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PTM - 1100

USER MANUAL

REV. 1

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HELM INSTRUMENT CO., INC.

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HELM INSTRUMENT COMPANY, INC. CUSTOMER SERVICE 361 WEST DUSSEL DRIVE MAUMEE, OHIO 43537 (419) 893-4356

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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-1100 SERIES

BENEFIT

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

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-1100 has two function modes controlled by an operator.

- Calibrate Mode Used for system setup or Job setup, capacity alarms are active, but relay output is disabled. Calibrate mode will automatically be turned back to peak after 5 minutes, incase accidently left in calibrate.
- **Peak Mode** Used after calibration is complete for standard tonnage monitoring operations. Capacity alarms and relays are active.

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.

OTHER FEATURES

- **Jobs Recipe** You create alarm settings per job base and store to Job Recipe for later quick download to setup the system.
- **Password Protection** The setup screen is password protected to insure only appropriate personnel can bypass the alarms (switch to calibrate more) or change the scale set point.

USER CONNECTIONS

Refer to page 12 for the user connections drawing.

CUSTOMER SUPPLIED POWER

A Precut hole has been provided to connect conduit for customer supplied power.

- **120VAC** Connect to the 3Amp Circuit Breaker
- AC Neutral Connect to the Neutral Terminal. (Neutral should be grounded at the transformer to prevent floating ground)
- **GND** Connect to Ground.

CAM INPUT

The provided CAM INPUT relay is a 24VDC relay, and can either be triggered by customer provided +24VDC and DC common, or Use the supplied DC1 (+24VDC) through a dry contact to A1 and connect DC2 (0VDC) to A2. This input can be triggered with a proximity switch or a PLC output. This input is the "look window" for the tonnage monitor.

- A1 +24VDC signal.
- A2 0VDC signal.

HIGH/LOW CAPACITY FAULT RELAY OUTPUT

The provided relay output is programmed to be energized unless a fault occurs; this is considered "Fail Safe". If a relay output turns off, a fault has occurred, and will commonly trigger a top stop.

- **11** Customer supplied Signal
- **12** Normally Closed Output, this is the typical not used.
- **14** Normally Open Output, this is the typical connection point for an alarm signal, and is commonly connected with the presses TOP STOP circuit.

STRAIN GAGE INPUT

The drawing on page 10 shows the proper wiring for a strain gage to the PTM. *The strain gage wiring should not be ran within 12" of any high voltage, (60V or above), if necessary wires should cross perpendicular to insure the least amount of noise transference.*

TOUCH SCREEN INTERFACE

MAIN MENU

Main menu allows you to access different area of the system. The PTM-1100[™] features a touch screen display for easy navigation and operation of the system. Click or touch on the button you wish to access.



JOB – Displays the current job. Press to go to job screen.

PEAK TONNAGE – Displays the peak tonnage value.

CAM INPUT - Pilot is set when Cam input is on (high).

HIGH TONNAGE – Displays the current High Capacity Alarm Set point. Pilot is set when there is a High tonnage alarm. *Pilot can be set and relay is off, if in calibrate mode.*

LOW TONNAGE – Displays the current Low Capacity Alarm Set point. Pilot is set when there is a Low tonnage alarm. *Pilot can be set and relay is off, if in calibrate mode.*

SPM – Displays the current Strokes Per Minute, which is calculated based on the duration of time between cam pulses.

HOME – This button is inactive on the main screen, but will return the user to the main screen when pressed.

FAULT RESET - This button will clear all displayed faults and fault relay outputs.

SETUP SCREEN – Pressing this will prompt the user for the Setup Password. By pressing the 0-9 number button the user can navigate to the keypad and enter the numeric password. Once entered, press the Enter (Carriage Return, in lower right corner). Then press OK and press the setup screen button again. The password privileges will automatically reset after 5 minutes of screen inactivity.

SETUP SCREEN

This screen is used to calibrate the system and set the scale value, this screen is password protected. Password is 361.



JOB – This displays the current loaded job.

PEAK TONNAGE – Displays the peak tonnage value.

CAM INPUT – Pilot is set when Cam input is on (high).

TRACK OUTPUT (V) – Displays the track output voltage, this can be used to reset the cal value if needed. This should not be used for Zero balance, as it cannot display negative numbers.

