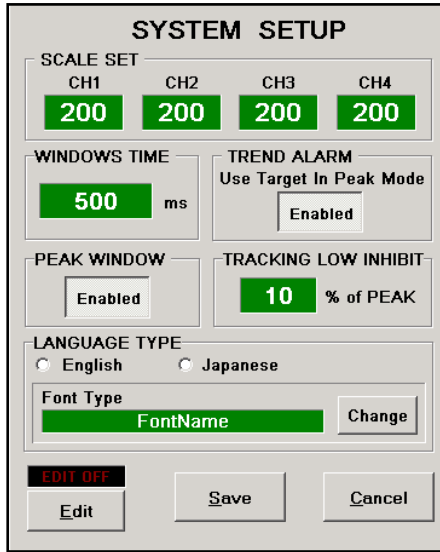
c. Enable Edit by entering master level of password (default: 1968)

d. Enter scale value to each channel on SCALE SET section and click Save.

4. For CAM input model , you need to enter initial Window Time for calibration.

    Look Window Time is the duration of time in millisecond when the force signature and peak tonnage is captured. The WINDOW TIME needs to be adjusted based on the speed of the machine to capture optimal force signature. For that reason the WINDOW TIME is one of the job recipe items that can be programmed for each job.

    For initial window time during calibration, set to 500ms and check the load signature after the first hit on load cell.

    If the load signatures loading duration is less than 25% of the total look window time, then reduce the Look Window Time.
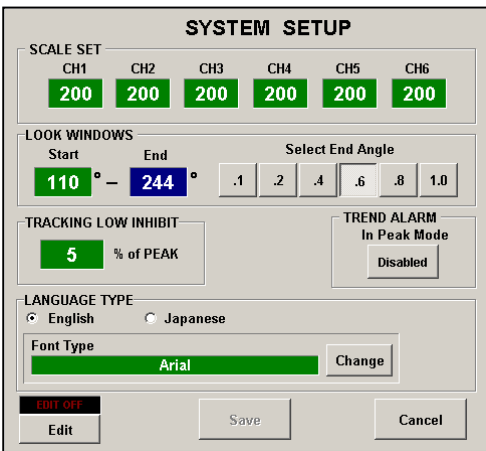
For TSM model, you need to select Look Window Angle. Look Window Angle is the area of the stroke in angle where the force signature and peak tonnage is monitored and captured.

Unlikely the Look Window Time, the Look Window Angle does not need to be adjusted per job.

Enter a Look Window Start angle value then select one of the multiplier (.1, .2, .4, .8. 1.0) to determine the End angle.

Click Save button to save the changes.

Now the PTM LoadGard is ready to be calibrated. For more details of the features and functions, please read the PTM LOADGARD User Manual and PTM-1 User Manual.

SYSTEM SPECIFICATIONS

1. 90-240 VAC input power source @ 3.125 Amp.

2. Automatic Zero Balance (Auto-Zero)

3. 2/4/6 channel load-strain gauge input utilizes 175 - 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. Communication Ports
   ADC(Automatic Die Change) (RS-422) - Optional
   Line Supervisor (ASCII) (RS-422) - Optional
   FirstMate (RS-422) - Optional

8. A/D Sampling Rate: 333   sec

9. A/D resolution: 16Bit

10. **Resolver Input: Sine/Cosine 12 bit   0.1-degree resolution

11. Speed Range: **3 - 200SPM , *3 - 1000SPM

12. 1 Ethernet port.

13. Interface Display
    10.4" TFT LCD Display with 640x480 Resolution   w/ Touch Screen.
    Windows XP Embedded with Read-Only Filter Enabled to protect OS files
    Duel Memory: 4GByte + 2GByte

_____

** : Resolver Input model only
*   : CAM Input model only

BYPASS &REMOTE ALARM RESET
OPTION FOR PTM-4500TSM MODEL

PTM-4500TSM model has Remote Alarm reset and Bypass option to bypass Low Trend and Low Tracking alarm feature while running. This feature is useful for initial setup procedure after job change while the parts are being fed through a press line.

While bypass is activated during the stroke, Trend alarm, Tracking alarm, and sampling are disabled. However, Capacity Press Curve alarms are still active to monitor any overload condition.

TO ENABLE THE BYPASS OPTION
Open "D:\PTM4500TSM\TMONITOR.INI" file using Windows Explorer, set bypass option to 1 as below. Save the file, then restart the system.

   [PTM6700i:SYSTEM]
   …..
   BYPASS OPTION=1

When bypass option is ON, every stroke will be bypassed until BYPASS input is closed while the silde position is entering Look window start angle set.

PTM-4500TSM
REMOTE ALARM RESET & BYPASS INPUT CONNECTION

+24V
+24V
-24V
-24V
+24V
CAM
AUX1
AUX2

REMOTE ALARM RESET

BYPASS/CAM INPUT

Keep the Contact opened during the entire look window will bypass the followings:

-Trend Alarm Monitoring
-Tracking Alarm Monitoring
-Sampling

Close the contact for 500msec to reset alarm condition. Make sure to reset while slide is outside of look window angle position
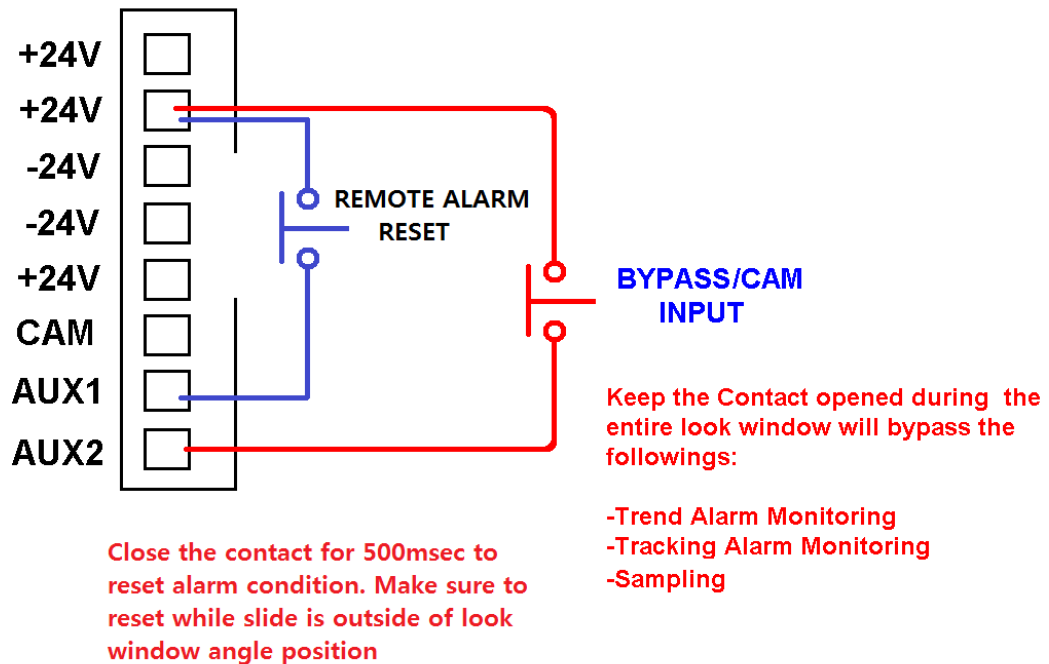
ADC ASCII PROTOCOL

This protocol is to communication with the ADC port of the PTM LOADGARD directly with optional RS422 serial interface for ADC feature.

- **Communication Port Setting**

  BAUD rate: 9600
  PARITY: None
  Data Bits: 8
  Stop Bits: 1

- **How to Send Command ASCII DATA**

There are 2 types of data protocol. COMMAND DATA and COMFIMATION DATA

1. Send 9 byte of COMMAND DATA
2. SCM Autograph will send back 9 byte of data you sent. Wait for the echo data.
3. Compare the 9 bytes of original data with echoed data for verification.
4. If both data matches, send COMFIRMATION DATA to complete the command

ASCII Data Format - COMMAND DATA

BYTE#	BYTE DESCRIPTION
1	ID Byte (96 + SCM sequence Number set by DIP switch on the board)
2	0 (MSByte of Remaining Data Byte to Send)
3	6 (LSByte of Remaining Data Byte to Send)
4	218
5	192
6	76
7	203
8	65
9	ADC Mode 0 – 250 = Download Job Number 251 = Change to Setup Mode 252 = Change to Monitor Part Mode 253 = Change to Monitor Part Mode 254 = Reset Alarm 255 = No Action

ASCII Data Format - CONFIRMATION DATA

BYTE#	BYTE DESCRIPTION
1	ID Byte (64 + SCM sequence Number set by DIP switch on the board)
2	0 (MSByte of Remaining Data Byte to Send)
3	5 (LSByte of Remaining Data Byte to Send)
4	218
5	192
6	76
7	203
8	85

Example)

To change the mode to Setup mode for SCM module which is set as Seq#1,

1. Send 9 bye of data below
    97, 0, 6,218, 192, 76, 203, 65, 251
2. Wait for response data (9byte) from SCM Autograph

3. compare the data received and the data you sent to see if all matches.

4. If both data matches, send COMFIRMATION DATA to complete the command as below

    65, 0, 5, 218, 192, 76, 203, 85

APPENDIX A (PTM-4500L2) - 4CH FRAME WITH 2 LINEAR TRANSDUCER

Customer Connections
(PTM-4500-LT2 SERIES)

NOTES:
1.) THIS UNIT USES 'PTM' MODULES
FOR SIGNAL CONDITIONERS.

DO NOT
REMOVE
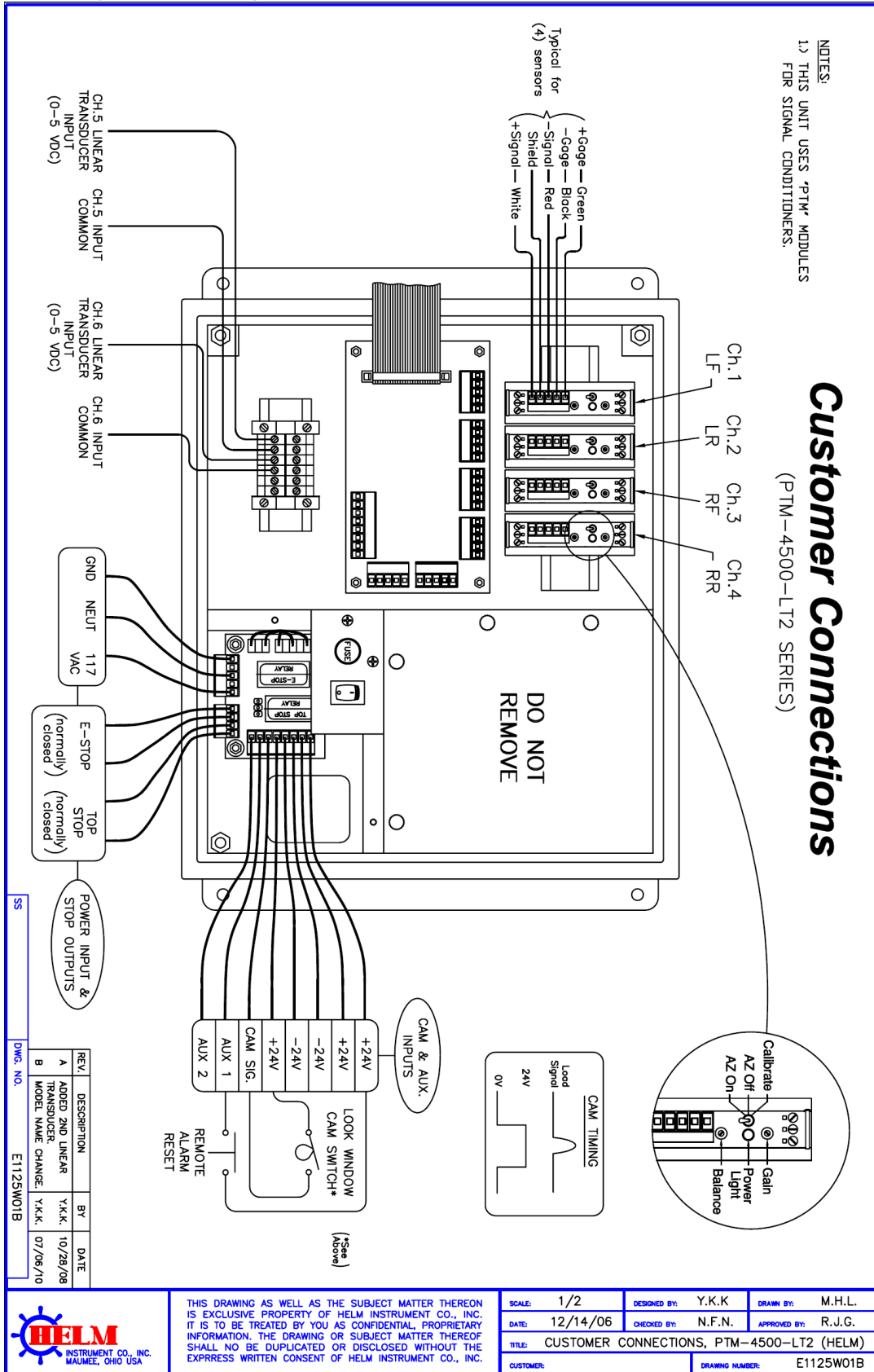
APPENDIX B (PTM-2300L) – 2CH FRAME/INDIE WITH 1 LINEAR TRANSDUCER INPUT
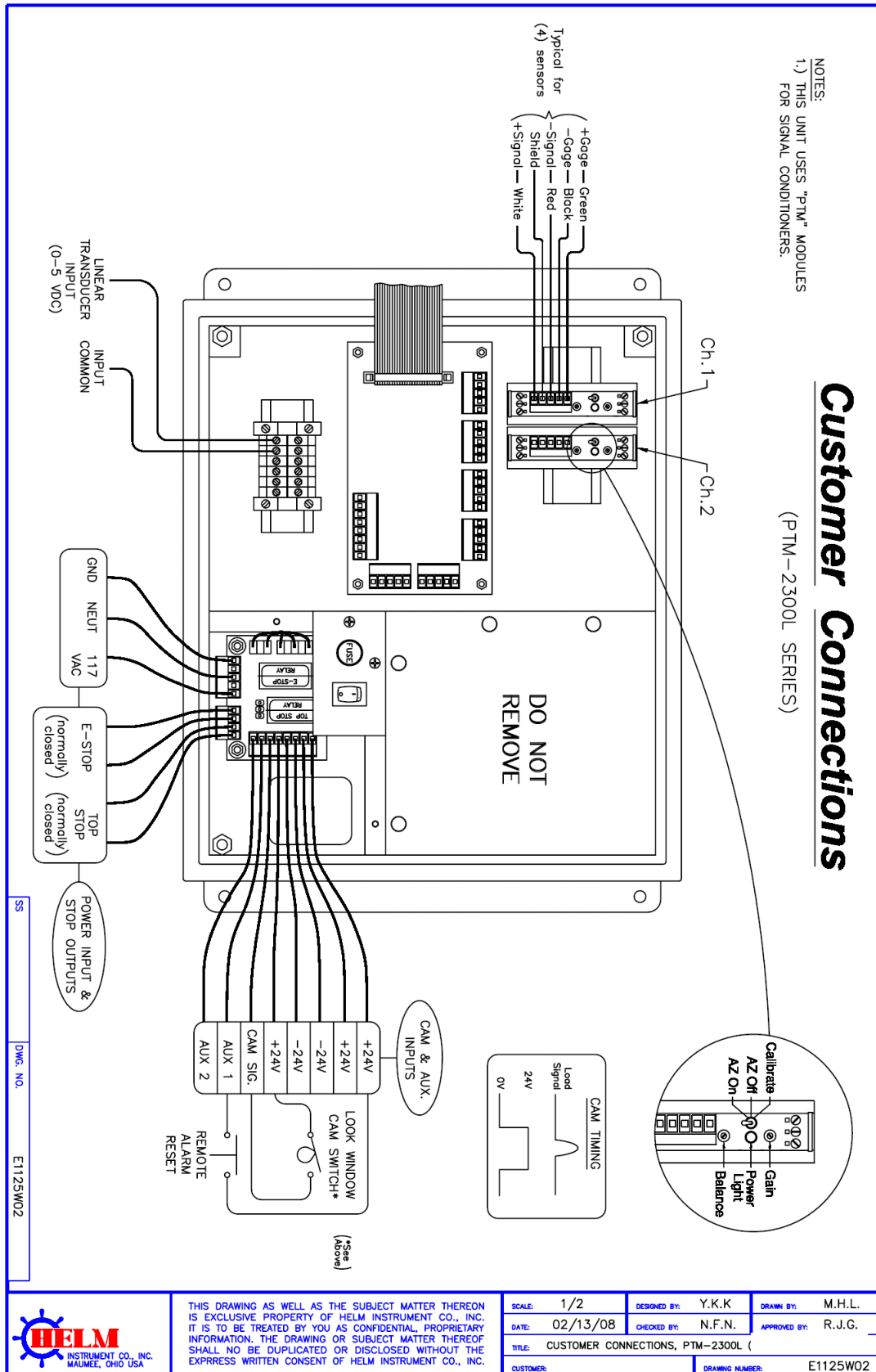
APPENDIX C   (PTM-6700I) – 6CH IN-DIE APPLCATION

APPENDIX D　(PTM-5600F) – 3CH IN-DIE + 2CH FRAME APPLICATION

Customer Connections
(PTM–5600F SERIES)

NOTES:
1.) THIS UNIT USES "PTM" MODULES FOR SIGNAL CONDITIONERS.

Typical for (5) sensors
+Gage — Green
–Gage — Black
–Signal — Red
Shield
+Signal — White

IN–DIE CHANNELS
Ch.1 Ch.2 Ch.3

FRAME CHANNELS
Ch.4 Ch.5
LEFT RIGHT

DO NOT REMOVE

GND NEUT
117 VAC

E-STOP
(normally closed)
TOP STOP
(normally closed)

POWER INPUT & STOP OUTPUTS

E-STOP RELAY
TOP STOP RELAY

AUX 2 AUX 1 CAM SIG. +24V –24V –24V +24V

CAM & AUX. INPUTS

REMOTE ALARM RESET
LOOK WINDOW CAM SWITCH

STA. 1, PART-IN-PLACE INPUT SIGNAL

TIMING DIAGRAM
Load Signal
24V
0V
24V
0V
100ms MIN.
LOOK WINDOW
PART-IN-PLACE

Calibrate
AZ Off
AZ On
Gain
Power Light
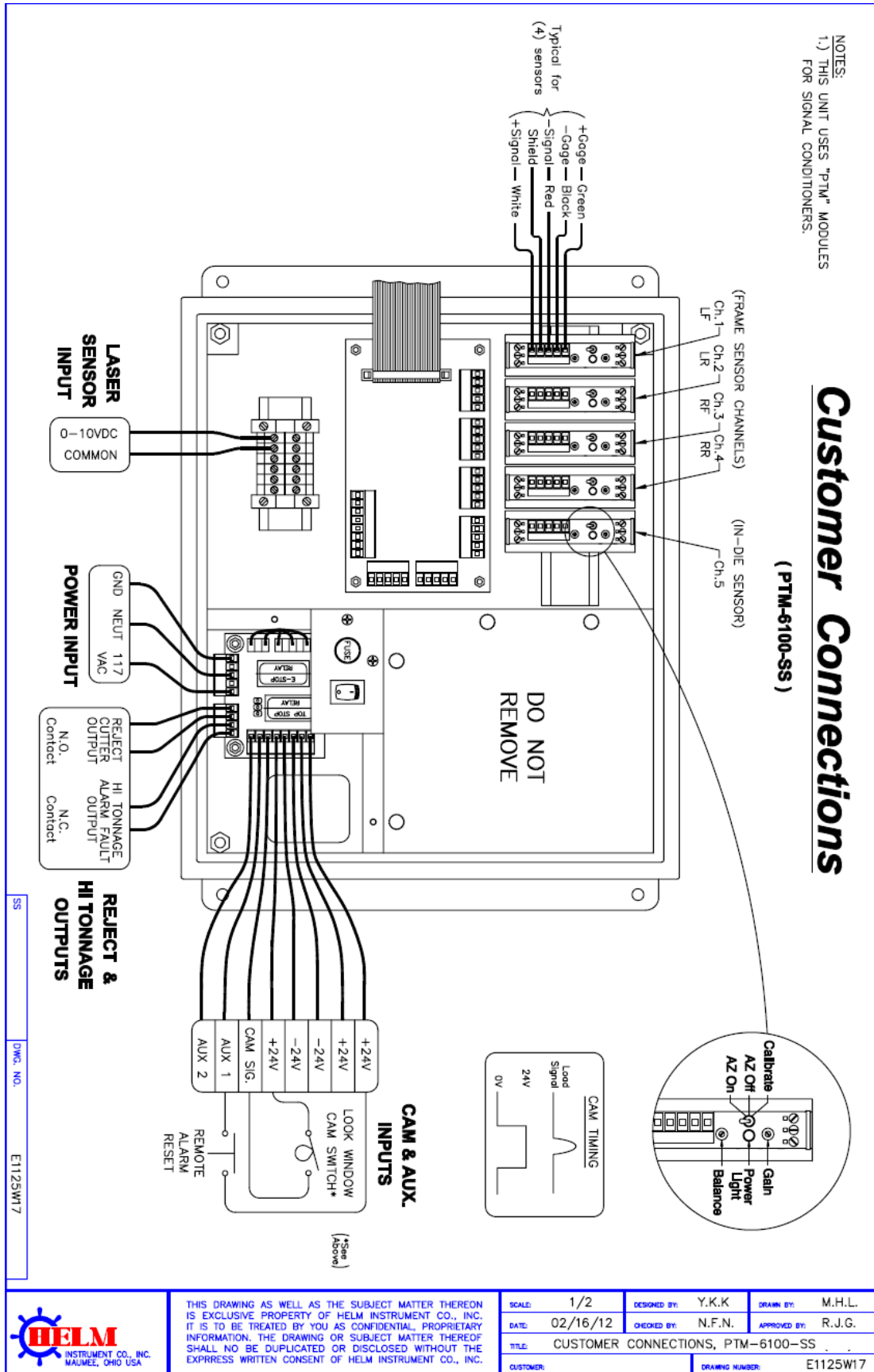Balance

SS   DWG. NO.   E1125W04

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HELM INSTRUMENT CO., INC. MAUMEE, OHIO USA

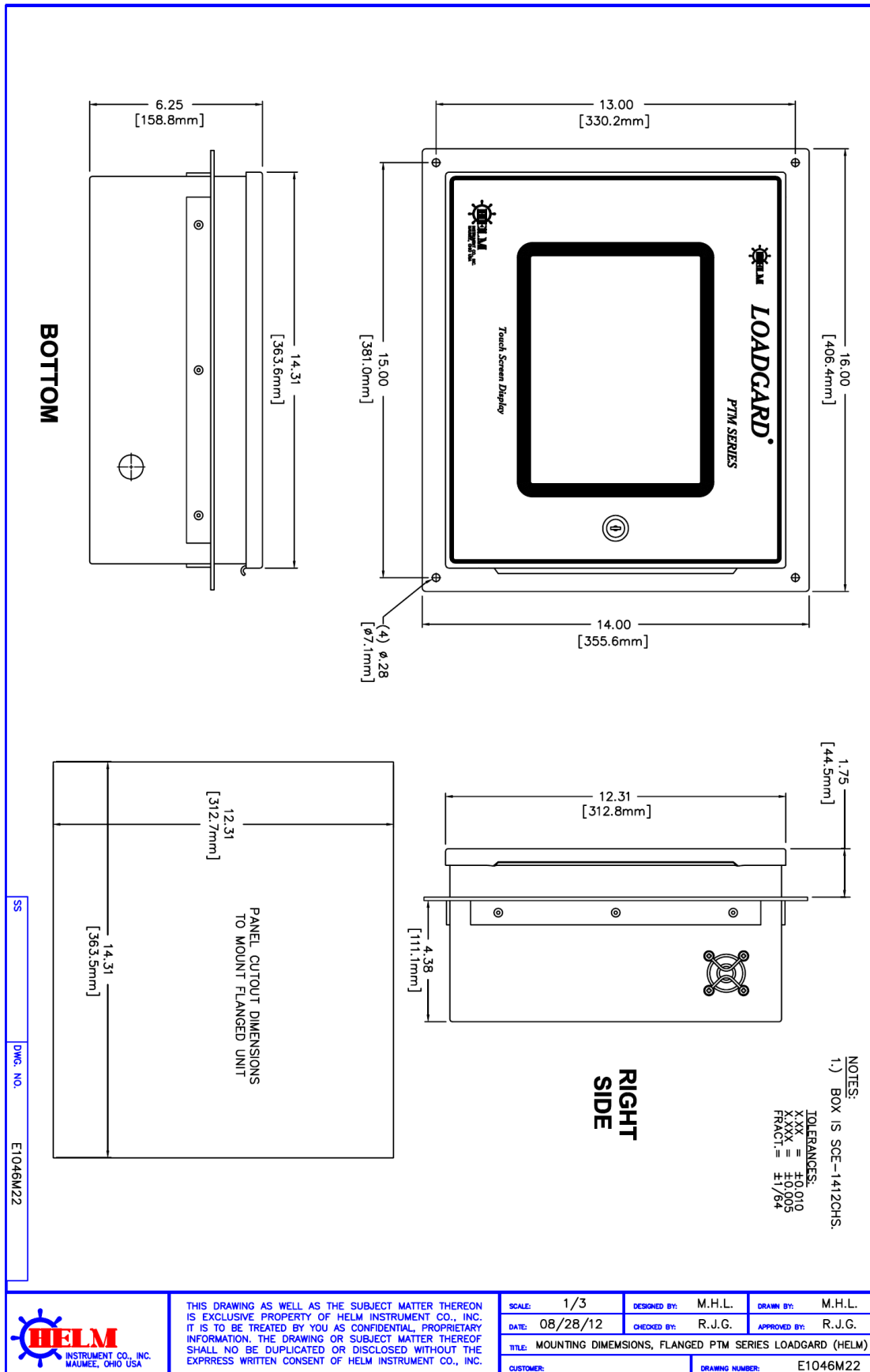| SCALE: | 1/2 | DESIGNED BY: | Y.K.K | DRAWN BY: | M.H.L. |
DATE:	01/30/09	CHECKED BY:	N.F.N.	APPROVED BY:	R.J.G.
TITLE:	CUSTOMER CONNECTIONS, PTM–5600F				
CUSTOMER:				DRAWING NUMBER:	E1125W04

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APPENDIX E   (PTM-6700TSM) 4CH FRAME + 2CH INDEA WITH RESOLVER INPUT

Customer Connections

(PTM-6700-TSM-R SERIES)

APPENDIX F (PTM-4400I) 4CH IN-DIE APPLICATION
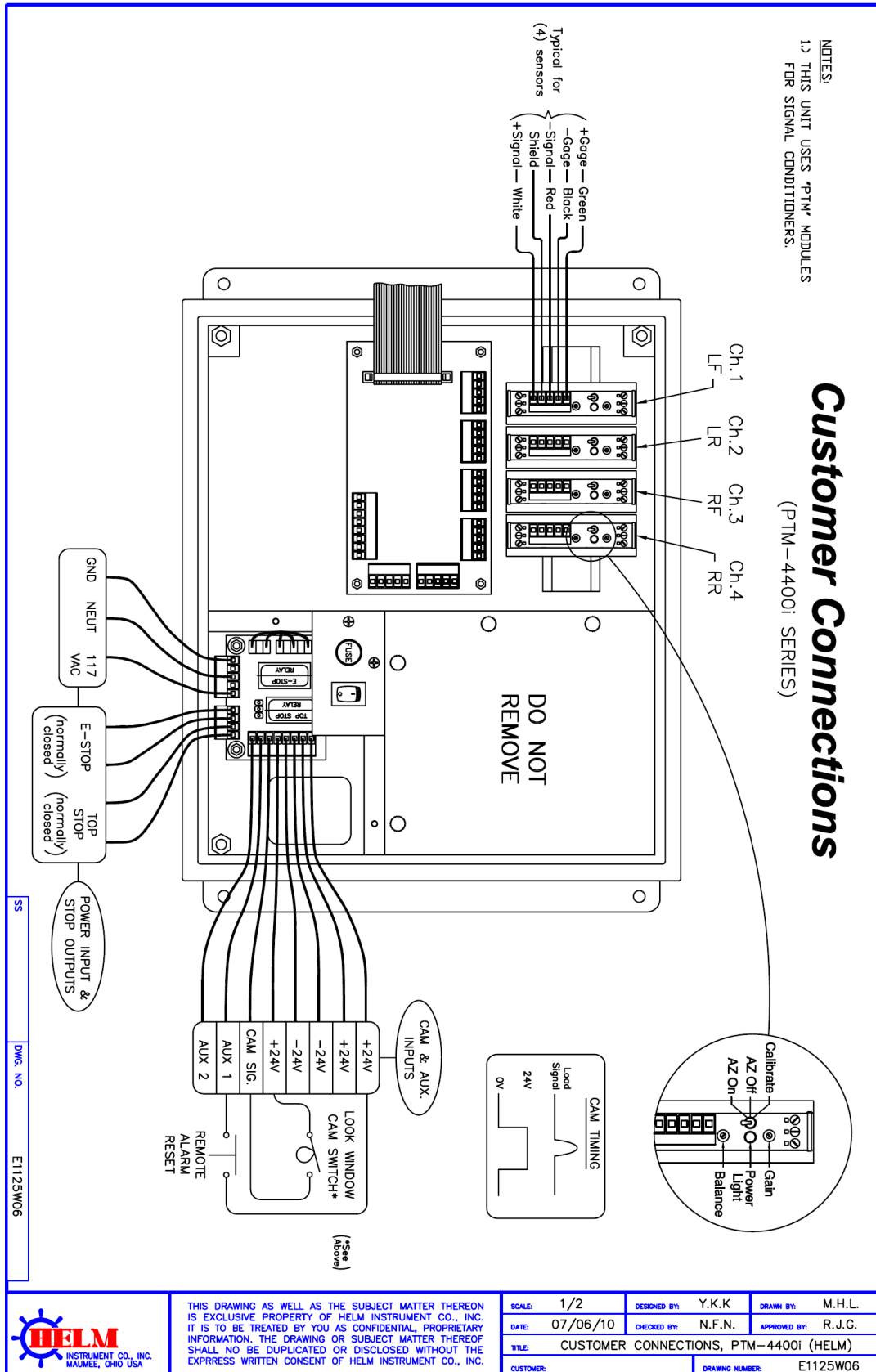
Customer Connections
(PTM−4400i SERIES)

NOTES:
1.) THIS UNIT USES 'PTM' MODULES FOR SIGNAL CONDITIONERS.

Typical for (4) sensors
+Gage — Green
−Gage — Black
−Signal — Red
Shield
+Signal — White

Ch.1 LF
Ch.2 LR
Ch.3 RF
Ch.4 RR

DO NOT REMOVE

GND
NEUT
117 VAC

E-STOP (normally closed)
TOP STOP (normally closed)

POWER INPUT & STOP OUTPUTS

E-STOP RELAY
TOP STOP RELAY
FUSE

AUX 2
AUX 1
CAM SIG.
+24V
−24V
−24V
+24V
+24V

CAM & AUX. INPUTS

REMOTE ALARM RESET

LOOK WINDOW CAM SWITCH*

(*See Above)

CAM TIMING
Load Signal
24v
0v

Calibrate
AZ Off
AZ On
Gain
Power
Light
Balance

SS

DWG. NO.

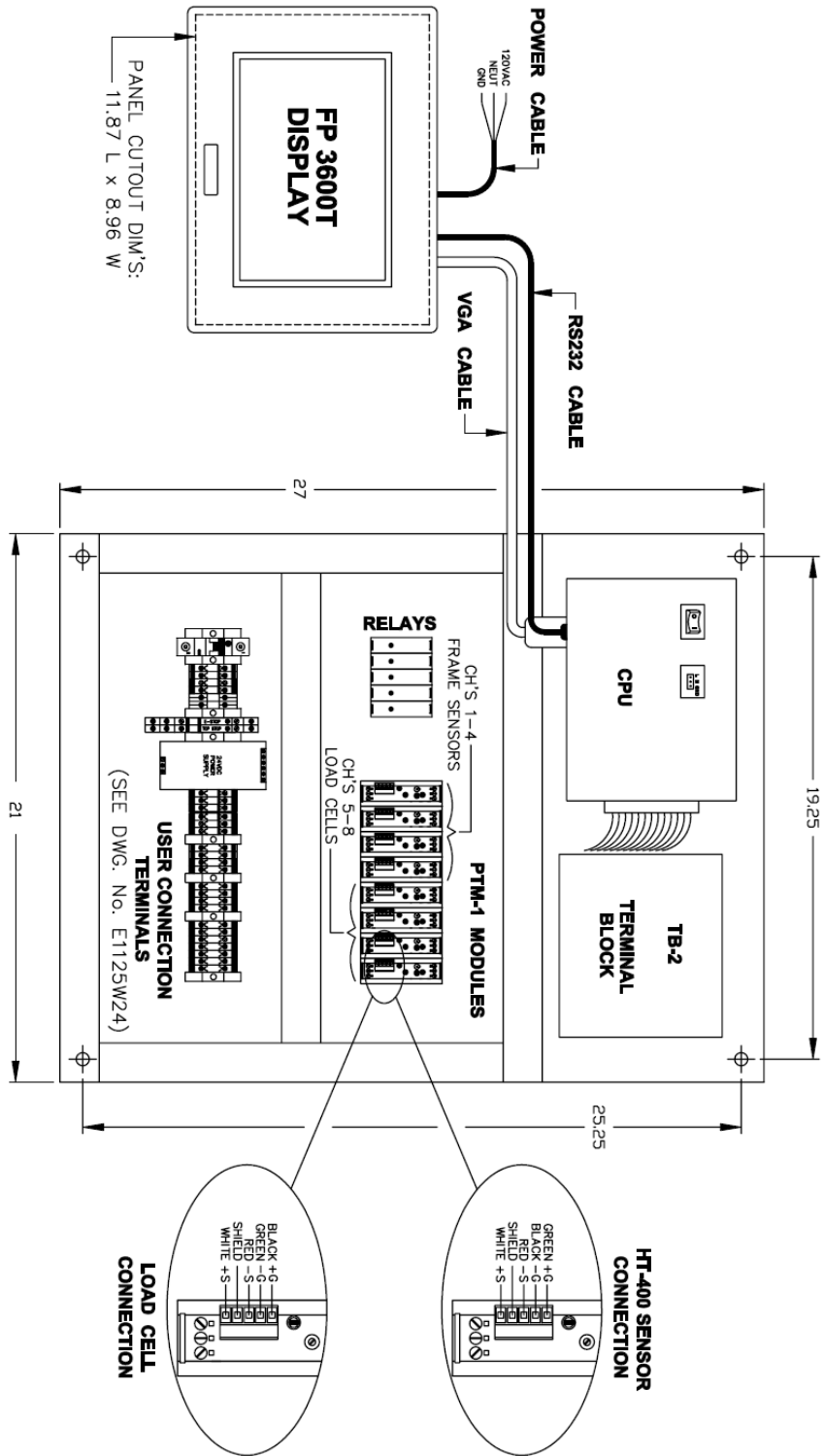E1125W06

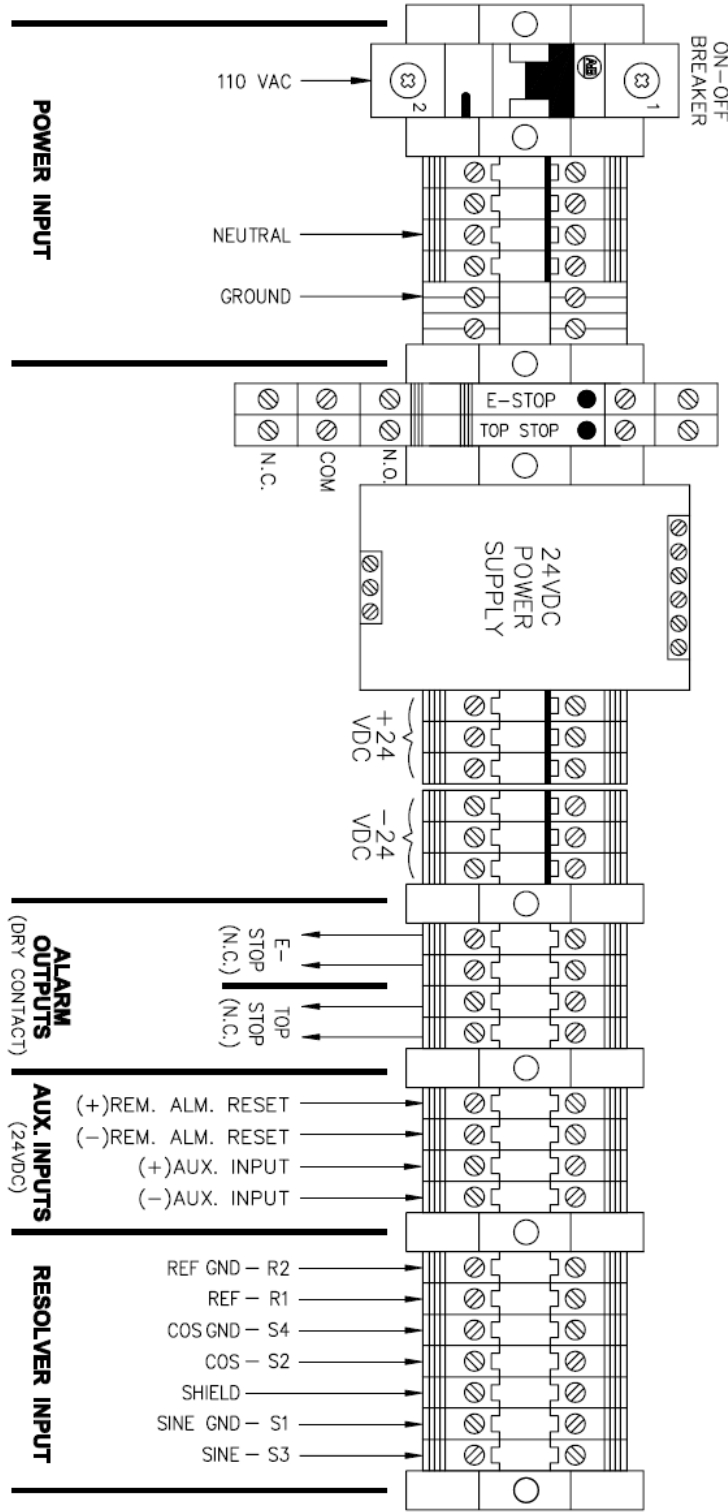|			
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	DATE: 07/06/10	CHECKED BY: N.F.N.	APPROVED BY: R.J.G.
	TITLE: CUSTOMER CONNECTIONS, PTM−4400i (HELM)		
	CUSTOMER:		DRAWING NUMBER: E1125W06

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APPENDIX G   (PTM-4500TSM)- 4CH FRAME WITH RESOLVER INPUT
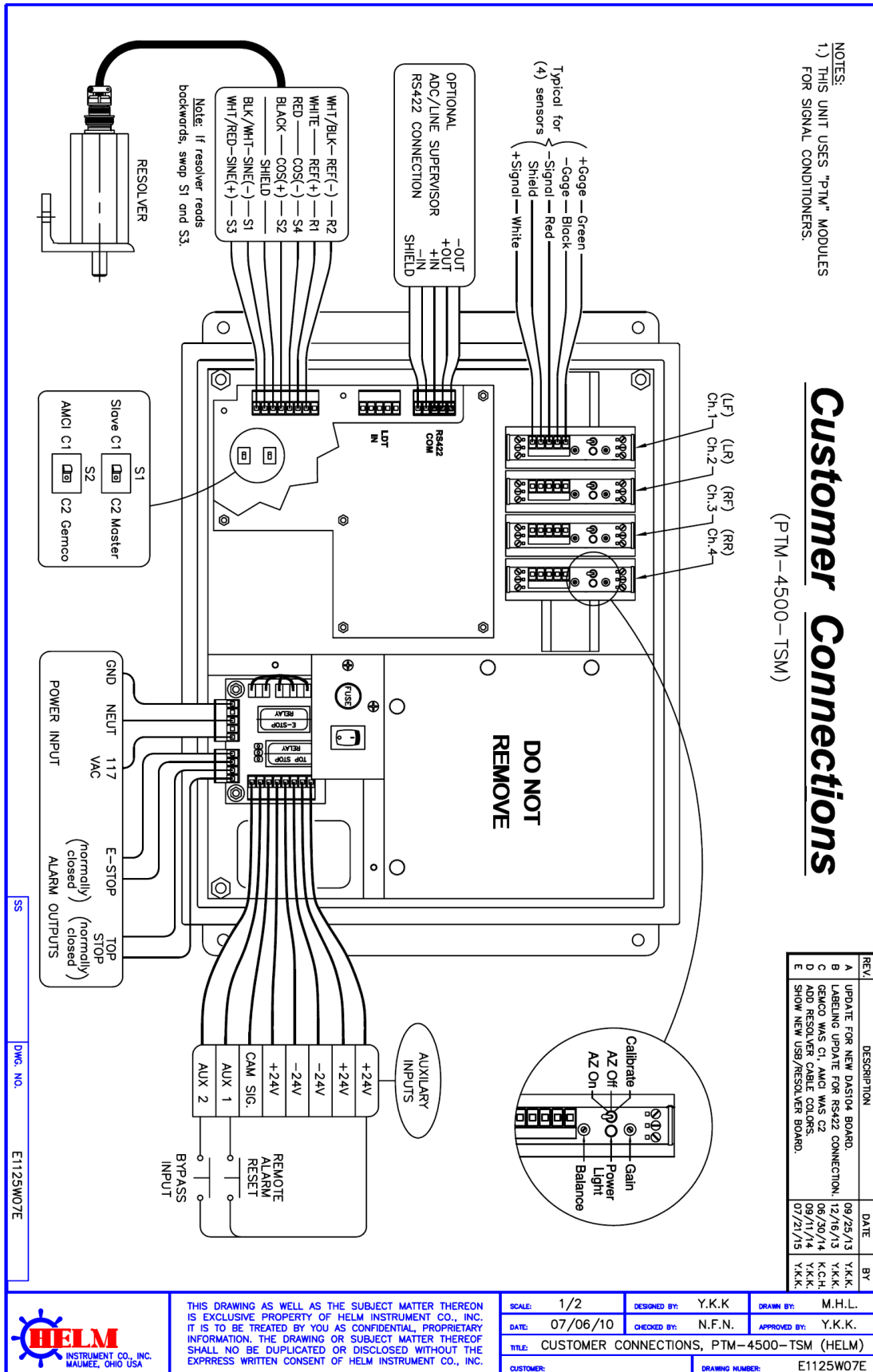
APPENDIX H (PTM-4500TSM-ASA)- 4CH FRAME + AUTO SHUTHEIGHT ADJUST W/ RESOLVER INPUT
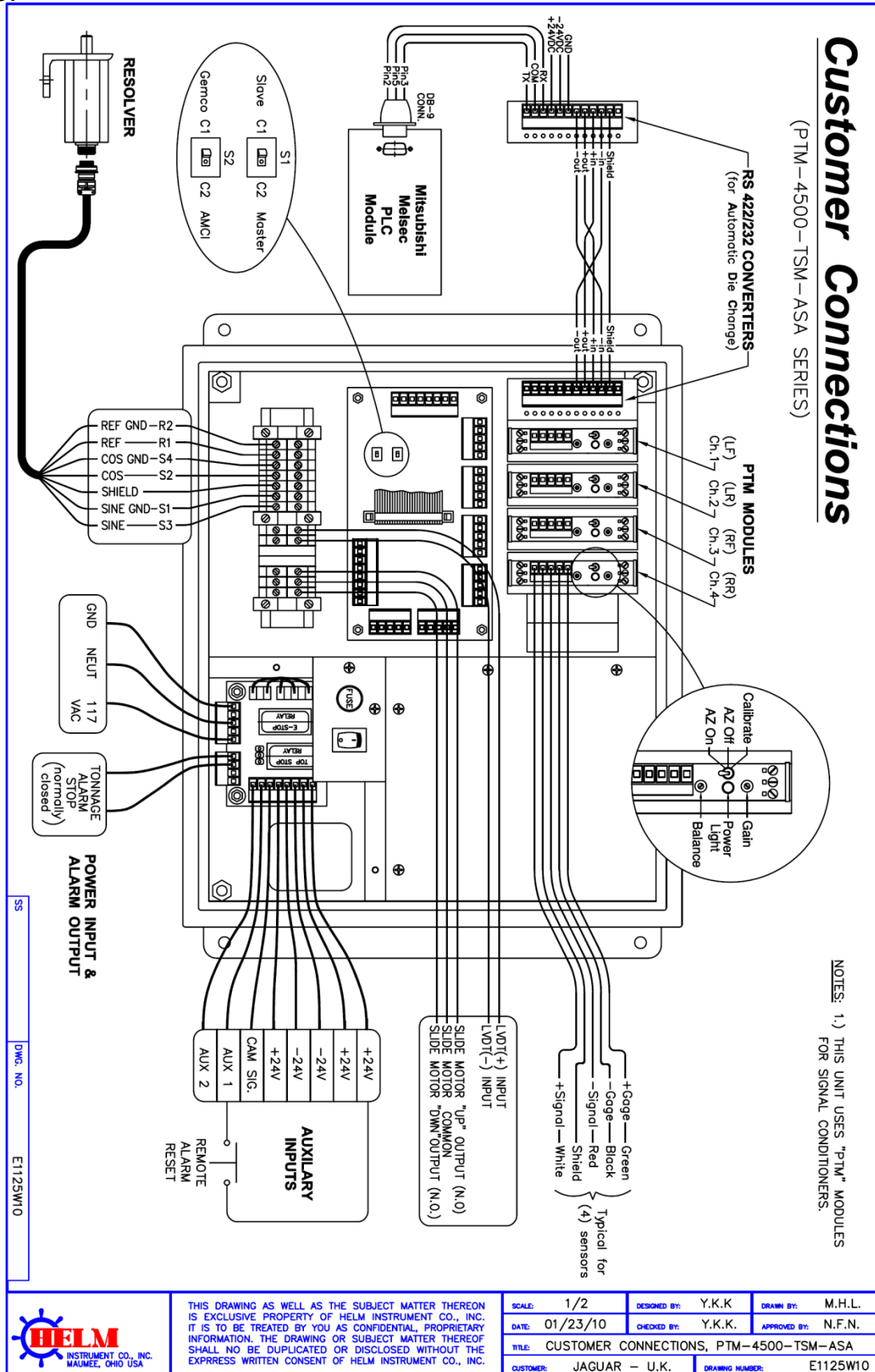
APPENDIX I   (PTM-5600P) - 5CH PIEZO SENSOR INPUT

Customer Connections

(PTM-5600P PIEZO SERIES)

NOTES:
1.) THIS UNIT USES PIEZO TYPE "PTM" MODULES
FOR SIGNAL CONDITIONERS.

Typical for   (−Signal— Black
(6) Piezo   { Shield
Sensors   (+Signal— White

DO NOT REMOVE

CUSTOMER CONNECTIONS, PTM−5600P

HELM INSTRUMENT CO., INC. MAUMEE, OHIO USA

SCALE:	1/2	DESIGNED BY:	Y.K.K	DRAWN BY:	M.H.L.
DATE:	02/09/11	CHECKED BY:	N.F.N.	APPROVED BY:	Y.K.K.

DRAWING NUMBER: E1125W11

DWG. NO.   E1125W11

APPENDIX J   (PTM-4500) - 4CH FRAME WITH CAM INPUT

APPENDIX K (PTM-4500-ADC) - 4Cʜ Fʀᴀᴍᴇ ᴡɪᴛʜ Aᴜᴛᴏᴍᴀᴛɪᴄ Dɪᴇ Cʜᴀɴɢᴇ Oᴘᴛɪᴏɴ

Customer Connections
(PTM-4500-ADC)

NOTES:
1.) THIS UNIT USES "PTM" MODULES FOR SIGNAL CONDITIONERS.

RS 422/232 CONVERTERS
(for Automatic Die Change)

Mitsubishi
Melsec
PLC
Module

DB-9 CONN.

SCALE:	1/2	DESIGNED BY:	Y.K.K	DRAWN BY:	M.H.L.
DATE:	03/09/11	CHECKED BY:	N.F.N.	APPROVED BY:	R.J.G.
TITLE:	CUSTOMER CONNECTIONS, PTM-4500-ADC (HELM)				
CUSTOMER:			DRAWING NUMBER:	E1125W15	

SS   DWG. NO.   E1125W15

APPENDIX L   LINE SUPERVISOR WITH RLG CONENCTION

RLG Line Supervisor Connections

(PTM-4500-TSM)

RLG LINE SUPERVISOR CONNECTION DIAGRAM
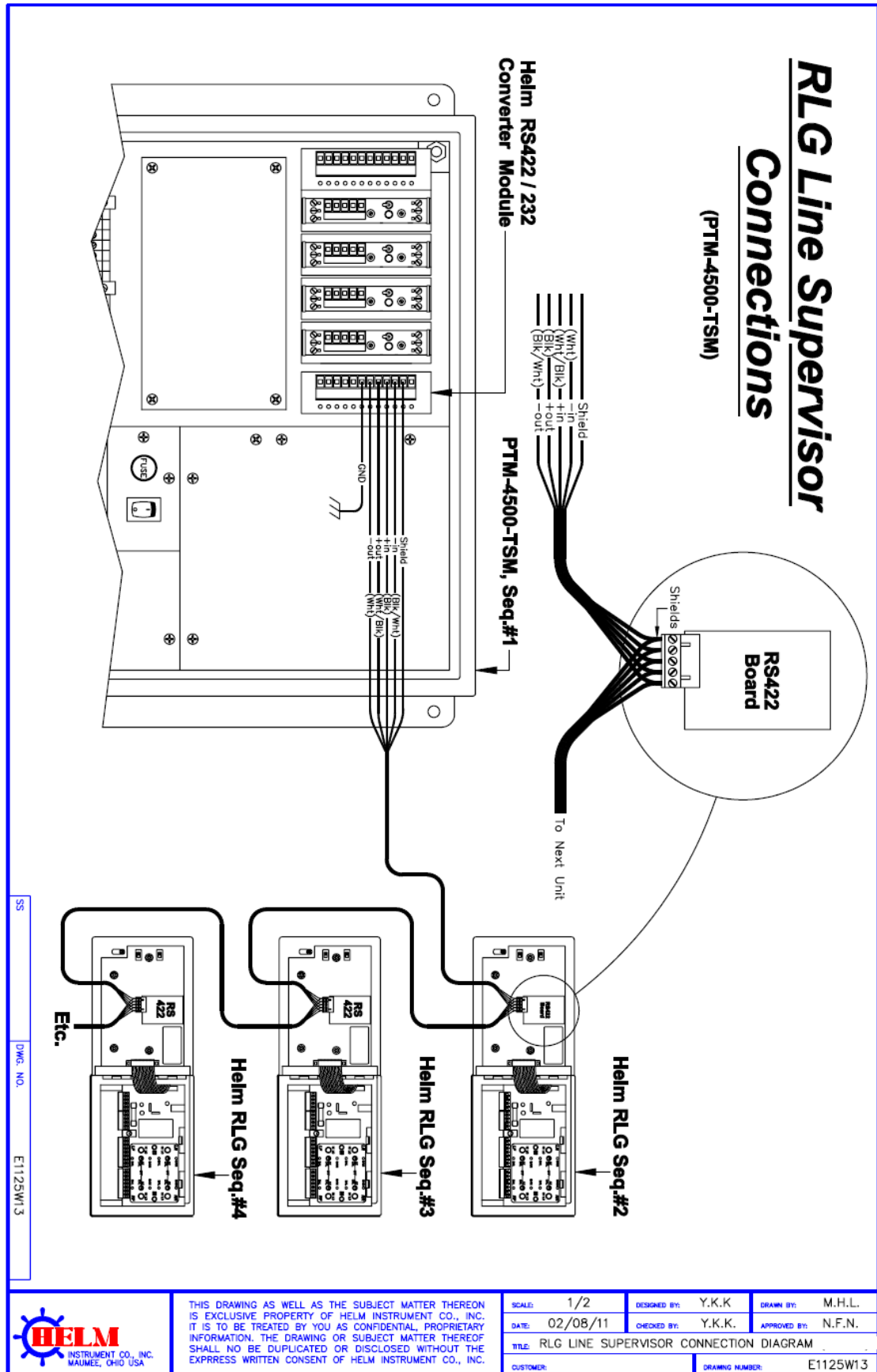
APPENDIX M (PTM-6100-SS) - 4CH FRAME, 1CH IN-DIE, 1CH LASER SENSOR

APPENDIX N (PTM-6700I-TSM) - 6CH IN-DIE WITH TREND WARNING OUTPUT

APPENDIX O PTM LOADGARD DIMEMSION (STANDARD MOUNT)

BOTTOM

10.38
[263.5mm]

14.75
[374.7mm]

14.31
[363.6mm]

Touch Screen Display

LOADGARD®

PTM SERIES

(4) ø.31
[ø7.9mm]

12.31
[312.8mm]

6.37
[161.9mm]

RIGHT
SIDE

NOTES:
1.) BOX IS SCE-1412CHS.

TOLERANCES:
X.XX = ±0.010
X.XXX = ±0.005
FRACT.= ±1/64

SS

DWG. NO.

E1046M21

SCALE:	1/3	DESIGNED BY:	M.H.L.	DRAWN BY:	M.H.L.
DATE:	08/28/12	CHECKED BY:	R.J.G.	APPROVED BY:	R.J.G.
TITLE:	MOUNTING DIMENSIONS, PTM SERIES LOADGARD (HELM)				
CUSTOMER:				DRAWING NUMBER:	E1046M21

HELM
INSTRUMENT CO., INC.
MAUMEE, OHIO USA

APPENDIX P PTM LOADGARD DIMEMSION (FLANGE MOUNT)

BOTTOM

6.25 [158.8mm]

14.31 [363.6mm]

13.00 [330.2mm]

15.00 [381.0mm]

16.00 [406.4mm]

Touch Screen Display

LOADGARD

PTM SERIES

14.00 [355.6mm]

(4) ø.28 [ø7.1mm]

PANEL CUTOUT DIMENSIONS
TO MOUNT FLANGED UNIT

12.31 [312.7mm]

14.31 [363.5mm]

RIGHT SIDE

12.31 [312.8mm]

1.75 [44.5mm]

4.38 [111.1mm]

NOTES:
1.) BOX IS SCE-1412CHS.

TOLERANCES:
X.XX = ±0.010
X.XXX = ±0.005
FRACT.= ±1/64

SS

DWG. NO.

E1046M22

HELM INSTRUMENT CO., INC. MAUMEE, OHIO USA

SCALE:	1/3	DESIGNED BY:	M.H.L.	DRAWN BY:	M.H.L.
DATE:	08/28/12	CHECKED BY:	R.J.G.	APPROVED BY:	R.J.G.

TITLE: MOUNTING DIMEMSIONS, FLANGED PTM SERIES LOADGARD (HELM)

CUSTOMER: DRAWING NUMBER: E1046M22

APPENDIX P-1 PTM LOADGARD PANEL PC CONNECTIONS LAYOUT
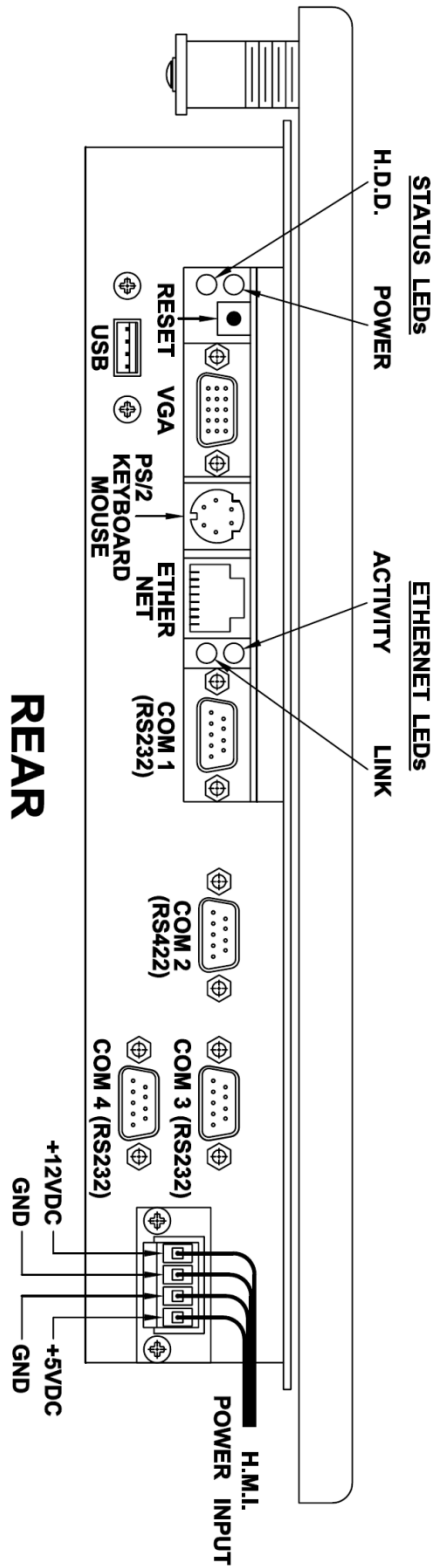
APPENDIX Q (PTM-884TSM-SS) 4CH FRAME, 4CH IN-DIE SENSORS

APPENDIX R (PTM-844TSM-SS) CONNECTION DRAWING

APPENDIX S (PTM-1248TSM-SS) 4CH FRAME, 8CH IN-DIE SENSORS
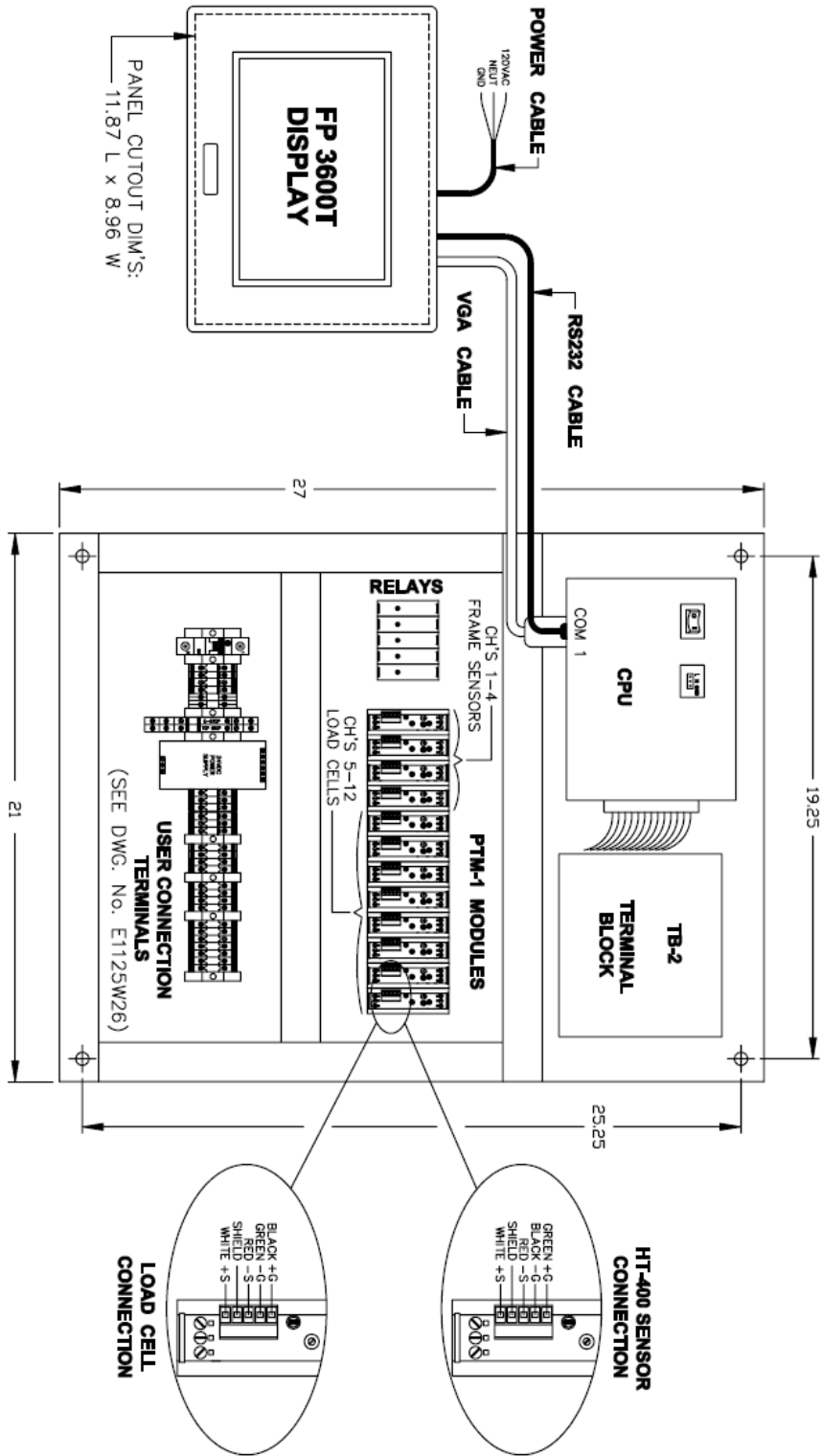
APPENDIX T (PTM-1248TSM-SS) CONNECTION DRAWING
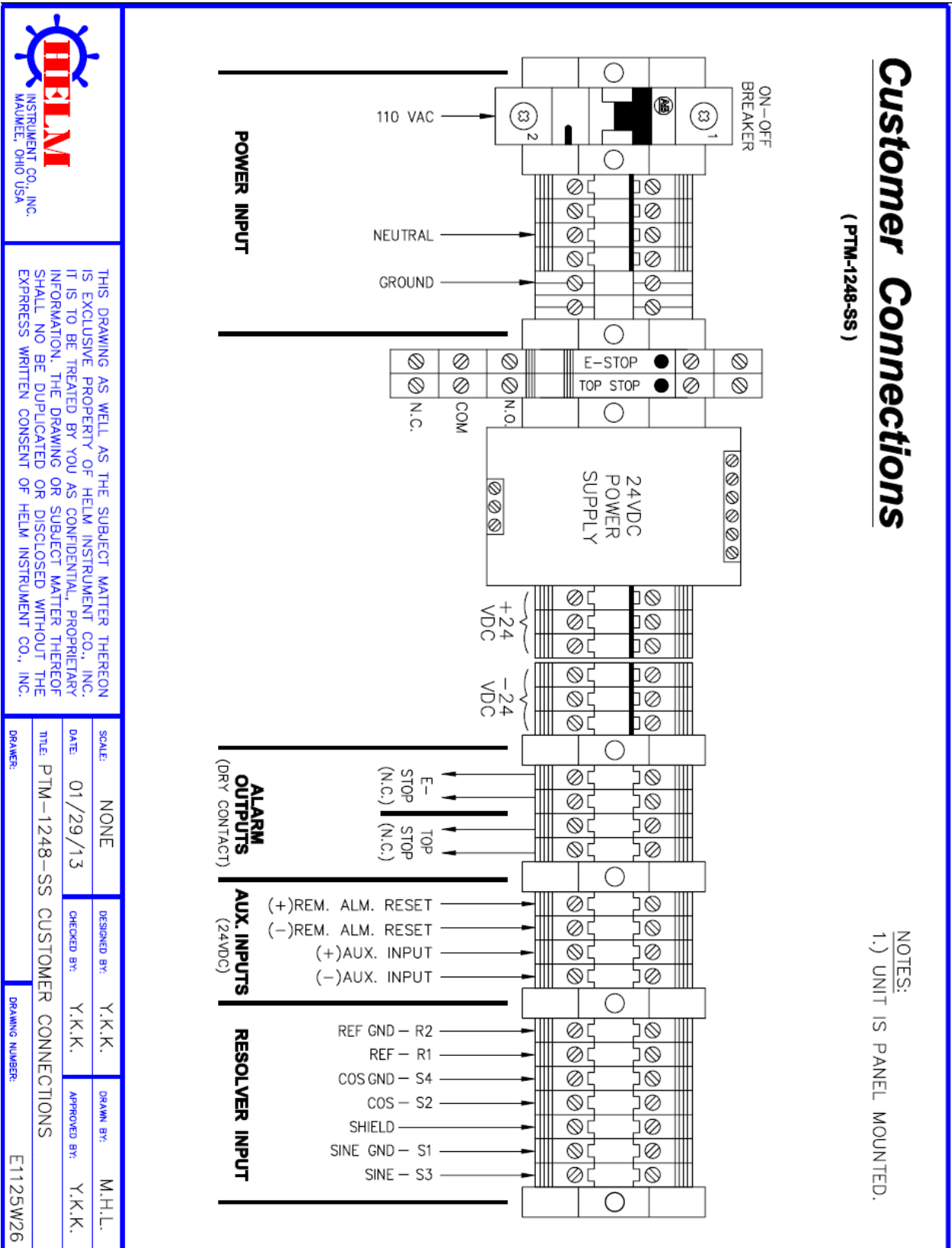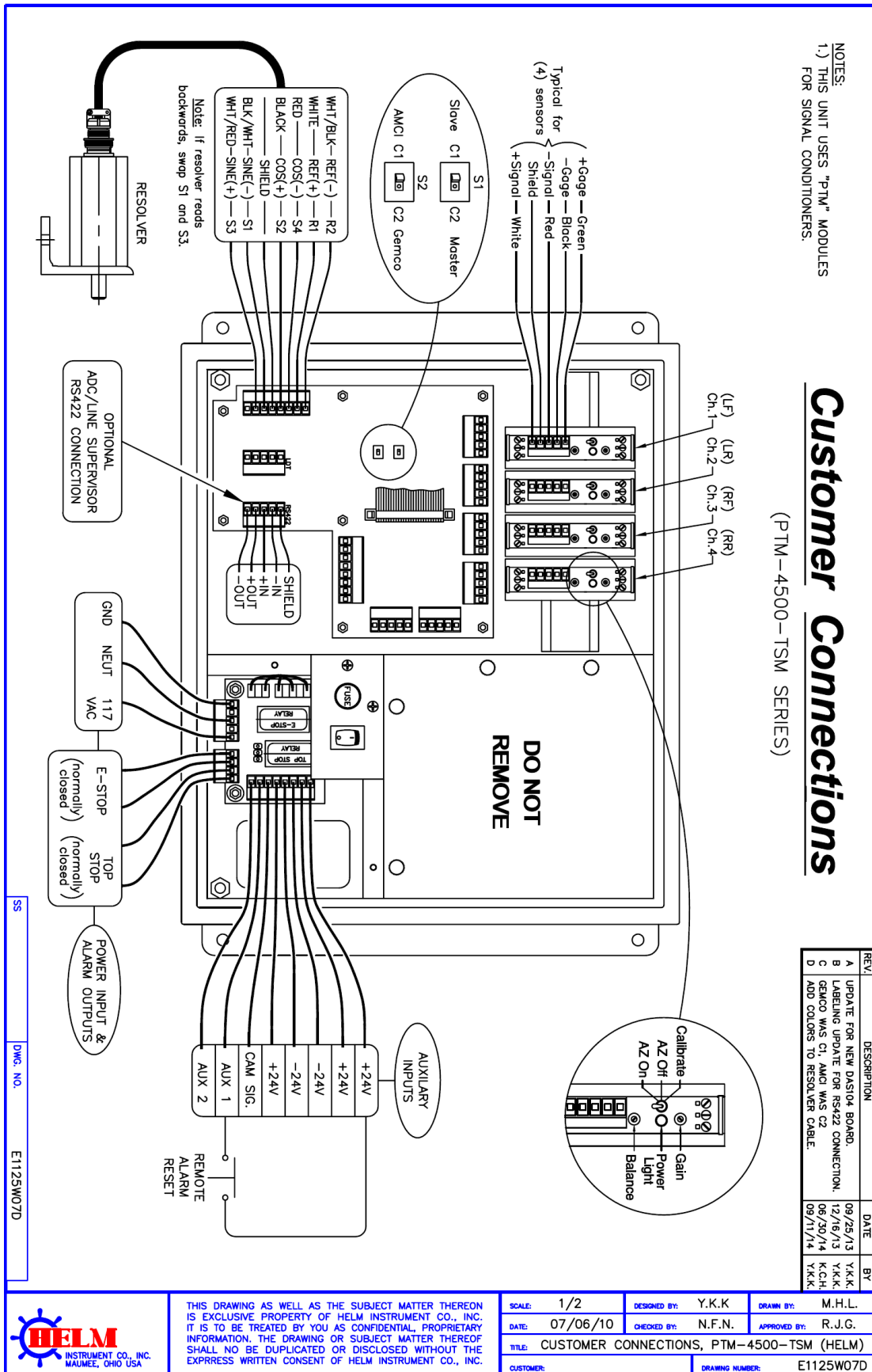

Customer Connections

(PTM-1248-SS)

HELM
INSTRUMENT CO., INC.
MAUMEE, OHIO USA

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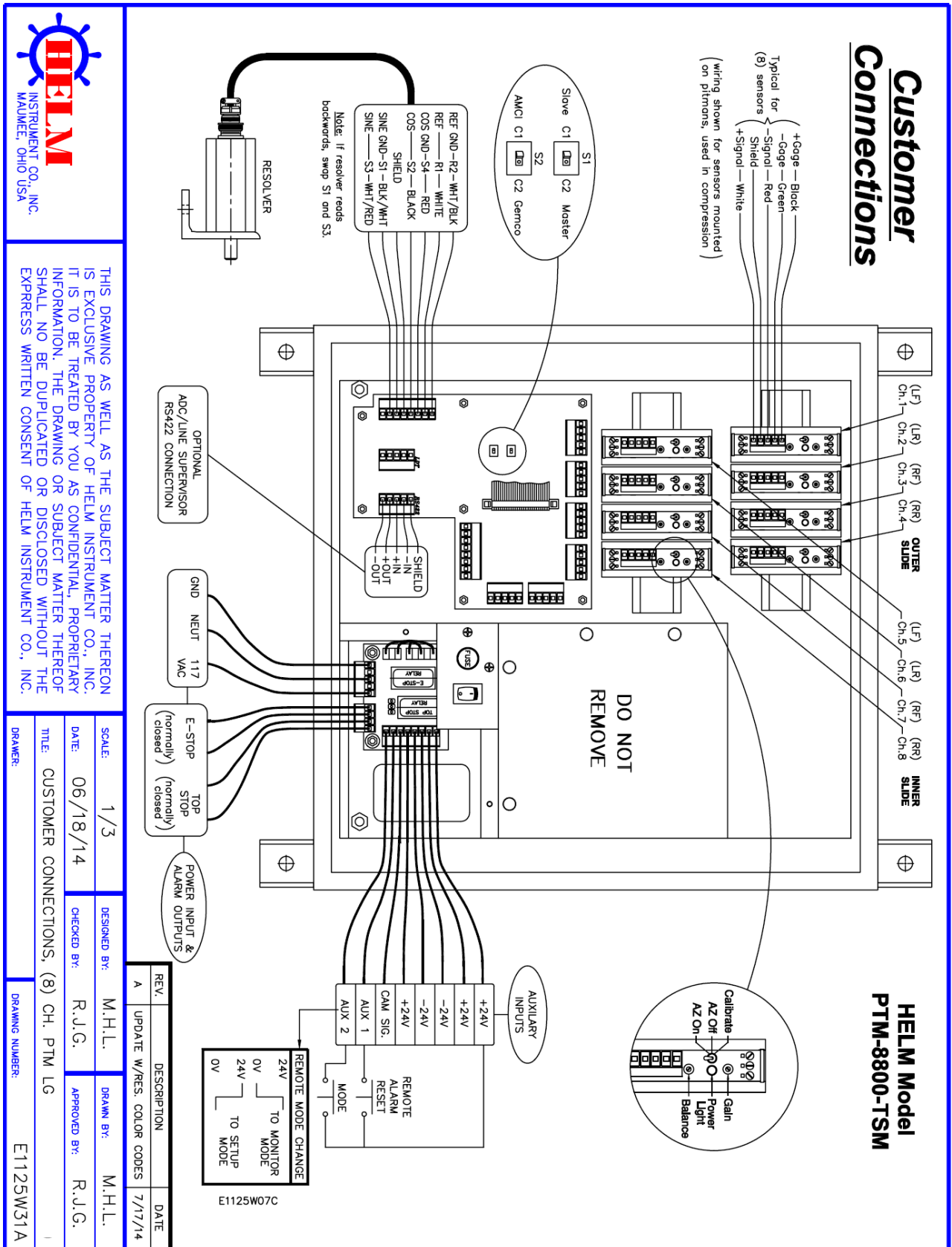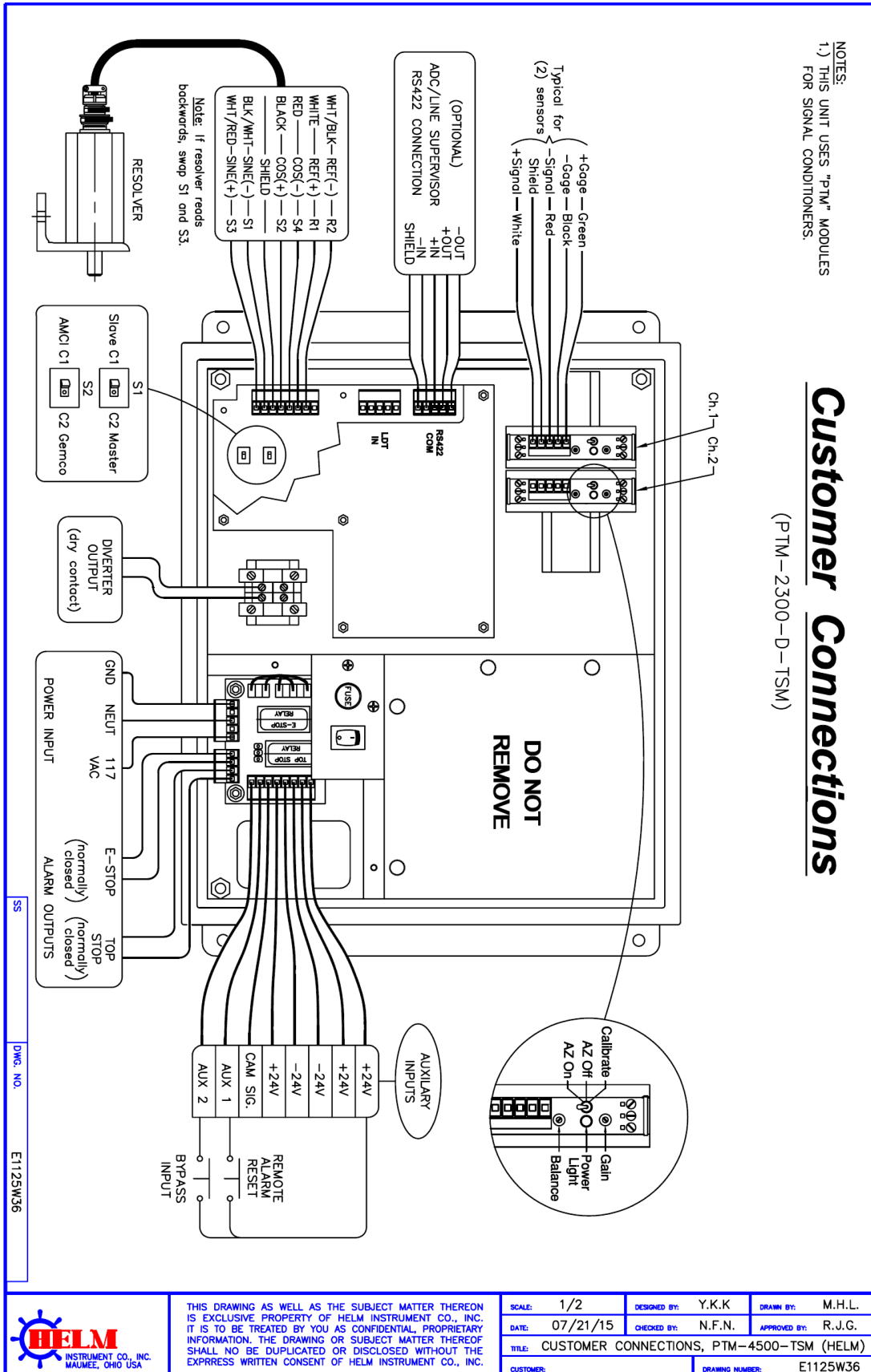EXPRESS WRITTEN CONSENT OF HELM INSTRUMENT CO., INC.

| SCALE: NONE | DESIGNED BY: Y.K.K. | DRAWN BY: M.H.L. |
| DATE: 01/29/13 | CHECKED BY: Y.K.K. | APPROVED BY: Y.K.K. |

TITLE: PTM-1248-SS CUSTOMER CONNECTIONS

DRAWER:

DRAWING NUMBER: E1125W26

NOTES:
1.) UNIT IS PANEL MOUNTED.

POWER INPUT

110 VAC
ON-OFF BREAKER
NEUTRAL
GROUND

N.C.   COM   N.O.
E-STOP
TOP STOP

24VDC POWER SUPPLY

+24 VDC
-24 VDC

ALARM OUTPUTS
(DRY CONTACT)
E-STOP (N.C.)
TOP STOP (N.C.)

AUX. INPUTS
(24VDC)
(+)REM. ALM. RESET
(-)REM. ALM. RESET
(+)AUX. INPUT
(-)AUX. INPUT

RESOLVER INPUT
REF GND — R2
REF — R1
COS GND — S4
COS — S2
SHIELD
SINE GND — S1
SINE — S3

APPENDIX U RLG LINE SUPERVISOR CONNECTION

APPENDIX V PTM-102L CONNECTIONS
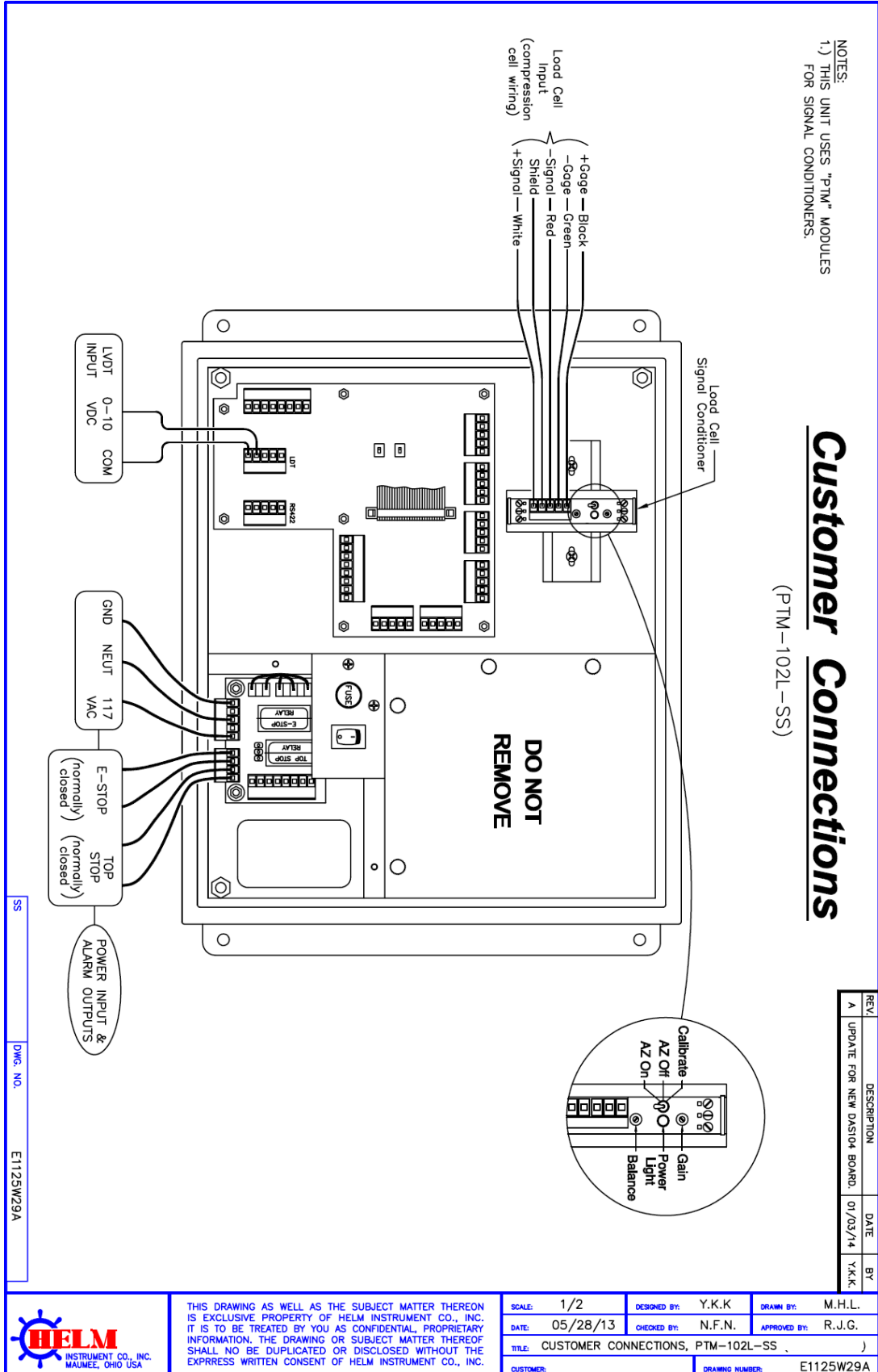
APPENDIX W PTM-4500TSM NEW I/O BOARD CONNECTIONS

APPENDIX X PTM-6600TSM FOR DOULE ACTION CONNECTIONS

APPENDIX Y PTM-8800TSM FOR DOULE ACTION CONNECTIONS

APPENDIX Z PTM-2300D-TSM WITH DIVERTER OUTPUT

Customer Connections

(PTM-2300-D-TSM)

NOTES:
1.) THIS UNIT USES "PTM" MODULES FOR SIGNAL CONDITIONERS.

SCALE:	1/2	DESIGNED BY:	Y.K.K	DRAWN BY:	M.H.L.
DATE:	07/21/15	CHECKED BY:	N.F.N.	APPROVED BY:	R.J.G.
TITLE:	CUSTOMER CONNECTIONS, PTM-4500-TSM (HELM)				
CUSTOMER:				DRAWING NUMBER:	E1125W36

APPENDIX Z1 PROFINET ADD-ON KIT CONNECTION

Profinet Add-On Kit Connection for PTM4500TSM ADC

(PTM-LOADGARD SERIES)

PTM-4500-TSM

Profinet Converter Module

ETHERNET CONNECTION
TO PROFINET NETWORK

DB-9 CONNECTOR TO
COMPORT 3 ON DOOR

+24VDC
−24VDC

+24VDC   −24VDC

FUSE

HELM
INSTRUMENT CO., INC.
MAUMEE, OHIO USA

	SCALE: 1/2	DESIGNED BY: M.H.L.	DRAWN BY: M.H.L.
DATE:	01/29/15	CHECKED BY: R.J.G.	APPROVED BY: R.J.G.
TITLE:	PROFINET ADD-ON KIT CONNECTION FOR PTM4500TSM ADC		
DRAWER:		DRAWING NUMBER:	E1125W35

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