SCALE – Set for the capacity of the press.

HIGH TONNAGE – Displays the current High Capacity Alarm Set point. Pilot is set when there is a High tonnage alarm. *Pilot can be set and relay is off, if in calibrate mode.*

LOW TONNAGE – Displays the current Low Capacity Alarm Set point. Pilot is set when there is a Low tonnage alarm. *Pilot can be set and relay is off, if in calibrate mode.*

HOME – Press to return to the main screen.

FAULT RESET – Press to clear all displayed faults and fault relay outputs.

CALIBRATE/PEAK MODE – This button will clear toggle the unit between peak and calibrate modes. (In calibrate mode capacity alarm relay outputs are bypassed). *The system will automatically switch back to peak mode after 5 minutes.*

JOB RECIPE SCREEN

This screen displays the high and low tonnage set points for each job recipe, and allows you to set, save, and load jobs.



CURRENT JOB – Displays the current job.

RECIPE – Displays the recipe selected, if pressed you can type the desired recipe (1-20).

UP ARROW – Used to move to higher value recipe.

DOWN ARROW - Used to move to lower value recipe.

HIGH TONNAGE - Press to set the recipe High Capacity Alarm Set point.

LOW TONNAGE - Press to set the recipe Low Capacity Alarm Set point.

HOME – Press to return to the main screen.

SAVE RECIPE – Press to save the displayed settings to the selected recipe.

LOAD JOB – Press to load the selected recipe into the system.

PTM MODULE

STRAIN GAGE SENSOR INPUT

The strain gage sensor wires are connected at the green 5-pole Weidmuller connector at the bottom of the module. Connections include "+ Gage", "+ Signal", and "Shield". For ease of wiring at the connector, it can be removed from the module while making the 5 connections at the screw terminals.

INITIAL SET-UP AND CALIBRATION

Zero Balance

After the proper wiring connections are made, the module should be set up by connecting a good quality voltmeter to the 0-10 VDC analog voltage "Track" output terminals ("Track" and "Acom"). There should be no load on the sensor, and the external timing input signal should be off (between cycles). Set the small 3-position calibration toggle switch at the top of the module to the center "Off" position. Adjust the "Gain" pot CCW until it reaches the stop, a click will be felt. Adjust the small "Bal" (Balance) pot below the switch so that the voltmeter reads 0.00 volts. This electronically "zero balances" the sensor to the module circuit.

Calibration: For Strain gage installations

The machine to which the sensors are mounted should be "field calibrated" using portable calibration load cells and instrumentation to verify the actual developed tonnages.

- 1. With the small 3-position calibration toggle switch at the top of the module to the center "Off" position, cycle the press and record developed tonnage.
- 2. Adjust the gain pot CW, and cycle the press again.
- 3. Compare the "Peak Output" scaled value on the display meter to the display of the calibration equipment, and continue to adjust the gain pot and cycle the press.

Note: If the value remains 0 (zero), continue to increase the gain by rotating Clock-wise, until the unit displays the developed value.

If there is not enough gain with the toggle switch at the tower LOW GAIN 140K position, move it to the upper HIGH GAIN 1 Megohm position, then repeat the zero balance. The corresponding voltage "Calibration Number" can be read from the track output with a voltmeter, with the 3-postion calibration toggle switch in the "Cal" position.

The two available calibration resistor values available for the PTM-1 module are:

HIGH GAIN (1 MEGOHM CAL RESISTOR): UPPER SWITCH POSITION This is for use typically with HT-400 Strain Gain sensors or other sensor types where the deflection and signal output is low.

LOW GAIN (140K OHM CAL RESISTOR): LOWER SWITCH POSTION This can be used with HT-400 Strain Gain sensors, in press load monitoring applications where high deflection and signal output is present. It should also be used with load cells having mid-range output (approx. 0.50-1.00 mV/V) or having high output (greater than 1.00 mV/V).

When the "Zero Balance" and "Calibration" procedures are completed, the toggle switch should be set to the lower "A/Z" (Auto-Zero) position for normal operation.

External "Peak Look Window" Timing

As stated above, an external timing signal input ("Peak Look Window") is required for each machine cycle to be monitored. This 24 VDC signal can be generated by a dry contact, prox probe, or PLC output. In general, the timing signal should start shortly before the forming load begins for the new cycle, and should end shortly after the forming load is finished. In effect, the timing signal "tells" the module when to "look" at the forming signal for each cycle, and to capture the "Peak" load value within that time frame. This occurs when the timing signal is "On". When the timing signal is "Off", and provided that the toggle switch is set to the lower "A/Z" (Auto-Zero) position, the "Auto-Zero Balance" function is turned on to maintain a proper zero balance reference. "Auto-Zero" is turned off when the timing signal is on, and load is occurring. At the start of each new timing signal, a "Peak Reset" function happens to reset the previous peak value, and to start the "Peak Capture" for the new machine cycle.

Normal Operation

After the set-up and calibration have been completed, the 3-position calibration toggle switch should be set to the lower "A/Z" (Auto-Zero) position for normal operation. This allows the "Auto-Zero Balance" function to operate between active load cycles, maintaining a proper zero reference for accurate signal output values.

As the machine is cycled and load is placed on the sensor or load cell, the module will generate scaled "Track Output" and "Peak Output" analog DC voltage signals. The "Track Output" is simply the instantaneous signal output from the sensor, and is always on. The "Peak Output" is controlled by the external timing signal with a "Peak Capture" function, and is the overall peak signal output from the sensor for a current cycle. It is held in memory at the end of each timing signal ("Peak Look Window"), and reset to zero by a "Peak Reset" function at the start of the next timing signal for the new cycle.

In terms of signal output scaling, the PTM-1100 standard is 3 VDC = 100% full scale capacity. Load values between no load and 100% capacity will yield a proportional output signal between the particular minimum and maximum output points.





Operators Manual

PTM MODULE WIRING:

•		4		ი	REV.																			-
MAUMEE, OHIO USA	INSTRUMENT CO INC.		•	1.) UPDATE WITH NEW HI-LO GA	DESCRIPTION		Mounting Configuration		Hazardous Environmental Classification	Operating Temperature	Calibration	Amplifier Roll-Off Frequen	(between +Input & -Input)	Normal Mode Rejection	Accuracy	Input Impedance	Signal Output, Peak	Signal Output, Track		Sensor Input	Power Consumption	Power Input	SPECI	HELM M. Peak-Tra
EXPRRESS WRITTEN O	SHALL NO BE DUP	I IS TO BE TREATED	HIS DRAWING AS W	AIN SWITCH. M.H.L.	BY		DI	HELM Stoc	Class 1, Div.	0°C-60°C (32	Manual A	cy 650 Hz at 3		50dB at 2	1% Full Sca	1k (0-10	0-10	175-70	Full Bridge	10	24	-ICATIONS	odel "P Ick Mo
CONSENT OF HELM	LICATED OR DISC	BY YOU AS CON	ELL AS THE SUB	04/21/08	DATE		N Rail	k No. 25198	2 Hazardous onment	2°F-140° F)	djustment	000 Gain		000 Gain	le Accuracy	Dhms	VDC	VDC	0 Ohm	Strain Gage	0 ma	VDC		TM-1 dule
INSTRUMENT CO., INC. DRAWER:	LOSED WITHOUT THE TITLE:	IDENTIAL, PROPRIETARY DATE:	JECT MATTER THEREON SCALE:			+24V	INFO	+CAM	EXTERNAL DRY-CONTACT CAM SWITCH			+24 Supp	0		+Signal()	Shie	-Signal	+Gage (g	Hi/Lo Gain Sv			A		H Analog Outpu
	PTM-1" PEAK-TRACK MODULE	09/17/04 снескер ву:	FULL DESIGNED BY:		24V PLC PLC OUTPUT COMMON			+CAM	24 VDC PLC OUTPUT	-	+Cam			000	white)			reen)						It Common
DRAWING NUMBER: E1096W03C	SPECIFICATIONS & WIRING (HELM)	R.J.G. APPROVED BY: R.J.G.	M.H.L. DRAWN BY: M.H.L.			+94V			EXTERNAL 2-WIRE PROX PROBE											— Balance	Light	Power		Analog Peak Output

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PTM MODULE SIGNAL DIAGRAM:



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PTM-1100 USER CONNECTIONS:

