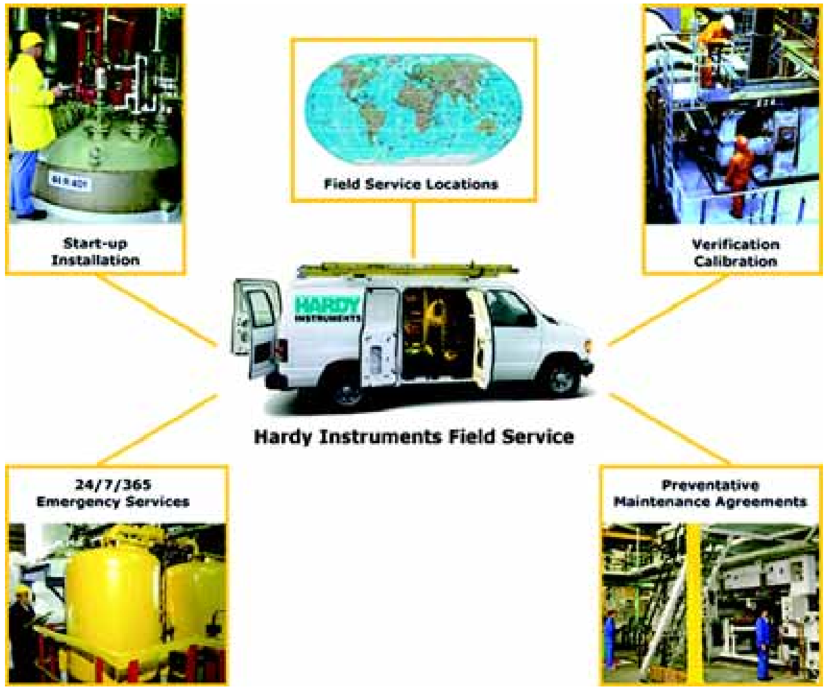
HARDY INSTRUMENTS

Weight Controller

HI 4050

User's Guide



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Hardy has over 200 field technicians in the U.S., and more positioned throughout the world to assist you in your support needs. We also have factory engineers who will travel to your facility anywhere in the world to help you solve challenging applications. We're ready to support you with:

- **Installation and start-up**
- **Routine maintenance and certification**
- **Plant audits and performance measurement**
- **Emergency troubleshooting and repair**

To request Emergency Service and Troubleshooting, Start-up, Installation, Calibration, Verification or to discuss a Maintenance Agreement please call **800-821-5831 Ext. 1757** or Emergency Service after hours (Standard Hours 6:00 AM to 6:00 PM Pacific Standard Time) and weekends Ext. 1111.

Outside the U.S

Hardy Instruments has built a network of support throughout the globe. For specific field service options available in your area please contact your local sales agent or our U.S. factory at +**1 858-292-2710, Ext. 1757**.

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Chapter 1
Overview

General Introduction to the HI 4050 Weight Controller

This Manual provides the Operator and Technician with a complete description of installation, setup and troubleshooting procedures for the HI 4050 Weight Controller. To get the maximum service life from this product, technicians should use this instrument in accordance with recommended practices either implied or expressed in this manual. Before using the HI 4050 Weight Controller, all operators and service personnel should read and understand all cautions, warnings, and safety procedures, referenced or explicitly stated in this manual, to insure the safe operation and repair of this instrument. Hardy Instruments sincerely appreciates your business. We encourage input about the performance and operation of our products from our customers. Should you not understand any information in this manual or experience any problems with this product, please contact our Technical Support Department at:

Phone: (858) 278-2900

Toll Free: 1-800-821-5831

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hi_sales@hardyinst.com

Or visit our web site at:

http://www.hardyinstruments.com

Our web site is full of useful information about our products, process weighing, web tension and vibration analysis applications. You can also update the HI 4050 User Guide. The latest revised manuals are available FREE in the Support Section of our Web Site. While you're on the site feel free to visit the other web pages which can provide answers to your questions about, load points, process weighing, vibration analysis, tensions control or other Hardy Instruments products. Be sure to sign up for the Hardy Newsletter to get the latest information on all Hardy products and services. For answers to technical issues and service problems check the Hardy Web Tech on our Hardy Web Site. Most problems can be resolved by the Hardy WebTech, 365 days a year, 24 hours a day 7 days a week. You can still contact a technician by phone during our normal operating hours (6:00 AM to 6:00 PM Pacific Time) if necessary.

Description

The Hardy HI 4050 is a single channel stand alone Weight Controller. The HI 4050 comes with a backlit LCD display and key pad or DIN Rail mountable blind remote. The Weight Controller is designed to accommodate any number of configurations which include the following:

Standard Communication

- RS 232 - Printer or Scoreboard Display (User Selectable) This port can be configured to receive commands and transmit weight data to a serial printer or scoreboard. Baud rates are user selectable at 600, 1200, 2400, 4800, 9600 or 19,200. (Default 9,600)

Mounting Options

- Din Rail Mount
- Panel Mount

Power Supply

- AC
- DC

Communication Options

- Ethernet/IP™ - Key Code Activation Required
- DeviceNet™ - Slave
- PROFIBUS®

NOTE *PROFIBUS® is a registered trademark of PROFIBUS International.*

NOTE *DeviceNet™ and Ethernet/IP™ are trademarks of ODVA™.*

FIG. 1 HI 4050 WEIGHT PROCESS CONTROLLER

Standard features include a selectable 10/100 Base T Ethernet port and embedded web server to link performance diagnostics and configuration data to and from your local Intranet, Extranet, VPN or via the Internet (World Wide Web). An available DeviceNet interface allows multiple applications to be viewed and controlled from one display and enables 3rd party I/O to be easily added to the system. Mapped I/O saves you wiring costs by distributing the I/O where you need it, at the process or in the control room. The available Ethernet/IP port allows the user to integrate the controller into their corporate network, enabling data to be transferred to and from a PLC® (Programmable Logic Controller), DCS (Distributed Control System) or computer network.

NOTE *PLC® is a registered trademark of the Allen-Bradley Corporation.*

The HI 4050 INTEGRATED TECHNICIAN, in conjunction with an IT Junction Box, provides built-in diagnostics enabling you to troubleshoot and diagnose your weighing system from the front panel, web browser or over a network. You can read individual load sensor voltages and weights, make comparisons and isolate individual system components for quick and easy troubleshooting.

Typical Applications

- Filling a Vessel Using a Feeder - Filling is adding (gain-in-weight) of a material into a container on a scale.
- Sequential Batch Control - A gain-in-weight application where multiple ingredients are added one at a time into a single weight hopper.
- Level Monitoring - Maintaining material levels in various vessels.

- Dispensing to a Vessel - Dispensing is the adding of a material by (loss-in-weight) from a vessel on a scale to a container which is off the scale.

Connectivity

The HI 4050 enable operators to use the selectable 10/100 Base T Ethernet port and its embedded web server to link performance, diagnostics and setup data to and from your intranet, extranet, VPN or the internet. The available DeviceNet or Ethernet I/P interface allows multiple applications to be viewed and controlled from a display and additional 3rd party I/O to be easily added to a system. The controller has a single RS-232 serial port configured as a printer port.

Mapped I/O

Mapped I/O saves wiring costs by distributing the I/O where you need it, at the process or in the control room. The controller is a DeviceNet Scanner and the DeviceNet Scan table is configured by using RS NetWorx®. Available interfaces for Ethernet/IP and DeviceNet provide communications to PLC, DCS or computer controlled systems.

WAVERSAVER®

Typically mechanical noise (from other machinery in a plant environment) is present in forces larger than the weight forces being detected. The HI 4050 is fitted with WAVERSAVER technology that eliminates the effects of vibratory forces present in all industrial weight control and measurement applications. By eliminating almost all of the ambient vibratory forces the controller is capable of identifying the actual weight data. WAVERSAVER can be configured from the front panel to ignore noise with frequencies as low as 0.25 Hz. One of four higher additional cut off frequencies can be selected to provide a faster instrument response time. The default factory setting is 0.50 Hz vibration frequency immunity.

C2® Calibration

C2® Electronic Calibration enables a scale system to be calibrated electronically without using certified test weights which equals the system's load capacity. A C2® weighing system consists of up to eight load sensors, a junction box, interconnect cable and an instrument with C2® capabilities such as the HI 4050 Weight Controller. All Hardy Instruments C2 certified load sensors contain digital information detailing its unique performance characteristics. The HI 4050 Weight Controller reads the performance characteristics of each individual load sensor and detects the quantity of load sensors in the system. Calibration is performed by simply adding a reference point from the front panel or the Web Server. The reference can be zero (no weight on the scale) or alternatively, a known weight on the scale.

NOTE *WAVERSAVER® and C2® are registered trademarks of Hardy Instruments Inc.*

Integrated Technician™

The HI 4050 INTEGRATED TECHNICIAN™ (IT®) in conjunction with an IT junction box provides built-in System diagnostics that makes it possible to diagnose weighing system problems from the front panel or over the available networks. IT reads individual load sensor voltages and weights and isolates individual system components for quick and easy troubleshooting.

Secure Memory Module (SMM - SD)

The Secure Memory Module is a Non-Volatile Secure Digital Card (Min. Storage 126 Megabytes) that stores critical configuration (up to 4 set points), calibration and setup data of the HI 4050 Weight Controller, thereby protecting this information from loss and/or corruption. The SD Card dramatically increases the HI 4050 non-volatile storage capacity and flexibility. Furthermore the SD Card can be read by a PC with an SD card reader. Each controller is equipped with one SD Card, for additional SD Cards and SD Card Readers, Writers and Adapters, contact your local Hardy Representative or the Hardy Instruments Service Center for price and availability.

NOTE *Hardy supports Hardy Branded SD Cards and readers only. Other non Hardy branded products are not supported.*

List of Model Numbers

An example of a possible number: **HI 4050-DR-AC-EIP-N2-N3**

HI 4050

- Blind Din Rail Mount, AC powered with Ethernet/IP com. port.

Mounts

- DR

- Din Rail

- PM

- Panel Mount with Local or Remote Display

Power Supply

-AC

- AC Voltage

-DC

- DC Voltage

Internal Options

-EIP

- Ethernet/IP

-N1

- No Internal Option

-MD

- Modbus/TCP/IP

-ROC

- Rate of Change Mode

Network Options

-DN

- DeviceNet

-N2

- No External Network

-PD

- Profibus

Auxiliary Options

-N3

- No Auxiliary Options

Output Options

-4ANA

- Analog Output Option - Network Slot

-4ANB

- Analog Output Option - Option Slot

-DIO

- Digital I/O Option - Option Slot

Rate of Change Option

The ROC option measures and displays the rate at which a material enters or is dispensed from the scale over a period of time. To develop ROC data, a register is used that is 21 entries in length. New weight values are written to the register at the rate of 1/20th of the time base. The first register is subtracted from the 21st Register. The 21st register is one time base older than the 1st register. The time frame can be set to units per second, minute or hour. A time base of discrete values is selectable from 1 to 1800.

Analog Output Option

Each of four independent Analog Outputs per option card are configured from the front panel or the embedded web server. this option allows the transmission of Gross, Net, available Rate-of-Change (ROC) or “mapped” weight as 0-5V or 0-10V over two of the outputs and 0-20 mA or 4-20 mA over the other two outputs. All four outputs are independent of each other. It also is possible to span these ranges over a portion of the weight data with a resolution of 16,000 counts for each channel. All parameters can be mapped to these Analog Outputs.

Digital I/O Option (Pending)

Available Communications

DeviceNet

The DeviceNet Network is an open, global industry standard communication network designed to provide an interface through a single cable from a programmable controller or PC directly to all HI 4050 instruments as well as smart devices such as sensors, push buttons, motor starters, simple operator interfaces, drives and other weigh modules.

Ethernet/IP

EtherNet/IP, short for **E**thernet **I**ndustrial **P**rotocol, is an open industrial networking standard that takes advantage of commercial, off-the-shelf Ethernet communication chips and media. Ethernet technology, enables the user to access device-level data from the Internet.The Ethernet/IP networking standard supports both implicit messaging (real-time I/O messaging) and explicit messaging (message exchange). EtherNet/IP is an open network that takes advantage of commercial technology that already exists.

Modbus/TCP/IP

TCP/IP is the common transport protocol of the Internet and is actually a set of layered protocols, providing a reliable data transport mechanism between machines. Ethernet has become the de facto standard of corporate enterprise systems and it has also become the de facto standard for factory networking. Ethernet has matured to the point that the cost of implementing this network solution has been dropping to where its cost is commensurate with those of today's field-buses. Using Ethernet TCP/IP in the factory allows true integration with the corporate Intranet and MES systems that support your factory.

Combining a versatile, scalable, and ubiquitous physical network (Ethernet) with a universal networking standard (TCP/IP) and a vendor-neutral data representation (MODBUS®) gives a truly open, accessible network for exchange of process data. It is also extremely simple to implement for any device that supports TCP/IP sockets.

Simplicity: MODBUS® TCP/IP simply takes the MODBUS® instruction set and wraps TCP/IP around it. If you already have a MODBUS® driver and if you understand Ethernet and TCP/IP sockets, you can, in short period of time, have a driver up and running and talking to a PC.

There are no exotic chipsets required to be purchased from vendors, and you can use standard PC Ethernet cards to talk to your implemented device. As the cost of Ethernet falls, you benefit from the price reduction of the hardware, and as the performance improves from 10 to 100 Mbit and soon to 1 Gbit, your technology moves with it protecting your investment.

NOTE *Mod-BUS® is a registered trademark of Schneider Automated Inc.*

PROFIBUS

The PROFIBUS-DP (Decentralized Peripherals) Communication Profile is designed for efficient data exchange at the field level. The central automation devices, such as PLC/PC or process control systems, communicate through a fast serial (RS485)connection with distributed field devices such as I/O, drives and valves, as well as measuring transducers. Data exchange with the distributed devices is mainly cyclic. The communication functions required for this are defined by the basic DP functions in accordance with the EN 50 170 standard. In addition to these basic functions, DP also offers extended acyclic communication services for the parameterization, operation, monitoring and alarm handling of intelligent field devices. Loading the *.GSD file and setting the Node Address is all you need to begin communicating weighing parameters to and from an HI 4050 Series controller to a PLC, PC or DCS system controller.

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Chapter 2 Specifications

About Chapter 2

Chapter 2 lists the specifications for the HI 4050A Weight Controller. Specifications are listed for the standard instrument and for instruments fitted with optional equipment. The specifications listed are designed to assist in the installation, operation and troubleshooting of the instrument. Service personnel should be familiar with this section before attempting an installation or repair of the instrument.

Number of Channels

- 1 Channel

Update Rate

- 110 Updates per Second

Resolution

- Displayed: 1:985,000 (@3 mV/V)
  1:656,000 (@2 mV/V)
- Internal: 1:1,048,576

Excitation Voltage

- 0-5 VDC

Averages

- 1 to 250 User Selectable in Single Increments

Input

- Up to eight (8) 350 ohm Full Wheatstone Bridge, Strain Gauge Load Sensor/Cells (5 volt excitation) on one vessel.
- Signal Voltage Range 0-15mV

Display

- 128 x 64 Backlit LCD Graphic Display

Display Increments (Graduations)

- 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 user selectable via the front panel key pad and Web Page
- Corresponding weight is dependent on the decimal point location.

Key Pad

- 9 tactile keys
- 4 Soft Keys (Mappable)

Non-Linearity

- 0.0015% of Full Scale

Maximum Zero Tolerance

- 32766

WAVERSAVER®

- 7.5 Hz
- 3.5 Hz
- 1.0 Hz - Default
- 0.5 Hz
- 0.25 Hz

Digital Voltmeter

- Accuracy ± 2% of full scale

Power and Utility Requirements

Voltage

- 24 VDC (Standard)
- 100/240 VAC Universal (Optional)

Frequency

- 47/63 Hz

Power

- 10 Watts maximum with options

Common Mode Voltage Range

- ± 2.5 VDC

Common Mode Rejection

- 100dB @ 50-60Hz

Environmental Requirements

Operating Temperature Range

- -10 to 40º C (14º to 104º F)

Storage Temperature Range

- DR Type: -40 to 85º C (-4 to 185º F)
- PM Type: -30 to 70º C (-40º to 158º F)

Temperature Coefficient

- Less than 0.005% of full scale per degree C for zero and span

Humidity Range

- 0-90% (non-condensing)

Maximum Altitude for Installation

- 2000 Meters (6,562 Feet)

Approvals

- UL

- CUL
- Hazardous Class I, Division 2, Groups A,B,C,D, T4A and Class II, Division 2, Groups E,F,G, T4A
- NTEP
- CE
- CB
- DeviceNet (ODVA)
- Ethernet/IP (ODVA)

Physical Characteristics

Panel Mount

- Depth

  5.125” (130.175mm) Back of the Bezel to rear cable clearance

- Case Dimensions

  2.99”H x 5.65”W x 3.125”D (75.9mm H x 143.51mm W x 79.37mm D)

- Case Material

  Aluminum Alloy (6063-T5)

- Weight

  1.85 pounds (.84 Kilograms)

- Enclosure Rating

  Front Panel NEMA 4, 4X Seal

Din Rail Mount

- Depth

  4.0” (101.6mm) Measured from bottom of the Din Rail Mounting Feet to top of the enclosure)

- Case

  2.99”H x 5.65”W x 3.125”D (75.9mm H x 143.51mm W x 79.37mm D)

Option Cards

Analog Option Card

Current Outputs

- 0-20 mA
- 0- 500Ω isolated load at 20mA

Voltage Output

- 0-10 V, max current 10mA

Resolution

- 32,000 counts over 0 to 20mA and 0 to 10V range

Accuracy

- ≤ 1% initial accuracy, ≤ 1% over temp

Digital I/O Card

The Inputs and Outputs must be mapped. (See Chapter 6, Mapping)

Outputs

- Four non-isolated outputs
- Pulled to ground and current-limited to 250mA.
- Weak 5V pullup (min 3V at 5mA out)
- Protected against input overvoltage above 30V

Inputs

- Three optically insolated inputs
- 24 VDC input k(30 VDC Maximum)
- 3V min input (high), 1V max input (low)
- Input load about 350Ω

Output Wiring

1. **Output 1**
2. **Output 2**
3. **Output 3**
4. **Output 4**
5. **GND**

Input Wiring

6. **Common**

7 **Input 1**
8 **Input 2**
9 **Input 3**

Network Option Cards

Profibus Card

Connector

- 9 pin Serial Connector, female

Chapter 3
Installation

About Chapter 3

All information contained in Chapter 3 pertains to unpacking, cabling, interconnecting and installing the HI 4050 Weight Controller. Alternatives to any specifications contained or implied in this section are not recommended. It is very important that the user and service personnel be familiar with the procedures contained in this chapter, before installing or operating the HI 4050 Weight Controller.

NOTICE: This equlpment is suitable for use in Class I, Division 2, Groups A,B,C,D, T4A & Class II, Division 2, Groups E,F,G, T4A or Non-Hazardous Locations Only.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 2.

AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DECOMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE DIVISION 2.

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS

ADVERTISSEMENT - RISQUE D’EXPLOSION - AVANT DE DÉCONNECTER L’EQUIPEMENT, COUPER LE COURANT OU S’ASSURER QUE L’EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX.

Unpacking

Step 1. Before signing the packing slip, inspect the packing for damage of any kind.

Step 2. Report any damage to the carrier company immediately.

Step 3. Check to see that everything in the package matches the bill of lading.

Step 4. If any items are missing, damaged, or there are any questions, please contact Customer Service at:

Hardy Instruments

3860 Calle Fortunada

San Diego, CA 92123-1825

Phone: (800) 821-5831

FAX: (858) 278-6700

Web Site: http//www.hardyinst.com

E-Mail: hardysupport@hardyinst.com

Step 5. Record the model number and serial number of the HI 4050. Store in a convenient, secure location for reference when contacting Hardy Instruments Customer Service Department or to buy parts or firmware upgrades.

Disassembly and Reassembly Notes and Cautions

- Installation of this equipment must be in compliance with any and all International, National and Local Electrical and Mechanical codes.
- Make sure that any disassembly is done in a clean, well ventilated, properly controlled static environment.
- Always make sure that the assemblies and sub-assemblies are well supported and insulated when doing any repairs on the instrument.
- Place small fasteners, connectors and electrical parts in closed containers so as not to lose parts during reassembly.
- Read all the disassembly instructions before any disassembly begins. Be sure that you are familiar with the procedures. If any of the instructions for disassembly are unclear, contact Hardy Instruments, Technical Support Department for additional information and assistance.

- Do not disconnect any electrical plug, connector or terminal unless an identification tag is present or one is attached. Always note where the connector or plug was attached to the electrical component or wiring harness.
- Always install complete hardware groups (Screws, Washers, Lock Washers, Spacers, Etc.) back to the original point of removal.
- Always replace broken or damaged hardware immediately!
- Always check to be sure that no loose parts are sitting on printed circuit boards or electrical connectors or wires when disassembling or reassembling.
- Always protect printed circuit boards from electrostatic discharge (ESD). Always use approved ESD wrist straps and anti-static pads.

Mechanical Installation

Installing the HI 4050 Weight Controller in a Panel

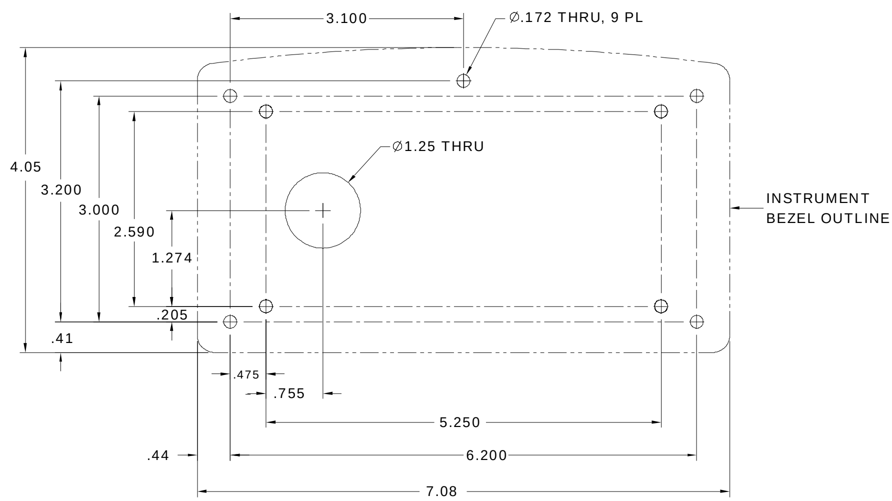


FIG. 2 PANEL HOLE DIMENSIONS

NOTE *Use a torque screw driver and torque each screw to 10 inch/pounds. DO NOT OVERTIGHTEN!*

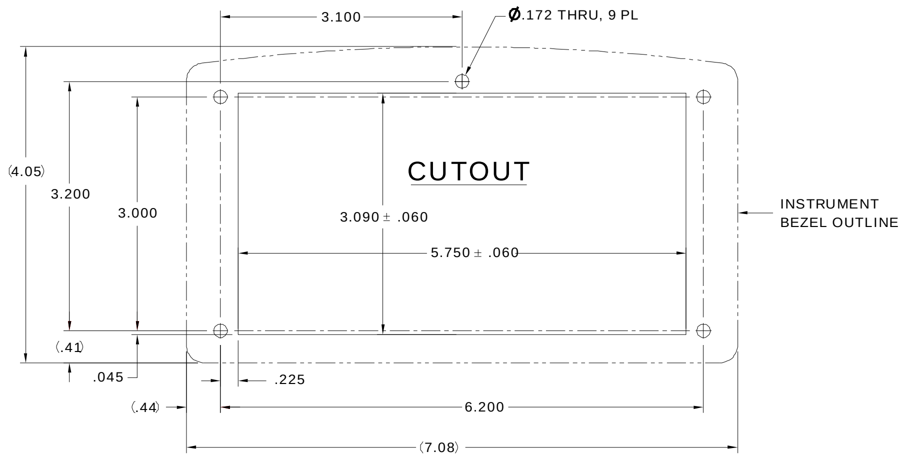


FIG. 3 PANEL HOLE DIMENSIONS (RETROFIT)

CAUTION **You must install the HI 4050 in a NEMA 4, 4X or IP 55 rated enclosure or better.**

> **WARNING - YOU MUST INSTALL THE HI 4050 IN A NEMA 4X ENCLOSURE WHEN USING THIS INSTRUMENT IN A CLASS I or CLASS II ENVIRONMENT.**

Step 1. Make sure that all Electrostatic Discharge (ESD) precautions are taken before and during installation.

Step 2. Use the attached template to make the hole pattern in the panel door or cover. (See Attached)

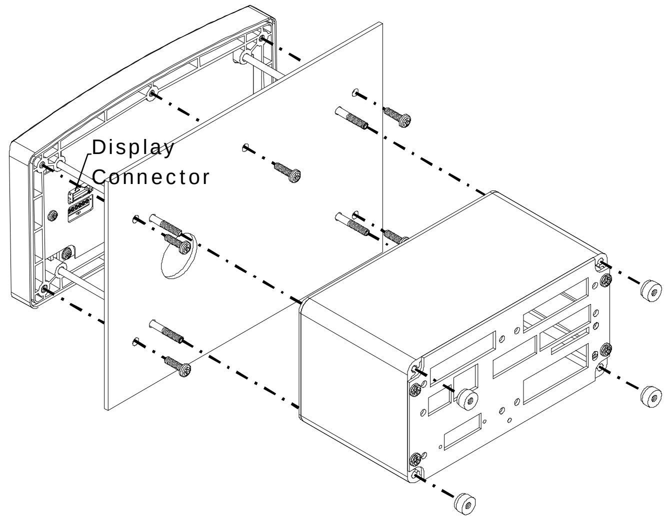


FIG. 4 PANEL MOUNT INSTALLATION

Step 3. Use a phillips head screwdriver and install the five (5) 6-32 x 1/2 inch screws that fasten the bezel to the panel. (See Fig. 4) Use a torque screw driver and torque each screw to 10 inch/pounds. DO NOT OVERTIGHTEN!

Step 4. Thread the four (4) threaded rods through the appropriate holes in the panel and into the bezel. For the retrofit you don't have to place the rods through the holes. (See Fig. 4)

Step 5. Hand tighten each rod until you can no longer turn the rod. Do not force the rods or use pliers of any kind.

Step 6. Put the Display cable and connector through the 1 inch hole in the panel door or cover and plug the display connector into the display header in the bezel. (See Fig. 5)

Step 7. Gently slide the electronic enclosure onto the threaded rods while making sure the display cable glides easily and does not kink. (See Fig. 5)

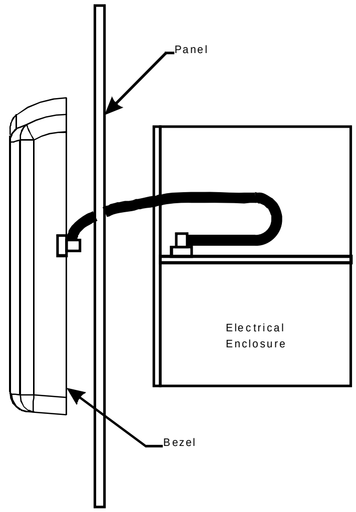


FIG. 5 THREADING DISPLAY CABLE INTO ELECTRICAL ENCLOSURE

Step 8. Move the electronic enclosure toward the panel until it stops. (See Fig. 5)

Step 9. Thread the four (4) 6-32 thumb screws onto the threaded rods until tight. Do not use pliers on the thumb screws.

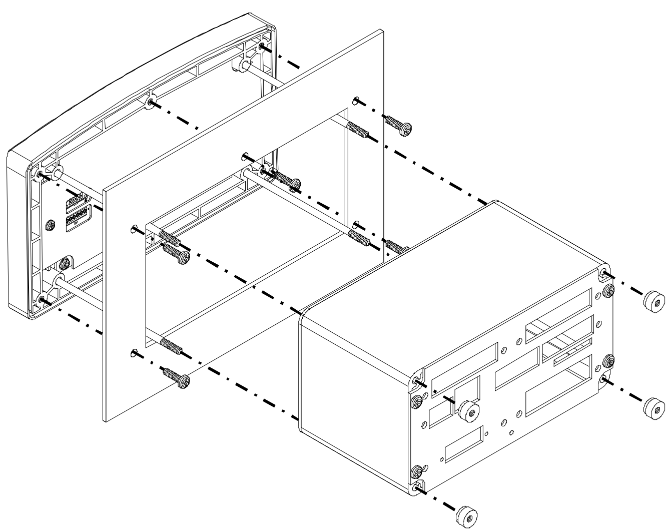


FIG. 6 RETROFIT PANEL MOUNT INSTALL FOR HI 2151/30 & HI 2110

DIN Rail Installation HI 4050 Weight Controller

Step 1. Snap the DIN rail mounting feet into any of the two holes on the front panel of the electronic enclosure. (See Figs. 7 & 8)

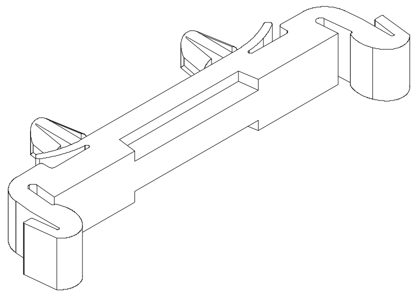


FIG. 7 DIN RAIL MOUNTING FOOT

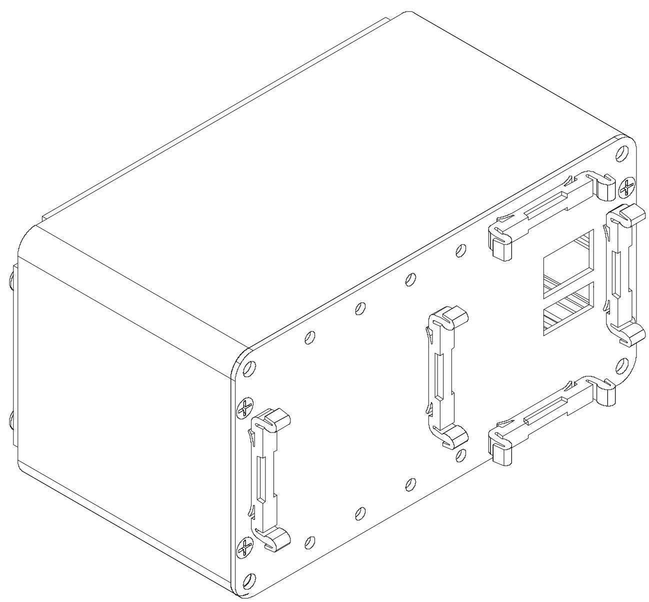


FIG. 8 VERTICAL AND HORIZONTAL ORIENTATION

Step 2. When installing push the mounting feet until you hear a snapping sound. The snap means they are mounted correctly.

CAUTION: **IF YOU DO NOT HEAR A SNAPPING SOUND THE MOUNTING FEET ARE NOT MOUNTED CORRECTLY AND THE INSTRUMENT WILL BE LOOSE WHICH MAY INTERFERE WITH OTHER ELECTRICAL EQUIPMENT OR WIRING.**

Step 3. After installation give each mounting foot a little tug to make sure they are seated correctly.

NOTE *There are several horizontal and vertical mounting options. It is required that at least two mounting feet be used per enclosure.*

Step 4. To mount the enclosure onto a DIN rail. Place the mounting feet on the DIN Rail and firmly press down until the mounting feet snap onto the rail.

Remote Display Installation

Step 1. Install the Electronic Enclosure on a DIN Rail or in a panel within 100 feet of the Electronic Enclosure (Remember the maximum length of the Display Cable is 100 Ft. (30.48 meters)).

Step 2. Use any 6 wire, (Shielded) cable (Minimum 22 AWG).

Step 3. Use the Template that was shipped with the instrument to cut the five holes required for mounting the display on a wall or on the door of an enclosure. (See Fig. 9)

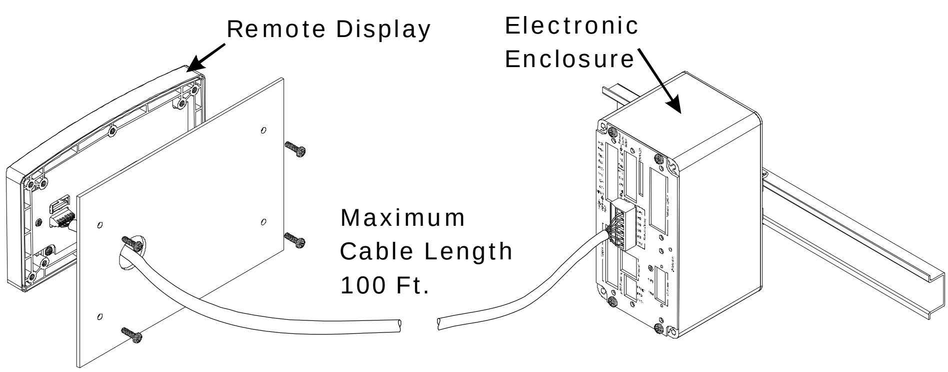


FIG. 9 REMOTE DISPLAY INSTALLATION

Step 4. Connect the cable wires to the display and the Electronic Enclosure. (See Figs. 10 & 11)

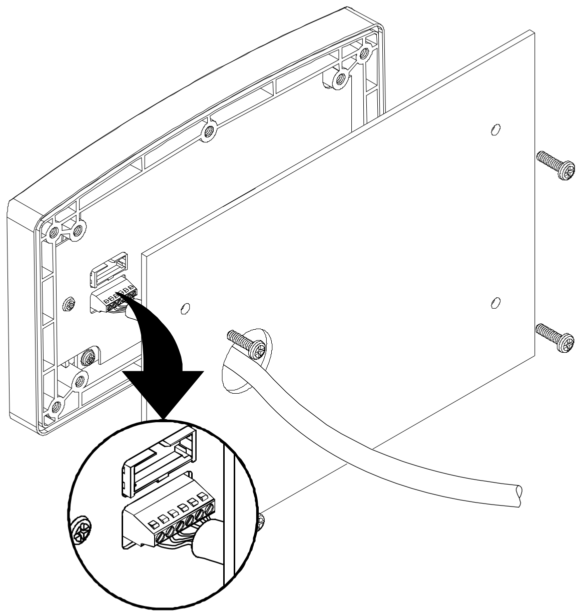


FIG. 10 CONNECTING DISPLAY CABLE TO DISPLAY

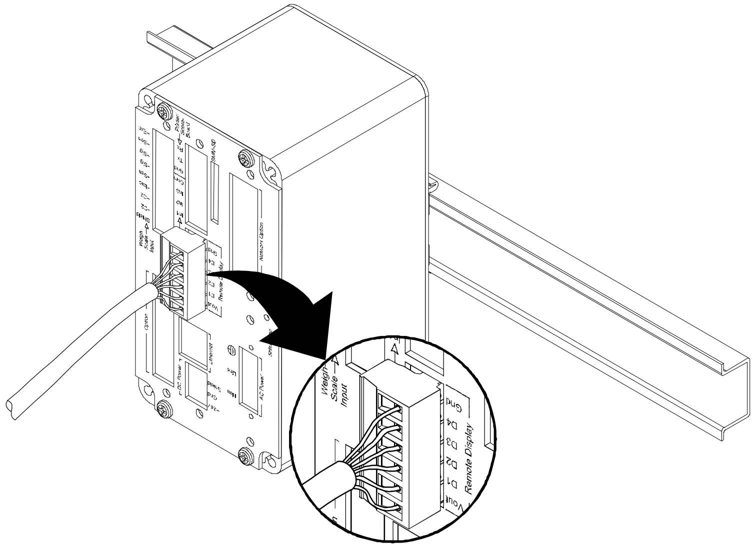


FIG. 11 CONNECTING DISPLAY CABLE TO ELECTRONIC ENCLOSURE

Step 5. Wire the cable connectors as follows:

DISPLAY	ELECTRONIC ENCLOSURE
Voltage In (Vin)	Voltage Out (Vout)
D1	D1
D2	D2
D3	D3
D4	D4
Ground (Gnd)	Ground (Gnd)

Step 6. Strip enough insulation off the cable wires so that you can connect the wires to the Electronic Enclosure, Remote Display connector.

Step 7. Plug the Cable connector into the Remote Display header at the front panel of the Electronic Enclosure.

WARNING - Always turn the instrument off before disconnecting the display connector. Do not hot-swap the display connector. Doing so will cause property damage or personnel injury.

Step 8. Put the cable through the 1 inch hole you cut in the surface where you are going to mount the display.

Step 9. Strip enough insulation off the cable wires so you can connect the wires to the Display connector mounted at the back of the display (See Fig. 10).

Step 10. Use a phillips head screwdriver and install the four (4) 6-32 x 1/2 inch screws that fasten the bezel to the panel or wall. (See Fig. 10) Use a torque screw driver and torque each screw to 10 inch/pounds. DO NOT OVERTIGHTEN!

NOTE *If you are mounting the remote panel in a washdown or hazardous area drill the fifth hole and install with the 6-32 x 1/2 inch screw. (See Fig. 2)*

Installing a Remote Display Only

If you only want a Remote Display and do not want the functionality from the front panel keyboard you can install a remote display by doing the following:

NOTE *You can still configure and operate the HI 4050 from the Web Browser.*

Step 1. Use any 4 wire (Shielded) cable (Min 22 AWG) or if you are using a 6 wire cable do not connect to terminals D3 & D4 on either or both ends of the Remote Display cable. (See Figs. 12 & 13)

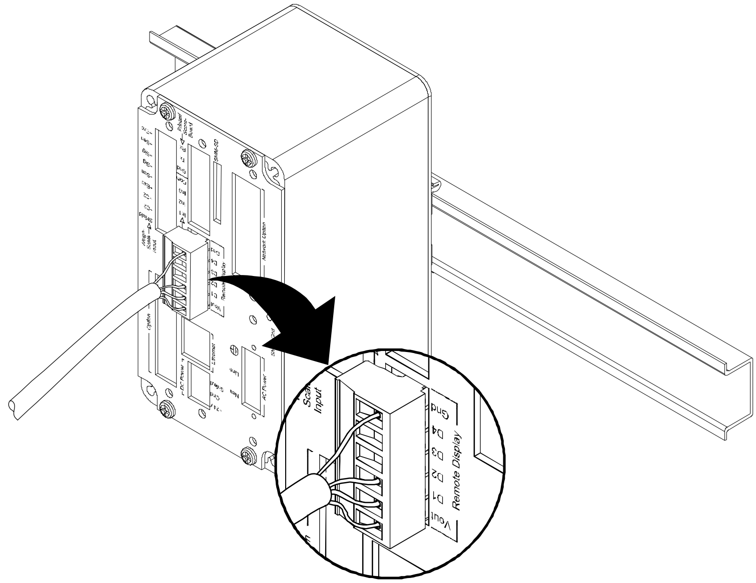


FIG. 12 REMOTE DISPLAY ONLY AT REAR PANEL

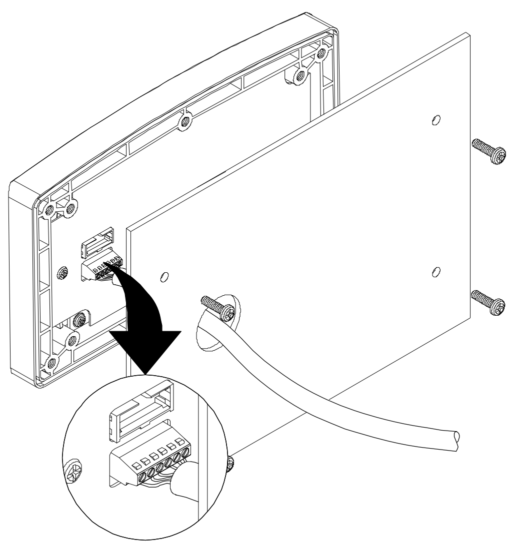


FIG. 13 REMOTE DISPLAY ONLY CONNECTING TO DISPLAY BOARD

Step 2. Wire the cable connectors as follows:

DISPLAY	ELECTRONIC ENCLOSURE
Voltage In (Vin)	Voltage Out (Vout)
D1	D1
D2	D2
D3 Not Used do not Connect	D3 Not Used do not Connect
D4 Not Used do not Connect	D4 Not Used do not Connect
Ground (Gnd)	Ground (Gnd)

Step 3. Connect the cable to the display connector. (See Fig; 13)

Step 4. Plug the connector into the Electronic Enclosure Rear panel header. (See Fig. 12)

Connecting Two Displays

You can connect up to two (2) displays by connecting one display at the front panel and one display at the rear panel. However, the display connected to the rear panel does not have any keyboard functionality. When connecting the display at the front panel (Panel Mount) you have to use the short cable that comes with the unit.

Step 1. Install the display to the front panel per Panel mount instructions above.

Step 2. Use any 4 wire (Shielded) cable and wire the rear panel connector per Remote Display instructions above.

Installing Printed Circuit Boards

Step 1. Line up the Printed Circuit board with the grooves in the electrical enclosure. (See Fig. 14)

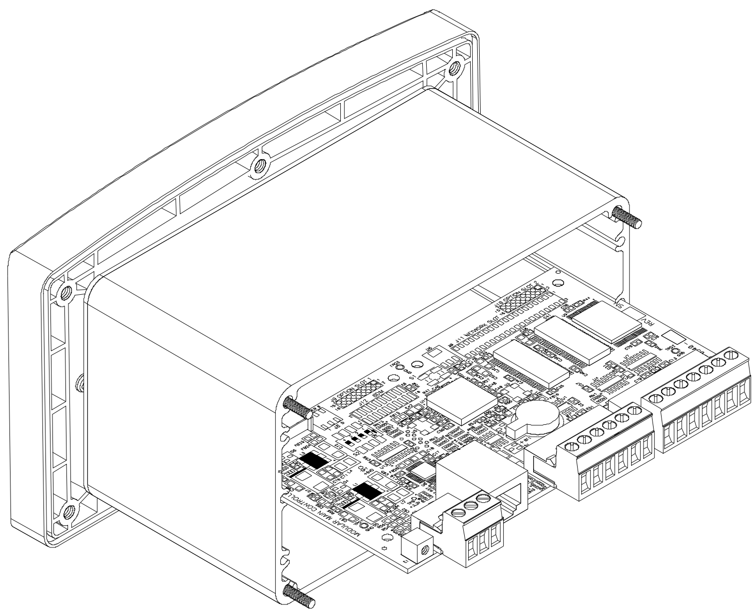


FIG. 14 INSTALLING PRINTED CIRCUIT BOARD INTO THE ELECTRICAL ENCLOSURE

NOTE *The Main Board and options are installed assembled. We are showing the Main Board installation only in Fig. 14 for illustration purposes.*

Step 2. You will normally have the rear panel installed prior to installing or resintalling the printed board assembly. (See Fig. 15)

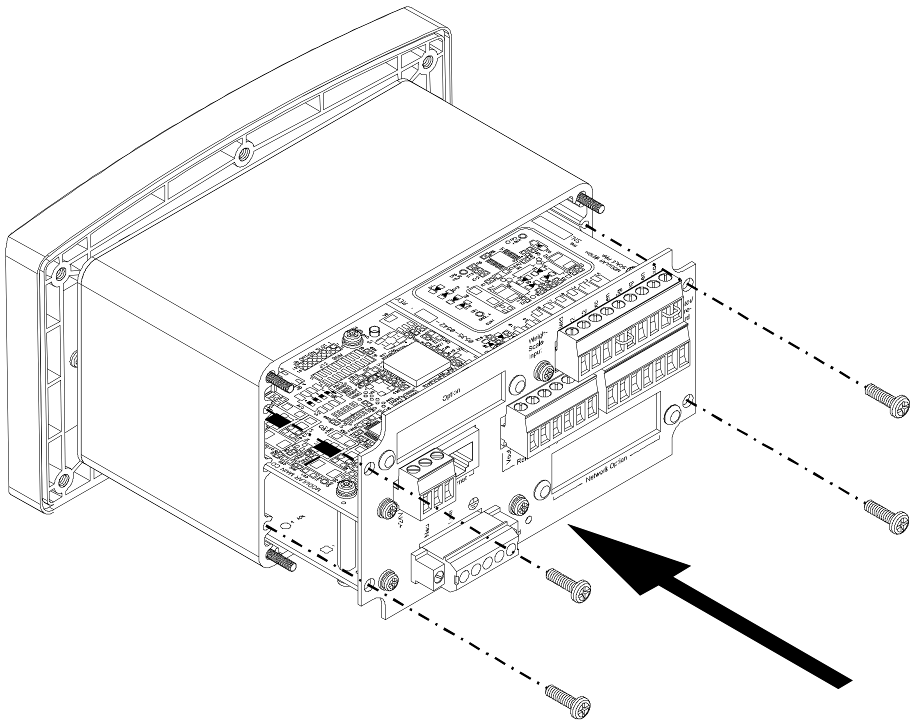


FIG. 15 INSTALLING CIRCUIT BOARDS INTO ELECTRICAL ENCLOSURE

Step 3. Gently slide the circuit boards into the electrical enclosure until rear panel is against the enclosure.

Step 4. Use the four (4) 6-32 x .1875 phillips pan head screws to fasten the rear panel to the electrical enclosure.

Step 5. Use a torque screw driver and torque each screw to 10 inch/pounds. DO NOT OVERTIGHTEN!

Step 6. To disassemble the printed circuit board assembly, reverse Steps 1-5.

Installing the SMM-SD Memory Card

Step 1. Slide the SMM-SD Card into the SMM-SD Slot on the rear panel. (See Fig. 16)

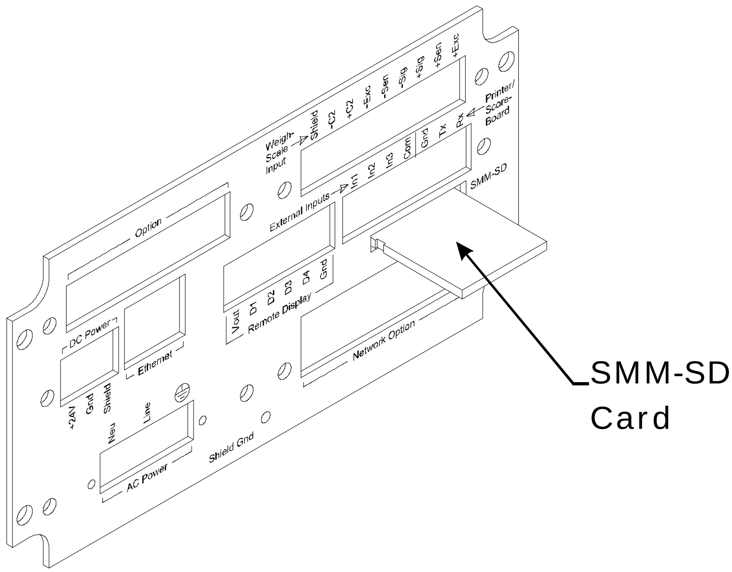


FIG. 16 INSTALLING THE SMM-SD CARD

NOTE *The rear panel may have plugs mounted above the SMM-SD slot. You need to be careful when removing these plugs so that you do not accidently disconnect the SMM-SD card.*

Step 2. Push in the SMM-SD card until you hear a snap indicating the card is seated.

Step 3. To remove the SMM-SD card gently push the card towards the instrument and release the card. The card will pop out a little allowing you to completely remove it from the housing.

Step 4. Always store the SMM-SD card in a Static Free enclosure and in a secure environment so as not to lose the information stored on the card.

Load Point Installation

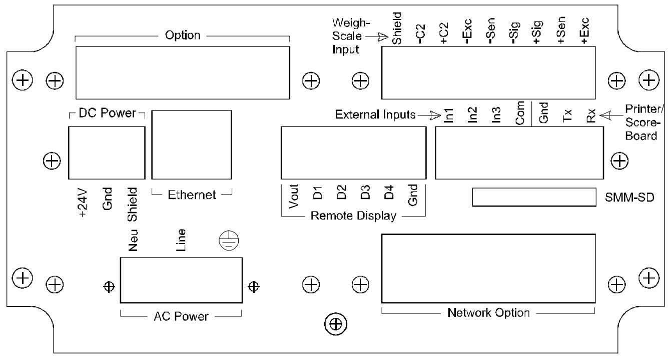


FIG. 17 REAR PANEL

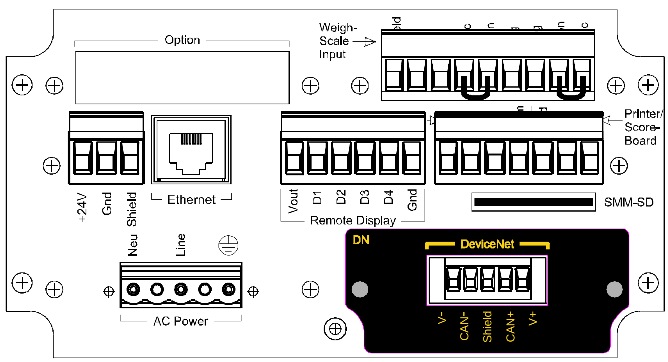


FIG. 18 REAR PANEL WITH DEVICENET OPTION

C2® Load Point Connection

Home run C2 (R) cable from instrument to junction box color Code for C2 Load Points (left to right facing the rear panel):

- ShieldGround Wire
- C2-Violet
- C2+Grey
- EXC-Black
- SEN-Brown

- SIG-White
- SIG+Green
- SEN+BLUE
- EXC+ RED

Step 1. Remove the factory installed jumpers from the terminal block if you are connecting an 8 wire cable from the junction box. (See Fig. 18)

Step 2. Connect the cable (Recommended load cell cable: Hardy Instruments Prt. # 6020-0001) wires to the Channel terminal block according to the cable color chart.

Step 3. Plug the terminal block into the Channel connector on the rear panel.

Step 4. For more information concerning C2 Load Point connection, consult the HI 4050 User Guide.

Non-C2 Load Point Connection

NOTE *Cable Color Codes vary between vendors, check with your supplier for the Color Code for your Non-C2 load point. Do not connect wires to the -C2 and +C2.*

Step 1. Remove the factory installed jumper from the terminal block if you have 6 wire load cell cable that includes sense wires from the load cell or junction box.

Step 2. Connect the cable (Recommended load cell cable: Hardy Instruments Prt. # 6020-0001) wires to the Channel 1 terminal block according to the Non-C2 cable color chart, or per manufacturers specification.

Step 3. Plug the terminal block into the Channel connector on the rear panel.

Printer/Scoreboard Wiring

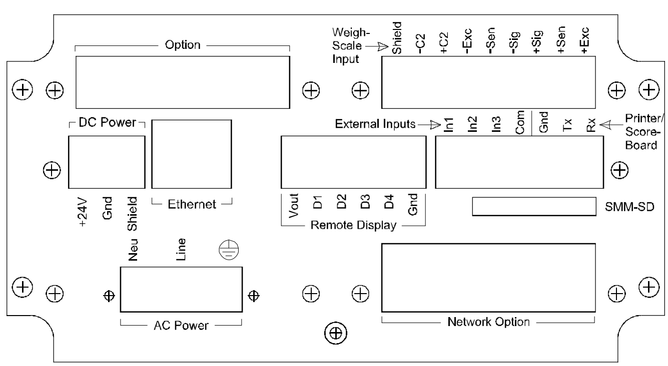


FIG. 19 REAR PANEL

- Printer/Scoreboard Wiring Diagram:

  Serial Gnd to Scoreboard Gnd

  Serial Tx to Scoreboard RX

  Serial Rx (No Connection)

Input Power Wiring

NOTE *It is recommended when you use external overcurrent protection devices the switch and/or circuit-breaker be mounted near the instrument.*

WARNING - Do not plug the power connector into the header with live power. To do so will result in property damage and/or personal injury.

WARNING - If a lithium battery is replaced with an incorrect type it may cause an explosion which will cause property damage or personal injury.

AC Input Power Wiring (-AC)

WARNING - Do not operate with incorrect line voltage. To do so will result in property damage and/or personal injury. Make sure that the power source does not exceed 240 VAC.

WARNING - If an automatic disconnect device is used on the AC input wires, the disconnect must act on both the line and neutral wires in a double pole, double throw arrangement i.e. DPDT Relay. Using other automatic disconnect arrangements may cause personal injury and/or property damage.

- The AC power should be supplied by a “clean” primary line, directly from the power panel. This line should not supply any other equipment, including the feeding unit, and should be supplied with a maximum 20 amp breaker.
- AC Power Input (See Fig. 18)

  Net (Low)

Line (HI)

- Ground

Step 1. The HI 4050 is configured with a universal power supply rated from 120 to 240 VAC.

Step 2. Make sure the VAC power is shut off before installing the wires to the connector.

Step 3. Install a 3-wire, minimum 14 AWG power line to the 3-pin terminal block connector.

DC Power Input (-DC)

WARNING - Do not operate with incorrect line voltage. To do so will result in property damage and/or personal injury. Make sure that the power source does not exceed 24 VDC.

CAUTION **You must use a power limited DC power supply (Class 2) on the DC input wiring.**

- The DC power should be supplied by a “clean” primary line, directly from the DC power source.

Step 1. Make sure the VDC power is shut off before installing the wires to the connector.

Step 2. Connect the 24 VDC Voltage wire, Ground wire and Shield wire to the connector that plugs into the DC voltage header at the rear panel.

Step 3. Plug the connector into the header at the rear panel. (See Fig. 18)

Step 4. Apply VDC power to the unit.

Installing Optional Boards

Installing the Analog Output Card

The Analog Output Card is a plug in option that connects to the Main Control board either from the Network header or Option Slot header. There are four (4) independent Analog Outputs, two current (4-10 mA etc.) and two voltage (1-10 V) which can be configured to any of the instruments parameters over an adjustable 16,000 counts of resolution.

WARNING - The Voltage and Current outputs are not interchangeable. To interchange voltage and current will cause personal injury and/or property damage.

WARNING - The Hardy Analog Card **is** the Analog Source. Do not connect the Analog card to another internal or external Analog Source. To do so may result in property damage and/or personal injury.

Installing the Analog Output Card (-4ANB) in the Network Option Slot

Step 1. Plug the 16 pin board stacker into the J9 header on the Analog board. (See Figs. 20 & 21)

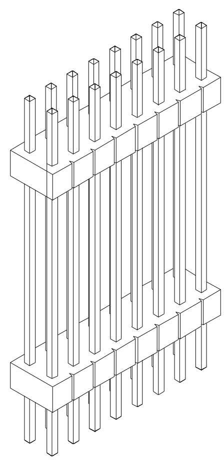


FIG. 20 16 PIN BOARD STACKER

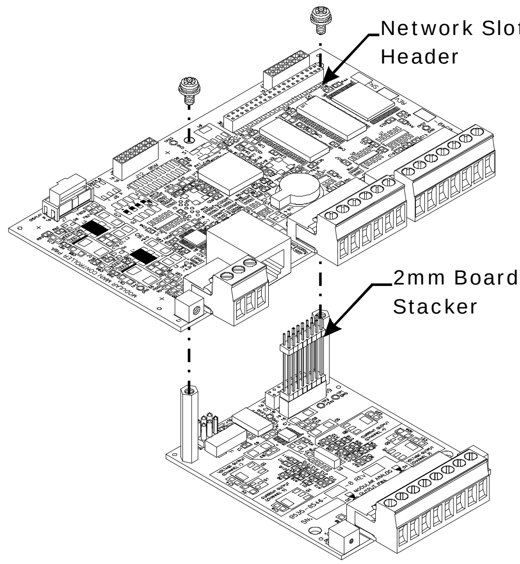


FIG. 21 ALIGNING THE BOARD STACKER PINS WITH THE NETWORK HEADER HOLES IN THE MAIN CONTROL BOARD

Step 2. Align the board stacker pins with the 16 right side pin holes for the Network Slot Header (J41) located on the bottom of the Main Controller board.

Step 3. Using two fingers gently push the board stacker pins into the Network Slot header until the standoffs bottom out on the Main Controller board.

Step 4. Use the four (2) pan head screws (4-40 x .25”) to fasten the standoffs to the Main Controller Board.

Step 5. Peel the protective cover off the Analog Output label.

Step 6. Align the label with the through holes on each side of the Network port.

Step 7. Press the label onto the rear panel making sure that label is evenly sticking to the rear panel.

Step 8. Use the two (2) pan head screws (4-40 x .25”) to fasten the rear panel to the card assembly. (See Figs. 22 & 23)

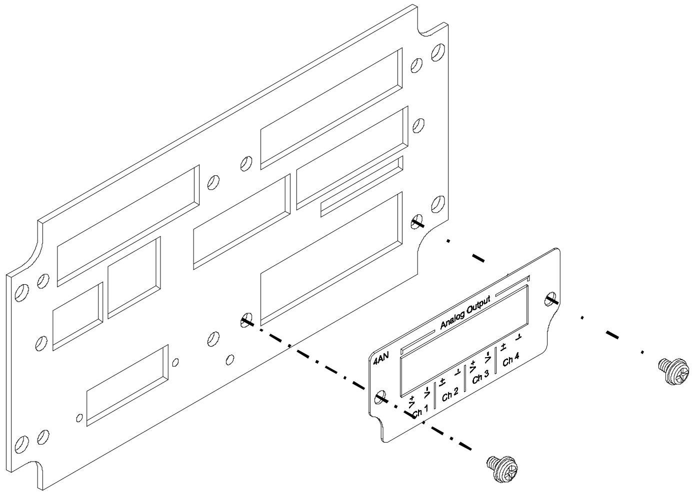


FIG. 22 INSTALLING THE ANALOG OUTPUT LABEL (-4ANA)

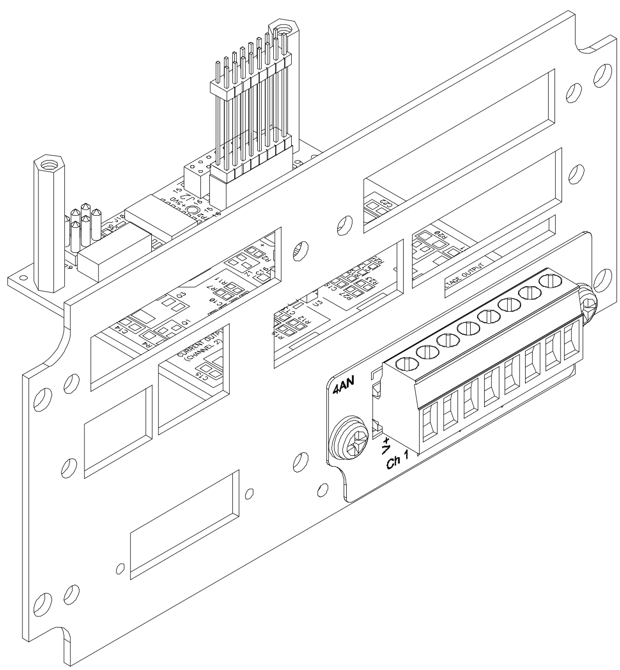


FIG. 23 ANALOG CARD AND LABEL(-4ANA) INSTALLED

Step 9. Slide the board assembly into the chassis until it stops.

Step 10. Use the four (4) pan head screws (6-32 x .1875”) to fasten the rear plate to the chassis.

Installing the Analog Output Card (-4ANB) in the Option Slot

Step 1. Plug the 16 pin board stacker into the J9 header on the Analog board. (See Figs. 24 & 25)

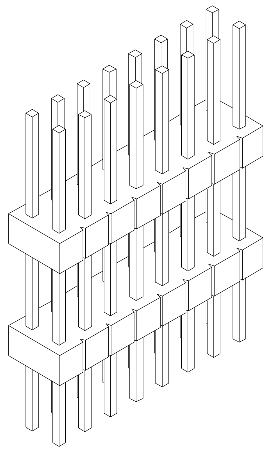


FIG. 24 SMALL BOARD STACKER

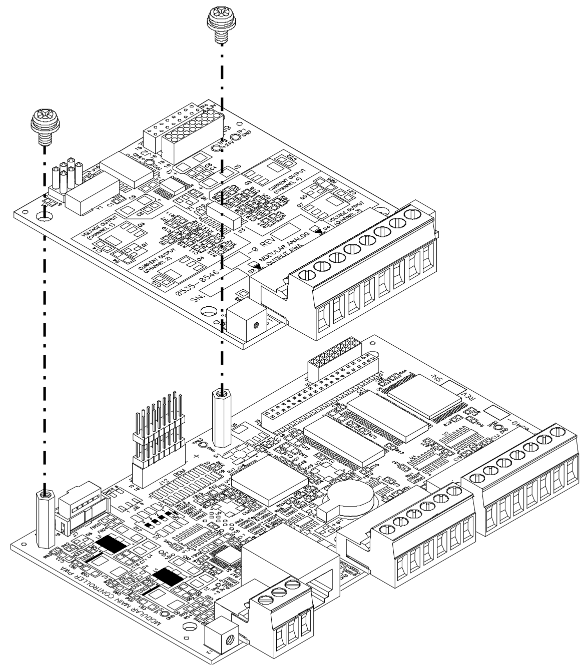


FIG. 25 ALIGNING THE ANALOG OUTPUT CARD WITH THE BOARD STACKER PINS AND STANDOFFS

Step 2. Plug the Board Stacker into Option Slot Header (J9) on the Main Controller board.

Step 3. There are through holes in the Analog Output Card that allow you to plug the Board Stacker into the Option Slot Header (J2) on the Analog Output Option Card. Align the Analog Option Card through holes with the pins of the Board Stacker.

NOTE *Be careful when plugging the Analog Board into the board stacker. The pins can be easily bent.*

Step 4. Gently push the analog board onto the board stacker pins (making sure you align the through holes on the analog board with the 2standoffs on the Main Controller board) until the pins are seated

Step 5. Peel the protective cover off the Analog Output label.

Step 6. Align the label with the through holes on each side of the Option port.

Step 7. Press the label onto the rear panel making sure that label evenly sticks to the rear panel surface.

Step 8. Use the two (2) pan head screws (4-40 x .25”) to fasten the rear panel to the card assembly. (See Figs. 26 & 27)

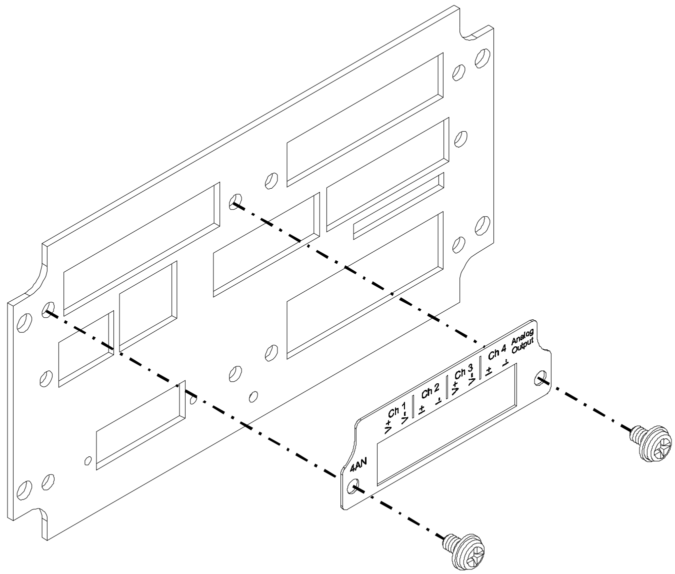


FIG. 26 INSTALLING THE ANALOG OUTPUT LABEL (-4ANB)

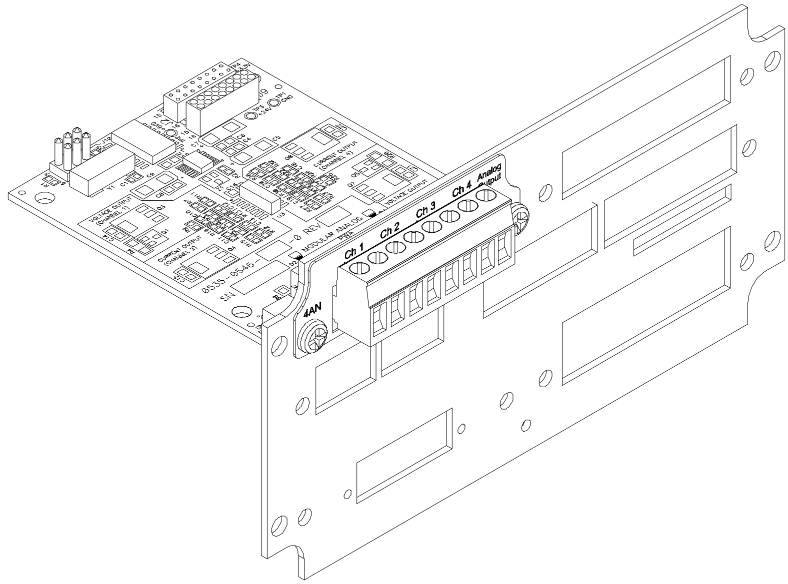


FIG. 27 ANALOG CARD (-4ANB) CONNECTED TO REAR PANEL

Step 9. Slide the board assembly into the chassis until it stops.

Step 10. Use the four (4) pan head screws (6-32 x .1875”) and washers to fasten the rear plate to the chassis.

Analog Wiring

- Channel 1 -Voltage
- Channel 2 - Current
- Channel 3 - Voltage
- Channel 4 - Current

Installing the Digital I/O Option Card (-DIO) in Option Slot Port

The Digital I/O Option Card has three (3) inputs and four (4) outputs which enable you to connect to external relays for switching on a valve, switch etc.

Step 1. The Installation of the Digital board is exactly the same as the Analog Output Card (-4ANB). See Steps 1-10 above for instructions.

NOTE *You can only install the Digital I/O board in the Option Slot.*

Step 2. Peel the protective cover off the Digital I/O label.

Step 3. Align the label with the through holes on each side of the Option port.

Step 4. Press the label onto the rear panel making sure that label is evenly sticking to the rear panel.

Step 5. Use the two (2) pan head screws (4-40 x .25”) to fasten the rear panel to the Digital I/O card assembly. (See Figs. 28 & 29)

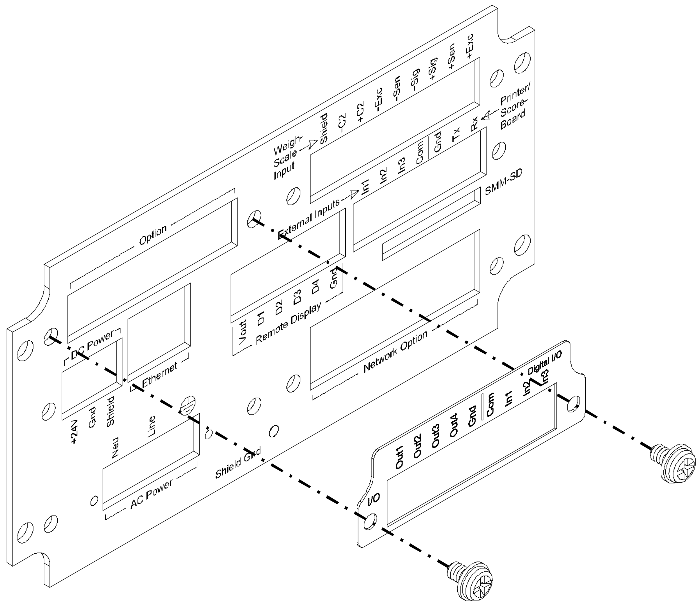


FIG. 28 INSTALLING THE DIGITAL I/O LABEL

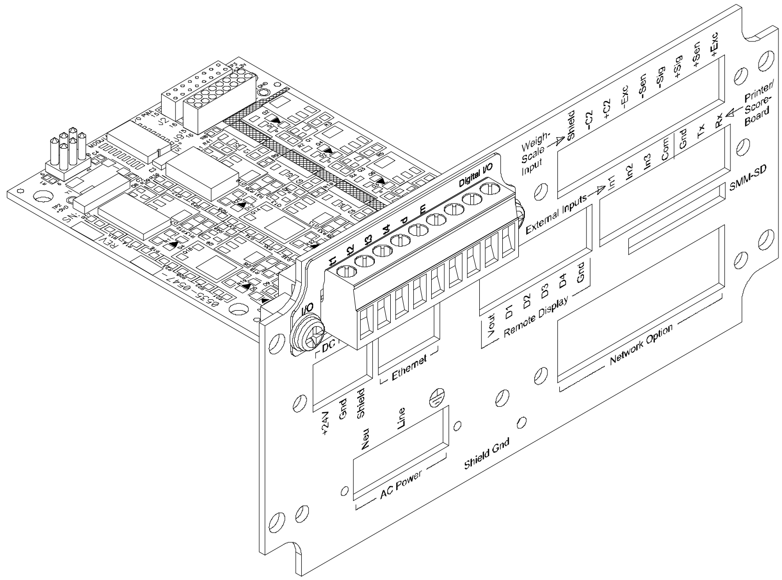


FIG. 29 DIGITAL I/O LABEL INSTALLED

Step 6. Slide the board assembly into the chassis until it stops.

Step 7. Use the four (4) pan head screws (6-32 x .1875”) and washers to fasten the rear plate to the chassis.

Digital Wiring

1 **Output 1**

2 **Output 2**

3 **Output 3**

4 **Output 4**

5 **GND**

6 **Common**

7 **Input 1**

8 **Input 2**

9 **Input 3**

Installing Network Cards

Installing the PROFIBUS Card

Step 1. Plug the 40 pin board stacker into the J11 header on the PROFIBUS board. (See Figs. 30 & 31)

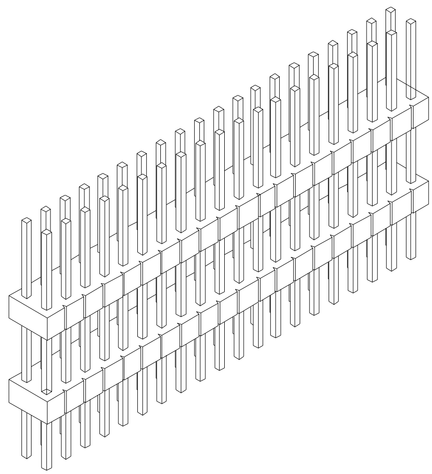


FIG. 30 40 PIN BOARD STACKER

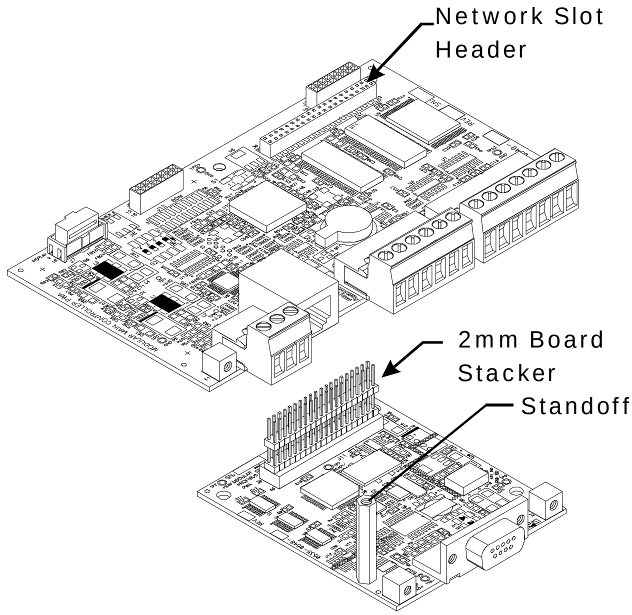


FIG. 31 INSTALLING PROFIBUS CARD

Step 2. Plug the Board Stacker into the Network Header (J11) on the PROFIBUS board.

Step 3. There are through holes in the Main Controller board that allow you to plug the Board Stacker into the Network Header. Align the Main Controller Card through holes with the pins of the Board Stacker.

NOTE *Be careful when plugging the PROIBUS Board into the board stacker. The pins can be easily bent.*

Step 4. Gently push the PROFIBUS board stacker pins into the Network header (making sure you align the through holes on the Main Controller board with the 2 standoffs on the PROFIBUS board) until the pins are seated.

Step 5. Peel the protective cover off the PROFIBUS label.

Step 6. Align the label with the through holes on each side of the Network port.

Step 7. Press the label onto the rear panel making sure that the label evenly sticks to the rear panel surface.

Step 8. Use the two (2) pan head screws (4-40 x .25”) to fasten the rear plate to the PROFIBUS board assembly. (See Figs. 32 & 33)

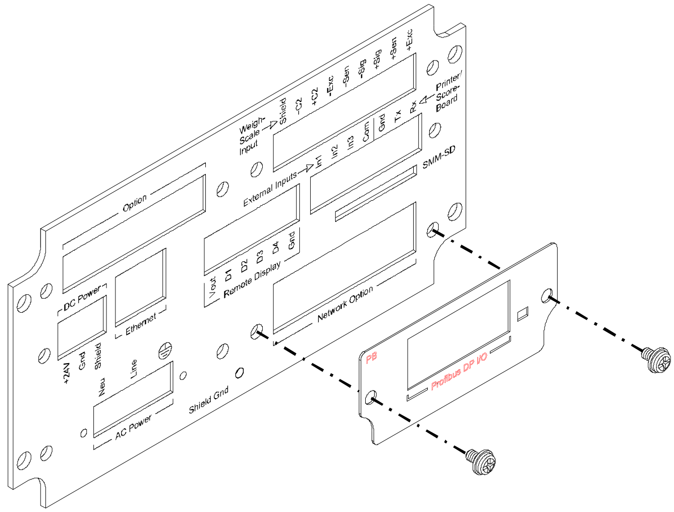


FIG. 32 INSTALLING THE PROFIBUS LABEL

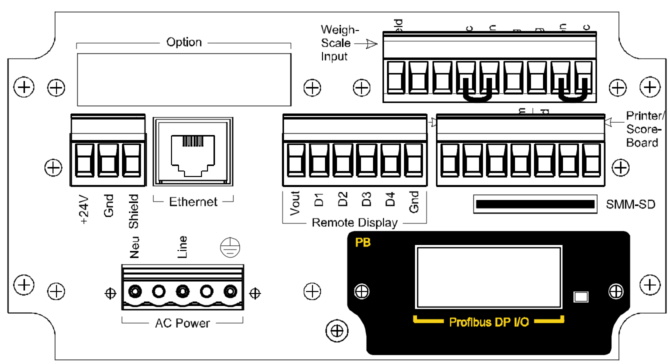


FIG. 33 PROFIBUS LABEL INSTALLED

Step 9. Slide the board assembly into the chassis until it stops.

Step 10. Use the four (4) pan head screws (6-32 x .1875”) and washers to fasten the rear plate to the chassis.

Step 11. Connect the 9 pin male Serial Cable connector to the Serial Port connector on the Profibus card.

Installing the DeviceNet Card

Step 1. Plug the 40 pin board stacker into the J11 header on the DeviceNet board. (See Figs. 34 & 35)

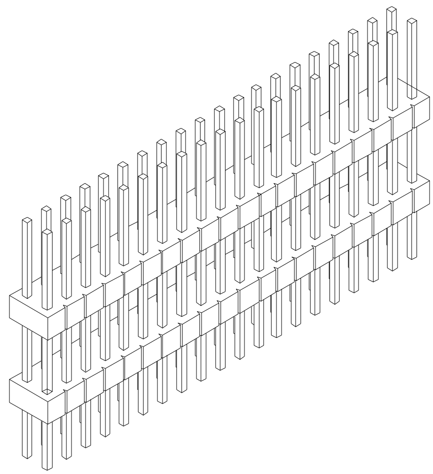


FIG. 34 40 PIN BOARD STACKER

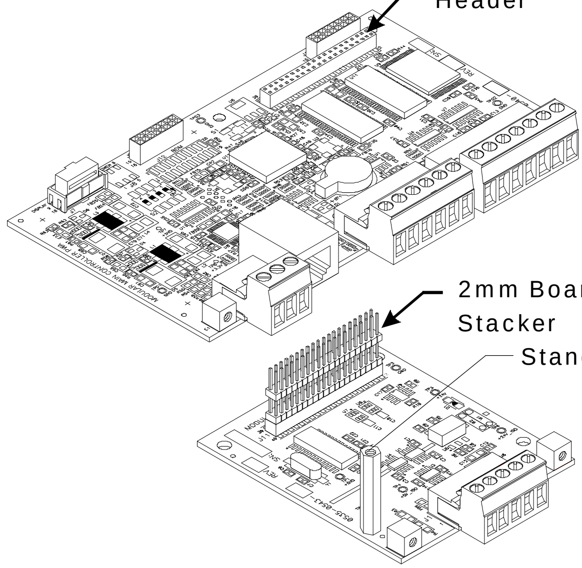


FIG. 35 INSTALLING DEVICENET CARD

Step 2. Plug the Board Stacker into the Network Header (J11) on the DeviceNet board.

Step 3. There are through holes in the Main Controller board that allow you to plug the Board Stacker into the Network Header. Align the Main Controller Card through holes with the pins of the Board Stacker.

NOTE *Be careful when plugging the DeviceNet Board into the board stacker. The pins can be easily bent.*

Step 4. Gently push the DeviceNet board stacker pins into the Network header (making sure you align the through holes on the Main Controller board with the 2 standoffs on the DeviceNet board) until the pins are seated.

Step 5. Peel the protective cover off the DeviceNet label.

Step 6. Align the label with the through holes on each side of the Network port.

Step 7. Press the label onto the rear panel making sure that the label evenly sticks to the rear panel surface.

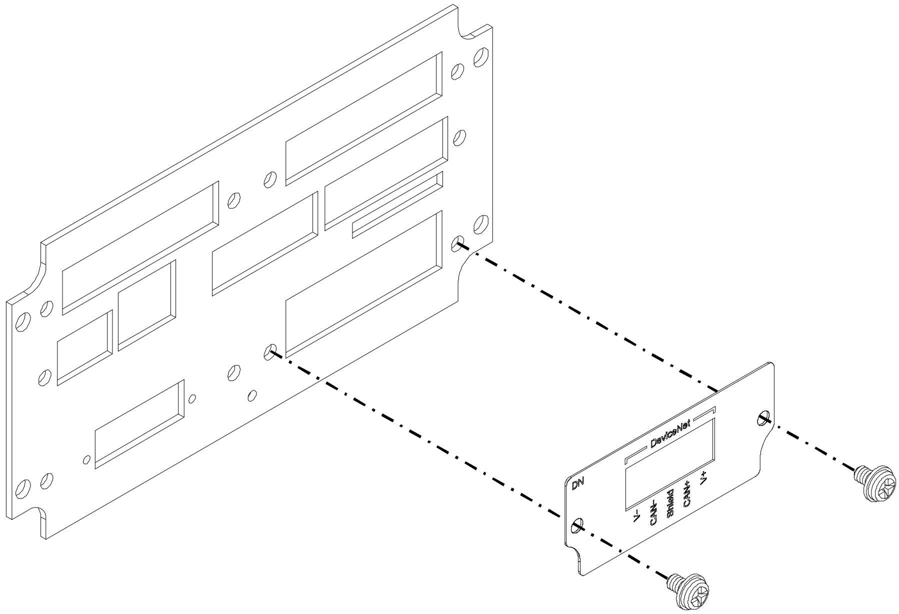


FIG. 36 INSTALLING THE DEVICENET LABEL

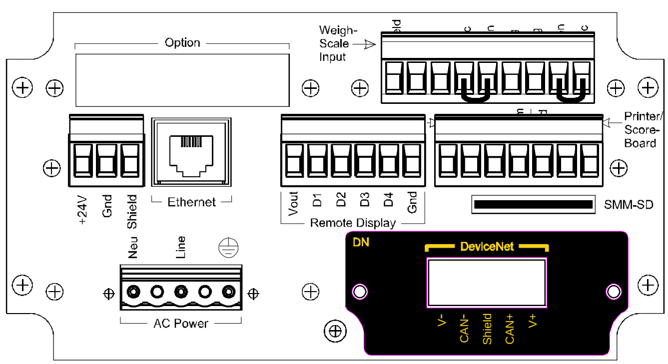


FIG. 37 DEVICENET LABEL INSTALLED

DeviceNet Wiring Color Codes

Left to Right facing the HI 4050 rear panel:

V-	Blue
CAN-	Clear
Shield	Uninsulated
CAN+	Clear
V+	Blue

Starting the HI 4050

Step 1. Connect the power connector (AC or DC) to the HI 4050.

Step 2. The Instrument boots up to the Summary Display. (See Fig. 38)

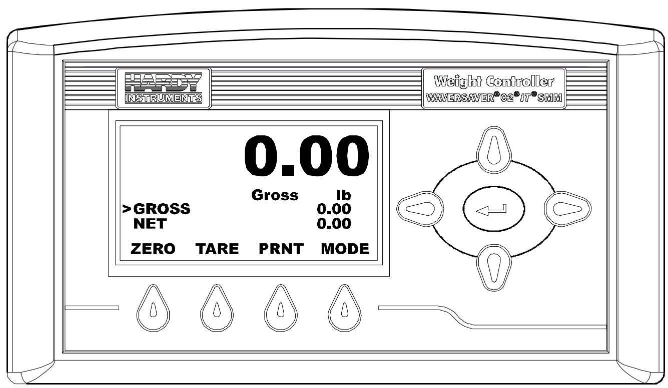


FIG. 38 SUMMARY DISPLAY

Step 3. Press the Enter button to go to the Configuration menus. (See Fig. 39)

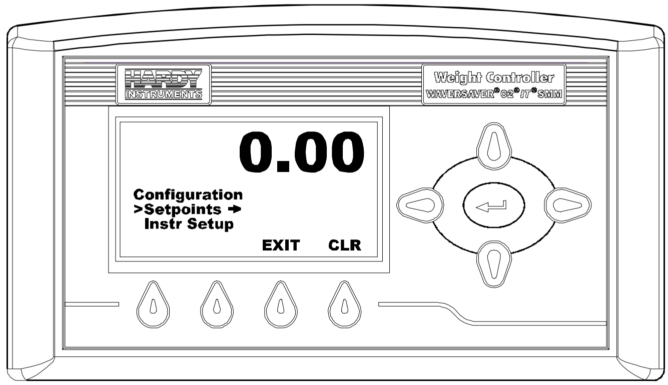


FIG. 39 CONFIGURATION DISPLAY

- Use the HI 4050 Weight Controller User Guide for Configuration, Operation and Troubleshooting instructions.

Downloading Firmware Upgrades (AutoUpdate)

The AutoUpdate program is available through the HI 4050 web browser and the Resource CD. The AutoUpdate program enables you to load Firmware updates to the HI 4050.

Step 1. From the HI 4050 Home Page click on the HI 4050 Links. (See Fig. 40)

FIG. 40 HI 4050 WEB PAGE/CLICKING ON LINKS

Step 2. The HI 4050 Series Support Sight page appears.

Step 3. Click on Downloads. The Downloads page appears.

Step 4. Right click on the latest update file you want to download to your computer. The Save Target As... display appears. (See Fig. 41)

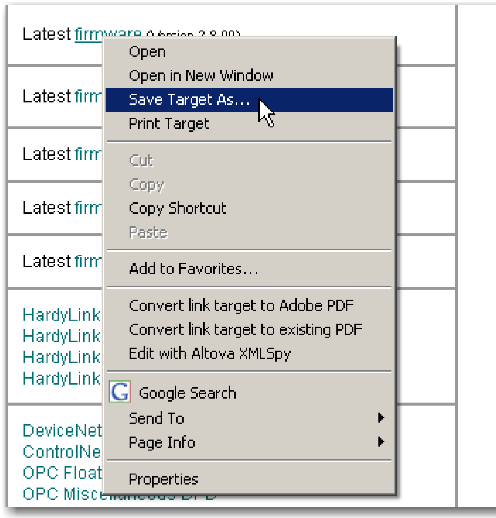


FIG. 41 SAVING LATEST UPDATE FOR THE HI 4050

NOTE *This procedure works in Internet Explorer 6 may not work in other browsers.*

Step 5. Click on Save Target As. The Save As dialog box appears. (See Fig. 42)

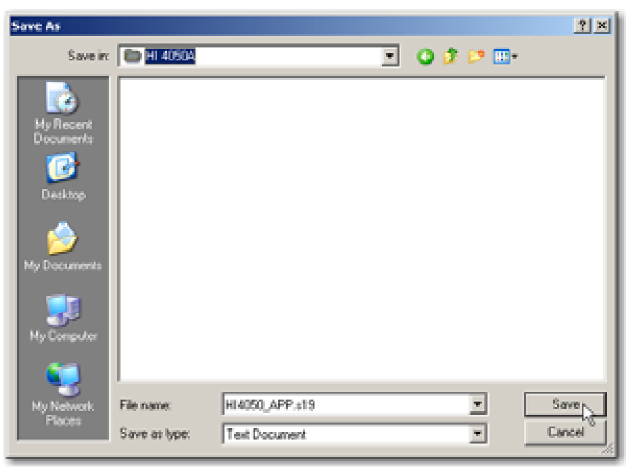


FIG. 42 SAVE AS DIALOG BOX/SAVING THE HI 4050 UPDATE FILE

Step 6. Select the folder you want to save the update file in. In our example we selected the HI 4050A Folder.

Step 7. Click on the Save button. The latest update file is saved to your computer.

Step 8. If you are installing or updating firmware for the first time you will need to download the "AutoUpdate" program.

Step 9. Click on Update. The AutoUpdate install appears. (See Fig. 43)

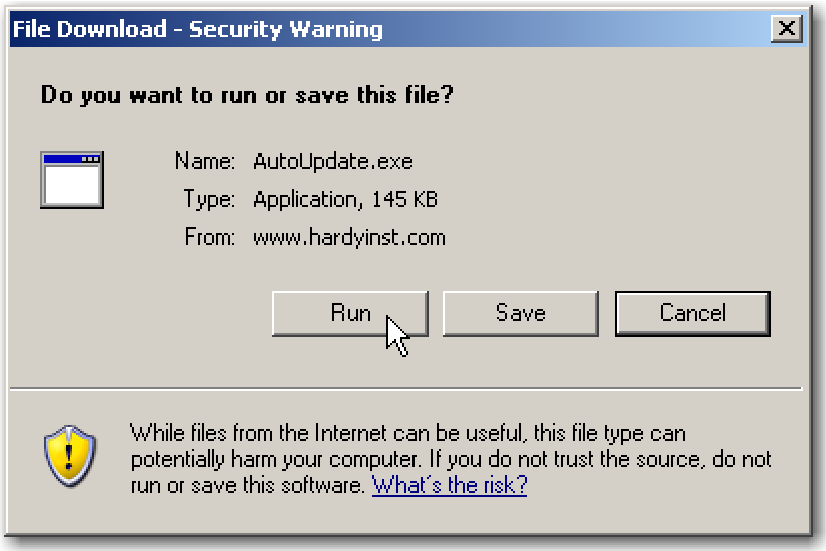


FIG. 43 AUTOUPDATE APPLICATION INSTALL

- If you want to save the AutoUpdate program for future use, save it to your hard disk.
- If you don't want to save the AutoUpdate program press on Run to bring up the Autodate program.

Step 10. Press on Run to install the program or double click on the AutoUpdate.exe file if you saved the AutoUpdate application. The AutoUpdate program appears. (See Fig. 44)

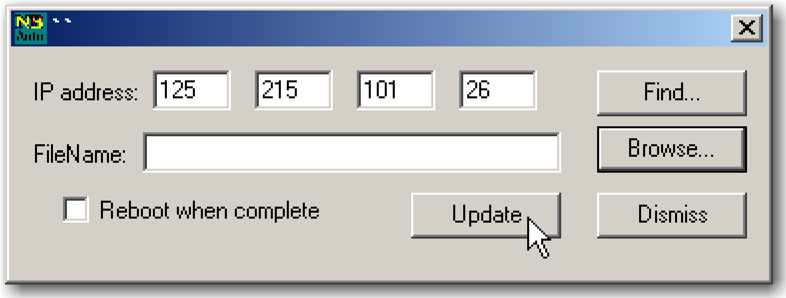


FIG. 44 AUTOUPDATE PROGRAM

- If you want to Find the IP Address of the instrument you want to update, click on the Find button. The AutoUpdate program lists all the Hardy Instruments Controllers that are installed on the network.
- Click on the IP address to select the instrument you want to update.
- If the controller is not on your network. Enter the IP address of the Hardy instrument you want to update in the IP Address fields. (See Fig. 44)
- Click on Browse to find the update file you just downloaded. The Open file dialog box appears. (See Fig. 45)

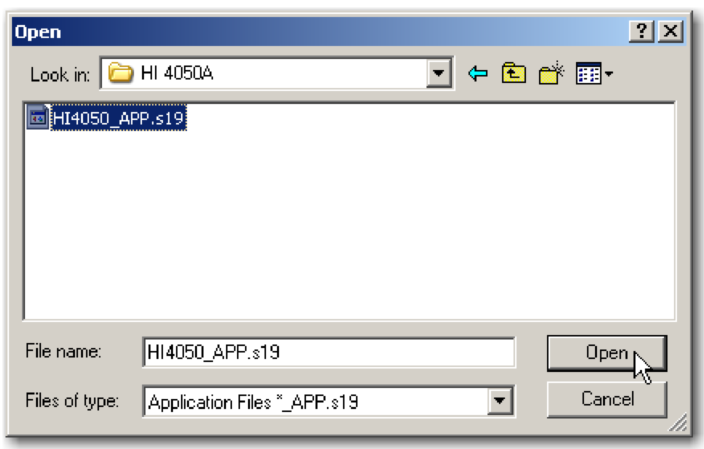


FIG. 45 OPENING UPDATE FILE

Step 11. Click on the Open button. The File appears in the AutoUpdate File Name field.

Step 12. Click on the UpDate button to update the firmware for your HI 4050.

Step 13. When the program asks you for a username enter “hardy” in lower case letters without the parentheses.

Step 14. When the program asks you for a password enter “updatepass” in lower case letters without the parentheses.

Step 15. A “Program complete without errors” message should appear. If this message does not appear. Contact Hardy Instruments Customer Service immediately for further instructions.

Step 16. Click on the OK button.

Step 17. When the update is complete, cycle power on the instrument.

Step 18. The Firmware is updated and ready to operate with the new firmware version.

Chapter 4 Configuration

About Chapter 4

Chapter Four contains step-by-step instructions for configuring the Hardy Instruments, HI 4050 Weight Controller. The procedures include complete instructions for configuring the Weight Controller from the Front Panel and Web Browser and the available communication networks including Ethernet/IP and Devicenet. We highly recommend reading these procedures before configuring the Weight Controller. Being familiar with the configuration procedures insures that the HI 4050 will provide trouble free service. Any alternatives to the procedures, either explicit or implied, in this section are not recommended.

Getting Started

Before operating the HI 4050 Weight Controller, check to make sure the following procedures have been performed:

- Power and Load Point cables are properly installed and in working order.
- Communication cables properly installed and in working order.

All the features of the Weight Controller operate the same no matter what the interface. First let’s get familiar with configuring the HI 4050 from the front panel of the instrument.

Description of the Front Panel

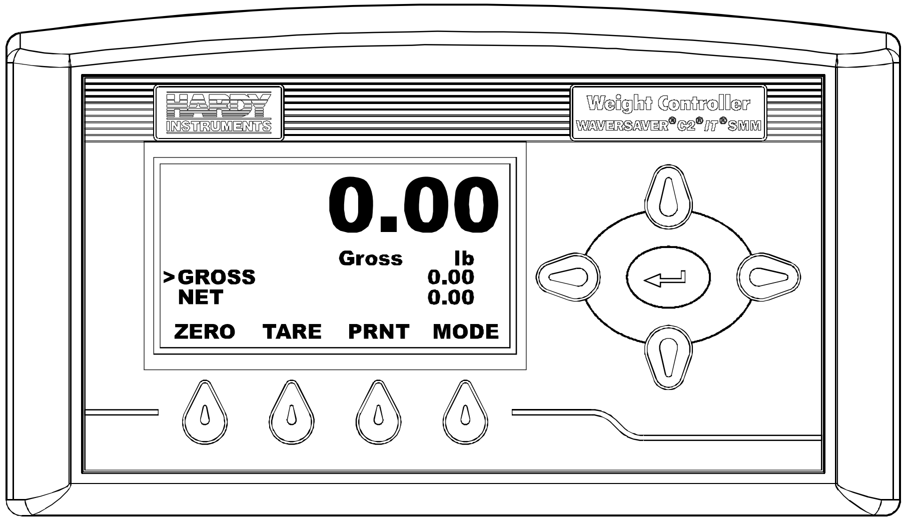


FIG. 46 FRONT PANEL/SUMMARY DISPLAY

Front Panel Display

The Front Panel Display is a 5 line Graphic LCD. The Summary screen displays the current weight in the selected mode (Gross, Net or available Rate of Change) and the selected engineering units (lb, oz, lb/oz, kg, g, Ton, t (Metric Ton)). The screen displays all the menus for Configuration, Calibration, Test and Operation of the HI 4050 Weight Controller. The four buttons below the display activate the function that is displayed above. For example to Zero the instrument press the button directly below the ZERO function. To move from one sub-menu to another press the Up or Down Arrow buttons to the right of the display. The Up or Down Arrow buttons also increase or decrease displayed values. The Left and Right Arrow buttons position the cursor on the display. The Left and Right Arrow buttons are used to select a number in a list.

Button Functions

Zero Button

The Zero button is used in Gross mode to zero the selected scale to within the tolerance level.

- This function can be used as many times as desired as long as the total does not exceed the value entered as the zero tolerance.

Tare Button

Tares the selected scale. The Tare button sets the Net Weight equal to 0. When you are in Net Mode (i.e. a channel displays Net in the Summary display) the weight changes to 0.00. If you are in Gross mode nothing happens however, the Net weight is changed to 0.00.

Print Button

The Print button prints the Gross, Net and Tare weights to an attached printer. If the Rate of Change option is activated the print button prints the ROC as well. If the Scoreboard is activated the Print button does not function.

Up/Down - Left/Right Buttons

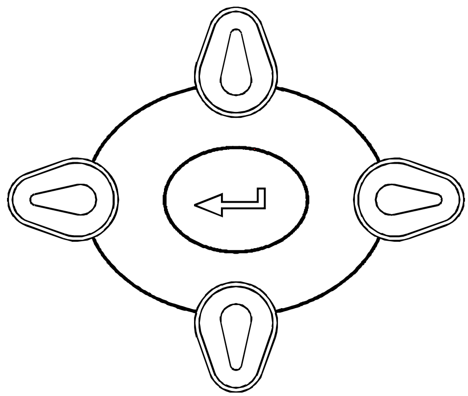


FIG. 47 DIRECTIONAL BUTTONS

the Up/Down arrow buttons move the cursor vertically allowing the user to scroll through each item of a menu. The Up/Down arrow buttons also move the cursor through a pick list. The Left/Right arrow buttons move the cursor horizontally left or right.

Enter Button

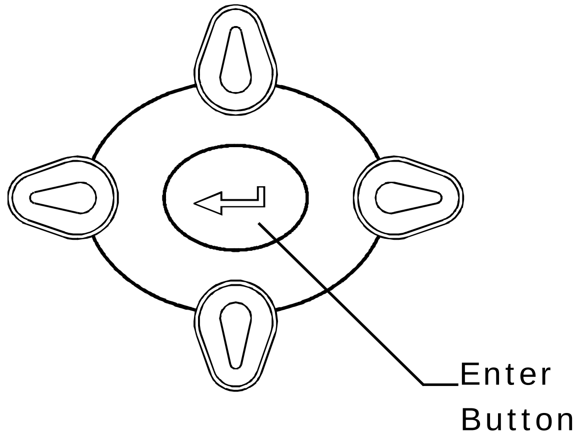


FIG. 48 ENTER BUTTON

The Enter button when pressed enters the Menus and Sub-Menus. The Enter button also enters the configured values or selected items form a pick list into non-volatile memory.

Exit Button

Takes you back to the previous menu. The Exit button only appears when you enter a menu, it does not appear on the Summary Display. (See Fig. 49)

Clear Button

The Clear (CLR) button clears the total Alphanumeric Entry and repositions the cursor for the first entry. (See Fig. 49) It is a good idea when a parameter value exists and you want to change the value to clear it before entering the new value to avoid making mistakes. It only appears when you enter a menu, it does not appear summary or operation displays.

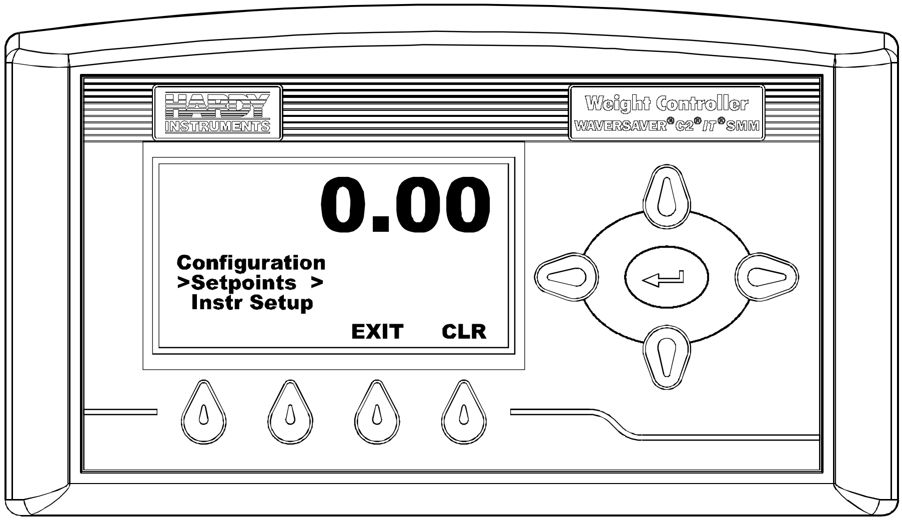


FIG. 49 MENU/EXIT BUTTON

Entering Alphanumeric Values

To enter a number, letter or punctuation mark use the up or down arrow buttons. Move the cursor to where you want to enter the value. Press the Up or Down Arrow buttons until the letter or number you want appears. Press the Right or Left buttons to move the cursor to the next position. The two punctuation marks are the period (.) and the minus (-) sign.

Set Points Configuration

About Set Points

The set point value is the target weight or level. It may be set in either net or gross weight units.

Set Point Limits

Dead Band Limits

- The Dead Band limit is the difference between the set point and the reset.
- The dead band value under normal operations will always be a positive value however the dead band value can be set as a negative value should your application require it. Dead Band limits are used to prevent rapidly fluctuating setpoint states once the set point is reached.

- For example: If a set point value was 1000 pounds and the dead band was set to 5 pounds, the relay would close at 1000 pounds but not open until the weight dropped to 995 pounds. You need to select the Type: Loss in Weight. This would be used if a set point is a high trip limit. Selecting the Type: Gain in Weight and dead band would be used for a low trip limit. Examples are show for Low and High Trip Limits. (See Figs. 42 & 43)

Three General Rules for Set Points

1. **Set points activate at the set point plus the preact.**
2. **Set points deactivate at the set point plus the deadband.**
3. **The deadband should be numerically larger than the preact to prevent rapidly fluctuating setpoint states.**

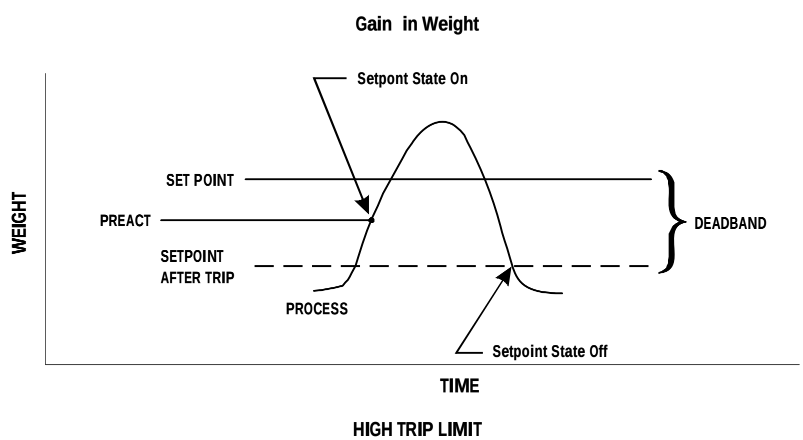


FIG. 50 GAIN IN WEIGHT/HIGH TRIP LIMIT

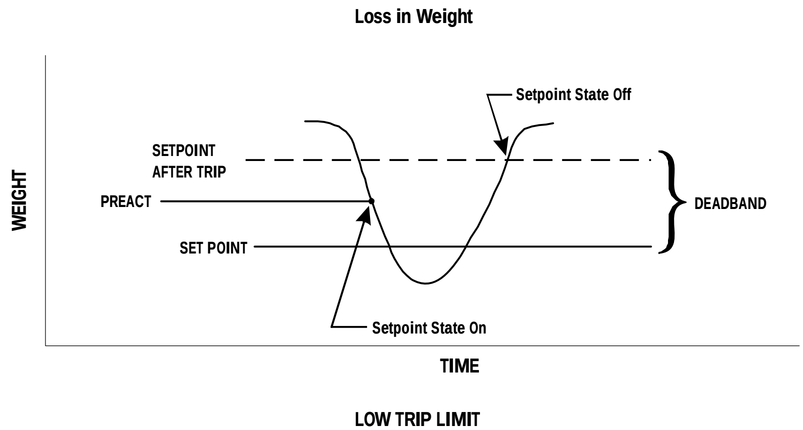


FIG. 51 LOSS IN WEIGHT/LOW TRIP LIMIT

Preact Limits

- The preact value is the difference between the set point and the trip point.
- It is used as an "in-flight" compensation value when filling a vessel. If set to zero, there will be no compensation.

Mode

Specifies which weight source is used as the set point input.

Type

Determines whether the set point turns on when the weight is greater than the set point **target** minus the **preact** and off when the weight is less than the target minus the deadband (Gain in Weight) or if it turns on when the weight is less than the set point target plus the preact and off when the weight is greater than the set point minus the preact (Loss in Weight)

Entering Set Points from the Front Panel

Step 1. From the Summary Display, press the Enter button. The Configuration Menu appears with the cursor in front of Setpoints. (See Fig. 52)

NOTE *On the right hand side of "Setpoints" you will see an arrow. The arrow indicates there are sub-menus for this menu.*

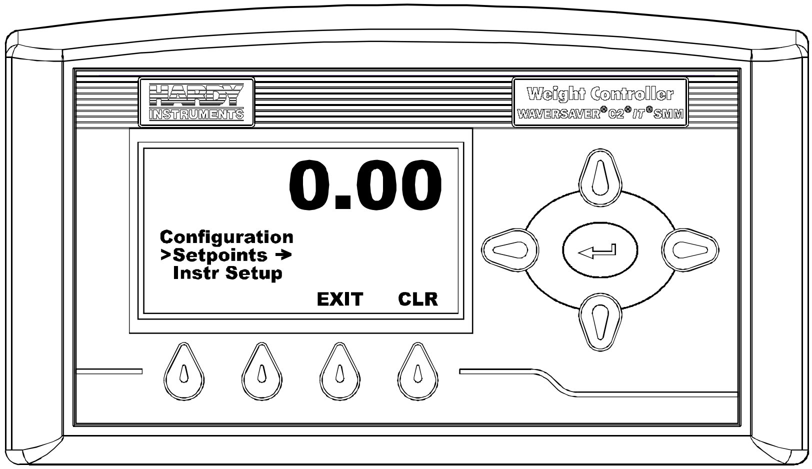


FIG. 52 CONFIGURATION MENU

Step 2. Press the ENTER button. The Set Point Menu appears with Set Point 1 selected.

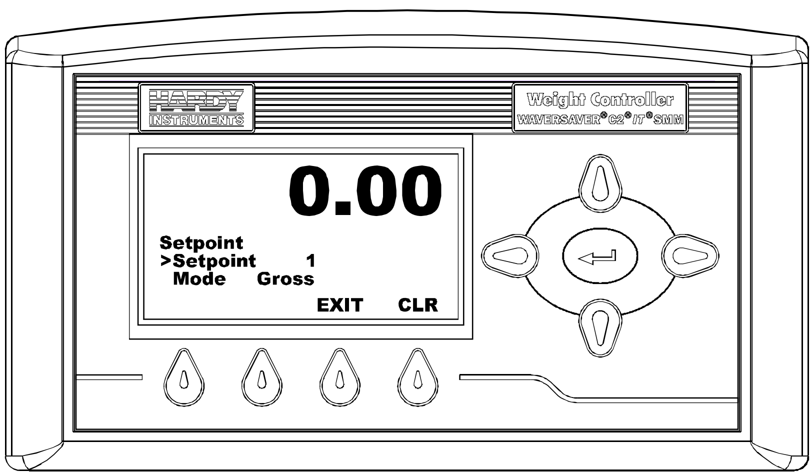


FIG. 53 SET POINT MENU/SELECTING SETPOINT 1

Step 3. There are 4 Set Points. Press the Left or Right Arrow buttons to select the Set Point you want to configure. Pressing the Right arrow button moves up the list and pressing the Left Arrow button moves down the list. In our example we selected Set Point 2. (See Fig. 54)

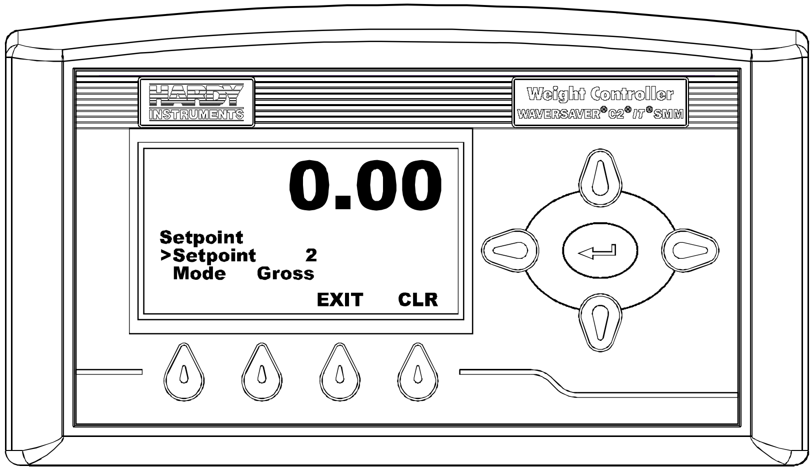


FIG. 54 SET POINT MENU/SELECTING SET POINT 2

Step 4. Press the Enter button to save the selection. You will briefly see a message "Entry Accepted". (See Fig. 55)

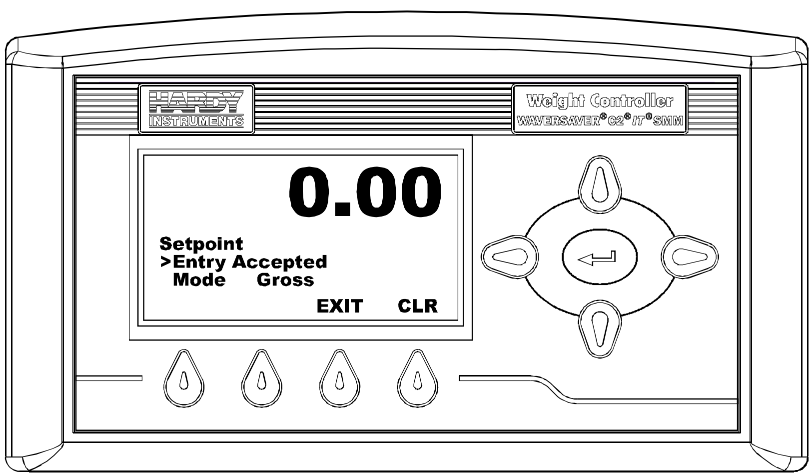


FIG. 55 SET POINT SELECTED/ENTRY ACCEPTED

NOTE *The Entry Accepted appears every time you press the Enter button to save a setting. If the Entry is not accepted an error message appears. For definitions of the error message go to Chapter 7, Troubleshooting.*

Step 5. Press the Down Arrow button until the cursor appears in front of Mode. (See Fig. 56)

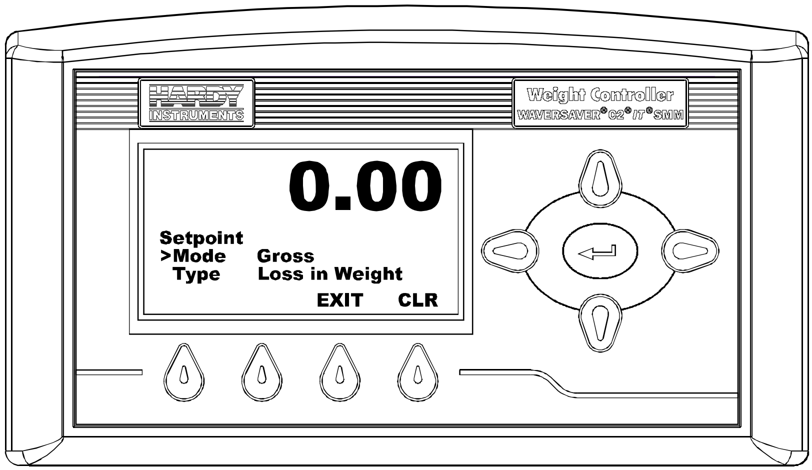


FIG. 56 SET POINT MENU/SELECTING MODE/GROSS

Step 6. Use the Right or Left Arrow to toggle between Gross, Net or available Rate of Change modes. In our example we selected “Gross”.

Step 7. Press the Enter button to save the selection.

Step 8. Press the Down Arrow button until the cursor is in front of “Type”. (See Fig. 57)

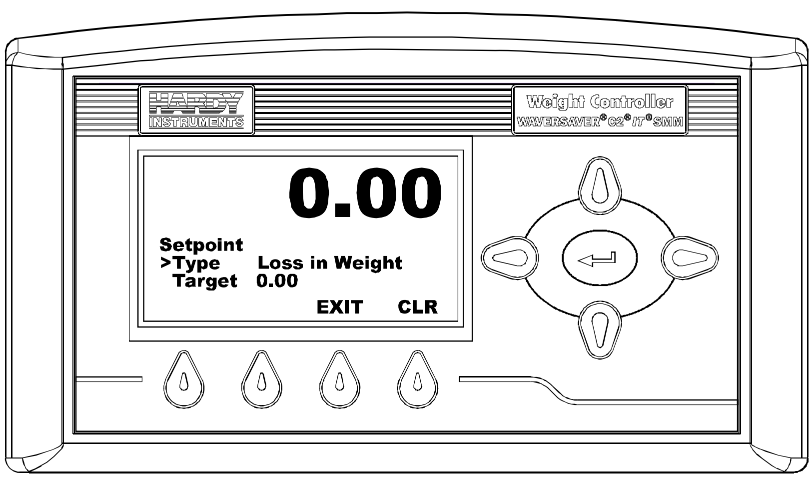


FIG. 57 SET POINT MENU/SELECTING LOSS IN WEIGHT

Step 9. Use the Right or Left Arrow buttons to toggle between “Loss in Weight” and “Gain in Weight”. In our example we selected “Loss in Weight”.

Step 10. Press the Enter button to save the setting. “Entry Accepted” appears briefly.

Step 11. Press the Down arrow button until the cursor is in front of “Target”. (See Fig. 58) The present target value is displayed to the right of the arrow.

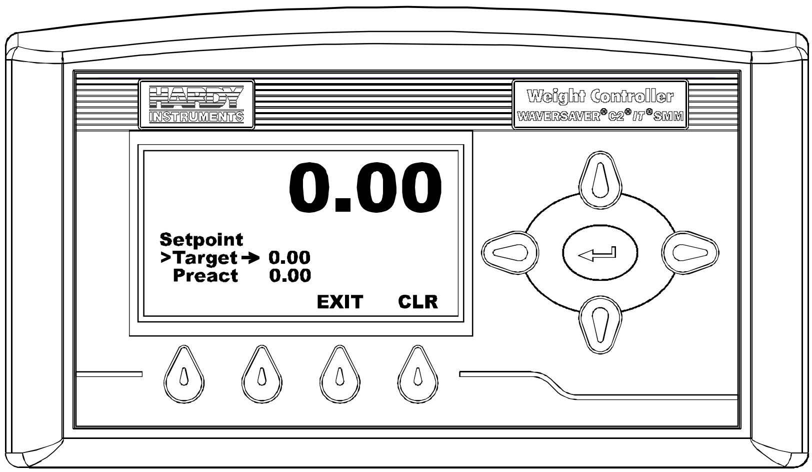


FIG. 58 SET POINT/SELECTING TARGET

Step 12. Press the Enter button. The Target Menu appears. (See Fig. 59)

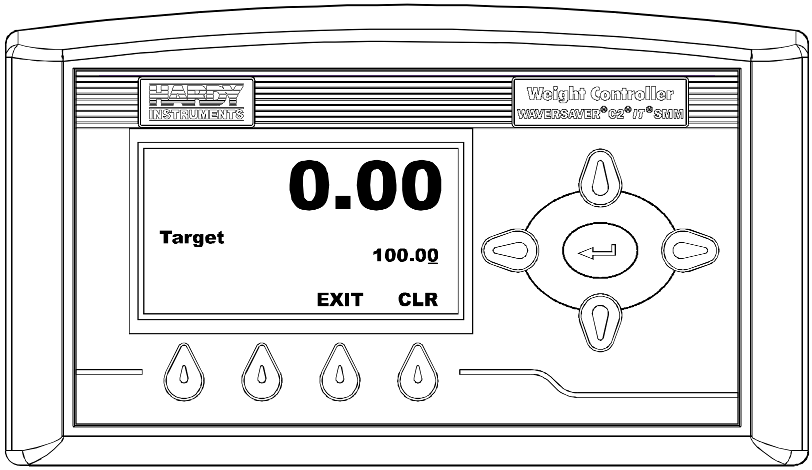


FIG. 59 SET POINT/TARGET MENU

Step 13. Press the Clear (CLR) button to clear the existing Target value.

Step 14. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number or decimal point. In our example we entered 100.00 for our target weight. The weight is in the units you select when you configure the instrument.

Step 15. Press the Enter button. “Entry Accepted” appears briefly. The target weight is saved and the Setpoint Menu appears.

Step 16. Press the down arrow button until the cursor is in front of “Preact” (See Fig. 60) The present preact value is displayed to the right of the arrow.

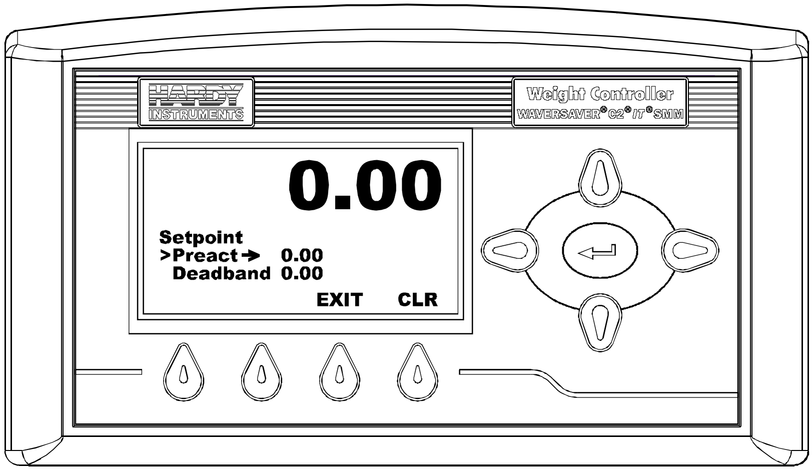


FIG. 60 SET POINT MENU/SELECTING PREACT

Step 17. Press the Enter button. The Preact Menu appears. (See Fig. 61)

Step 18. Press the CLR button to clear the current value.

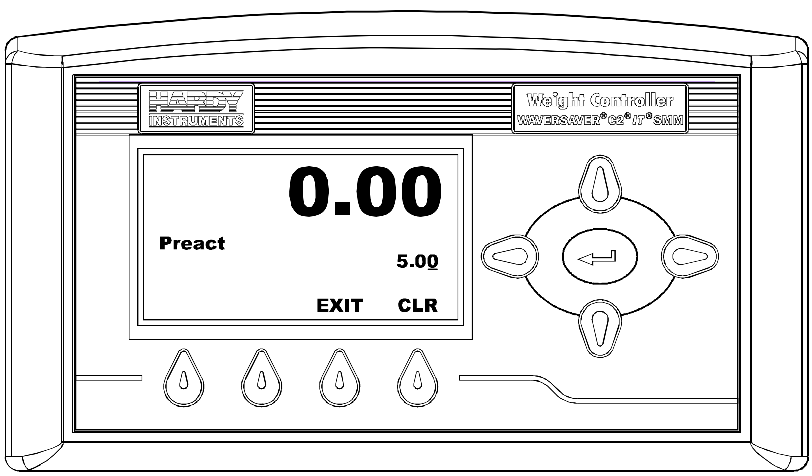


FIG. 61 PREACT MENU/ENTERING PREACT VALUE

Step 19. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number and decimal point. In our example we entered 5.00 for our Preact limit. The weight is in the units you select when you configure the instrument.

Step 20. Press the Enter button. “Entry Accepted” appears briefly. The Preact value is saved and the Setpoint Menu appears.

Step 21. Press the down arrow button until the cursor is in front of “Deadband” (See Fig. 62) The present deadband value is displayed to the right of the arrow.

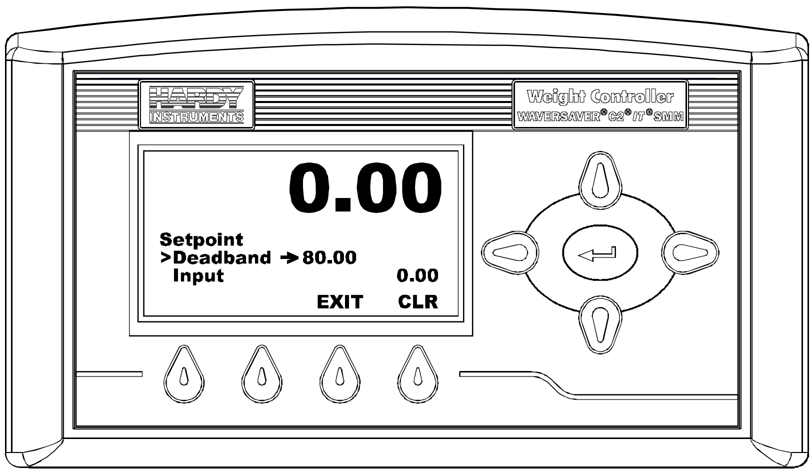


FIG. 62 SET POINT MENU/SELECTING DEADBAND

Step 22. Press the Enter button. The Deadband menu appears. (See Fig. 63)

Step 23. Press the CLR button to clear the current value.

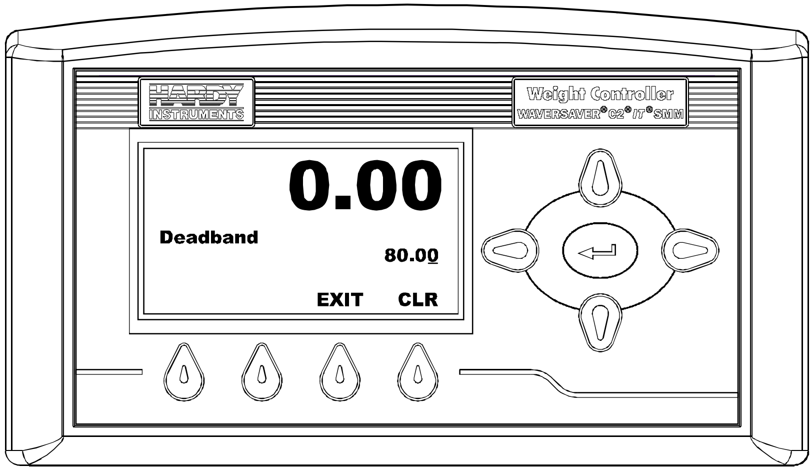


FIG. 63 DEADBAND MENU/ENTERING DEADBAND VALUE

Step 24. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number and decimal point. In our example we entered 80.00 for our Deadband limit. The weight is in the units you select when you configure the instrument.

Step 25. Press the Enter button. “Entry Accepted” appears briefly. The Deadband value is saved and the Setpoint Menu appears.

Step 26. Press the down arrow button until the cursor is in front of “Input”. (See Fig. 64)

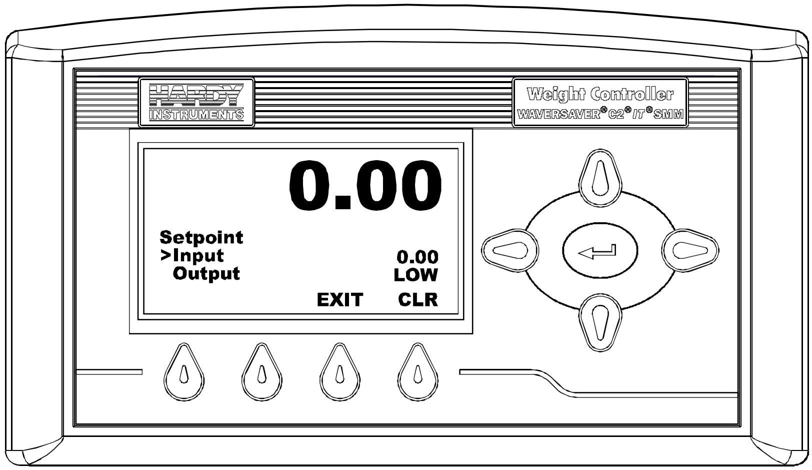


FIG. 64 SETPOINT MENU/READING INPUT

Step 27. The Input displays the present weight on the scale in the setpoint mode (Gross, Net or Rate of Change) selected. Input is a read only value, you cannot not change it directly.

Step 28. Press the down arrow button until the cursor is in front of “Output”. (See Fig. 65)

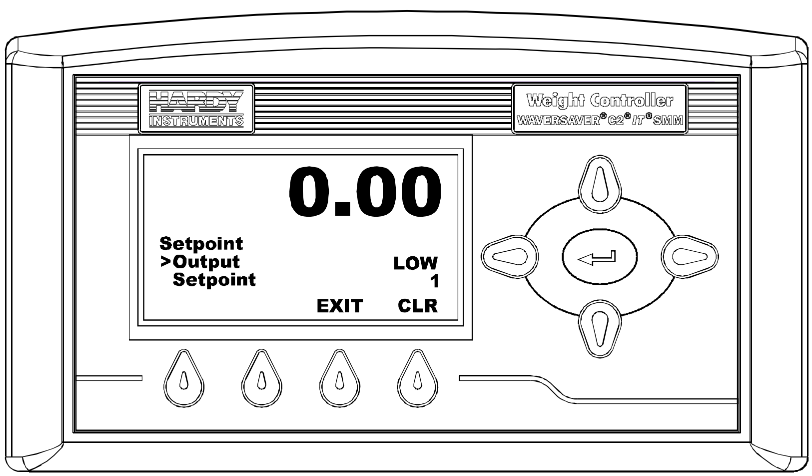


FIG. 65 SETPOINT MENU/READING OUTPUT

Step 29. The Output reads the Set Point as either high or low relative to the Target weight. If the target weight is lower than the Set Point, Output reads HIGH. If the target weight is higher than the Set Point, Output reads LOW.

Step 30. Output is read only and cannot be changed directly.

Step 31. All Set Points are configured the same. To configure the rest of the Setpoints repeat the procedures in this section.

Weight Controller Configuration from the Front Panel

The Weight Controller Configuration process sets up the instrument to operate as a scale. This includes configuring WAVERSAVER®, Scale Capacity, Units of Measure, Motion tolerance and other instrument parameters required for your process. Here is where the permanent parameters are entered. All the parameters configured except the communication parameters, (IP Address etc.) are stored in the Secure Memory Module (SMM-SD).

Step 1. From the Summary display press the Enter button. The Configuration Menu appears. (See Fig. 66)

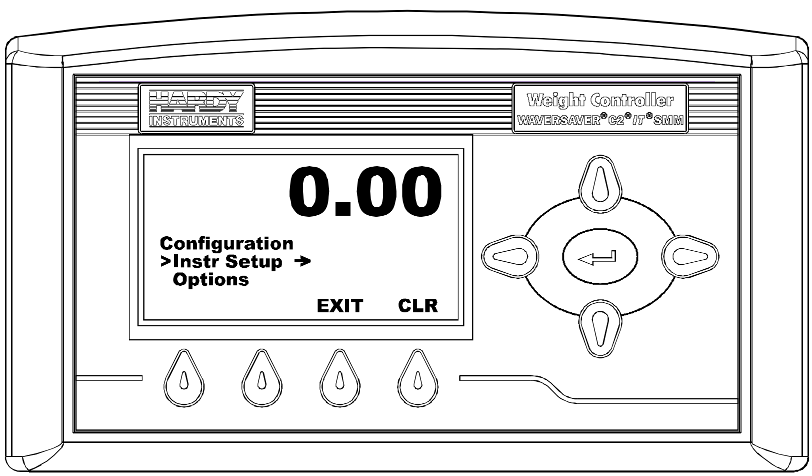


FIG. 66 CONFIGURATION MENU

Step 2. Press the Down arrow until the cursor is in front of Instrument Setup (Instr Setup).

Step 3. Press the Enter button. The Setup Menu appears with the cursor in front of Units. The current units is displayed. (See Fig. 67)

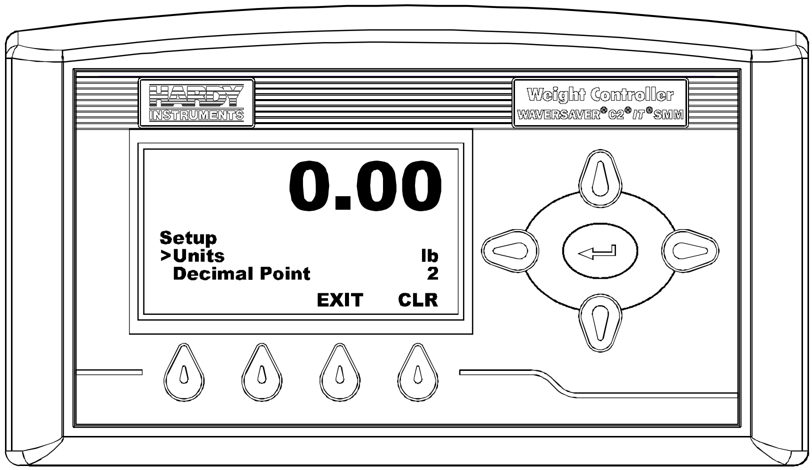


FIG. 67 CONFIGURATION/SETUP MENU/SELECTING UNITS OF MEASURE

Unit of Measure Parameters

The Unit of Measure Parameter sets the scale to either English or Metric units The Selections are:

- Pounds (lb) - Default
- Ounces (oz)
- Pounds/Ounces (lb/oz)
- Ton (Ton)
- Kilograms (Kg)
- Grams (G)
- Metric Ton (t)

PARAMETER: UNITS

RANGE: LB, OZ, LB/OZ, TON, KG, G, , T

DEFAULT: LB

Step 1. If the cursor is not in front of Units, press the Down or Up Arrow button until the cursor is in front of Units. (See Fig. 68)

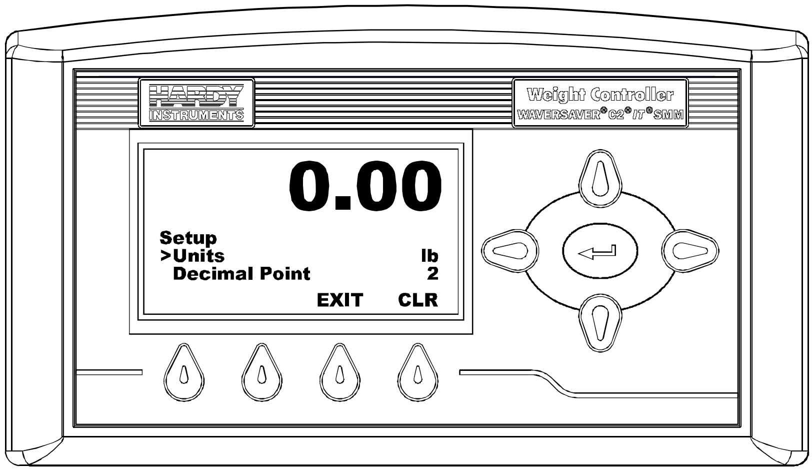


FIG. 68 SETUP MENU/SELECTING UNITS

Step 2. Press the Left or Right Arrow buttons to select the Unit of measure you want.

Step 3. Press the Enter button to save the selection.

Decimal Point Parameter

The Decimal Point Parameter is set to determine the resolution you want for the instrument. Here you set the location of the decimal point for the weight resolution. The higher the number the farther to the left the decimal point moves and the higher the resolution of the scale. It is important to note that setting resolution does effect the overall accuracy of the instrument.

PARAMETER: DECIMAL POINT

RANGE: 0-5

DEFAULT: 2

Step 1. Press the Down Arrow button until the cursor is in front of Decimal Point. (See Fig. 69) The current number of digits to the right of the decimal point is displayed.

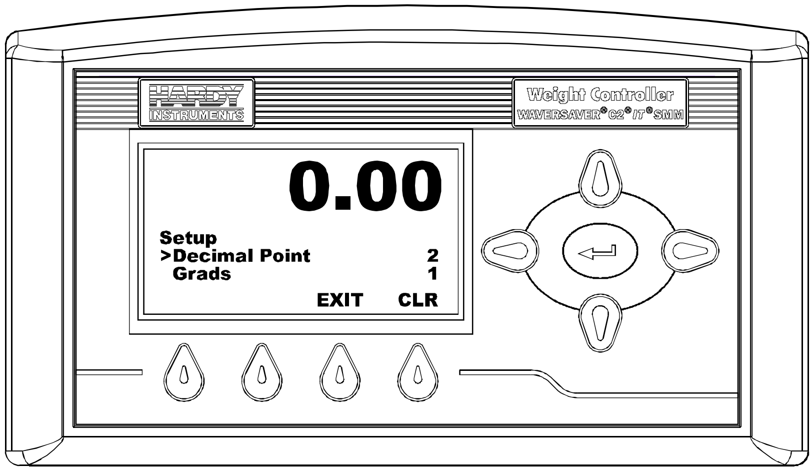


FIG. 69 SETUP MENU/SELECTING DECIMAL POINT POSITION

Step 2. Press the Right or Left Arrow buttons to select the Decimal point position you want for this instrument.

Step 3. Press the Enter button to save the selection.

Graduation Size Parameter

The Graduation Size is the Minimum increment displayed by the instrument. The Base Graduation Number can be calculated by dividing the Total Load Cell Capacity by 10,000.

For example:

- With two (2) decimal points selected, the graduation size 10 will display increments of.10 engineering units. With two (2) decimal points selected, the graduation size 50 will display increments of..50 engineering units.

PARAMETER: GRADS

RANGE: 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000

DEFAULT: 1

Step 1. Press the Down Arrow button until the cursor is in front of Grads. (See Fig. 70) The current Grads value is displayed.

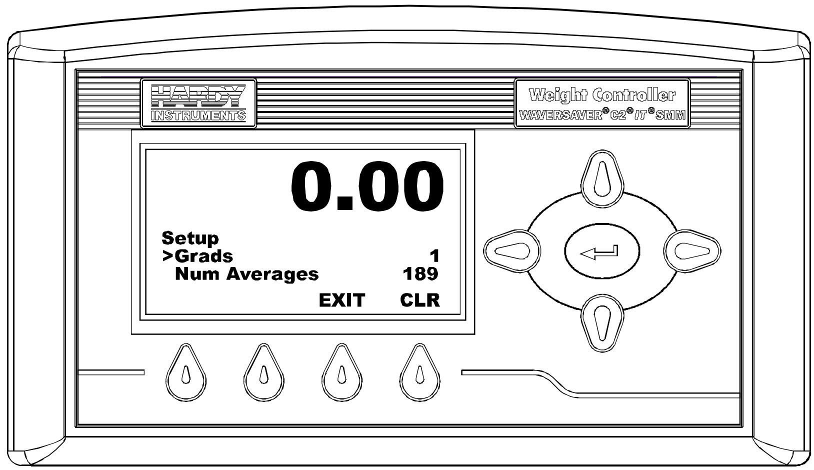


FIG. 70 SETUP MENU/SELECTING GRADUATION SIZE

Step 2. Press the Right or Left Arrow buttons to select the Graduation Size you want for this instrument.

Step 3. Press the Enter button to save the selection.

Averages Parameter

This setting is to aid in ignoring the effects of material impact and/or vibration. If material is not entering or exiting the scale evenly, weight fluctuations can be seen. Applications requiring very quick weight readings should reduce this setting to it's minimum. If the weight is unstable, increase the averages. This sets the number of weight readings that will be used to compute the displayed weight. The average is a sliding average so that a new average is available for display at every reading.

The Weight Controller does 110 updates per second which translates to an update approximately every 10 milliseconds. If you average enough weight readings the weight loss or gain remains smooth. If you average the weight too much you can cause over filling.

PARAMETER: NUM AVERAGES

RANGE: 1-250

DEFAULT: 10

Step 1. Press the Down Arrow button until the cursor is in front of Num Averages. (See Fig. 71) The current number of averages is displayed.

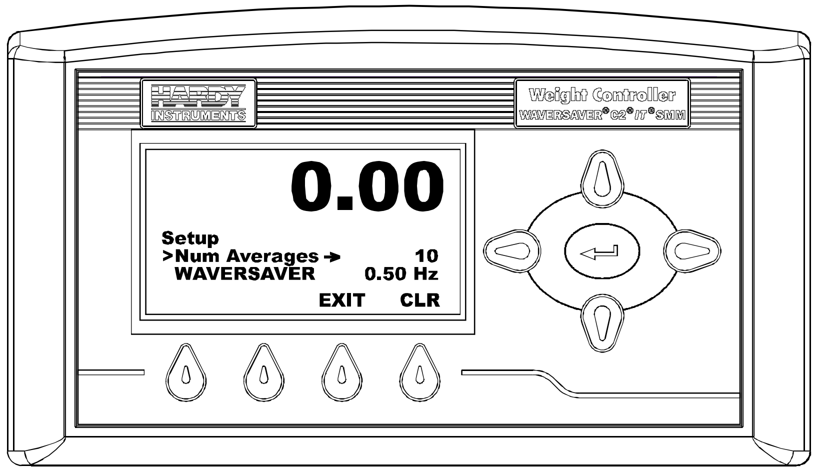


FIG. 71 SETUP MENU/SELECTING NUM AVERAGES

Step 2. Press the Enter button. The Num Averages Menu appears.

Step 3. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number you want for this application. In our example we entered 189 for our Number of Averages. (See Fig. 72)

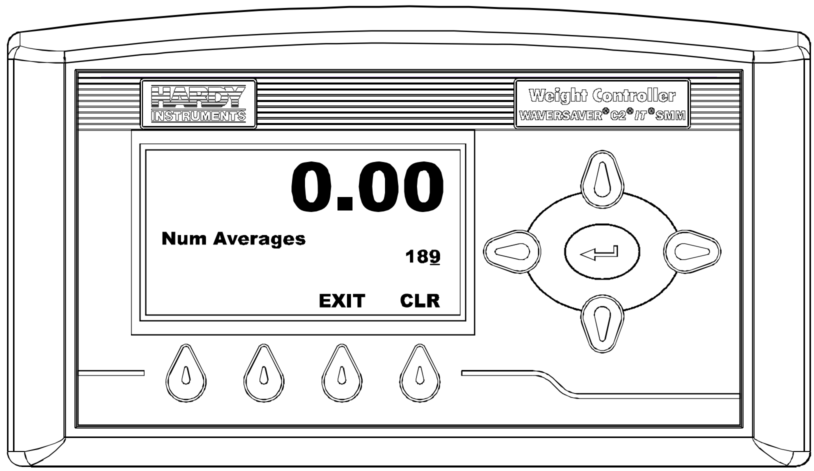


FIG. 72 NUM AVERAGES MENU

NOTE *The number entered in Figure 68 is for illustration purposes only, yours will vary depending on your application.*

Step 4. Press the Enter button to save the selection.

The WAVERSAVER® Parameter

Typically, mechanical noise (from other machinery in a plant environment) is present in forces larger than the weight forces trying to be detected. The Weight controller is fitted with Hardy Instruments exclusive WAVERSAVER® technology which eliminates the effects of vibratory forces present in all industrial weight control and measurement applications. By eliminating the factor of vibratory forces the Weight Controller is capable of identifying the actual weight data. WAVERSAVER enables the Weight Controller to distinguish between actual weight data and mechanical noise, both of which are typically transferred to the Weight Controller by the load cell signal. WAVERSAVER can be configured to ignore noise with frequencies as low as 0.25 Hz. One of four higher additional cut off frequencies may be selected to provide a faster instrument response time. the function is user selectable and can be turned off.

PARAMETER: WAVERSAVER®

RANGE: .25 HZ,.50 HZ, 1.0 HZ, 3.50 HZ, 7.50 HZ, OFF

DEFAULT: 1.00 HZ

Step 1. Press the Down Arrow button until the cursor is in front of WAVERSAVER. (See Fig. 73) The current WAVERSAVER setting is displayed.

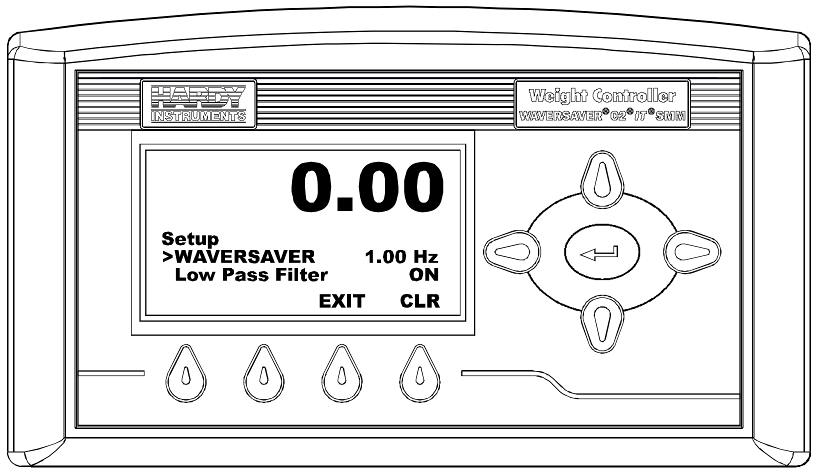


FIG. 73 SETUP MENU/SELECTING WAVERSAVER

Step 2. Press the Right or Left Arrow buttons to select the WAVERSAVER setting you want for this instrument.

Step 3. Press the Enter button to save the selection.

Low Pass Filter Parameter

The Low Pass filter can be toggled on or off. When it is on it provides a more stable weight reading but at the expense of the reaction time. In some applications a more stable reading is desired due to the nature of the application. If you can live with the reaction time, leave the Low Pass Filter On, otherwise turn it off.

PARAMETER: LOW PASS FILTER

RANGE: ON/OFF

DEFAULT: ON

Step 1. Press the Down Arrow button until the cursor is in front of Low Pass Filter. (See Fig. 74) The state of the low pass filter is displayed.

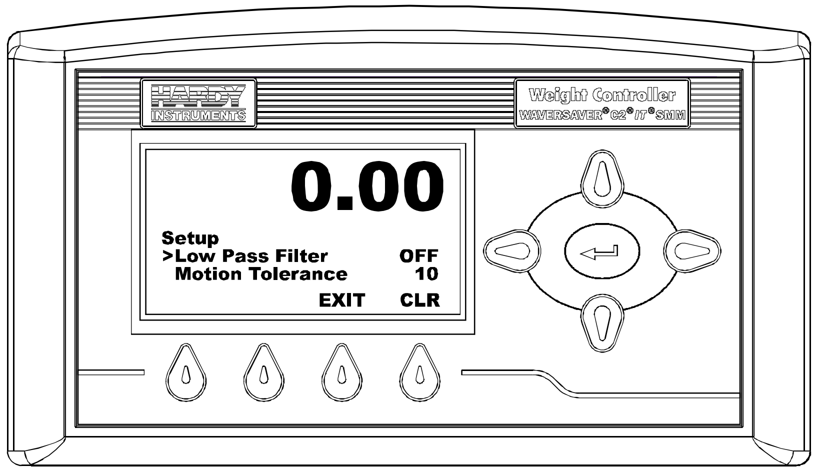


FIG. 74 SETUP MENU/SETTING LOW PASS FILTER

Step 2. Press the Right or Left Arrow buttons to toggle between ON or OFF.

Step 3. Press the Enter button to save the selection.

Motion Tolerance Parameter

Motion is the amount of allowable deviation between consecutive readings before a weighment is accepted as being complete. Setting Motion Tolerance establishes the amount of deviation you can allow in your particular process. The base motion number can be calculated by using the following formula:

- Base Motion Number = (Total Load Cell Capacity/10,000) x 3

NOTE *Motion Tolerance must be greater than or equal to the Graduation Sizes. Our recommendation is three (3) graduation sizes.*

PARAMETER: MOTION TOLERANCE

RANGE: .000001 - 999999

DEFAULT: 10

Step 1. Press the Down Arrow button until the cursor is in front of Motion Tolerance. (See Fig. 75) The present motion tolerance value is displayed.

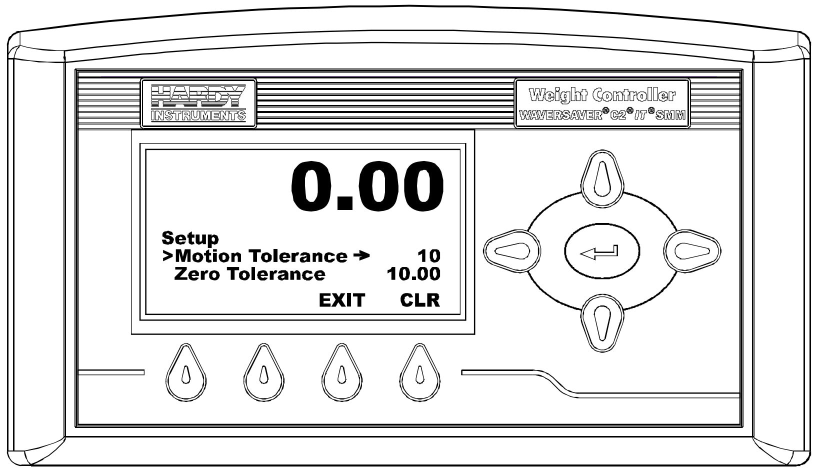


FIG. 75 SETUP MENU/SELECTING MOTION TOLERANCE

Step 2. Press The Enter button. The Motion Tolerance Menu appears. (See Fig. 76)

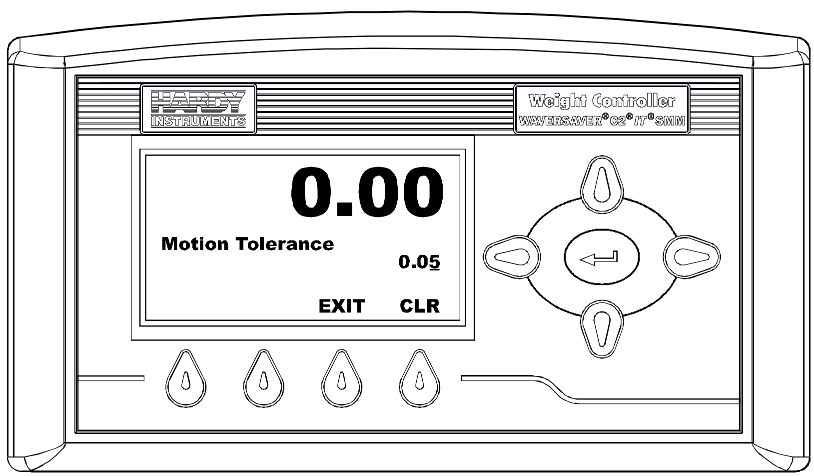


FIG. 76 MOTION TOLERANCE MENU

Step 3. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number and decimal point you want for this application. In our example we entered 0.05 for our Motion Tolerance.

NOTE *The number entered in Figure 72 is for illustration purposes only, yours will vary depending on your application.*

Step 4. Press the Enter button to save the entry.

Zero Tolerance Parameter

The Zero Tolerance parameter sets the weight units from zero that will be accepted as zero by the instrument when you push the Zero button to Zero the instrument.

PARAMETER: ZERO TOLERANCE

RANGE: .000001 - 999999

DEFAULT: 10.0

Step 1. Press the Down Arrow button until the cursor is in front of Zero Tolerance. (See Fig. 77) The current zero tolerance value is displayed.

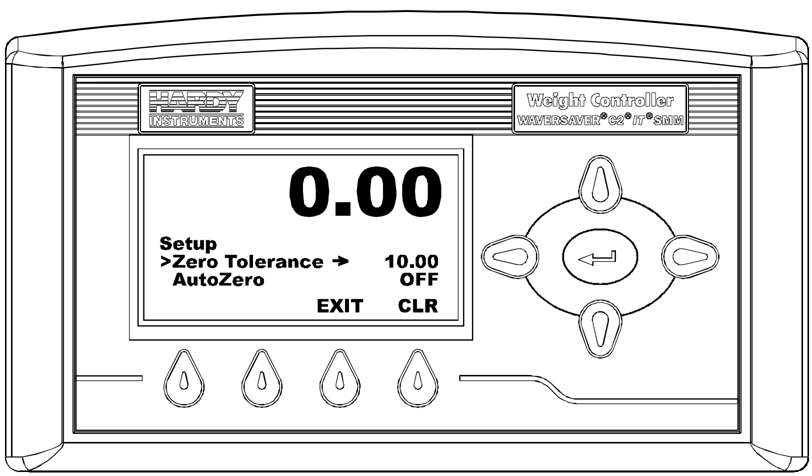


FIG. 77 SETUP MENU/SELECTING ZERO TOLERANCE

Step 2. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number and decimal point you want for this application. In our example we entered 5.00 for our Zero Tolerance. (See Fig. 78)

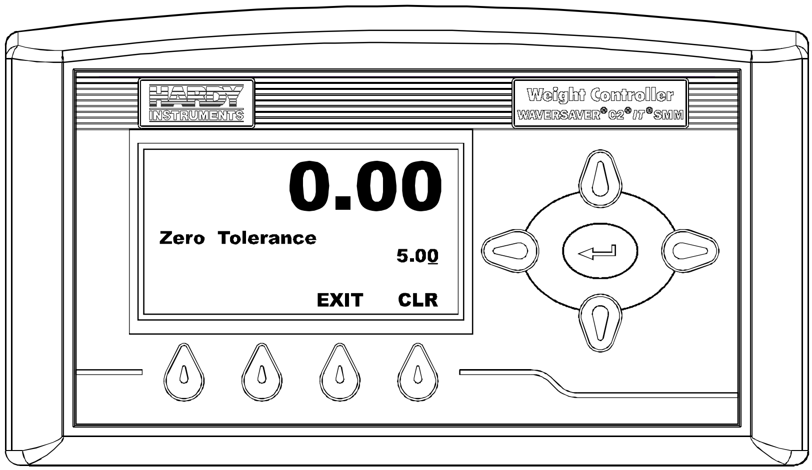


FIG. 78 ZERO TOLERANCE MENU

NOTE *The number entered in Figure 74 is for illustration purposes only, yours will vary depending on your application.*

Step 3. Press the Enter button to save the entry.

AutoZero Parameter

The AutoZero Parameter can be turned on to make the zeroing of the instrument automatic. When the AutoZero is turned on the instrument is automatically zeroed, if the motion is within tolerance, every few seconds until you turn the AutoZero off and the value is within the AutoZero tolerance value. This is useful in applications where you are zeroing a scale quite often and don't want to push the Zero button each time.

NOTE *AutoZero does not override the Zero Function. Even though you toggled the AutoZero function on, you can still press the Zero button to zero the Instrument at any time.*

PARAMETER: AUTOZERO

RANGE: ON/OFF

DEFAULT: OFF

Step 1. Press the Down Arrow button until the cursor is in front of AutoZero. (See Fig. 79) the AutoZero tolerance is displayed.

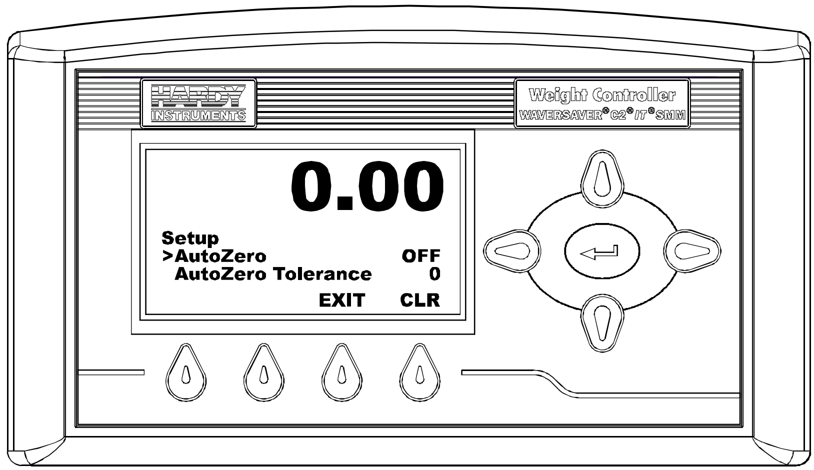


FIG. 79 SETUP MENU/ACTIVATING AUTOZERO

Step 2. Use the Left or Right Arrow buttons to toggle between On and Off.

Step 3. Press the Enter button to save the entry.

AutoZero Tolerance Parameter

The AutoZero Tolerance parameter sets the weight units from zero that will be accepted as zero by the instrument. It is highly recommended that the AutoZero Tolerance parameter be slightly smaller than the Tolerance Parameter. In the event the AutoZero Tolerance is exceeded for some reason you have a backup to zero the instrument.

PARAMETER: AUTOZERO TOLERANCE

RANGE: .000001 - 999999

DEFAULT: 10.0

Step 1. Press the Down Arrow button until the cursor is in front of AutoZero Tolerance. (See Fig. 80) The present AutoZero Tolerance is displayed.

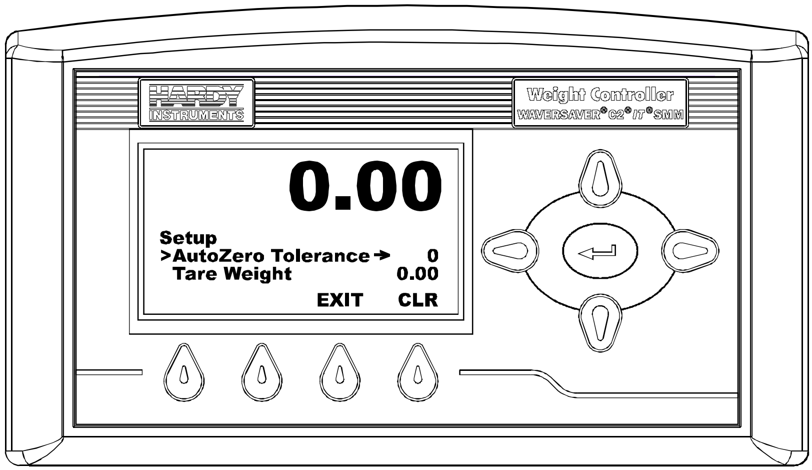


FIG. 80 SETUP MENU/SELECTING AUTOZERO TOLERANCE

Step 2. Press the Enter button. The AutoZero Tolerance Menu appears. (See Fig. 81)

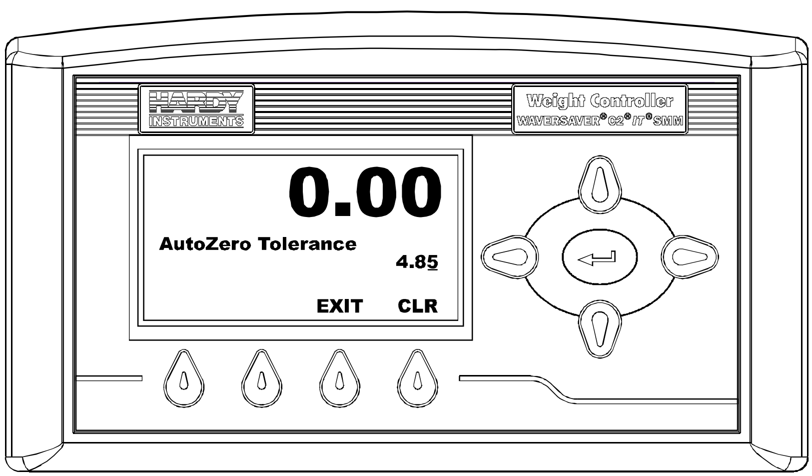


FIG. 81 AUTOZERO TOLERANCE MENU

Step 3. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number and decimal point you want for this application. In our example we entered 4.85 for our AutoZero Tolerance. (See Fig.81)

NOTE *The number entered in Figure 81 is for illustration purposes only, yours will vary depending on your application.*

Step 4. Press the Enter button to save the entry.

Tare Weight Parameter

The Tare Weight Parameter allows the user to enter a known Tare Weight value for those applications where you don't want to push the Tare button each time you weigh something.

PARAMETER: TARE WEIGHT

RANGE: .000001 - 999999

DEFAULT: 0.00

Step 1. Press the Down Arrow button until the cursor is in front of Tare Weight. (See Fig. 82) The present Tare Weight value is displayed.

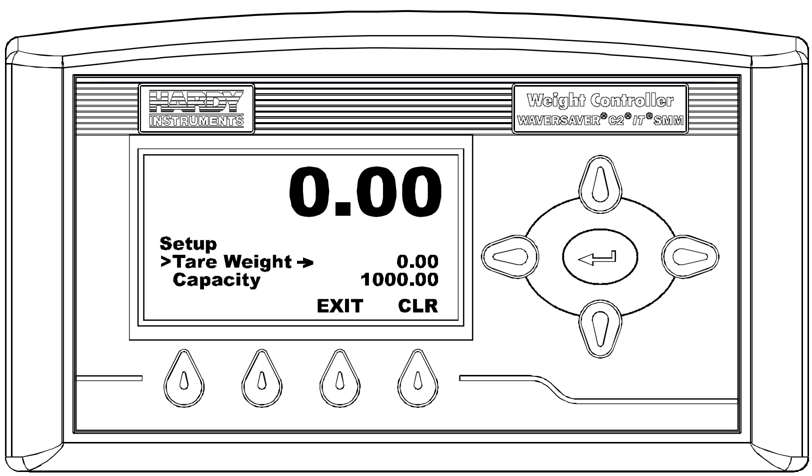


FIG. 82 SETUP MENU/SELECTING TARE WEIGHT

Step 2. Press the Enter button. The Tare Weight Menu appears. (See Fig. 83)

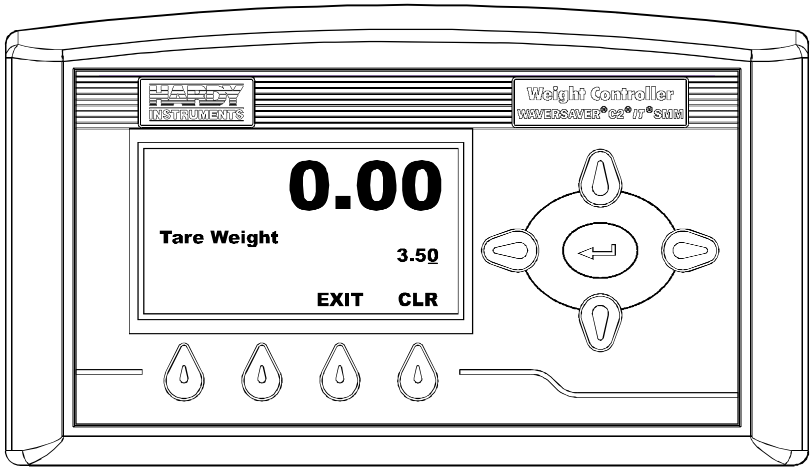


FIG. 83 TARE WEIGHT MENU

Step 3. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number and decimal point you want for this application. In our example we entered 3.50 for our Tare Weight. (See Fig. 83)

NOTE *The number entered in Figure 79 is for illustration purposes only, yours will vary depending on your application.*

Step 4. Press the Enter button to save the entry.

Capacity Parameter

The Scale Capacity Parameter is the total weight capacity of the scale system. If this value is exceeded by 5% a HI indication appears on the front display. Communications to and from optional devices are not effected. This value is the nominal operating capacity of the scale. (It is recommended that you use the default parameter.)

PARAMETER: CAPACITY

RANGE: .000001 - 999999

DEFAULT: 999999

Step 1. Press the Down Arrow button until the cursor is in front of Capacity. (See Fig. 84) The present Scale Capacity value is displayed.

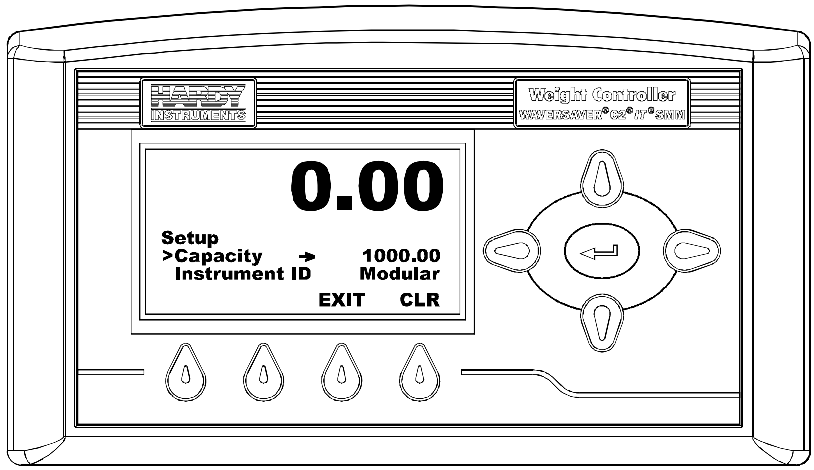


FIG. 84 SETUP MENU/SELECTING CAPACITY

Step 2. Press the Enter button. The Capacity Menu appears. (See Fig. 85)

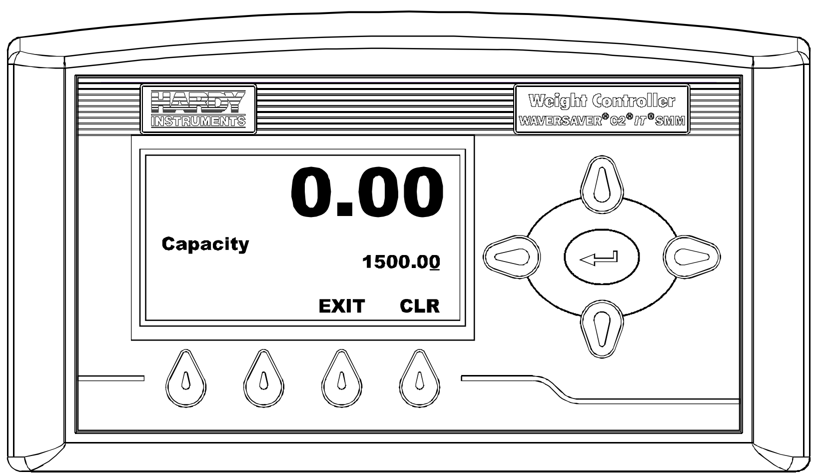


FIG. 85 CAPACITY PARAMETER MENU

Step 3. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number and decimal point you want for this application. In our example we entered 1500.00 for our Capacity Weight. (See Fig. 85)

NOTE *The number entered in Figure 85 is for illustration purposes only, yours will vary depending on your application.*

Step 4. Press the Enter button to save the entry.

Instrument ID Parameter

The Instrument ID parameter is used to provide specific identification for a Weight Controller. This is extremely important when using several HI 4050's in a process. An unique Instrument ID allows you to identify one instrument from another.

PARAMETER: INSTRUMENT ID

RANGE: 19 CHARACTERS

DEFAULT: MODULAR

Step 1. Press the Down Arrow button until the cursor is in front of Instrument ID. (See Fig. 86) The current Instrument ID is displayed.

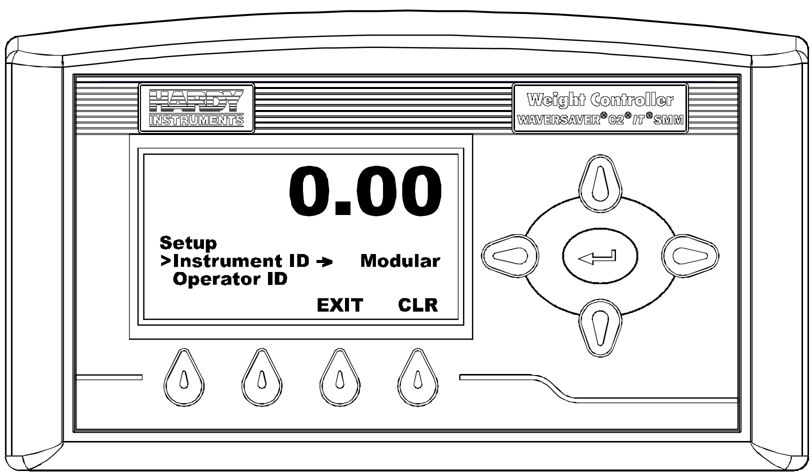


FIG. 86 SETUP MENU/SELECTING INSTRUMENT ID

Step 2. Press the Enter button. the Instrument ID Menu appears. (See Fig. 87)

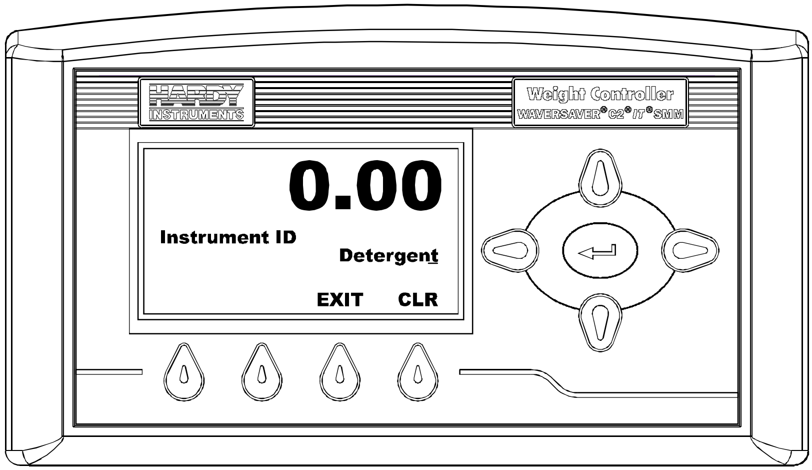


FIG. 87 INSTRUMENT ID MENU

Step 3. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number or letter you want for this instrument. (See Fig. 87)

Step 4. Press the Enter button to save the entry.

Operator ID Parameter

The Operator ID is the ID of the user who is going to operate the Weight Controller or service the instrument. Select three letters or numbers or any combination of two that adequately identifies the user. We have provided some examples for your assistance. The Operator ID is used in connection with the security level of the user.

Some examples of Operator IDs:

- Joe
- 312
- J15
- JD7

PARAMETER: OPERATOR ID

RANGE: NONE

DEFAULT: BLANK

Step 1. Press the Down Arrow button until the cursor is in front of Operator ID. (See Fig. 88) The last Operator ID is displayed.

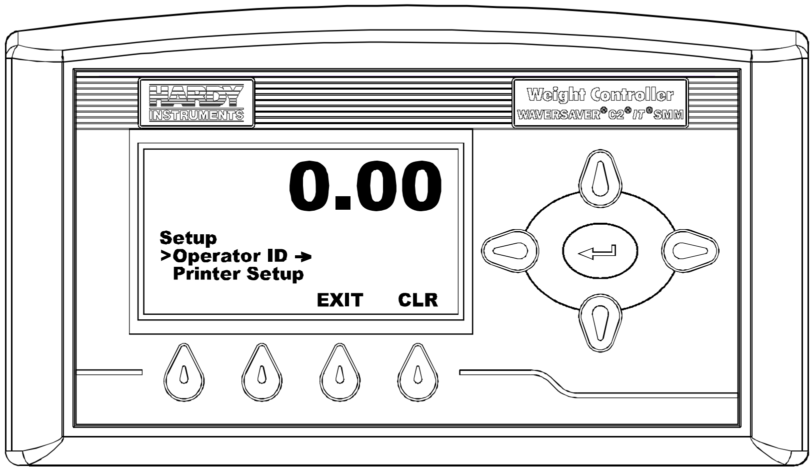


FIG. 88 SETUP MENU/SELECTING OPERATOR ID

Step 2. Press the Enter button. The Operator ID Menu appears. (See Fig. 89) The current Operator ID is displayed.

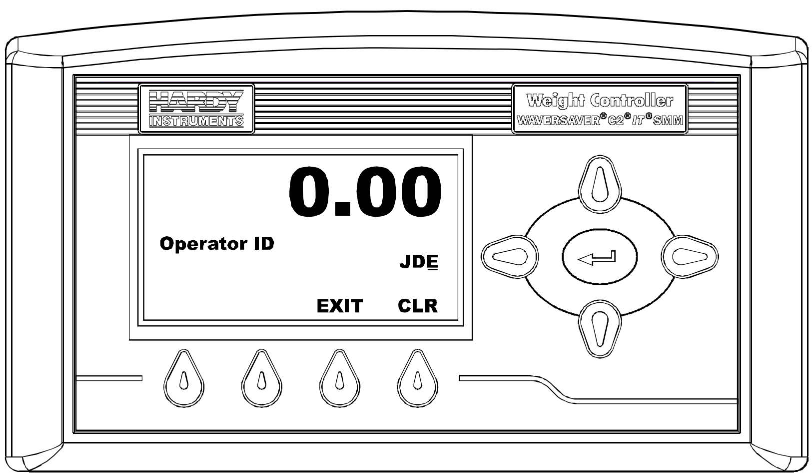


FIG. 89 OPERATOR ID MENU

Step 3. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number or letter you want for the current user. (See Fig. 89)

Step 4. Press the Enter button to save the entry.

Serial Port Setup Parameters

The Serial Port Parameters are set to operate a Printer or Scoreboard which can print out or display on a Scoreboard the Gross, Net and Tare with a Rate of Change Option and weight units (lb, kg etc.).

NOTE *If the Scoreboard is configured the Print button does not function.*

PARAMETER: PRINTER SETUP

RANGE: PRINTER - SCOREBOARD

DEFAULT: PRINTER

PARAMETER: PRINTER MODE

RANGE: GROSS, NET, ROC

DEFAULT: GROSS

PARAMETER: SCOREBOARD

RANGE: GROSS, NET, ROC

DEFAULT: GROSS

PARAMETER: BAUD RATE

RANGE: 300, 1200, 2400, 4800, 9600, 19200

DEFAULT: 9600

PARAMETER: PARITY

RANGE: NONE, ODD, EVEN

DEFAULT: NONE

PARAMETER: DATA BITS

RANGE: 7 OR 8

DEFAULT: 8

Step 1. Press the Down button until the cursor is in front of Printer Setup. (See Fig. 90)

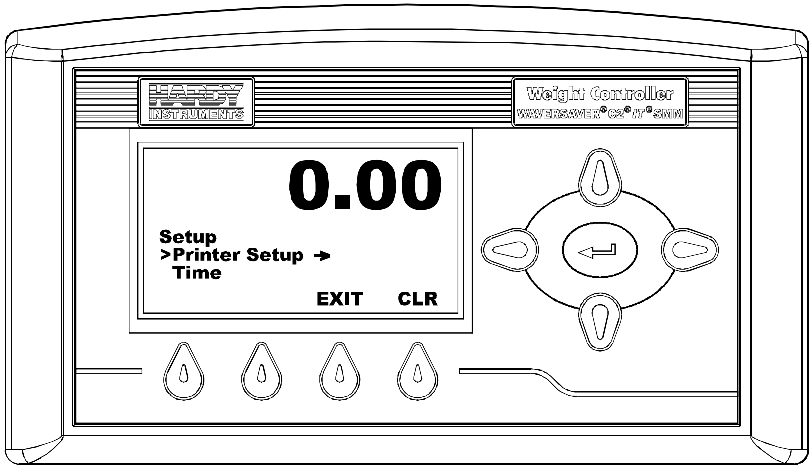


FIG. 90 SETUP MENU/SELECTING PRINTER SETUP

Step 2. Press the Enter button. The Printer Setup Menu appears. (See Fig. 91)

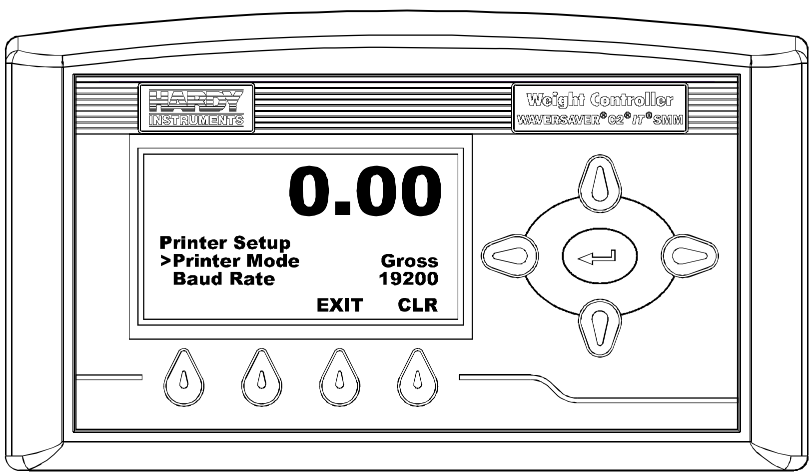


FIG. 91 PRINTER SETUP MENU/SELECTING PRINTER MODE

Step 3. To select the Printer Mode use the Left or Right Arrow buttons to toggle between Gross, Net or Rate of Change (If this option is enabled).

Step 4. Press the Enter button to save the entry.

Step 5. Press the Down Arrow button until the cursor is front of Baud Rate. (See Fig. 92) The current Baud Rate is displayed.

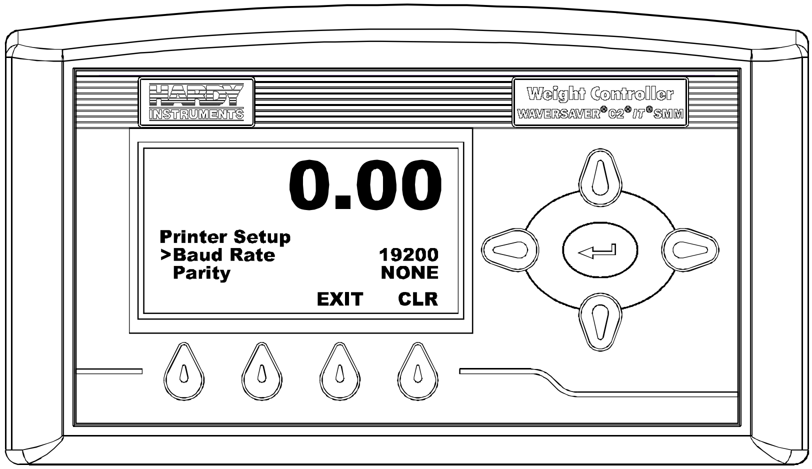


FIG. 92 PRINTER SETUP MENU/SELECTING BAUD RATE

Step 6. To select the Baud Rate press the Left or Right Arrow buttons until the baud rate you want appears.

Step 7. Press the Enter button to save the entry.

Step 8. Press the Down Arrow button until the cursor is in front of Parity. (See Fig. 93) the current Parity value is displayed.

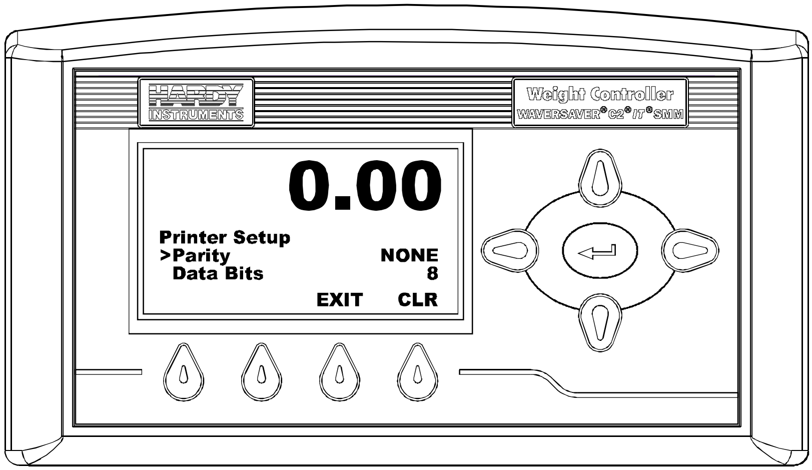


FIG. 93 PRINTER SETUP MENU/SELECTING PARITY

Step 9. To select the Parity press the Left or Right Arrow buttons until the parity you want appears.

Step 10. Press the Enter button to save the entry.

Step 11. Press the Down Arrow button until the cursor is in front of Data Bits. (See Fig. 94) The current Data Bits value is displayed.

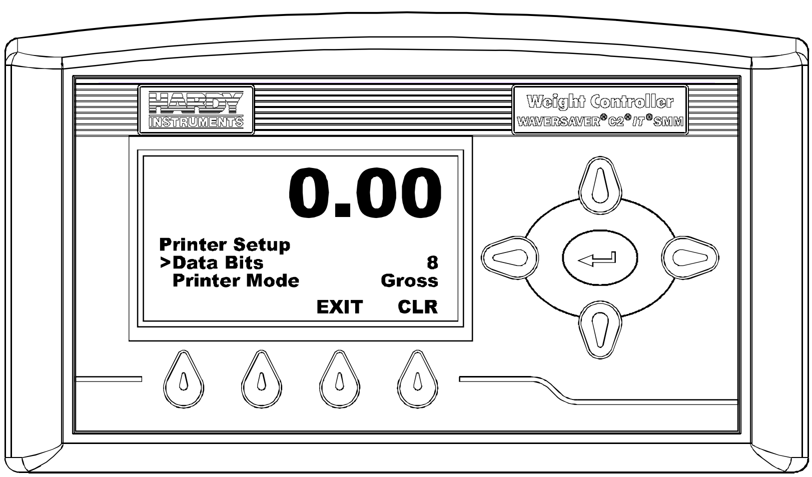


FIG. 94 PRINTER SETUP MENU/SELECTING DATA BITS

Step 12. To select the Data Bits press the Left or Right Arrow to toggle between 8 and 7.

Step 13. Press the Enter button to save the entry.

Step 14. Press the Exit button to return to the Setup Menu.

Scoreboard Setup

Step 1. From the Printer Setup display press the down arrow button until the cursor is in front of Printer Mode. (See Fig. 95)

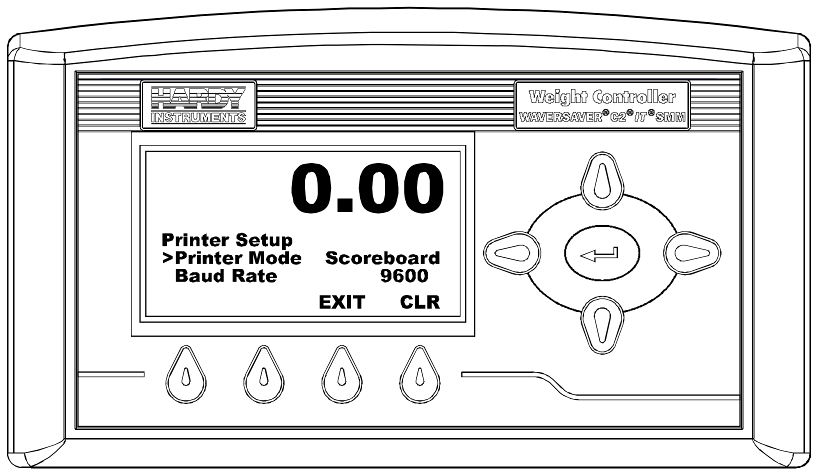


FIG. 95 PRINTER SETUP/SELECTING SCOREBOARD

Step 2. Use the left or right arrow buttons to select Scoreboard.

Step 3. Press the Enter button to set the selection.

Step 4. Repeat steps 5-13 in the Printer Setup Configuration above.

Time Setup Parameter

You can set Hour, Minute, Month, Day and Year parameters here. these settings are the times stamps for the alarms. You can also select Greenwich Mean Time.

PARAMETER: HOURS

RANGE: HH (01-24)

DEFAULT: NONE

PARAMETER: MINUTES

RANGE: MM (01-60)

DEFAULT: NONE

PARAMETER: MONTH

RANGE: JAN. THRU DEC.

DEFAULT: NONE

PARAMETER: DAY

RANGE: DD (01-31)

DEFAULT: NONE

PARAMETER: TIME-YEAR

RANGE: YYYY (2001, 2002, 2003)

DEFAULT: NONE

PARAMETER: TIMEZONE

RANGE: -12 TO +12

DEFAULT: PST -8H

Step 1. Press the Down arrow button until the cursor is in front of Time. (See Fig. 96)

NOTE *To set up Greenwich Mean Time please see Appendix A.*

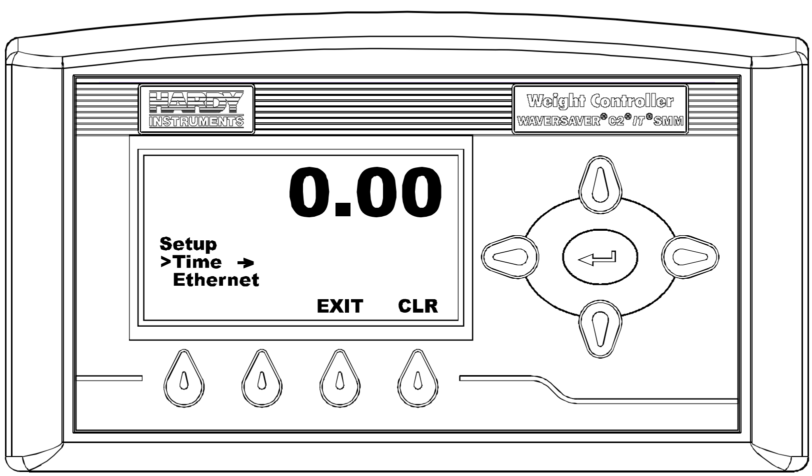


FIG. 96 SETUP MENU/SELECTING TIME

Step 2. Press the Enter button. The Time Setup Menu appears with the cursor in front of Time Zone. (See Fig. 97)

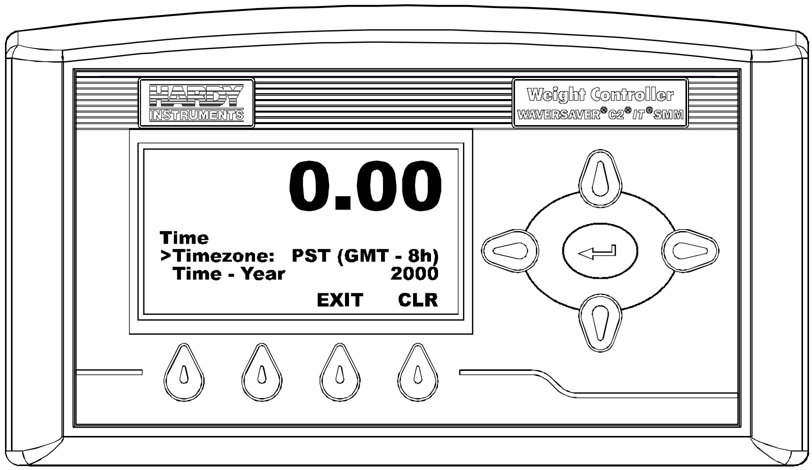


FIG. 97 TIME MENU/SELECTING GREENWICH MEAN TIME

Step 3. Press the Left or Right Arrow buttons to select the time zone in your location. The present selected time zone is displayed. (See Fig. 98)

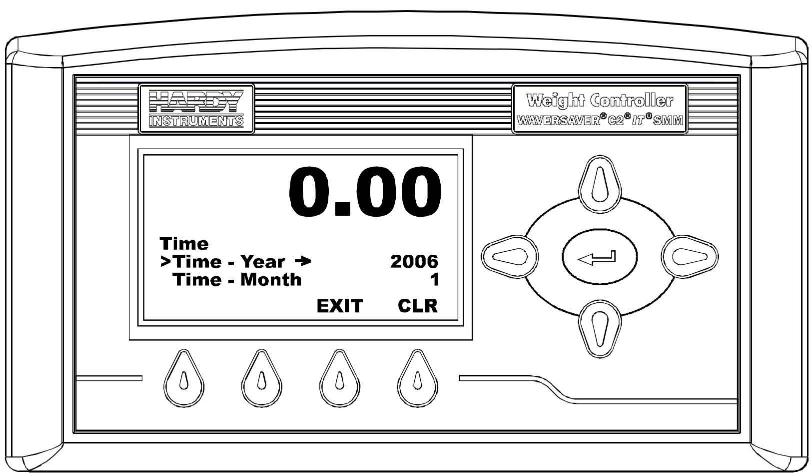


FIG. 98 TIME MENU/SELECTING YEAR

Step 4. Press the Enter button. The Time-Year Menu appears. (See Fig. 99) The present Year is displayed.

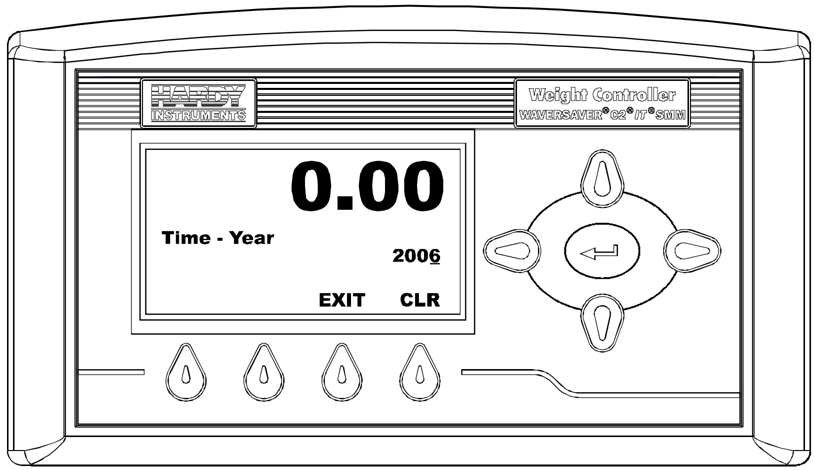


FIG. 99 TIME - YEAR MENU

Step 5. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the numbers for the current year.

Step 6. Press the Enter button to save the entry.

Step 7. Press the Down Arrow button until the cursor is in front of Time - Month. (See Fig. 100) The present Month is displayed.

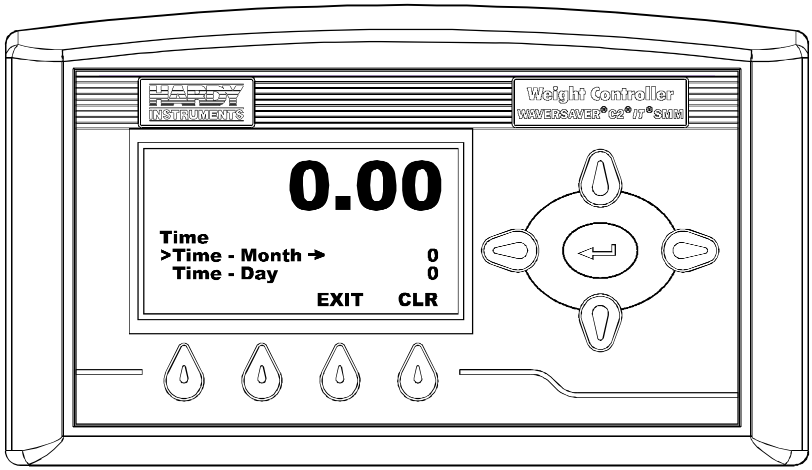


FIG. 100 TIME MENU/SELECTING TIME-MONTH

Step 8. Press the Enter button. The Time - Month Menu appears. (See Fig. 101)

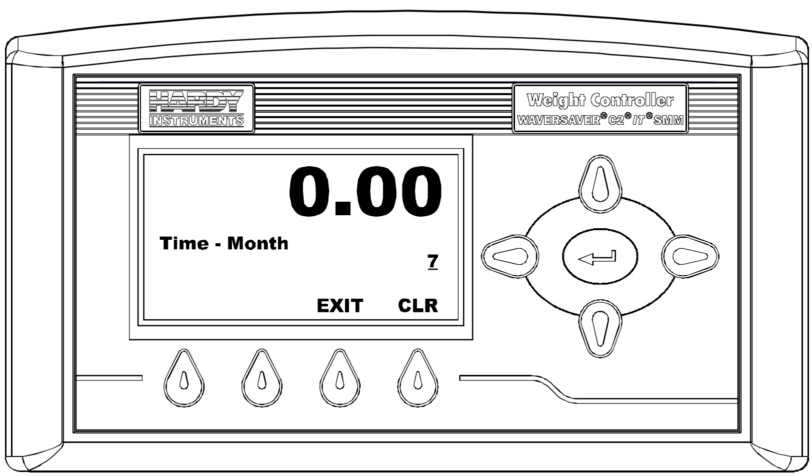


FIG. 101 TIME - MONTH MENU

Step 9. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the numbers for the current month.

Step 10. Press the Enter button to set the entry.

Step 11. Press the Down arrow button until the cursor is in front of Time - Day. (See Fig. 102) The present day is displayed.

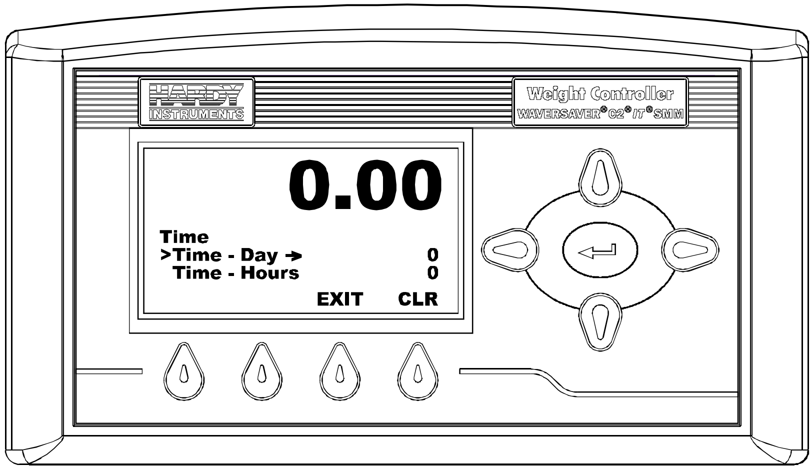


FIG. 102 TIME MENU/SELECTING TIME - DAY

Step 12. Press the Enter button. The Time - Day Menu appears. (See Fig. 103) The present Day is displayed.

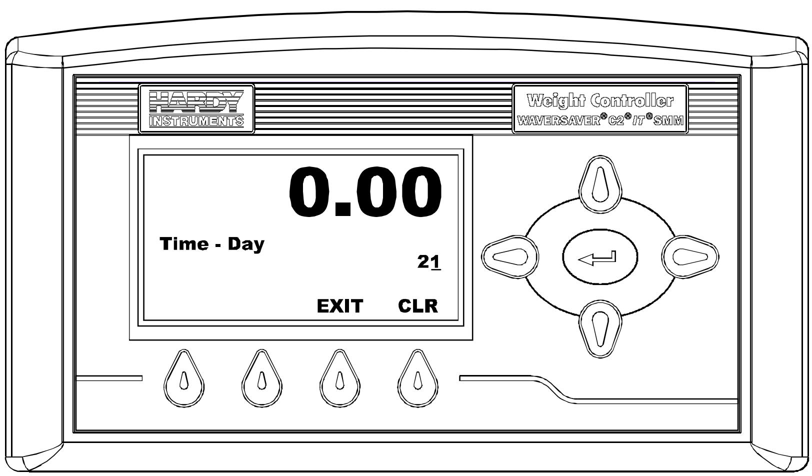


FIG. 103 TIME - DAY MENU

Step 13. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the numbers for the current Day.

Step 14. Press the Enter button to save the entry.

Step 15. Press the Down arrow button until the cursor is in front of Time - Hours. (See Fig. 104) The present hour in 24 hour format is displayed.

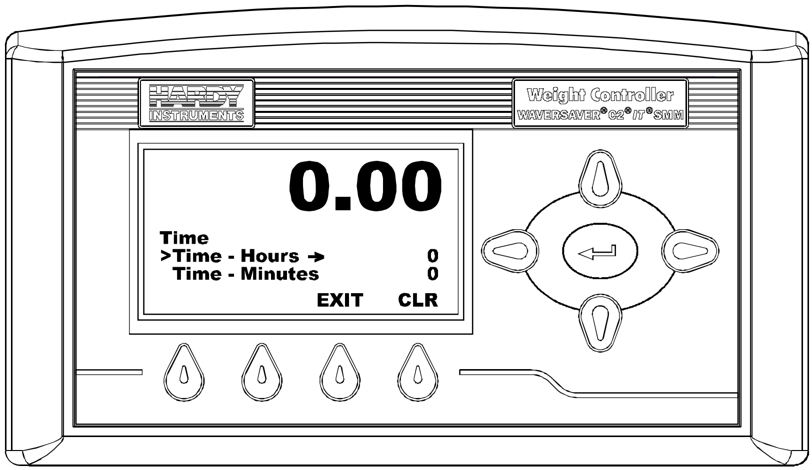


FIG. 104 TIME MENU/SELECTING HOURS

Step 16. Press The Enter button. The Time - Hours Menu appears. (See Fig. 105)

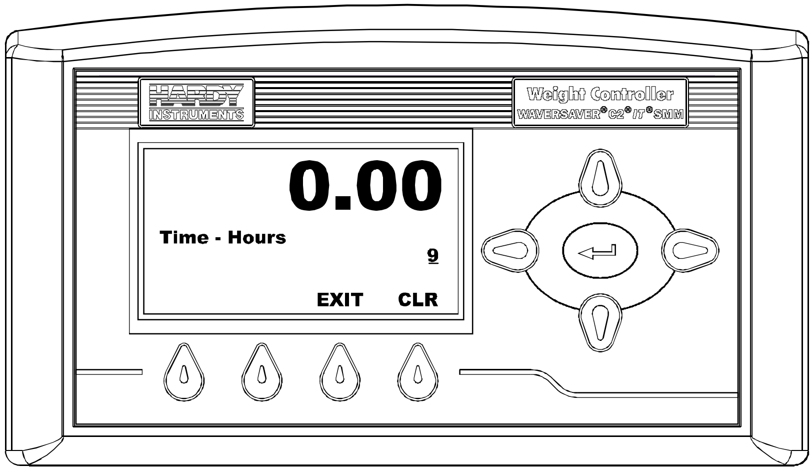


FIG. 105 TIME - HOURS MENU

Step 17. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the numbers for the current Hours.

Step 18. Press the Enter button to set the entry.

Step 19. Press the Down Arrow button until the cursor is in front of Time - Minutes. (See Fig. 106) The present minute setting is displayed.

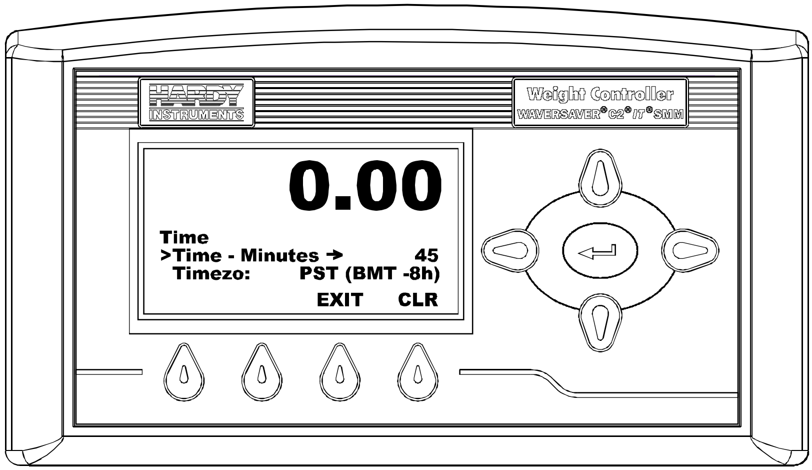


FIG. 106 TIME MENU/SELECTING TIME-MINUTES

Step 20. Press The Enter button. The Time - Minutes Menu appears. (See Fig. 107)

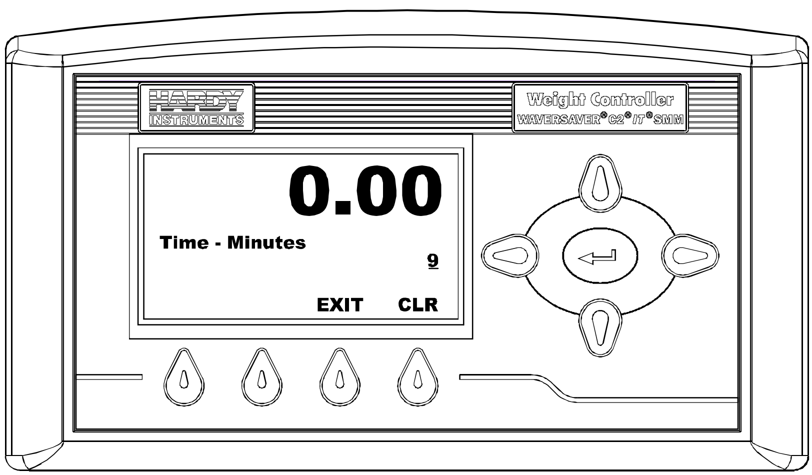


FIG. 107 TIME - MINUTES MENU

Step 21. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the numbers for the current Minutes.

Step 22. Press the Enter button to set the entry.

Step 23. Press the Exit button to return to the Setup Menu.

Ethernet Parameters

All Weight Controllers are designed with a selectable 10/100 base T Ethernet connection which links your PC to an embedded server in the instrument. You can connect to an instrument via the Internet, Intranet, Extranet, or VPN (Virtual Private Network). Your computer must have an ethernet card and cable with an RJ45 connector to connect to the instrument. Once connected you can, monitor, map and configure any of the instruments from your web browser from any location in your plant or enterprise. Help Dialogs are also available in the browser to assist when performing setup or troubleshooting of an instrument. In addition the browser connects you to the Hardy Web Site which connects the user to a full range of customer services and support. File downloads from your control room are a snap. No more hauling devices to download files to an instrument. Should you want to download a file or monitor the instrument from your laptop at the site, simply connect a short cable from the lap top to the Ethernet connection at the rear panel of the instrument to transfer files, monitor or configure the instrument. No matter where you are, if you are connected to our instrument you can configure and troubleshoot the HI 4050 Weight Controller.

NOTE *Do not confuse the onboard Ethernet TCP/IP communication with Ethernet/IP. Ethernet/IP is a keyed option.*

About IP Addresses

An IP address consists of 32 bits (4 Bytes). It is composed of two parts:

- The Network Number
- The Host Number

By convention, the address is expressed as four decimal numbers separated by periods, such as “200.1.2.3” representing the decimal value of each of the four bytes. Valid addresses thus range from 0.0.0.0 to 255.255.255.255, for a total of about 4.3 billion addresses.

It is recommended that you leave the Mask, Gate and DNS settings alone. Contact your Network Administrator if you need to set these parameters.

DHCP - Is short for **D**ynamic **H**ost **C**onfiguration **P**rotocol, a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the device's IP address can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.

Dynamic addressing simplifies network administration because the software keeps track of IP addresses rather than requiring an administrator to manage the task. This means that a new computer can be added to a network without the hassle of manually assigning it a unique IP address.

PARAMETER: ETHERNET

RANGE: 0.0.0.0 - 255.255.255.255

DEFAULT: 192.168.100.1

Step 1. Press the Down arrow button until the cursor is in front of Ethernet. (See Fig. 108)

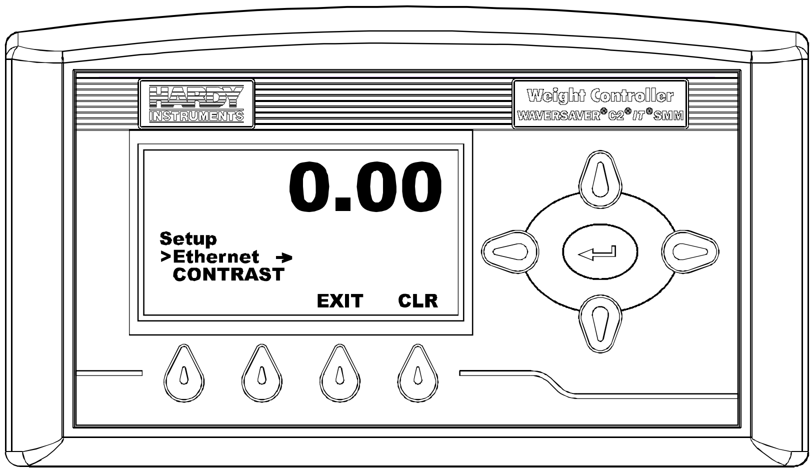


FIG. 108 SETUP MENU/SELECTING ETHERNET

Step 2. Press the Enter button. The Ethernet Menu appears with the cursor in front of IP. (See Fig. 109)

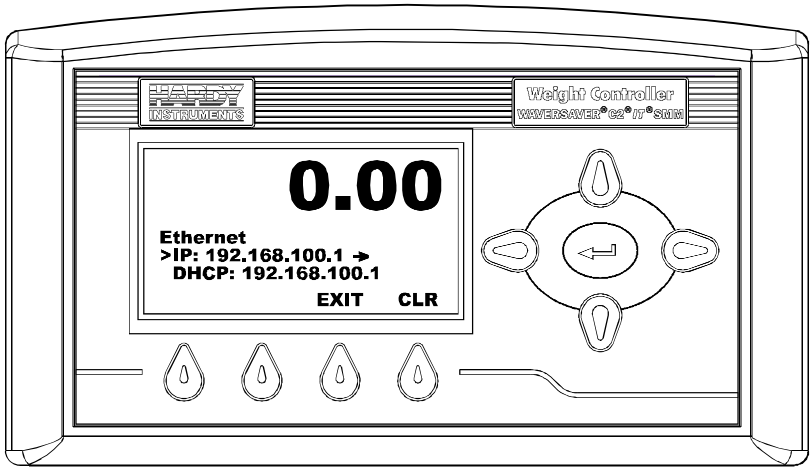


FIG. 109 ETHERNET MENU/SELECTING IP

Step 3. Press the Down Arrow button until the cursor is in front of IP.

Step 4. Press the Enter button. The IP Menu appears. (See Fig. 110)

- If you are configuring the instrument for the first time the default IP address appears.
- You must change this address when starting the instrument for the first time.

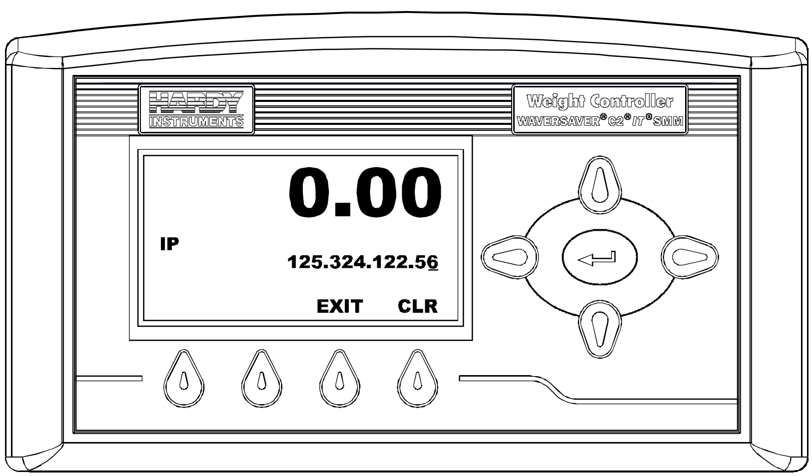


FIG. 110 ETHERNET MENU

Step 5. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the IP address assigned to this instrument. Make sure you have a period between each octet (set of three numbers).

Step 6. This is the only parameter you need to change.

Step 7. Press the Enter button to save the entry.

Step 8. To configure DHCP do the following:

- Press the down arrow until the cursor is in front of IP.
- Press the Enter button. The IP Menu appears. (See Fig. 111)

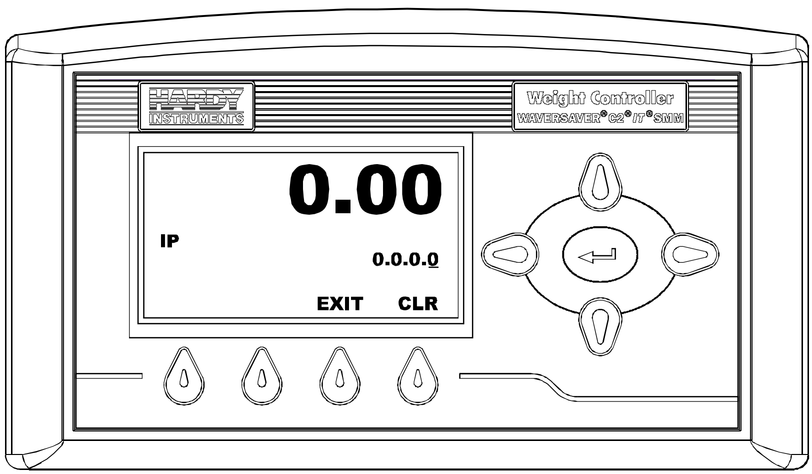


FIG. 111 IP MENU

- Press the Clear button to clear the address.
- Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter a 0.0.0.0 IP address. When you enter 0.0.0.0 IP address the instrument automatically defaults to DHCP. Make sure you have a period between each octet (set of three numbers).
- Press the Enter button to save the entry. The Ethernet Menu appears with the IP address 0.0.0.0. (See Fig. 112)

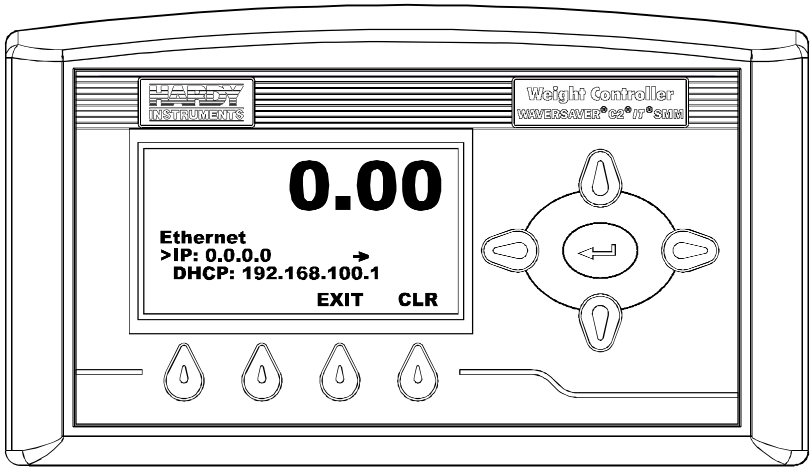


FIG. 112 ETHERNET MENU/IP ADDRESS 0.0.0.0

- Press the Exit button. The Setup Menu appears.

Displaying the Complete DHCP IP Address

There is a limited number of characters per line that can be displayed in read only screens. To see the complete IP address in DHCP you need to do the following:

Step 1. In the Ethernet Menu, press the up or down arrow buttons until the cursor is in front of DHCP. The DHCP address in our example shows 192.168.100.12. The actual address is “192.168.100.128”. The “8” is not displayed. (See Fig. 113)

Step 2. Press the Enter button. The DHCP Menu appears with the complete IP address. (See Fig. 114)

NOTE *This is a Read Only menu you cannot change the values.*

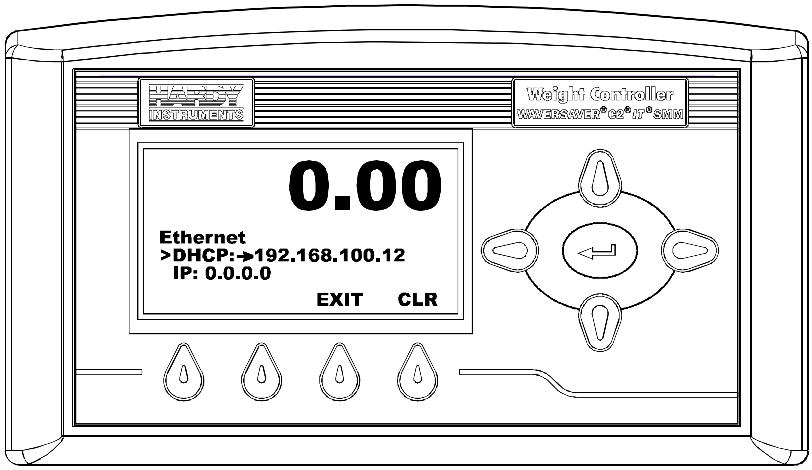


FIG. 113 ETHERNET MENU/DHCP DOES NOT SHOW ALL THE IP ADDRESS

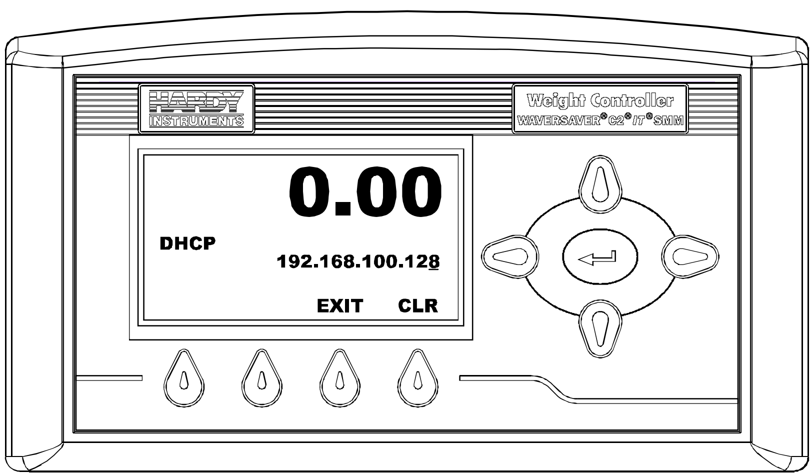


FIG. 114 DHCP MENU/DISPLAYING COMPLETE ADDRESS

Step 3. Press the Exit button to return to the Ethernet Menu.

Set LCD Contrast Parameter

The Set LCD Contrast Parameter is used to increase or decrease the contrast of the display. Press the right arrow button to increase the contrast. Press the left arrow to decrease the contrast.

PARAMETER: SET LCD CONTRAST

RANGE: NONE

DEFAULT: NONE

Step 1. Press the Down Arrow button until the cursor is in front of CONTRAST. (See Fig. 115)

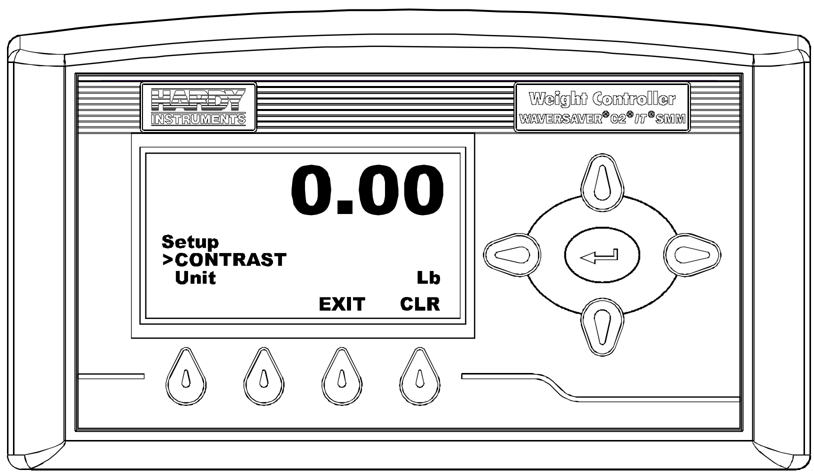


FIG. 115 SETUP MENU/SELECTING CONTRAST

Step 2. Press the left or right arrow button to increase or decrease the contrast.

Step 3. This completes the Instrument Configuration.

Step 4. Press the Exit button to return to the Configuration Menu.

Options Configuration

DeviceNet Parameters

DeviceNet is a low-level network designed to connect the Weight Controller to higher-level controllers such as PCs, PLCs or embedded controllers.The DeviceNet Network is an open, global industry-standard communication network designed to provide an interface through a single cable from a programmable controller or PC directly to the HI 4050 Weight Controller as well as smart devices such as sensors, push buttons, motor starters, simple operator interfaces, drives and other weight modules. With DeviceNet the user can monitor or control multiple applications from one display and allows 3rd party I/O to be easily added to any system. You no longer have to hard-wire each device to an I/O module or I/O block. The network also provides access to the intelligence present in the instruments for superior diagnostics and troubleshooting to help increase system up time. The DeviceNet network lets you monitor your plant-floor devices from a central location and reconfigure them as your needs change or service them as required. You can, for example, configure the Weight Controller modules for different applications.

The user can adjust the number of Bytes In and Bytes Out should their process require a different configuration than the default 32 Bytes In and/or Out.

PARAMETER: DNET BAUD

RANGE: 125K, 250K, 500K

DEFAULT: 125K

PARAMETER: DNET NODE

RANGE: 0-63

DEFAULT: 63

PARAMETER: DNET BYTES IN

RANGE: 0-32

DEFAULT: 32

PARAMETER: DNET BYTES OUT

RANGE: 0.32

DEFAULT: 32

Step 1. From the Summary display, press the Enter button. The Configuration Menu appears.

Step 2. Press the Down Arrow button until the cursor is in front of Options. (See Fig. 116)

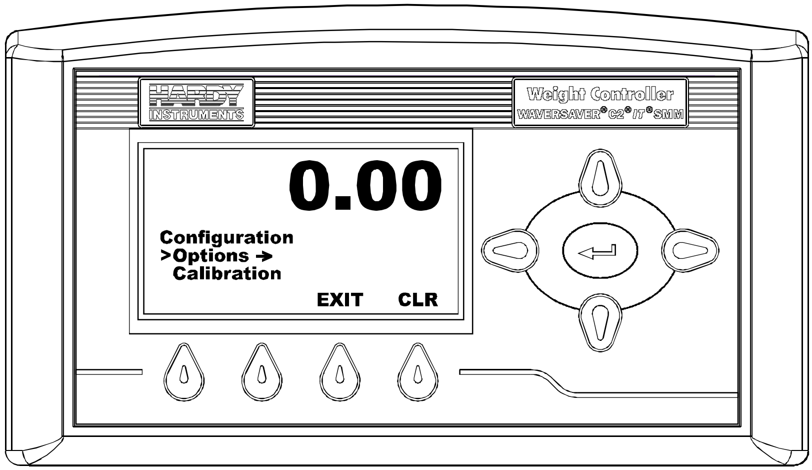


FIG. 116 CONFIGURATION MENU/SELECTING OPTIONS

Step 3. Press the Enter button. The Options Menu appears. (See Fig. 117)

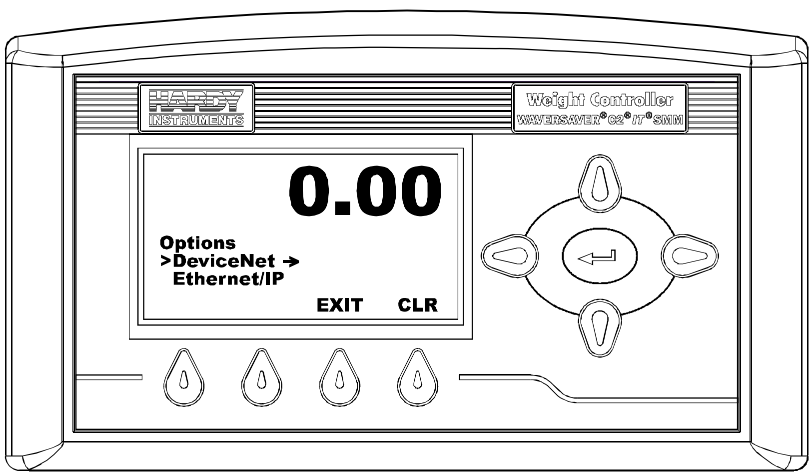


FIG. 117 OPTIONS MENU/SELECTING DEVICENET

Step 4. Press the Down arrow until the cursor is in front of DeviceNet.

Step 5. Press the Enter button. The DeviceNet Menu appears with cursor in front of DNET Baud Rate. (See Fig. 118) The present Baud Rate setting is displayed.

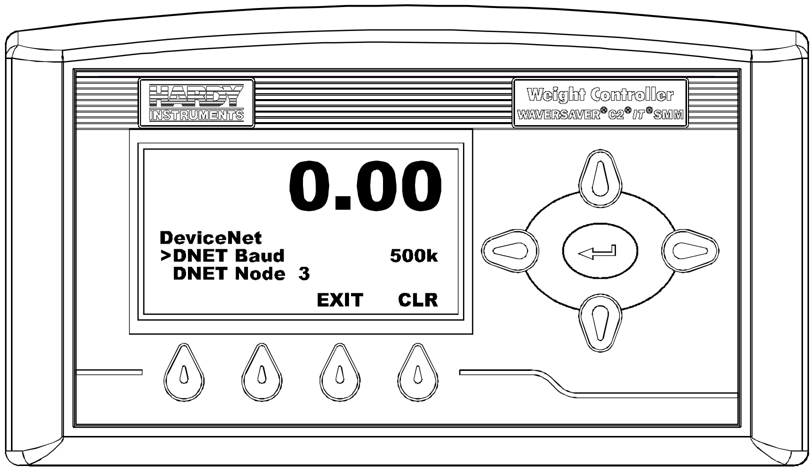


FIG. 118 DEVICENET MENU/SELECTING BAUD

Step 6. Press the right or left arrow buttons to select the Baud Rate you want.

- 125k
- 250k
- 500k

NOTE *Check with your Network Administrator for the Baud Rate if you don't know the correct Baud Rate.*

Step 7. Press the Enter button to save the entry.

Step 8. Press the Down arrow until the cursor is in front of DNET Node. (See Fig. 119) The present node setting is displayed.

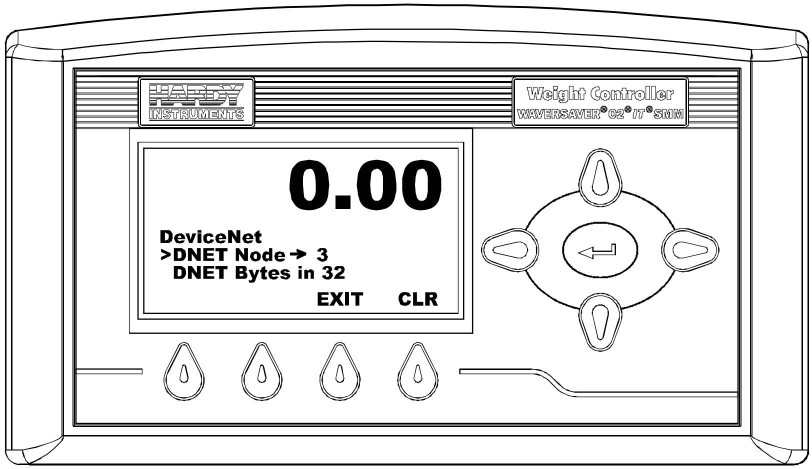


FIG. 119 DEVICENET MENU/SELECTING NODE

Step 9. Press the Enter button. The DNET Mode Menu appears. (See Fig. 120)

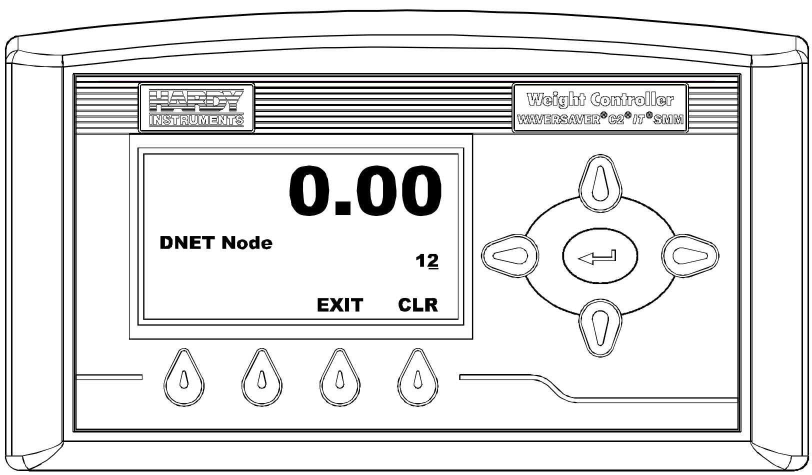


FIG. 120 DNET NODE MENU

Step 10. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the node address assigned to this instrument.

Step 11. Press the Enter button to save the entry.

Step 12. Press the Down Arrow button until the cursor is in front of “DNET Bytes in”. (See Fig. 121) The present DNET BYTES setting is displayed.

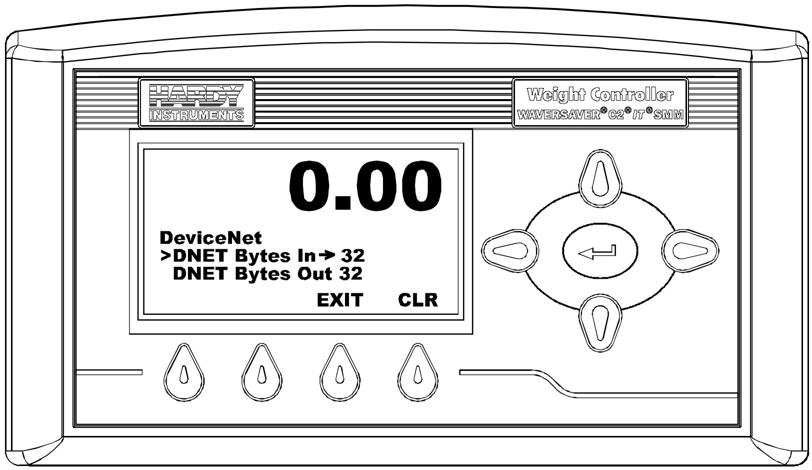


FIG. 121 DEVICENET MENU/SELECTING DNET BYTES IN

Step 13. Press the Enter button. The “DNET Bytes In” menu appears. (See Fig. 122)

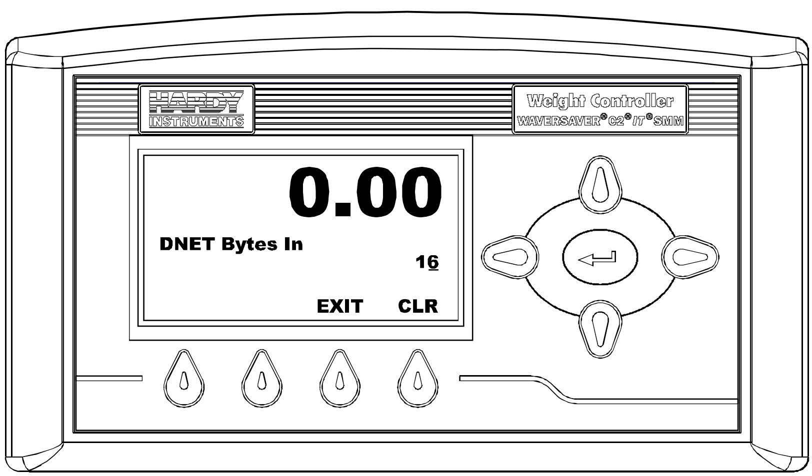


FIG. 122 DNET BYTES IN MENU

Step 14. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter a new bytes value. In our example we entered 16 bytes.

Step 15. Press the Enter button to save the entry.

Step 16. Press the Down Arrow button until the cursor is in front of “DNET Bytes Out”. (See Fig. 123) The present DNET Bytes Out setting is displayed.

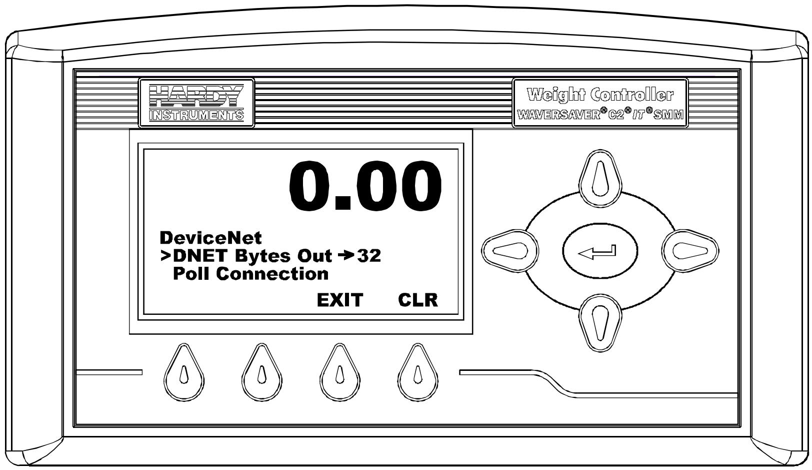


FIG. 123 DEVICENET MENU/SELECTING DNET BYTES OUT

Step 17. Press the Enter button. The “DNET Bytes Out” menu appears. (See Fig. 124)

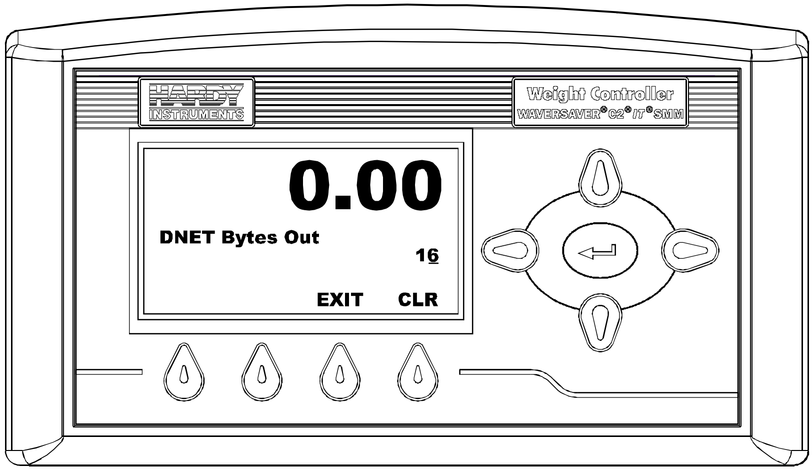


FIG. 124 DNET BYTES OUT MENU

Step 18. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter a new bytes value. In our example we entered 16 bytes.

Step 19. Press the Enter button to save the entry.

Step 20. The Poll Connection entry is read only telling you that the instrument is connected and polling.

- If the instrument is not connected to the DeviceNet Network a “No Connection” message appears. (See Fig. 125)
- Reconnect the DeviceNet cable. The “No Connection” goes away and the Poll Connection reappears.

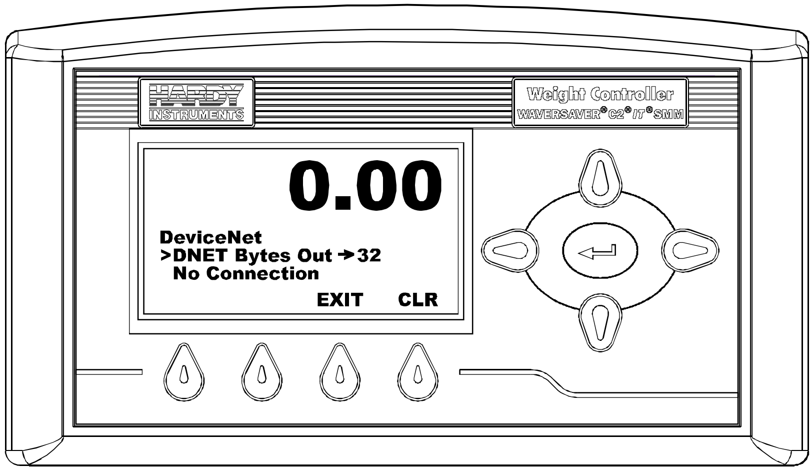


FIG. 125 DEVICENET MENU/NO CONNECTION

Step 21. Press the Exit button to return to the Setup Menu.

Ethernet/IP™ Parameters

EtherNet/IP™

EtherNet/IP, short for **E**thernet **I**ndustrial **P**rotocol, is an open industrial networking standard that takes advantage of commercial, off-the-shelf Ethernet communication chips and media. Ethernet technology, enables the user to access device-level data from the Internet.The Ethernet/IP networking standard supports both implicit messaging (real-time I/O messaging) and explicit messaging (message exchange). EtherNet/IP is an open network that takes advantage of commercial technology that already exists.

TCP/IP is the transport and network layer protocol of the Internet and is commonly linked with all Ethernet installations and the business world. TCP/IP provides a set of services that any two devices can use to share data. Because Ethernet technology and standard protocol suites such as TCP/IP have been published for public use, standardized software tools and physical media have been mass-produced and are readily available, offering you the benefits of known technology and accessibility. The UDP/IP (User Datagram Protocol) is also used in conjunction with the Ethernet network. UDP/IP provides fast, efficient data transport required for real-time data exchange.

NOTE *Ethernet/IP™ is a trademark of ODVA.*

Step 1. You will need a key number to enable Ethernet/IP. You can purchase a key number by contacting the Hardy Service Center or your local Hardy Representative.

Step 2. Once you have a key number. From the Summary display click on the Enter button The Configuration Menu appears.

Step 3. Press the Down arrow until the cursor is in front of Ethernet/IP (See Fig. 126)

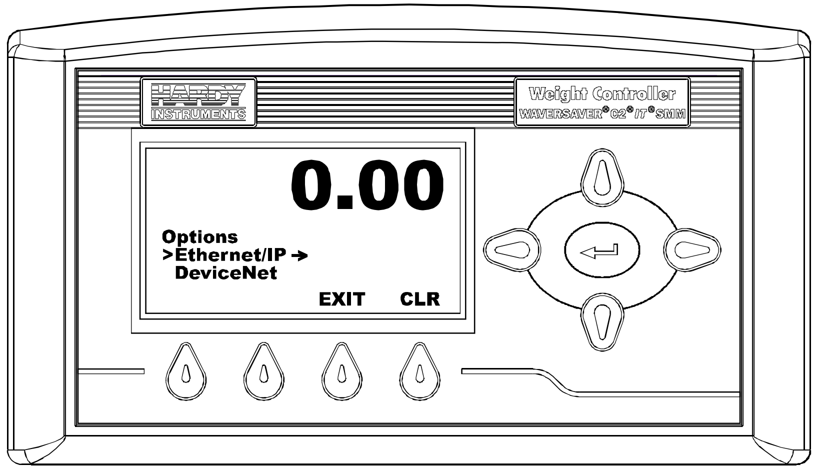


FIG. 126 OPTIONS MENU/SELECTING ETHERNET/IP

Step 4. Press the Enter button. The Ethernet/IP menu appears.

Step 5. Press the down arrow button until the cursor is in front of EIP Key. (See Fig. 127)

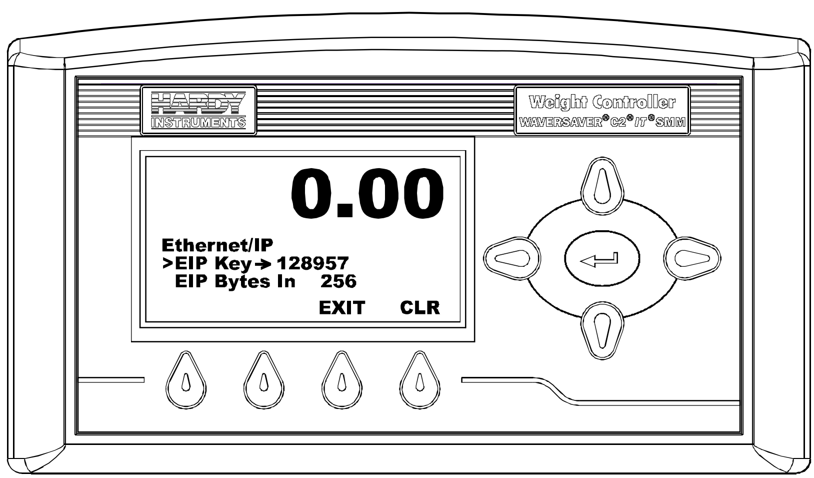


FIG. 127 ETHERNET/IP/EIP KEY NUMBER

Step 6. Press the Enter button. The EIP Key Menu appears with no key entered. (See Fig. 128)

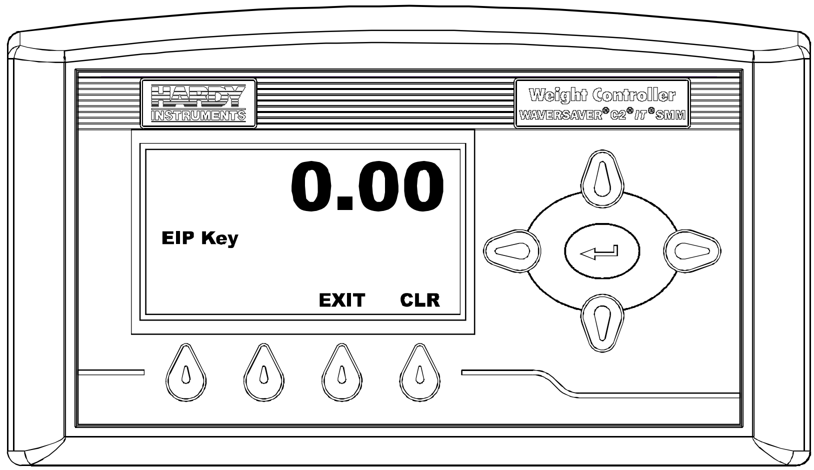


FIG. 128 EIP KEY MENU/NO KEY ENTERED

Step 7. Use the up and down arrow buttons to enter the key number you received from Hardy Instruments Service Center. (See Fig. 129)

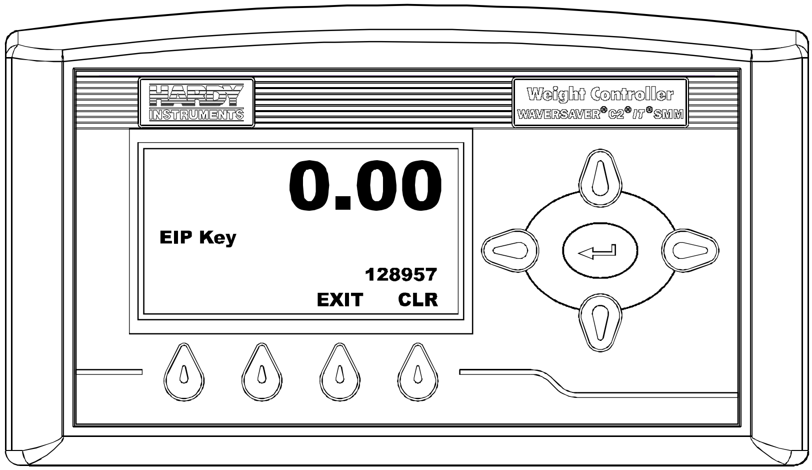


FIG. 129 EIP KEY MENU/WITH KEY

NOTE *The number entered in Fig. 125 is for illustration purposes only it does not resemble the key number in any way.*

Step 8. Press the Enter button to save the key entry.

Step 9. You will have to set the following parameters on your PLC in order to communicate with the HI 4050:

- **COMM FORMAT: DATA - SINT**
- **INPUT INSTANCE 100, LENGTH 256**
- **OUTPUT INSTANCE 112 - LENGTH 256**
- **CONFIGURATION INSTANCE 150 - LENGTH 0**

Step 10. Press the down arrow button until the cursor is in front of EIP Bytes In. (See Fig. 130)

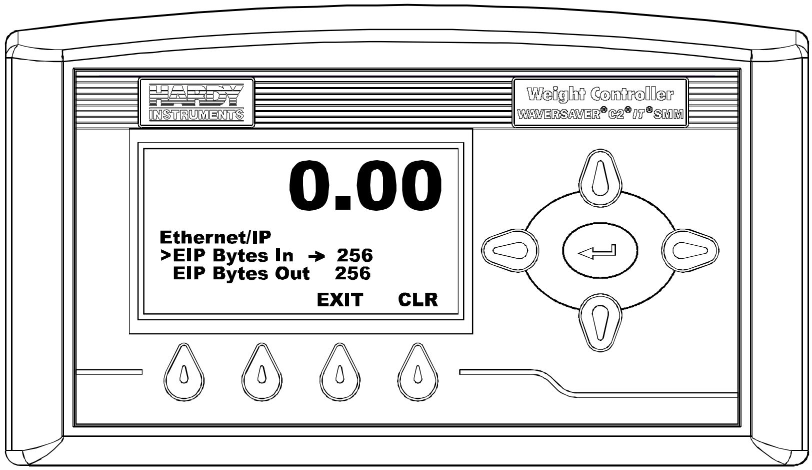


FIG. 130 ETHERNET/IP MENU/SELECTING EIP BYTES IN

Step 11. Press the Enter button. The “EIP Bytes In” menu appears. (See Fig. 131) The current value is displayed.

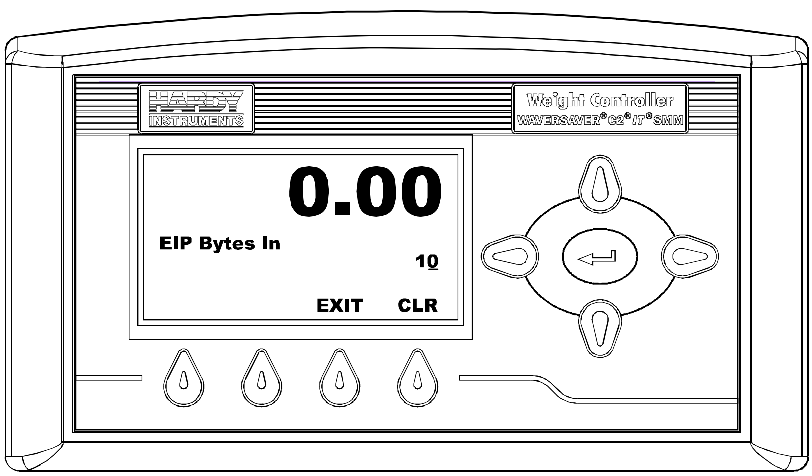


FIG. 131 EIP BYTES IN MENU

Step 12. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter a new bytes value. In our example we entered 10 bytes.

Step 13. Press the Enter button to save the entry.

Step 14. Press the Down Arrow button until the cursor is in front of "EIP Bytes Out". (See Fig. 132) The current value is displayed.

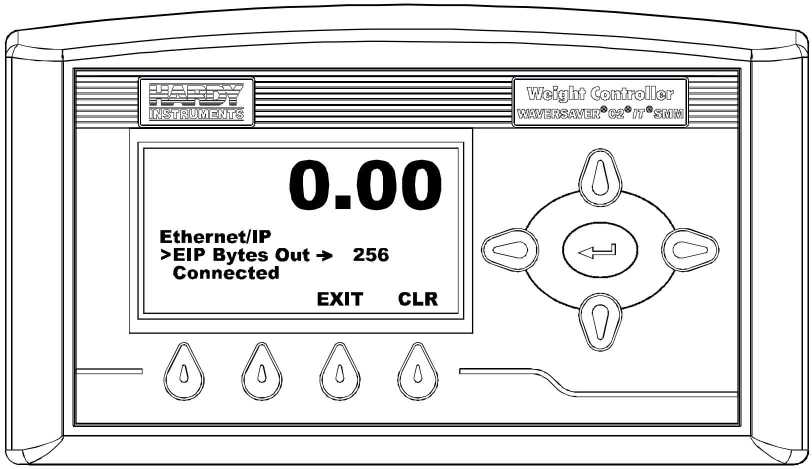


FIG. 132 ETHERNET/IP MENU/SELECTING EIP BYTES OUT

Step 15. Press the Enter button. The EIP Bytes Out menu appears. (See Fig. 133)

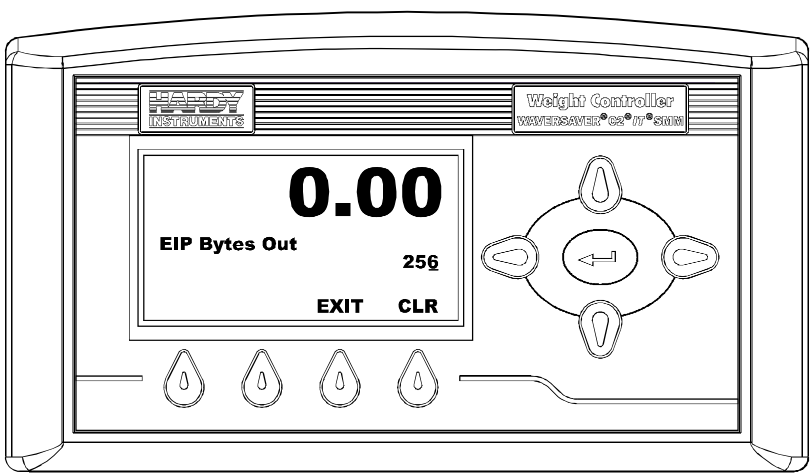


FIG. 133 EIP BYTES MENU

Step 16. Use the Left or Right Arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter a new bytes value. In our example we entered the default value of 256 bytes.

Step 17. Press the Enter button to save the entry.

Step 18. The Connected entry is read only and means that the instrument is connected to an Ethernet/IP network.

- If the instrument is not connected to the network a message appears saying “Not Connected”.
- Check the Ethernet/IP connection at the rear of the instrument to make sure it is securely fastened to the Ethernet/IP port.

Step 19. Press Exit to return to the Options Menu.

Enabling Modbus TCP/IP from the Front Panel

Step 1. You will need a key number to enable Modbus TCP/IP. You can purchase a key number by contacting the Hardy Service Center or your local Hardy Representative.

Step 2. Once you have a key number. From the Summary display click on the Enter button The Configuration Menu appears. (See Fig. 134)

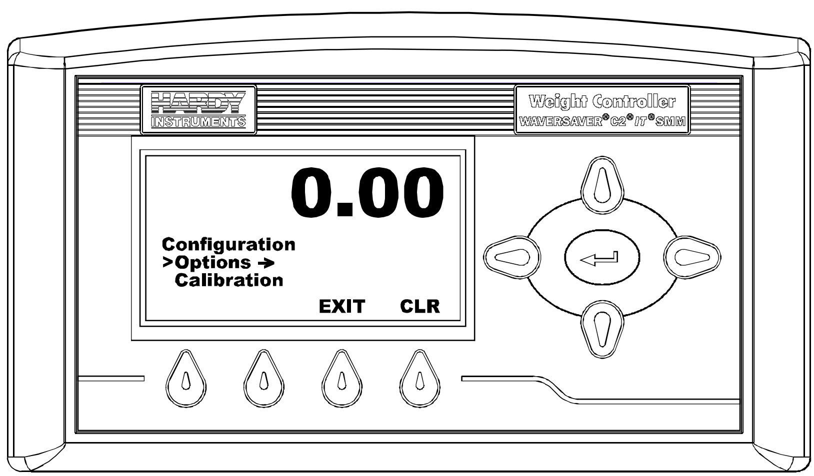


FIG. 134 CONFIGURATION/SELECTING OPTIONS

Step 3. Press the down arrow until the cursor is in front of Options.

Step 4. Press the Enter button. The Options Menu appears. (See Fig. 135)

Step 5. Press the up or down arrow buttons until the cursor is in front of Modbus Key. (See Fig. 135)

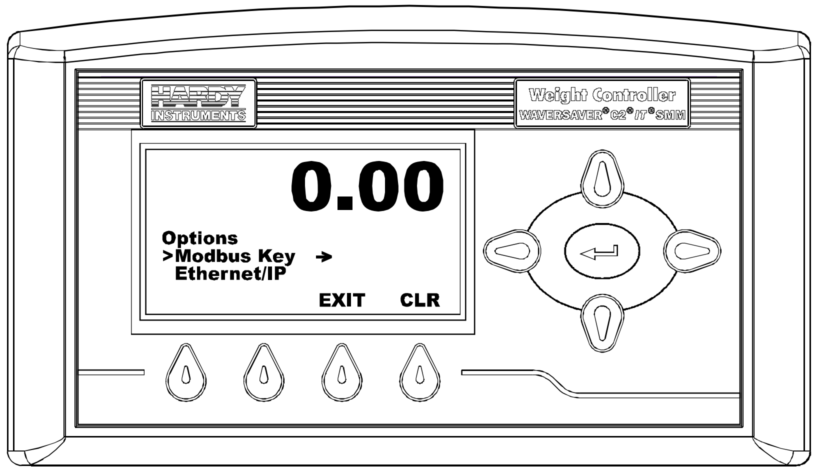


FIG. 135 RATE OF CHANGE/SETTING TIME BASE

Step 6. Press the Enter button. The Modbus Key menu appears. (See Fig. 136)

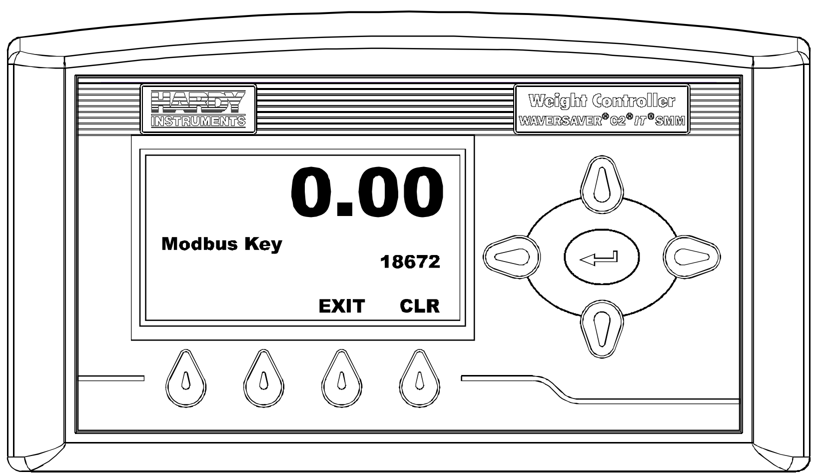


FIG. 136 ROC KEY MENU/ENTERING ROC KEY NUMBER

Step 7. Press the Clear (CLR) button.

Step 8. Use the left and right arrow buttons to enter the Modbus TCP/IP Key number.

NOTE *The key number entered in Fig. 132 is for illustration purposes only and does not resemble a key number in any way. Your ROC key number will vary.*

Step 9. Press the Enter button to save the Key Number to memory.

Step 10. The Modbus TCP/IP option is now enabled.

Rate of Change (-ROC) Option Configuration

ROC Configuration from the Front Panel

PARAMETER: TIMEMEASURE

RANGE: SEC, MIN, HRS

DEFAULT: SEC

PARAMETER: TIMEBASE

RANGE: 1-1800 SECONDS

DEFAULT: 1 SECOND

Enabling Rate of Change from the Front Panel

Step 1. You will need a key number to enable Rate of Change. You can purchase a key number by contacting Hardy Service Center or your local Hardy Representative.

Step 2. Once you have a key number. From the Summary display click on the Enter button.

Step 3. From the Summary Display, press the Enter button. The Configuration Menu appears with the cursor next to Setpoints.

Step 4. Press the down arrow until the cursor is in front of Options. (See Fig. 137)

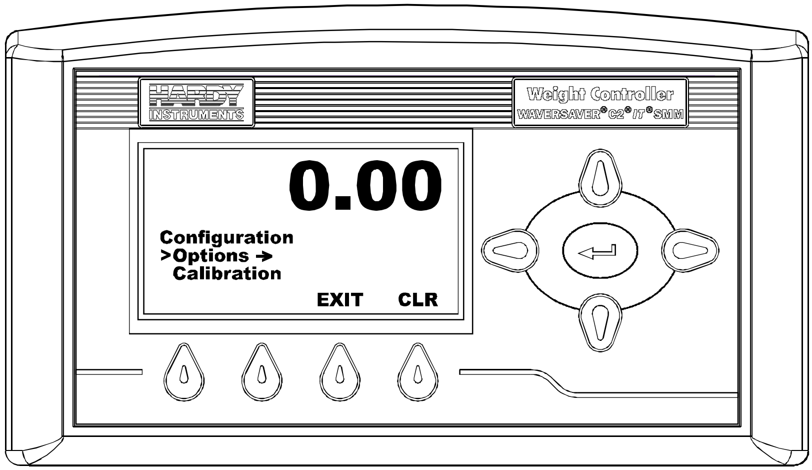


FIG. 137 CONFIGURATION/SELECTING OPTIONS

Step 5. Press the Enter button. The Options Menu appears. (See Fig. 138)

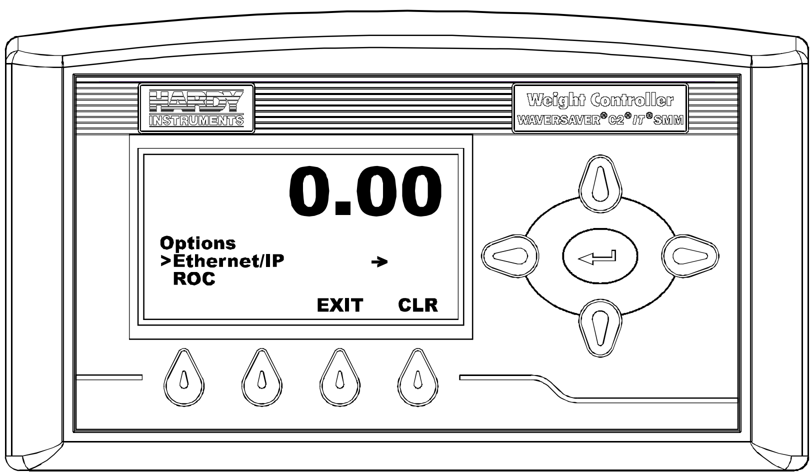


FIG. 138 OPTIONS MENU

Step 6. Press the up or down arrow buttons until the cursor is in front of Rate of Change. (See Fig. 139)

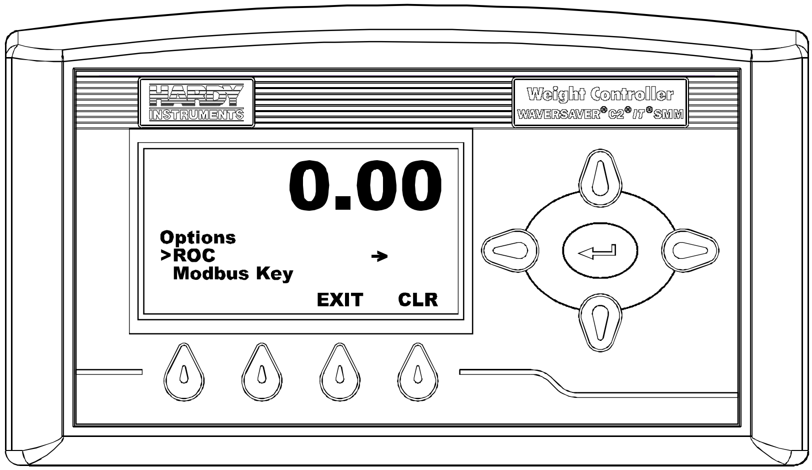


FIG. 139 OPTIONS MENU/SELECTING ROC

Step 7. Press the Enter button. The Rate of Change Menu appears with the cursor in front of Time Base. (See Fig. 140)

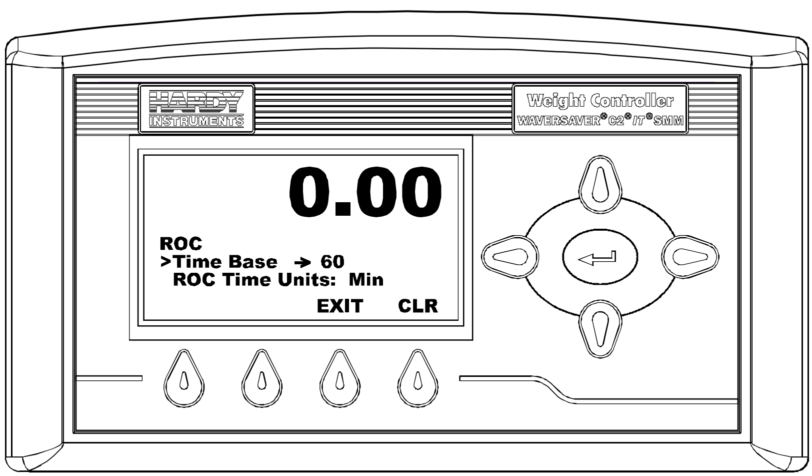


FIG. 140 RATE OF CHANGE/SETTING TIME BASE

Step 8. Press the down arrow until the cursor is in front of ROC Key. (See Fig. 141)

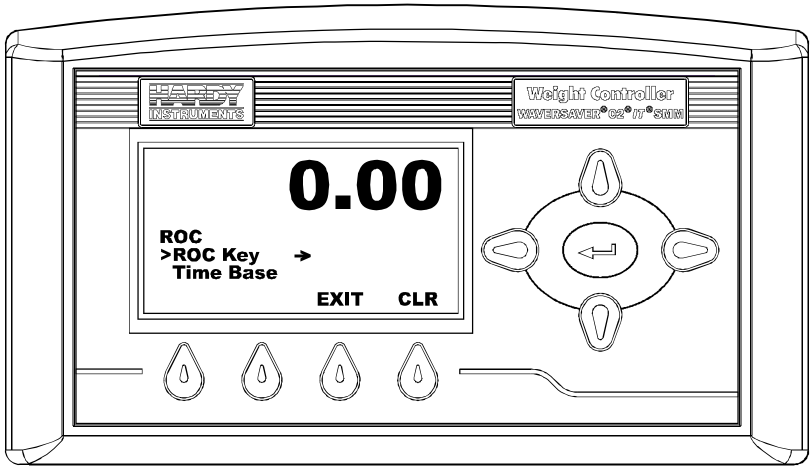


FIG. 141 ROC MENU/ENTERING ROC KEY

Step 9. Press the Enter button. The ROC Key menu appears. (See Fig. 142)

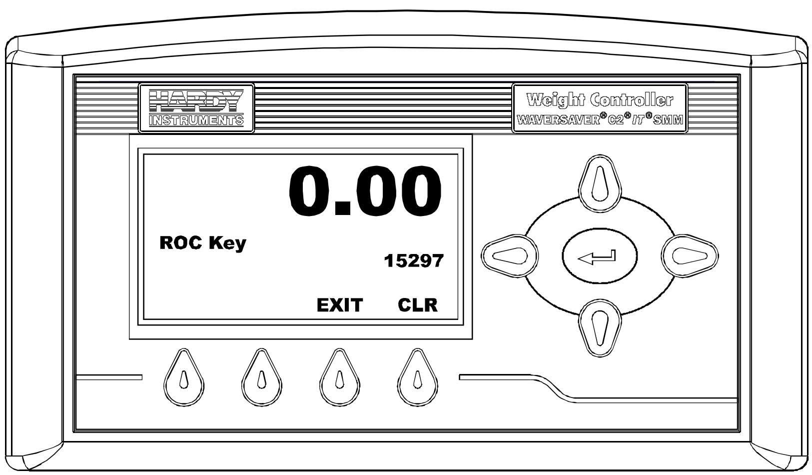


FIG. 142 ROC KEY MENU/ENTERING ROC KEY NUMBER

Step 10. Press the Clear (CLR) button.

Step 11. Use the left and right arrow buttons to enter the ROC Key number.

NOTE *The key number entered in Fig. 134 is for illustrations purposes only and does not resemble a key number in any way. Your ROC key number will vary.*

Step 12. Press the Enter button to save the Key Number to memory.

Step 13. The Rate of Change is now enabled.

Step 14. Press the Exit button to return to the Rate of Change Menu.

Configuring Rate of Change

Step 1. Press the Enter button. The Time Base Menu appears. (See Fig. 143)

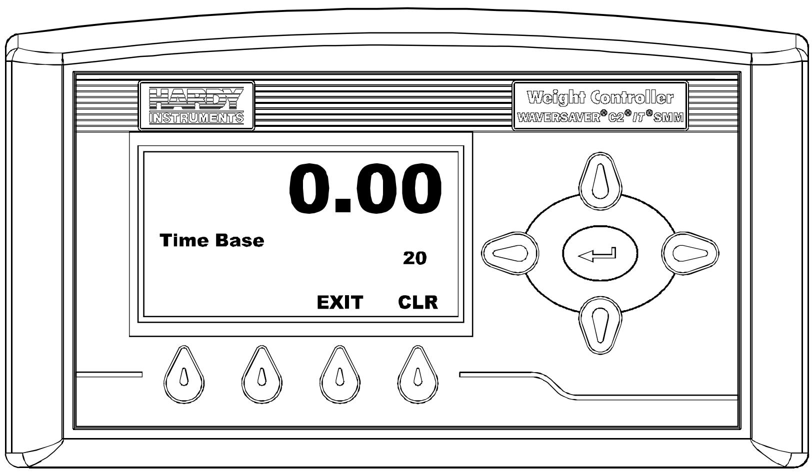


FIG. 143 TIME BASE/SETTING TIME/20

Step 2. To set the Time Base, press the Clear (CLR) button to delete the current entry.

Step 3. Use the up and down arrows to increase or increase the values. Use the left and right arrows to move the cursor left and right. In our example we entered 20.

Step 4. Press the Enter button to save the entry. The ROC Menu reappears. (See Fig. 144)

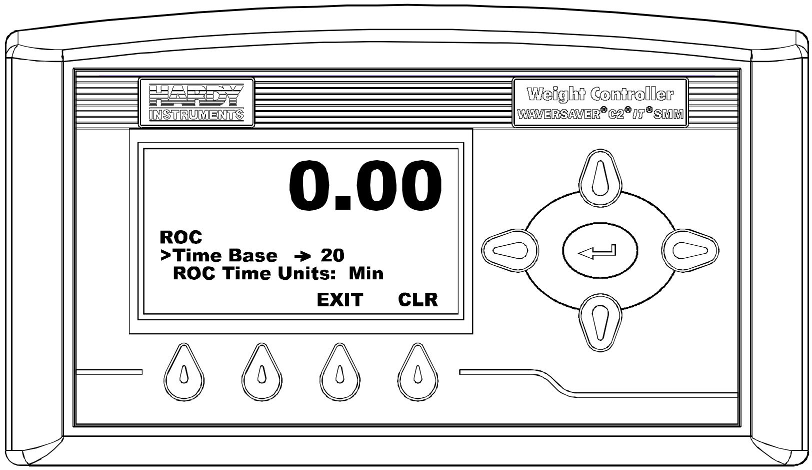


FIG. 144 ROC MENU

Step 5. Press the down arrow button until the cursor is in front of ROC Time Units. (See Fig. 145)

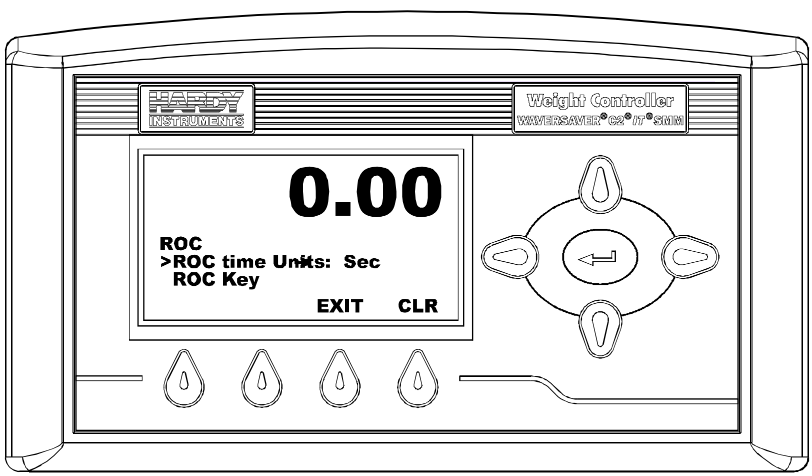


FIG. 145 ROC MENU/SETTING TIME UNITS

Step 6. To set the ROC Time Units, press the left or right arrow buttons to select the Timebase value. In our example we selected seconds.

Step 7. Press the Enter button to set the entry.

Step 8. Press the Exit button to return to the Configuration Menu.

NOTE *To configure ROC from the Web Browser go to "Configuring ROC From the Browser" in this manual.*

Configuring Optional Boards

Configuring the Analog Output Card from the Front Panel

The analog parameters configure the analog output channels. The channels are configured as voltage or current outputs. Channels 1 and 3 are voltage output channels (0-10 VDC). Channels 2 and 4 are current outputs (0-20 mA).

Step 1. From the Options Menu, press the down arrow button until the cursor is in front of "Analog Card". (See Fig. 146)

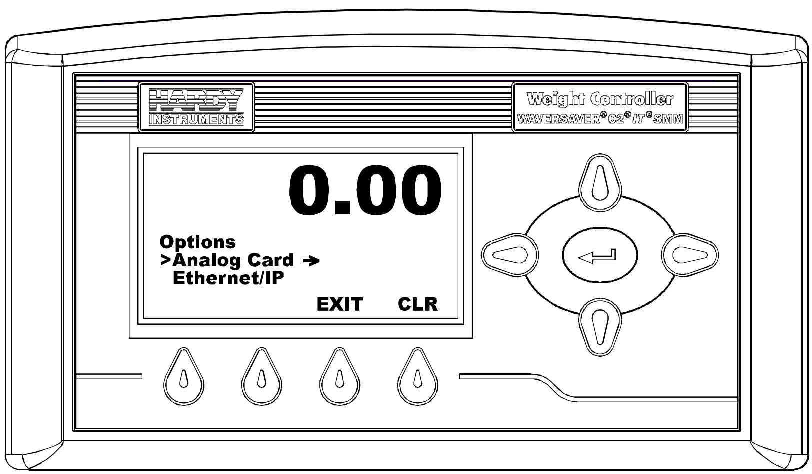


FIG. 146 OPTIONS MENU/SELECTING ANALOG CARD

Step 2. Press the Enter button. the Analog Card Sub-Menu appears. (See Fig. 147)

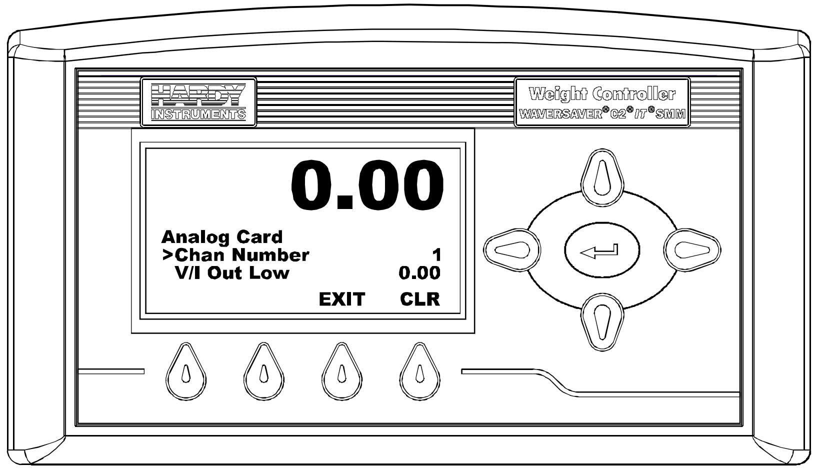


FIG. 147 ANALOG CARD/LISTING CHANNEL NUMBER 1

Step 3. Press the right or left arrow button to select the channel you want to view and/or configure. In our example we selected Channel 1.

PARAMETER: CHAN NUMBER

RANGE: 1-4

DEFAULT: 1

Step 4. Press the down arrow button until the cursor is in front of "V/I Out Low". (See Fig. 148) Keep in mind that Channel 1 and Channel 3 are 0-10 Voltage Channels.

Setting Channel 1 & 3 Output Voltage Parameters

PARAMETER: V/I OUT LOW

RANGE: 0-10V

DEFAULT: 0-10V

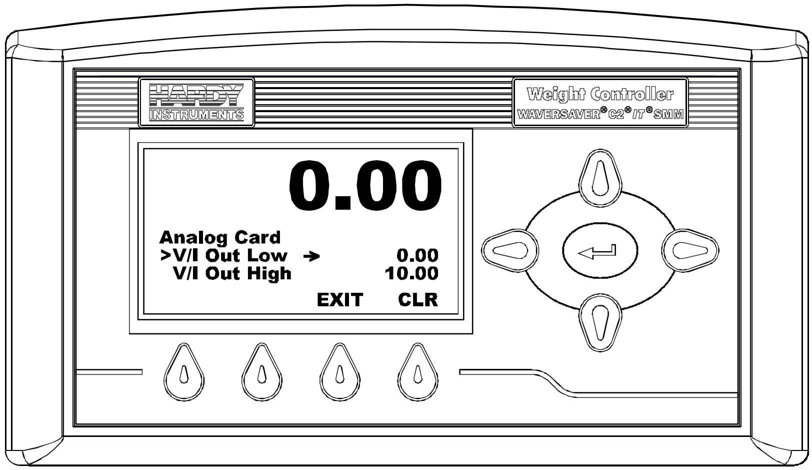


FIG. 148 V/I OUT LOW/SETTING LOW OUTPUT

Step 1. Press the Enter button. The V/I Out Low Menu appears. (See Fig. 149)

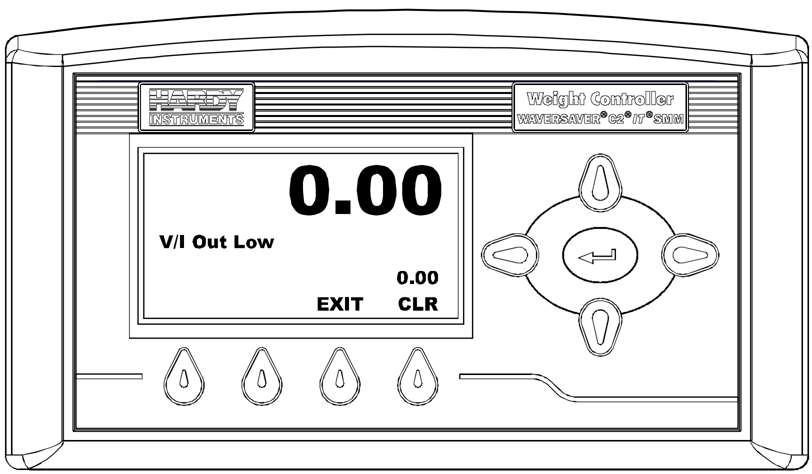


FIG. 149 V/I OUT LOW MENU/SETTING LOW OUTPUT VOLTAGE

Step 2. Press the CLR button to clear the current value. Use the up and down arrows to set the number you want and the left and right arrow buttons to move the cursor left and right. In our example we selected 0.00 as out Low Output voltage value.

If for example you wanted to narrow the total range from 0-10 V to 5-10. You would change the V/I Out Low value to 5.00. (See Fig. 150) You can adjust the low output voltage to any value you want to meet your application requirements.

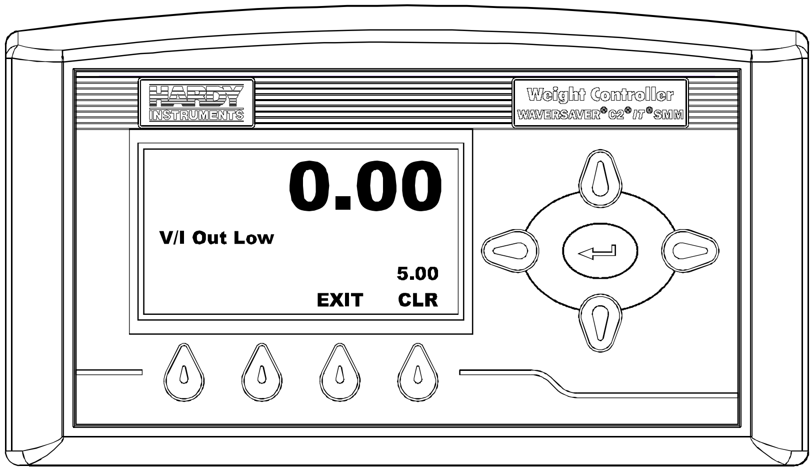


FIG. 150 ADJUSTING V/I OUT LOW TO 5.0 VOLTS

Step 3. Press the Enter button to save the setting.

- A brief message “Entry Accepted” appears if the value is between 0-10 Volts.
- If the value is not between 0-10 Volts the V/I value reverts to 0.00.

Step 4. Press the down arrow button until the cursor is in front of V/I Out High. (See Fig. 151)

Step 5. To Set or Change the Voltage Out High press the Enter button. the V/I High Menu appears. (See Fig. 152)

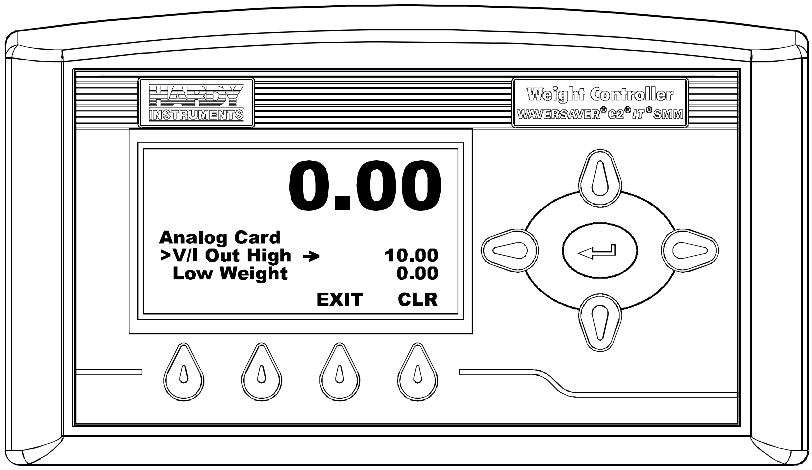


FIG. 151 ANALOG CARD MENU/SELECTING V/I OUT HIGH

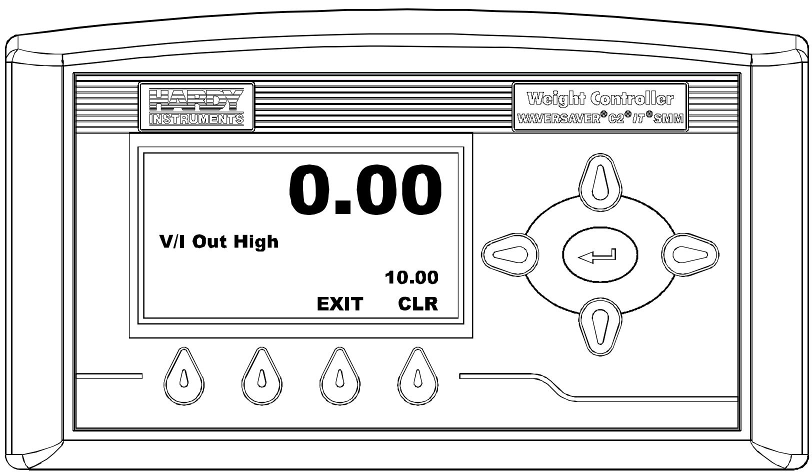


FIG. 152 V/I OUT HIGH MENU/SETTING HIGH VOLTAGE

Step 6. Press the CLR button to clear the entry.

Step 7. Use the up or down arrows to set the value and the left or right arrow buttons to move the cursor left and right. In our example we left the High Voltage value at 10.00 Volts.

Step 8. Press the Enter button to save the entry.

Step 9. Press the Down arrow button until the cursor is in front of Low Weight. (See Fig. 153)

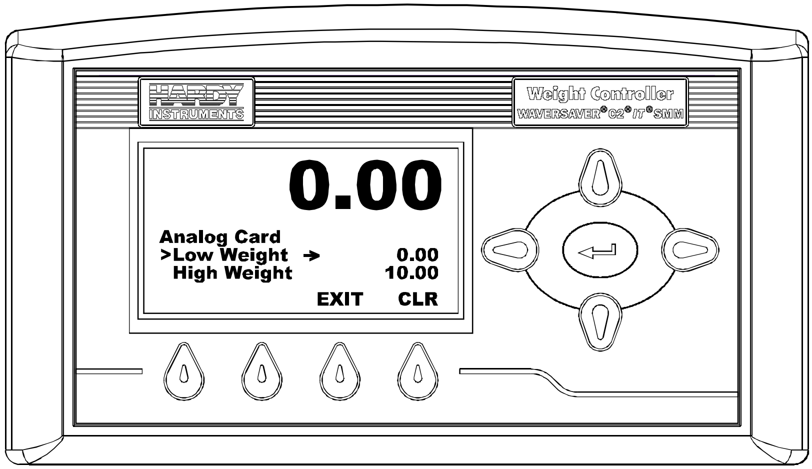


FIG. 153 ANALOG CARD MENU/SELECTING LOW WEIGHT

Step 10. Press the Enter button. the Low Weight Menu appears. (See Fig. 154)

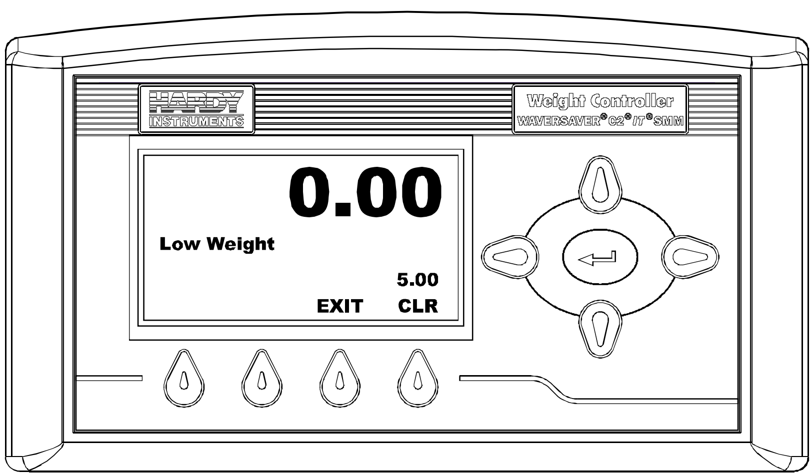


FIG. 154 LOW WEIGHT MENU/SETTING LOW WEIGHT

Step 11. Press the CLR button to clear the entry.

Step 12. Use the up or down arrows to set the value and the left or right arrow buttons to move the cursor left and right. In our example we set the Low Weight value at 5.00. Keep in mind that you have already set the weight units when you configured the Instrument. The Low Weight will read out in whatever units you selected.

Step 13. Press the Enter button to save the entry.

Step 14. Press the Down arrow button until the cursor is in front of “High Weight”. (See Fig. 155)

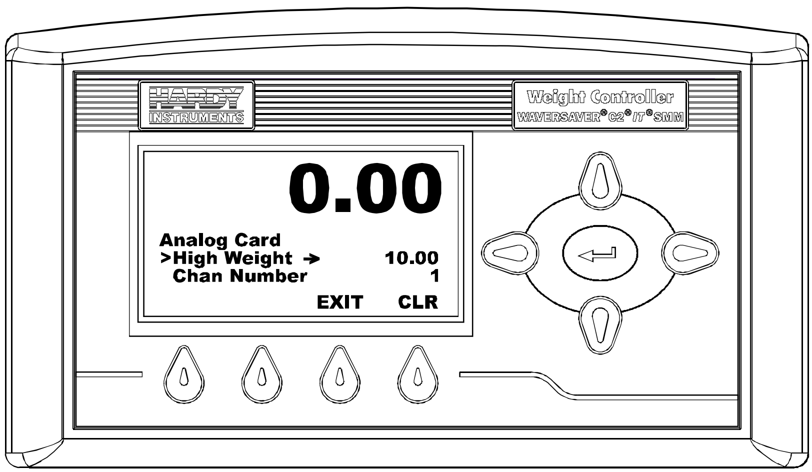


FIG. 155 ANALOG CARD/SELECTING HIGH WEIGHT

Step 15. Press the Enter button. the High Weight Menu appears. (See Fig. 156)

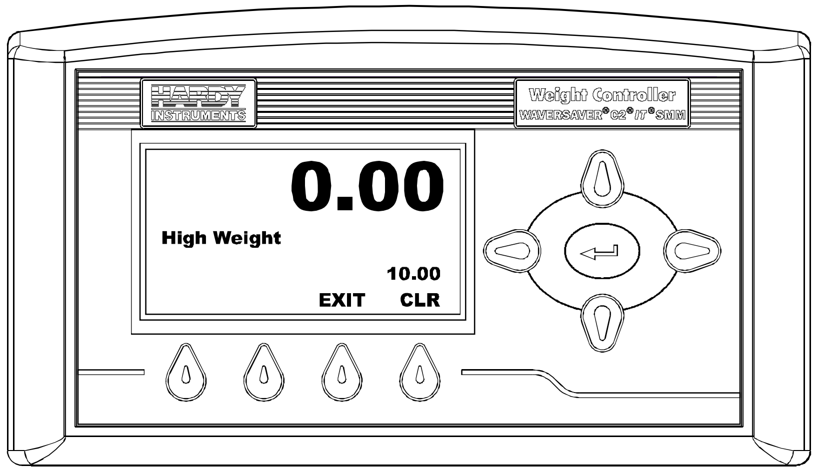


FIG. 156 HIGH WEIGHT MENU/SETTING HIGH WEIGHT

Step 16. Press the CLR button to clear the entry.

Step 17. Use the up or down arrows to set the value and the left or right arrow buttons to move the cursor left and right. In our example we set the High Weight value at 10.00. Keep in mind that you have already set the weight units when you configured the Instrument. The High Weight will displayed in whatever units you selected.

Step 18. Press the Enter button to save the entry.

Step 19. Press the right or left button to change the Channel. (See Fig. 157)

Step 20. The process for configuring Channel 3 is the same.

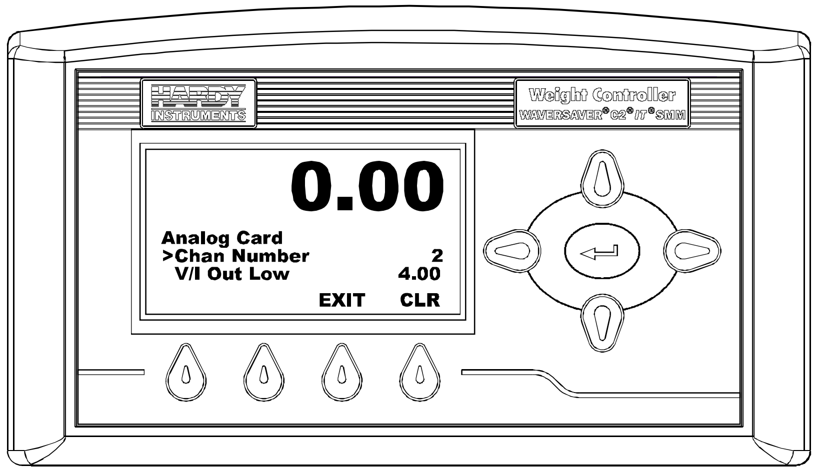


FIG. 157 ANALOG CARD/SELECTING CHANNEL 2

Setting Current Channel 2 & 4 Parameters

NOTE *The V/I Out Low value is 4 mA.*

PARAMETER: V/I OUT LOW

RANGE: 0 - 20 MILLIAMPS

DEFAULT: 4 MILLIAMPS

PARAMETER: V/I OUT HIGH

RANGE: 0-20 MILLIAMPS

DEFAULT: 20

Step 1. Press the Down arrow button until the cursor is in front of V/I Out Low. (See Fig. 158)

NOTE *The V/I Out High value is 20 mA.*

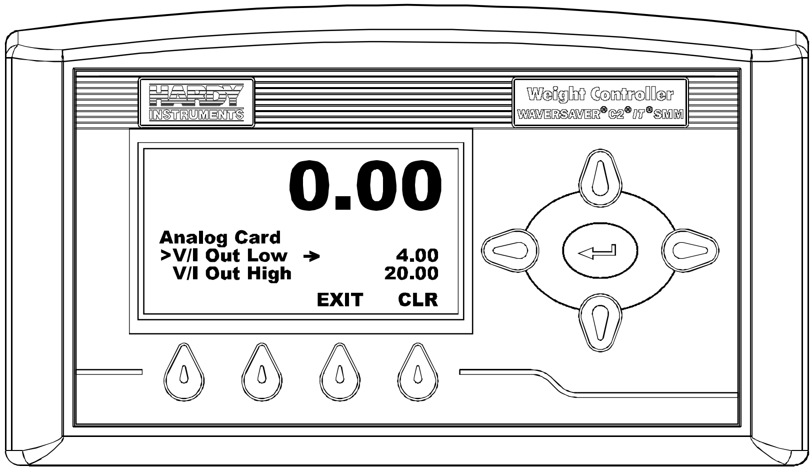


FIG. 158 ANALOG CARD/SELECTING V/I OUT LOW

Step 2. Follow steps 1-19 above (Configuring the Voltage Parameters) keeping in mind that you are setting up your current and weight parameters.

Step 3. The process for configuring Channel 4 is the same.

NOTE *When finished with the configuration from the front panel you need to go to the HI 4050 Web Page/Mapping and Map an input signal to the Analog Channel. For mapping instructions please see Chapter 6 of this manual.*

NOTE *To set the Analog Card Parameters from the Web Page go to "Configuring the Analog Card from the Web Page".*

Reading the Digital I/O Card Parameters and Status from the Front Panel

The HI 4050 has a total of six (6) Digital inputs with the Digital I/O card installed and four (4) Digital Outputs. The Main Board has three (3) Digital Inputs and the Digital I/O Option Card has three (3) Digital Inputs. The Digital Inputs can be used to Tare, Zero or calibrate the instrument for example when a voltage signal is sent to the instrument. You will have to Map the Input to one of the actions you want to perform. The Digital Outputs can be used to send an output voltage signal to actuate either a solid state relay or mechanical relay. You cannot configure the Digital I/O Card Inputs or Outputs from the Front Panel, you must use the Web Page for Configuration.

Step 1. From the Options Menu, press the down arrow button until the cursor is in front of "Digital I/O Card". (See Fig. 159)

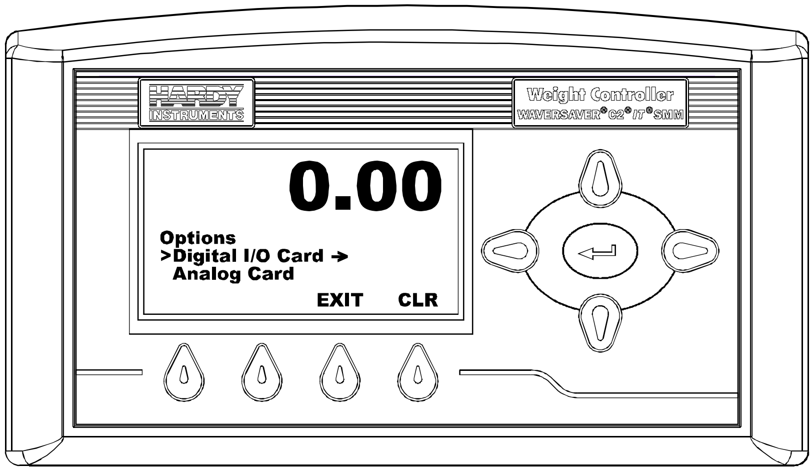


FIG. 159 OPTIONS MENU/SELECTING DIGITAL I/O CARD

Step 2. Press the Enter button. the Digital I/O Card Menu appears. (See Fig. 160)

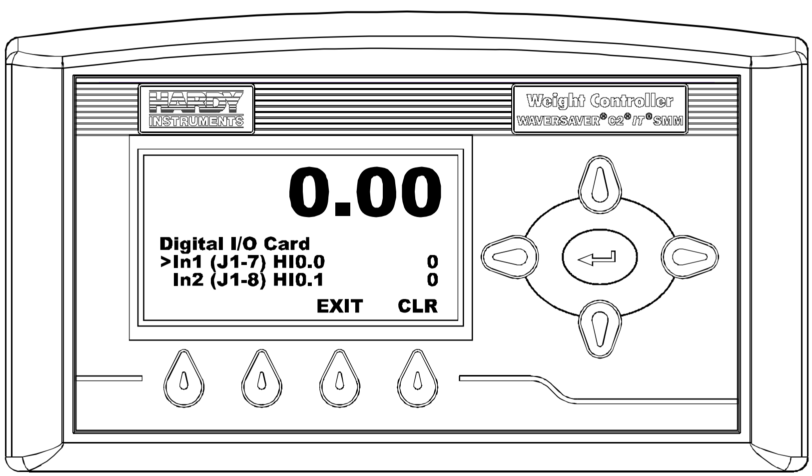


FIG. 160 DIGITAL I/O CARD/READING INPUT 1

Step 3. To read the status of each Digital Input and Output press the down arrow button to scroll through the list. These are read only menus you cannot change the parameters from the front panel.

NOTE *You must set the Digital I/O Card Parameters from the Web Page. Go to “Configuring the Digital I/O Card from the Web Page” for instructions.*

Configuring Network Option Cards from the Front Panel

PROFIBUS® Configuration

ProfiBus DP operates using a cyclic transfer of data between master(s) and slave(s) on an RS485 network. An assigned master periodically requests (polls) each node (slave) on the network. The HI 4050 is a slave device. All data communication exchanges between a master and the HI 4050 originate from the master device. Each HI 4050 is assigned to one master and only that master may write output data to that HI 4050. Other masters may read information from any slave, but can only write output data to their own assigned slaves.

Because ProfiBus uses a cyclic (periodic) polling mechanism between masters and slaves, it is also deterministic. Therefore behavior of a ProfiBus system can be reliably predicted over time. ProfiBus is designed to guarantee a deterministic response.

The length (and timing) of the I/O data to be transferred from a single slave to a master is predefined in the slave's device data base or GSD file. The GSD files of each device connected via the network (slaves and class 1 masters only) are compiled into a master parameter record which contains parameterization and configuration data, an address allocation list, and the bus parameters for all connected stations. A master uses this information to set up communication with each slave during startup.

Slaves can only acknowledge the messages they receive or transfer messages to a master when the latter requests a slave to do so. Slaves are also designated as passive nodes.

PROFIBUS-DP Network Setup

NOTE *Hardy Instruments Inc. is a member of Profibus International.*

Initialization Process

To be able to add an HI 4050 to a Profibus-DP network, you need a PC and software such as Siemens Step 7™, Simatic Manager or equal, that allows the Profibus-DP PLC and the HI 4050 to exchange data.

Profibus-DP .GSD File

All devices connected to a Profibus-DP network require a *.gsd file. The *.gsd file contains all the parameters including the baud rate, table formats and necessary data required by the network PLC when an HI 4050 is connected to the network.

A copy of the *.gsd file can be found on the CD that comes with the instrument or at the Hardy Website or at http://www.profibus.com/libraries.html.

Whichever Simatic Manager you select, you must go through these three steps:

Step 1. Connect the HI 4050 Series Instrument to the Profibus DP network and verify the address. (See Fig. 161) (Installation and Cabling Instructions are located in the Installation Section of this Manual)

Step 2. Connect the PC to the Trunk Line. Load the configuration properties to the initialization software on the PC and transfer them to the PLC.

Step 3. Install the *.gsd file, and map I/O data table properties to the instrument.

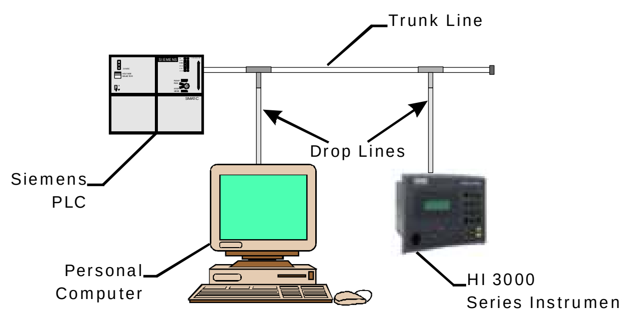


FIG. 161 SIMPLE PROFIBUS NETWORK WITH TRUNK AND DROP LINES

Pre-Initialization Procedures

Step 1. Inspect the network cables and make sure that the cables have been installed correctly and satisfy the Profibus-DP guidelines for the data transmission baud rate(s) required. (See the Cabling Chapter/Profibus Installation in this manual for Profibus-DP cable specifications and cabling guidelines.)

Step 2. Select the Node address for the HI 4050. (See below) This can be done before or after Initialization.

Step 3. Cycle power, or perform the two previous steps before powering up your network. Address selection can only occur after cycling the power. Make sure that the software you use will detect the values as you have set them.

Caution: **The address should never be changed during operation. If the address is modified while the power is on, an internal error could be generated and the module disconnected from the network.**

NOTE *Profibus-DP provides a very flexible network solution. In addition to the basic guideline provided in this manual, your installation could require procedures that are beyond the scope of this manual. For more information and to locate lists of links to other sources of Profibus-DP information, check the Profibus website at http://www.profibus.com.*

Step 4. Complete any additional configuration that is required by your PLC for initialization. Our initialization example is for a Siemens PLC. Your PLC initialization requirements may differ.

Step 5. Install the *.GSD file for the instrument you connected to the Profibus Network.

Initialization Procedures

NOTE: The examples provided are taken from the Siemens Step 7™, Simatic Manager Software. Your software will vary from these procedures. Step 7™ is a trademark of the Siemens Corporation.

Step 1. In the Siemens Step 7™, Simatic Manager open the Hardware Catalog. (See Fig. 162)

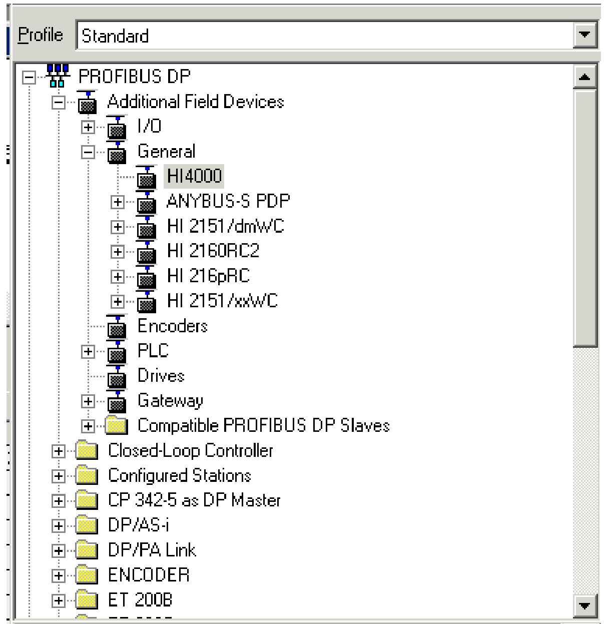


FIG. 162 HARDWARE CATALOG/SELECTING HI 4000 PDP FOLDER

Step 2. Click on the "+" to expand the Additional Field Devices Folder. (See Fig. 162)

Step 3. Click on the "+" to expand the General Folder. (See Fig. 162)

Step 4. Highlight the CPU you selected in the UR dialog box.

Step 5. Double Click on "HI4000" or drag and drop the "HI4000" folder to the Profibus-DP Network. The Parameters dialog box appears. (See Fig. 162)

Step 6. You can set the address of the instrument here if necessary.

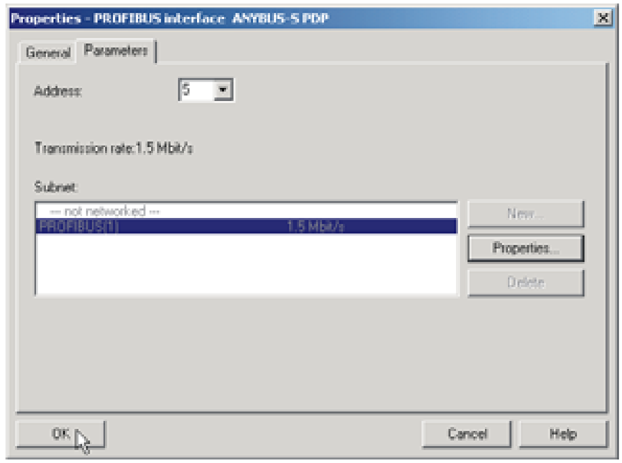


FIG. 163 HI 4000 PDP PARAMETERS DIALOG BOX

NOTE *The HI 4050 Series Input and Output Sizes are expressed in words. 16 words input and 16 words output.*

Step 7. Click on the OK button to set the Node Address.

Step 8. The HI 4050 Series (HI 4000) module appears in the Profibus Network. (See Fig. 164)

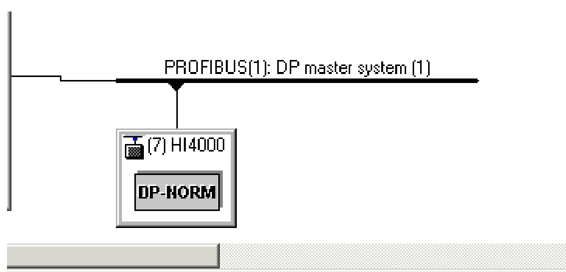


FIG. 164 HI 4000 APPEARS IN THE NETWORK

Step 9. Click on the Down Load Icon to download the configuration to the PLC. (See Fig. 165) The Select Destination Module dialog box appears. (See Fig. 166)

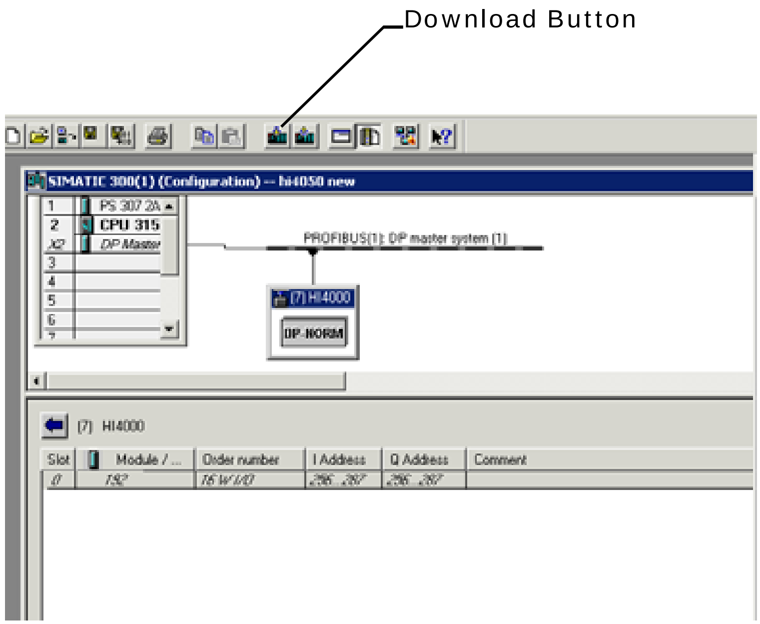


FIG. 165 DOWNLOADING HI 4050 CONFIGURATION

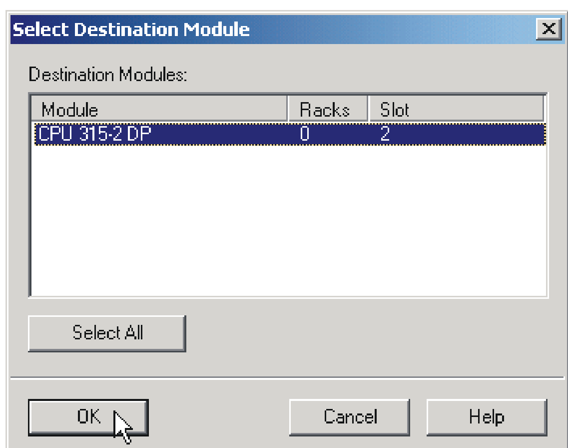


FIG. 166 SELECT DESTINATION MODULE DIALOG BOX

Step 10. Click on OK. The Select Station Address Dialog box appears. (See Fig. 167)

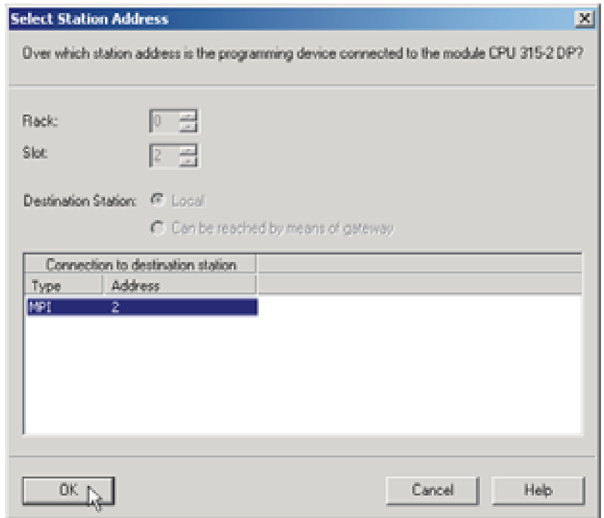


FIG. 167 SELECT STATION ADDRESS DIALOG BOX

Step 11. Click on OK. A prompt appears indicating that the Step 7 is downloading the configuration to the PLC. (See Fig. 168)

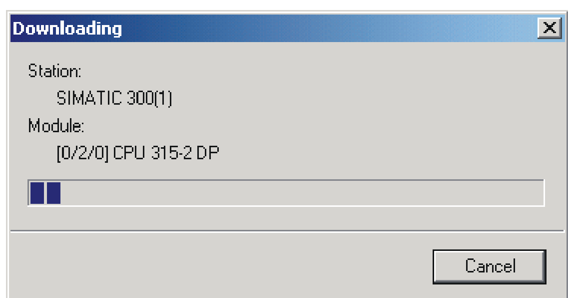


FIG. 168 DOWNLOADING CONFIGURATION PROMPT

Step 12. When the download is complete the HW Config dialog box should look something like this. (See Fig. 169)

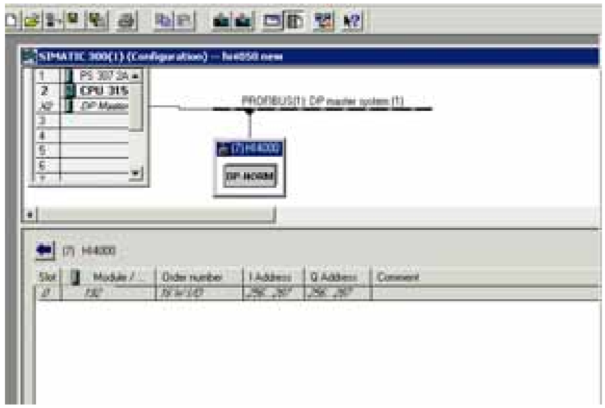


FIG. 169 INITIALIZATION COMPLETE

Step 13. Initialization is complete.

Configuring Profibus from the Front Panel

PARAMETER: PROFIBUS NODE ADDRESS

RANGE: 1-125

DEFAULT: 5

NOTE *PROFIBUS Node Address #5 is the lowest address number that can be used by a slave device.*

Step 1. From the summary display, press the Enter button. The Configuration display appears. (See Fig. 170)

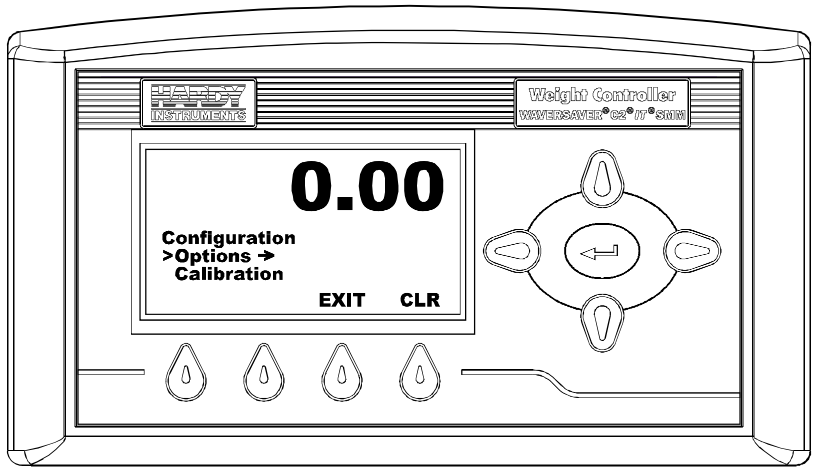


FIG. 170 CONFIGURATION MENU/SELECTING OPTIONS

Step 2. Press the down arrow button until the cursor is in front of Options.

Step 3. Press the Enter button. The Options display appears. (See Fig. 171)

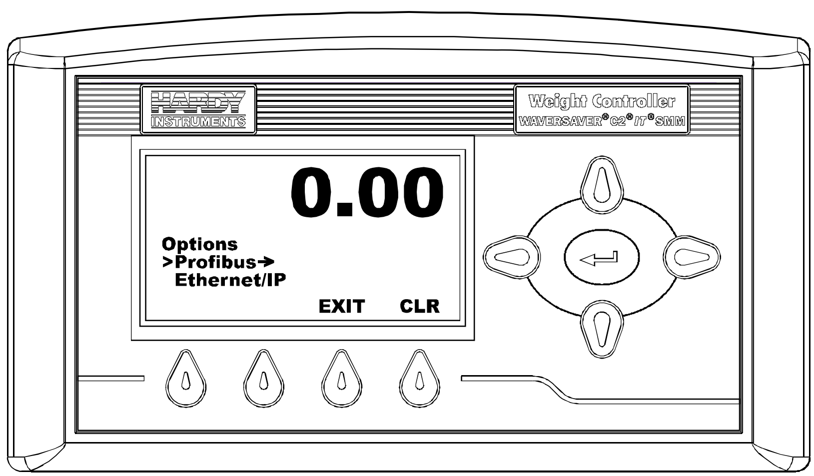


FIG. 171 OPTIONS MENU/SELECTING PROFIBUS

Step 4. Press the down arrow until the cursor is in front of Profibus.

Step 5. Press the Enter button. The Profibus Menu appears. (See Fig. 172)

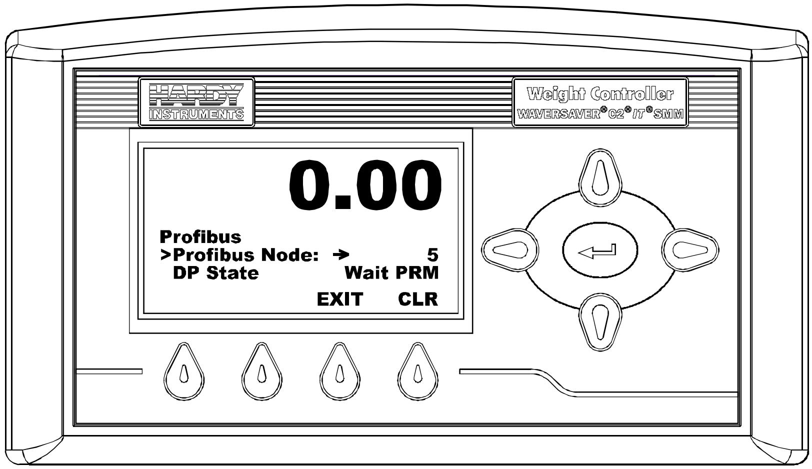


FIG. 172 PROFIBUS MENU/SETTING NODE ADDRESS

Step 6. Press the up or down arrow buttons until the cursor is in front of Profibus Node. Press the Enter button. the Profibus Node Menu appears with the current Node address setting. (See Fig. 173)

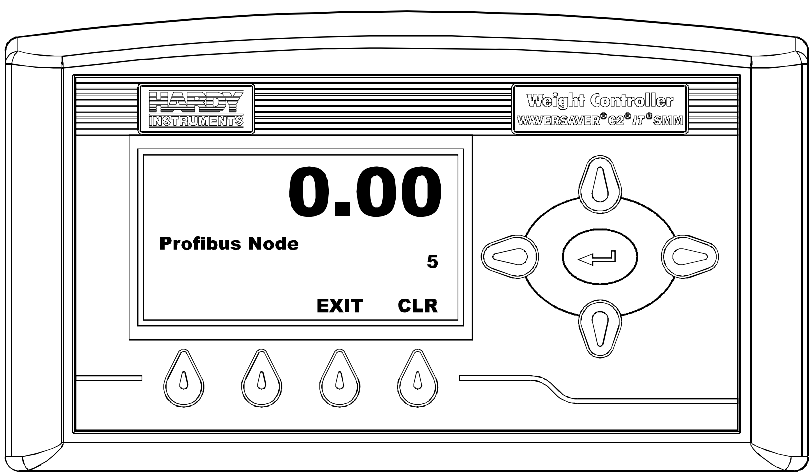


FIG. 173 PROFIBUS NODE MENU/SELECTING NODE ADDRESS NUMBER

Step 7. Press the CLR (Clear) button to clear the current address.

Step 8. Use the up or down arrows to set the value and the left or right arrow buttons to move the cursor left and right. In our example we set the Node Address at #7. (See Fig. 174)

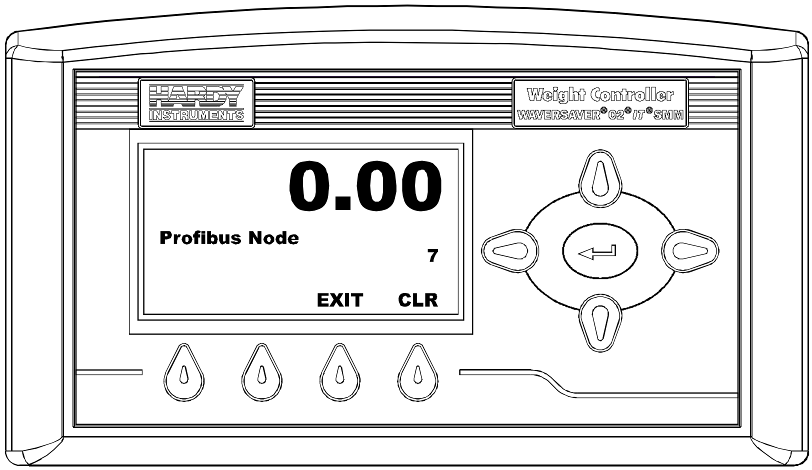


FIG. 174 PROFIBUS MENU/SELECTING NODE ADDRESS #7

Step 9. Press the Enter button to save the entry.

Step 10. The other parameters are status indicators and are read only. The status indicators indicate the state of communications between the Master and the HI 4050.

DP State (Read Only)

- 00 = Status “Wait_ Prm” (HI 4050 waiting for communications from the Master Device.) (See Fig. 175)

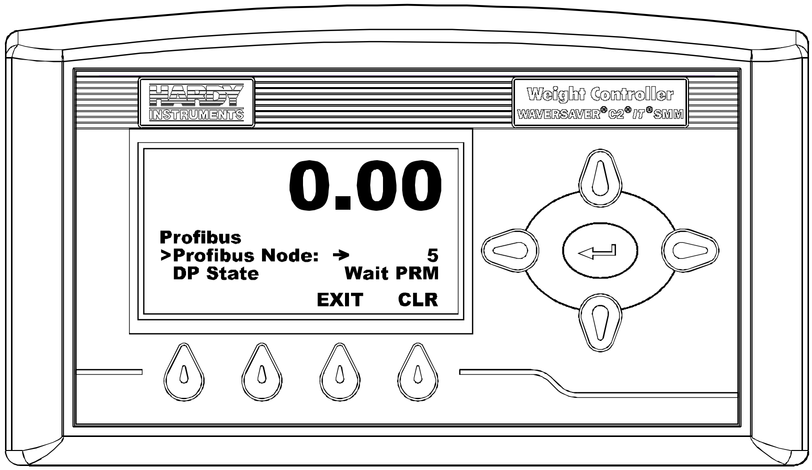


FIG. 175 DP STATE/WAIT PRM

- 01 = Status “Wait_Cfg” (HI 4050 configuring for Data Exchange)
- 10 = Status “DATA_EX” (HI 4050 Exchanging Data with Master)

Baud Rate

Reads out the baud rate at which the HI 4050 is communicating with the Master Device. If “Error” appears it means that no data is being exchanged between the HI 4050 and a Master device.

WD State (Read Only)

- 00 = Status “Baud_Search”. (HI 4050 searching for baud rate.) (See Fig. 176)

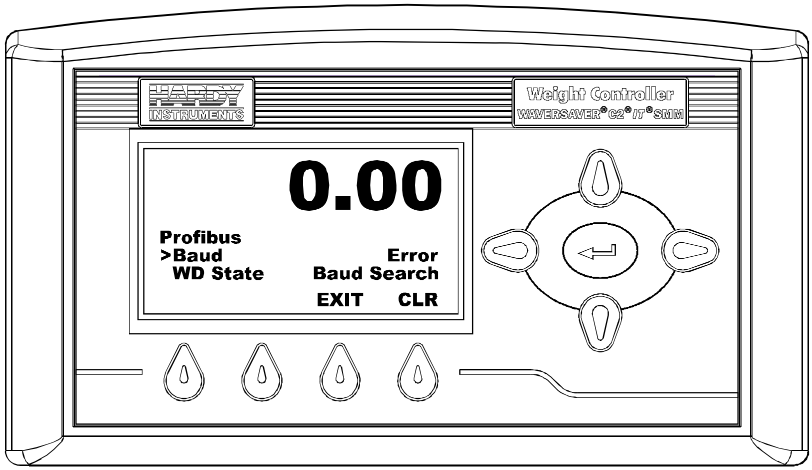


FIG. 176 PROFIBUS MENU/SEARCHING FOR BAUD RATE

- 01 = Status "Baud_Control". (HI 4050 found the baud rate.)
- 10 = Status "DP_Control". (HI 4050 communicating at the current baud rate.)

Step 11. Press the Exit button until you return to the Summary display.

NOTE *For information on Configuring the Profibus Card Option from the Web Page go to the "Configuring Profibus from the Browser" chapter below.*

Configuring the Instrument from the Web Page

Entering Set Points from the Web Page

NOTE *See Page 35 for an explanation of Set Points.*

Step 1. From the Home Page click on Configuration. (See Fig. 177) The Configuration Page appears. (See Fig. 178)

FIG. 177 HOME PAGE/SELECTING CONFIGURATION

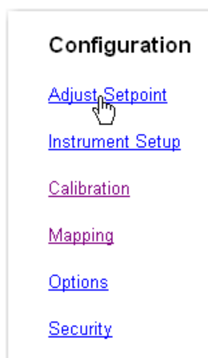


FIG. 178 CONFIGURATION PAGE/SELECTING ADJUST SETPOINT

Step 2. Click on Adjust Setpoint. The Setpoint page appears. (See Fig. 179)

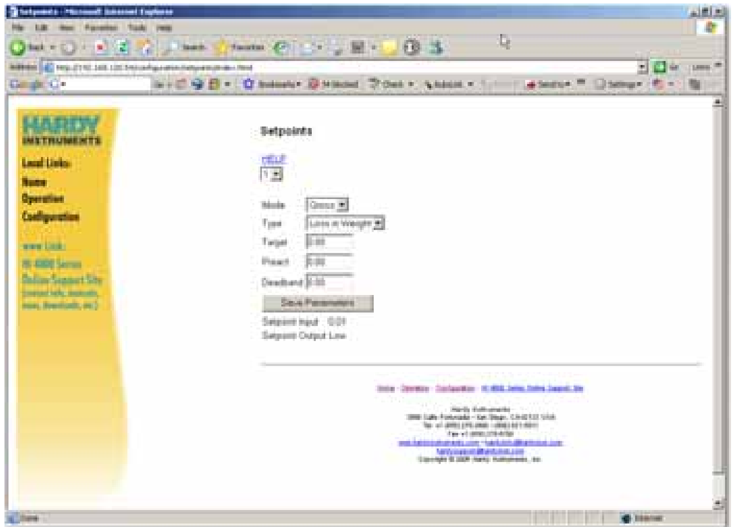


FIG. 179 SETPOINTS PAGE

NOTE *You can Save parameters two ways. One is to save each parameter after you select them or wait until you have selected all the parameters and save all the parameters at once. You save the parameters by pressing the Save Parameters button. In our instructions we recommend waiting until all parameters are selected before saving them.*

Step 3. To select the Setpoint you want to configure, click on the number pull down list. (See Fig. 180)

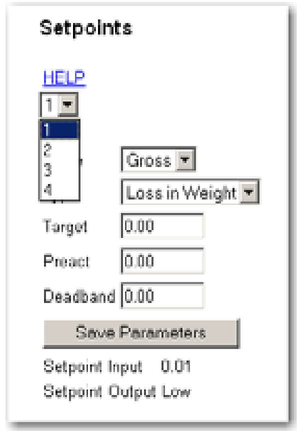


FIG. 180 SETPOINT PAGE/SELECTING SETPOINT NUMBER

Step 4. Click on the Setpoint number you want to configure. In our example we selected Setpoint 1. The Setpoint number appears in the text field.

Step 5. Click on the Mode pull down list. (See Fig. 181)

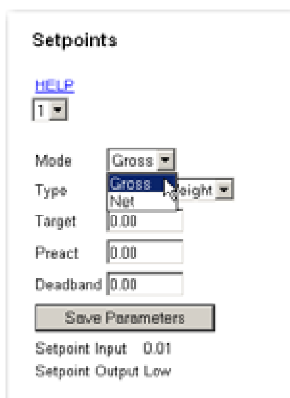


FIG. 181 SETPOINTS/SELECTING MODE

Step 6. Click on the mode you want. In our example we selected Gross.

Step 7. Click on the Type pull down list. (See Fig. 182)

Step 8. Click on the Type of control you want for your application. In our example we selected "Loss in Weight".

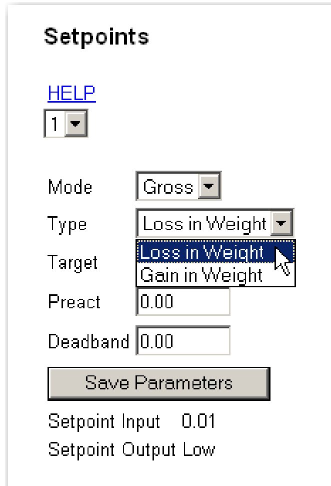


FIG. 182 SETPOINTS/SELECTING TYPE

Step 9. Click in the Target text field until the target weight is highlighted. (See Fig. 183)

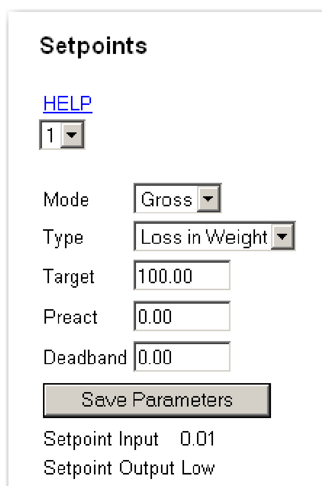


FIG. 183 SETPOINTS/ENTERING TARGET WEIGHT

Step 10. Type in the Target weight you want for your application. In our example we entered 100.00 lbs.

Step 11. Click in the Preact text field until the Preact value is highlighted. (See Fig. 184)

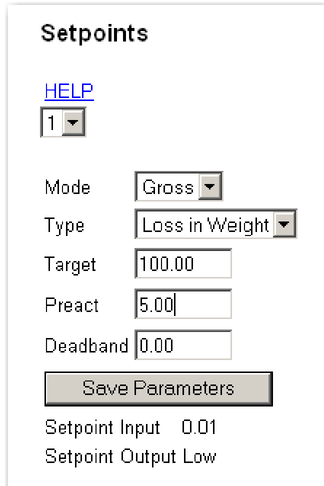


FIG. 184 SETPOINTS/ENTERING PREACT

Step 12. Type in the Preact value you want for your application. In our example we entered 5.00 lbs.

Step 13. Click in the Deadband text field. (See Fig. 185)

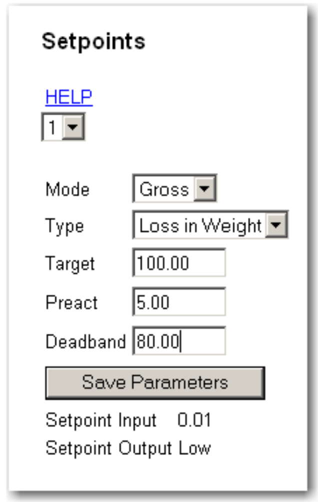


FIG. 185 SETPOINTS/ENTERING DEADBAND

Step 14. Type in the Deadband value you want for your application. In our example we entered 80.00 lbs.

Step 15. Click on the Save Parameters button. (See Fig. 186) The Setpoint parameters are saved to non-volatile memory.

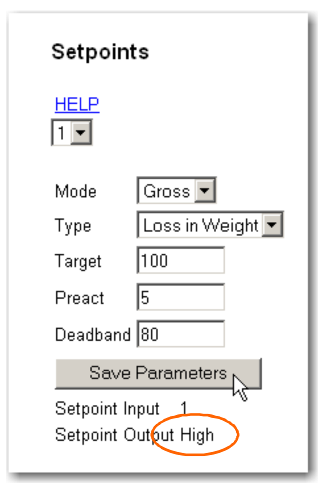


FIG. 186 SETPOINTS/SAVING PARAMETERS

Step 16. Note that the Setpoint Input number is listed below the Save Parameters button. This is read only and indicates the Setpoint you currently configuring.

Step 17. The Output reads the Set Point as either high or low relative to the Target weight. If the target weight is lower than the Set Point, Output reads HIGH. If the target weight is higher than the Set Point, Output reads LOW.

Step 18. Output is read only and cannot be changed directly.

Step 19. All Set Points are configured the same. To configure the rest of the Setpoints repeat the procedures in this section.

Step 20. Click on Configuration to return to the Configuration page.

Weight Controller Configuration from the Web Page

NOTE *For detailed information about each parameter go to the Weight Controller from the Front Panel Section above.*

The Weight Controller Configuration process sets up the instrument to operate as a scale. This includes configuring WAVERSAVER®, Scale Capacity, Units of Measure, Motion tolerance and other instrument parameters required for your process. Here is where the permanent parameters are entered. All the parameters configured except the communication parameters, (IP Address etc.) are stored in the Secure Memory Module (SMM-SD).

Step 1. From the Configuration page click on “Instrument Setup”. (See Fig. 187) The Instrument Setup page appears. (See Fig. 188)

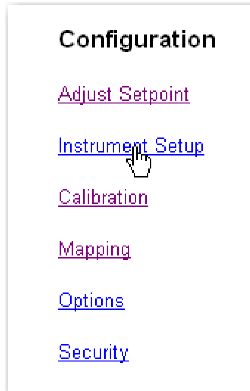


FIG. 187 CONFIGURATION PAGE/SELECTING INSTRUMENT SETUP

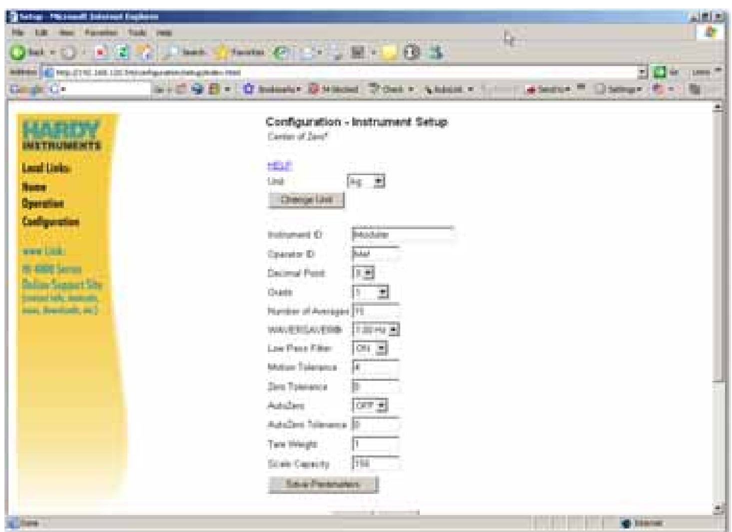


FIG. 188 CONFIGURATION PAGE

Unit of Measure Parameters

The Unit of Measures Parameter sets the scale to either English or Metric units. The selections area:

- Pounds (lb) - Default
- Ounces (oz)
- Pounds/OUnces (lb/oz)
- Kilograms (Kg)
- Grams (G)
- Ton (Ton)
- Metric Ton (t)

Step 2. Click on the Units pull down list. (See Fig. 189)

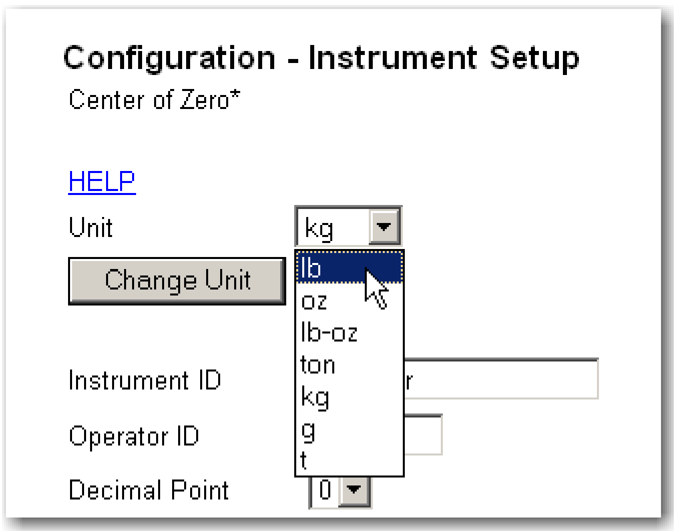


FIG. 189 INSTRUMENT SETUP/SELECTING UNIT

Step 3. Click on the units you want for this instrument. In our example we selected pounds (lb). (See Fig. 190)

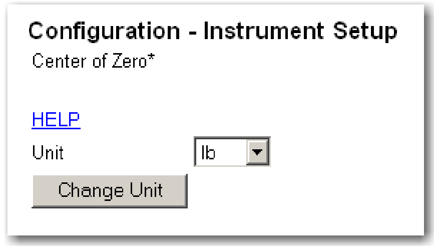


FIG. 190 INSTRUMENT SETUP/SELECTING UNITS (LB)

Step 4. Click on the Change Unit button. The units are changed to pounds.

Instrument and Operator ID

Step 1. Click in the Instrument ID text field. (See Fig. 191)

Step 2. Enter a name to identify the instrument. In our example we entered “Silo 4”.

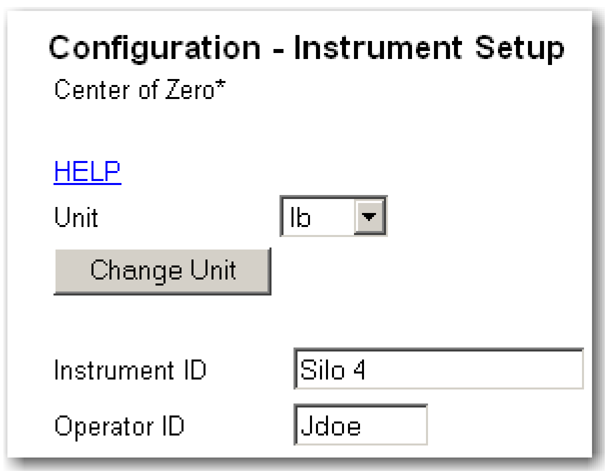


FIG. 191 INSTRUMENT & OPERATOR ID

Step 3. Click in Operator ID text field. Type in a name that identifies the operator of this instrument.

Step 4. In our example we entered “Jdoe”.

NOTE *You can Save parameters two ways. One is to save each parameter after you select them or wait until you have selected all the parameters and save all the parameters at once. You save the parameters by pressing the Save Parameters button. In our instructions we recommend waiting until all parameters are selected before saving them.*

Decimal Point Parameter

Step 1. Click on the Decimal Point pull down list. (See Fig. 192)

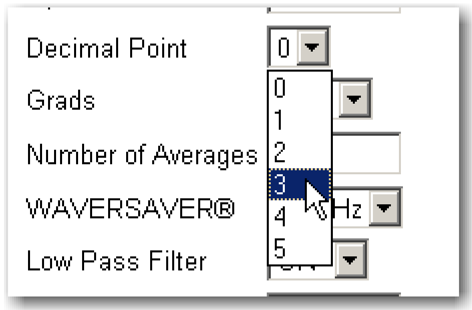


FIG. 192 INSTRUMENT SETUP/SELECTING DECIMAL POINT POSITION

Step 2. Click on the decimal position you want for this instrument. In our example we selected 3.

Graduation Size Parameter

Step 1. Click on the Grads pull down menu. (See Fig. 193)

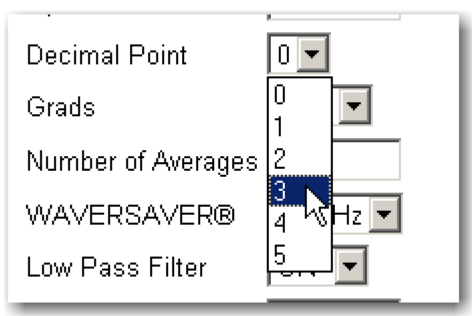


FIG. 193 INSTRUMENT SETUP/SETTING GRADUATION SIZE

Step 2. Click on the graduation size you want for this instrument. In our example we selected a grad size of 3.

Number of Averages Parameter

Step 1. Click in the Number of Averages text field. (See Fig. 194)

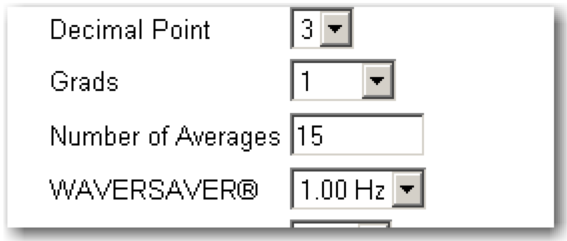


FIG. 194 INSTRUMENT SETUP/ENTERING NUMBER OF AVERAGES

Step 2. Type in the number of averages you want for this instrument. In our example we entered 15.

WAVERSAVER® Parameter

Step 1. Click on the WAVERSAVER pull down menu. (See Fig. 195)

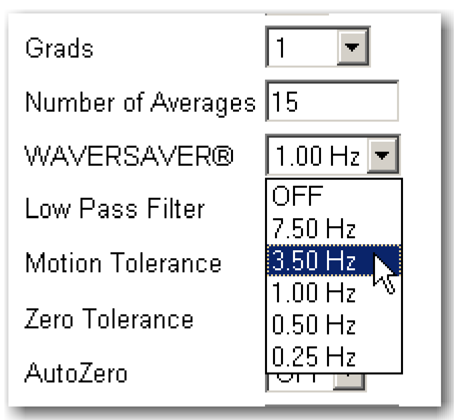


FIG. 195 INSTRUMENT SETUP/SELECTING WAVERSAVER PARAMETER

Step 2. Click on the WAVERSAVER setting you want for this application. In our example we selected 3.50 Hz.

Low Pass Filter Parameter

The Low Pass filter can be toggled on or off. When it is on it provides a more stable weight reading but at the expense of the reaction time. In some applications a more stable reading is desired due to the application. If you can live with the reaction time, turn the Low Pass Filter On. For most applications the Low Pass Filter should remain Off.

Step 1. Click on the Low Pass Filter pull down list. (See Fig. 196)

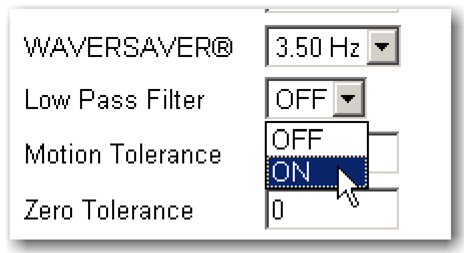


FIG. 196 INSTRUMENT SETUP/LOW PASS FILTER

Step 2. Click on ON to turn the filter on and OFF to turn the filter off.

Motion Tolerance Parameter

Step 1. Click in the Motion Tolerance text field. (See Fig. 197)

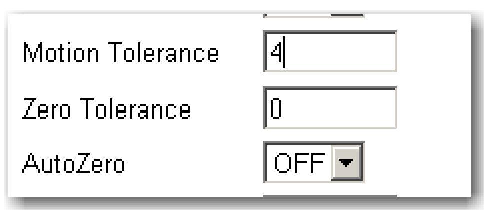


FIG. 197 INSTRUMENT SETUP/ENTERING MOTION TOLERANCE

Step 2. Type in the Motion Tolerance value you want for this instrument. We entered a motion tolerance of 4.

Zero Tolerance Parameter

Step 1. Click in the Zero Tolerance text field. (See Fig. 198)

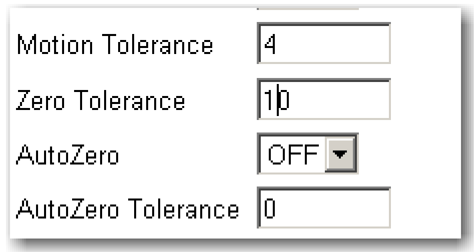


FIG. 198 INSTRUMENT SETUP/ENTERING ZERO TOLERANCE

Step 2. Enter the Zero Tolerance you want for this instrument. In our example we entered 10.

AutoZero Parameter

Step 1. Click on the AutoZero pull down list. (See Fig. 199)

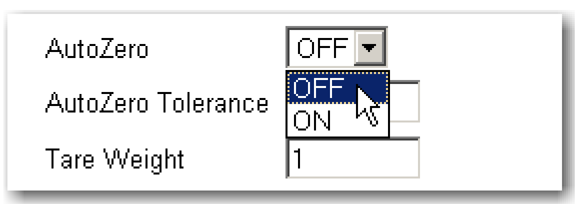


FIG. 199 INSTRUMENT SETUP/SELECTING AUTOZERO

Step 2. Click on ON to turn on Autozero and OFF to shut AutoZero off.

AutoZero Tolerance Parameter

Click in AutoZero Tolerance text field. (See Fig. 200)

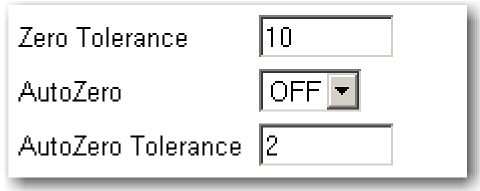


FIG. 200 INSTRUMENT SETUP/ENTERING AUTOZERO TOLERANCE VALUE

Step 3. Type in the AutoZero Tolerance value you want for this instrument.

Tare Weight Parameter

Step 1. Click in the Tare Weight text field. (See Fig. 201)

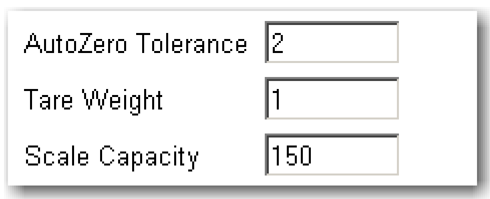


FIG. 201 INSTRUMENT SETUP/ENTERING TARE WEIGHT

Step 2. Type in the Tare Weight value you are using for this instrument. In our example we entered 1 lb.

Scale Capacity Parameter

Step 1. Click in the Scale Capacity text field. (See Fig. 202)

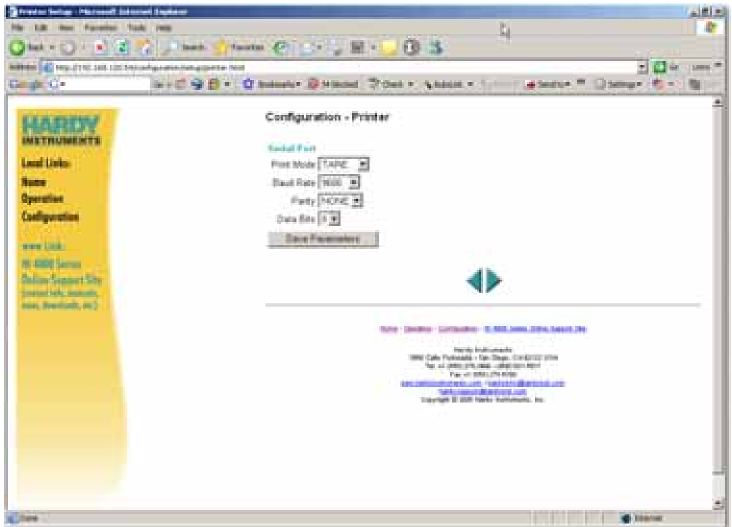


FIG. 202 PRINTER SETUP PAGE

Step 2. Click on the Print Mode pull down list. (See Fig. 203)

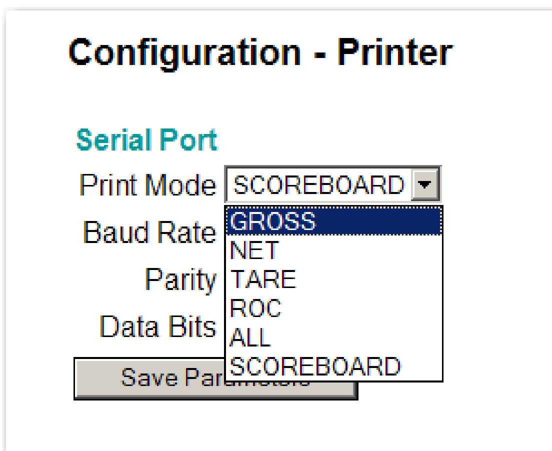


FIG. 203 PRINTER SETUP/SELECTING GROSS MODE

Step 3. Click on the information you want to print. The choices are:

- Gross
- Net]
- Tare
- All (Gross, Net, Tare)
- Available ROC (Rate of Change)
- Scoreboard

In our example we selected Gross.

No matter which mode you select, the information is sent to the printer, terminal etc., with the current time/current date and the mode are printed.

Step 4. Click on the Baud Rate pull down list. (See Fig. 204)

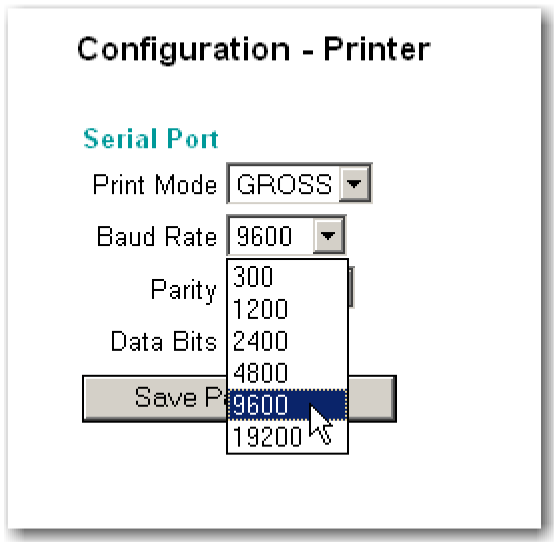


FIG. 204 PRINTER SETUP/SELECTING BAUD RATE

Step 5. Click on the Baud Rate for the printer you are connected to. In our example we selected a Baud Rate of 9600.

Step 6. Click on the Parity pull down list. (See Fig. 205)

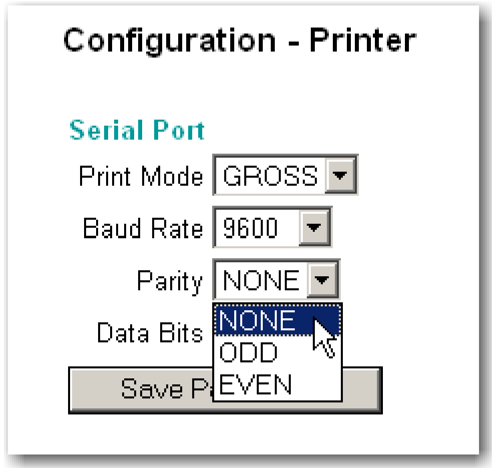


FIG. 205 PRINTER SETUP/SELECTING PARITY

Step 7. Click on the Data Bits pull down list. (See Fig. 206)

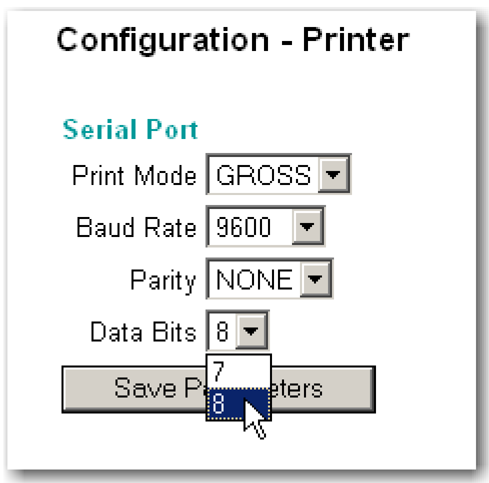


FIG. 206 PRINTER SETUP/SELECTING DATA BITS

Step 8. Click on the Data Bits parameter for the printer to which you are connected.

Step 9. Click on the Save Parameters button to save the parameters. (See Fig. 207)

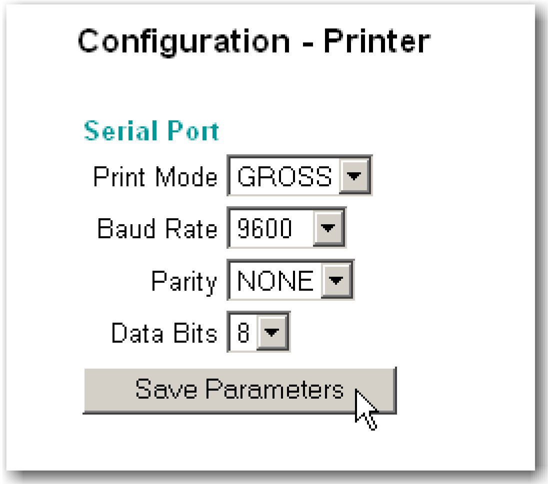


FIG. 207 PRINTER SETUP SAVING PARAMETERS

Scoreboard Setup

Step 1. From the Main Menu go to the Configuration Page.

Step 2. Click the right arrow until you reach the Configuration - Printer page. (See Fig. 209)

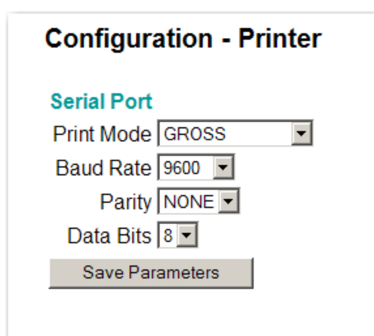


FIG. 208 CONFIGURATION - PRINTER PAGE

Step 3. From the Configuration - Printer page click on the Print Mode pull down list. (See Fig. 210)

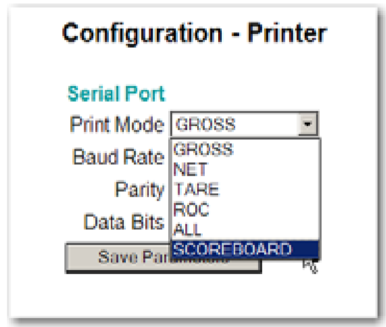


FIG. 209 CONFIGURATION - PRINTER PAGE/SELECTING PRINT MODE/SCOREBOARD

Step 4. Click on SCOREBOARD.

Step 5. Click on the Save Parameters button. (See Fig. 210)

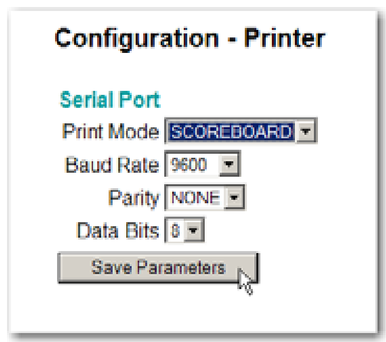


FIG. 210 CONFIGURATION - PRINTER/SAVING SCOREBOARD PARAMETER

Step 6. Repeat steps 4-10 in the Printer Configuration section above.

Step 7. Click on the right arrow at the bottom of the page. The Date and Time Configuration page appears. (See Fig. 211)

Configuring Date and Clock

FIG. 211 DATE/TIME CONFIGURATION PAGE

Step 1. Double click in the Minute text field. (See Fig. 212) Enter the current Minute.

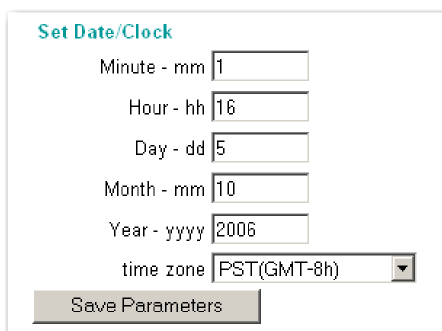


FIG. 212 SET DATE/CLOCK

Step 2. Click in the Hour text field.

Step 3. Enter the current Hour.

Step 4. Click in the Day text Field.

Step 5. Enter the current Day.

Step 6. Click in the Month text field.

Step 7. Enter the current Month.

Step 8. Click in the Year text field.

Step 9. Enter the current Year.

Step 10. Click on the (Greenwich) time zone pull down list. (See Fig. 213)

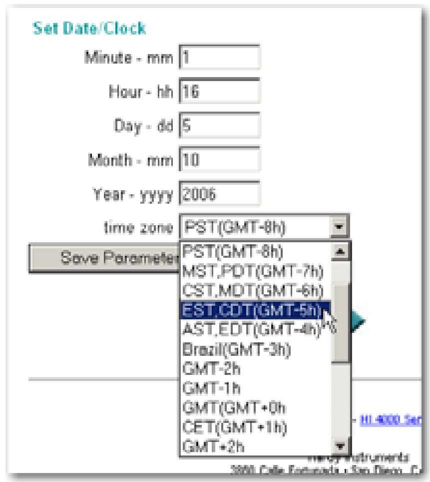


FIG. 213 DATE/TIME SETUP/SELECTING GREENWICH TIME

Step 11. To determine which Greenwich time zone you are in go to the Date and Clock setup for the Front Panel.

Step 12. Click on the Save Parameters button to save the Date and Clock parameters. (See Fig. 214)

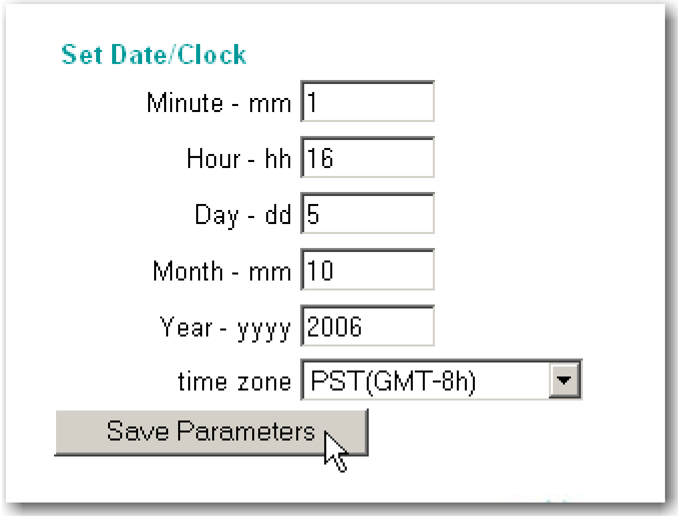


FIG. 214 DATA/CLOCK SETUP SAVING PARAMETERS

Options Setup from the Web Page

Step 1. From the Home Page click on Configuration. The Configuration page appears. (See Fig. 215)

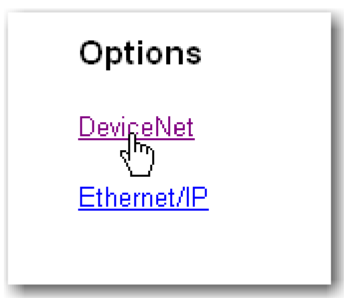


FIG. 215 OPTIONS PAGE/SELECTING DEVICENET

Configuring DeviceNet

Step 1. From the Options Page click on DeviceNet. The DeviceNet Setup page appears. (See Fig. 216)

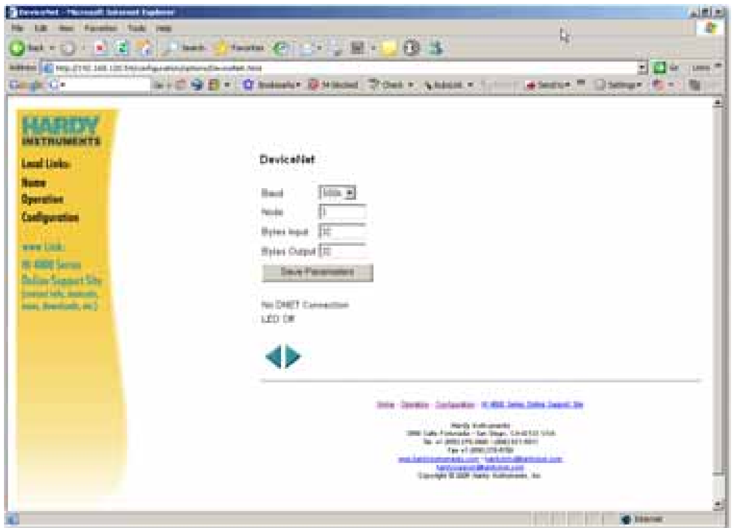


FIG. 216 DEVICENET PAGE

Step 2. Click on the Baud Pull Down List. (See Fig.217)

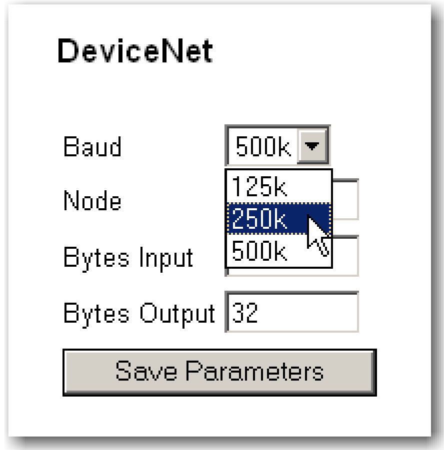


FIG. 217 DEVICENET SETUP/SELECTING BAUD RATE

Step 3. Click on the Baud rate you need for your DeviceNet Network. In our example we selected 250 K.

Step 4. Click in the Node text field. Type in the Node address of the instrument. In our example we entered Node Address 3. (See Fig. 218)

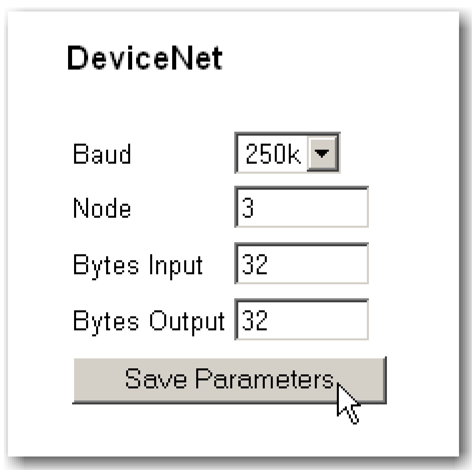


FIG. 218 DEVICENET PAGE/ENTERING DATA

Step 5. Click in the Bytes Input text field. Type in the Bytes Input value you need for your application. In our example we selected 32 Bytes input.

Step 6. Click in the Bytes Output text field. Type in the Bytes Output value you need for your application. In our example we selected 32 Bytes output.

Step 7. Click on the Save Parameters to save the configuration. (See Fig. 219)

Step 8. Notice that the status of the DeviceNet Connection is located at the bottom of the display. (See Fig. 219)

- If the instrument is connected to the DeviceNet Network the status message reads: Yes DNET Connection. LED On
- If the instrument is not connected to the DeviceNet Network the status message reads: No DNET Connection. LED Off (See Fig. 219)

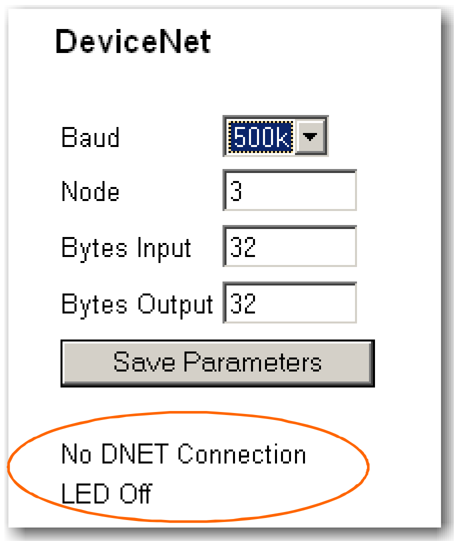


FIG. 219 DNET CONNECTION/NO

Configuring Ethernet/IP

Step 1. From the Options Page click on Ethernet/IP (See Fig. 220) The Ethernet/IP page appears. (See Fig. 221)

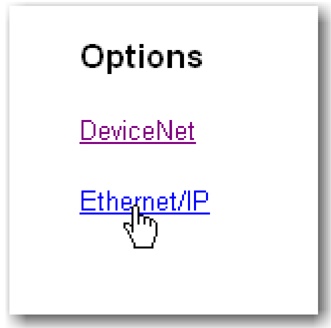


FIG. 220 OPTIONS/SELECTING ETHERNET/IP

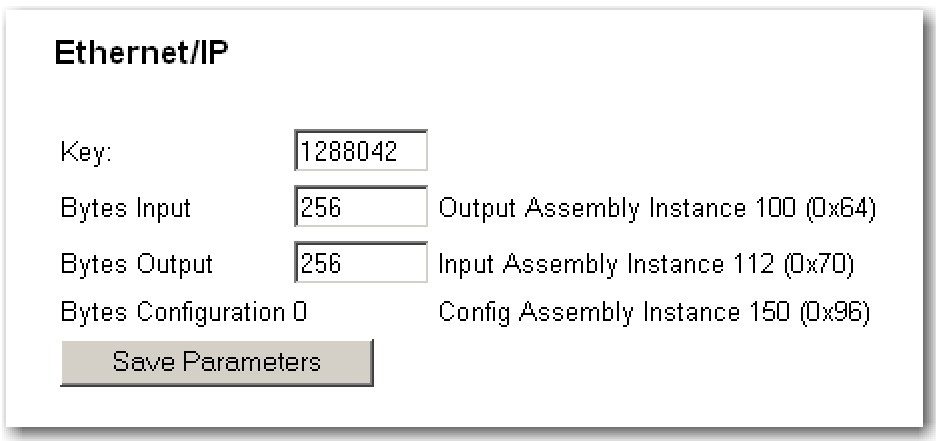


FIG. 221 ETHERNET/IP PAGE

Step 2. You will need a key to activate Ethernet/IP. If you have not received a key, contact the Hardy Instruments Service Center to get the key.

Step 3. Click in the Key text field and enter the key number you received when you purchased the Ethernet/IP option.

Step 4. Click in the Bytes Input field and enter the number of bytes you require for your application. In our example we entered 256 bytes.

Step 5. Click in the Bytes Output field and enter the number of bytes you require for your application. In our example we entered 256 bytes.

Step 6. Click on the Save Parameters button to save the settings.

Step 7. The Connection status is below the Save Parameters button. (See Fig. 222)

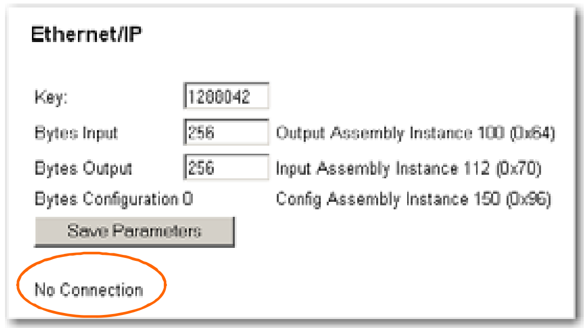


FIG. 222 ETHERNET/IP CONNECTION STATUS

MODBUS - TCP/IP Over Ethernet

About MODBUS/TCP/IP Over Ethernet

MODBUS is an application layer messaging protocol, positioned at level 7 of the OSI model, that provides client/server communication between devices connected on different types of buses or networks. Support for the simple and elegant structure of MODBUS continues to grow. The Internet community can access MODBUS at a reserved system port 502 on the TCP/IP stack.

MODBUS is a request/reply protocol and offers services specified by function codes. MODBUS function codes are elements of MODBUS request/reply PDUs. The objective of this document is to describe the function codes used within the framework of MODBUS transactions.

MODBUS is an application layer messaging protocol for client/server communication between devices connected on different types of buses or networks. (See Fig. 223)

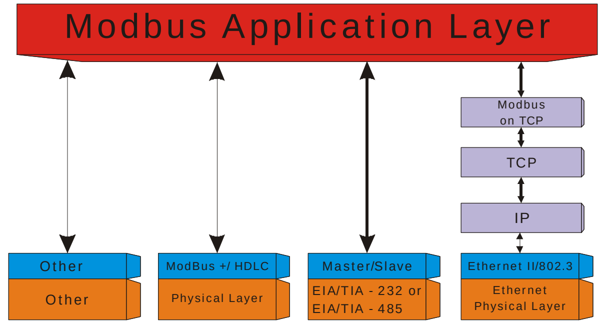


FIG. 223 MODBUS COMMUNICATION DIAGRAM

It is currently implemented for the HI 4050 product line using:

1 **TCP/IP over Ethernet.**

Installing MODBUS

Step 1. Enabling MODBUS in the HI 4050 Module

MODBUS is an optional network communication protocol and requires a Key to enable. You can purchase the option with the Key by contacting your local Hardy Instruments Representative or Hardy Service Center.

Step 2. From the HI 4050 module home page, click on Configuration. (See Fig. 224) The Configuration Page appears. (See Fig. 225)

FIG. 224 WEIGHT CONTROLLER/SELECTING CONFIGURATION

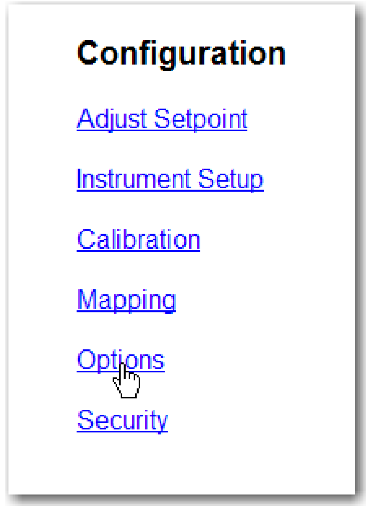


FIG. 225 CONFIGURATION/SELECTING OPTIONS

Step 3. Click on Options. The Options page appears. (See Fig. 226)

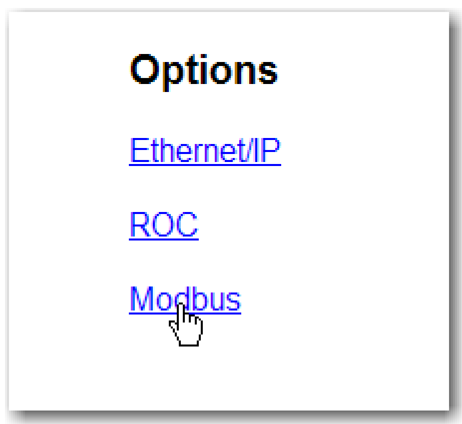


FIG. 226 CONFIGURATION - OPTIONS/SELECTING MODBUS

Step 4. Click on Modbus. MODBUS-Options page appears. (See Fig. 227)

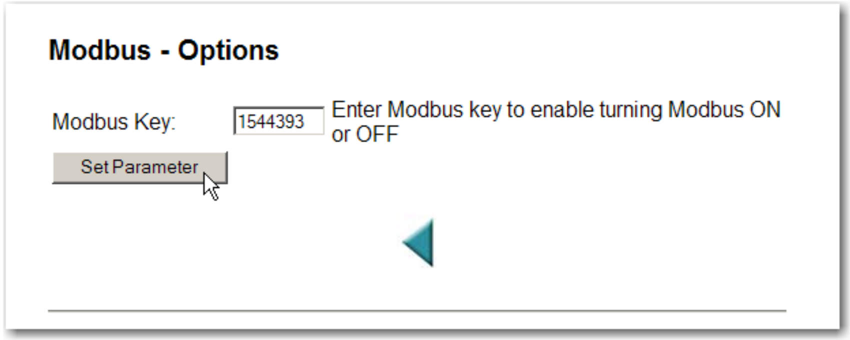


FIG. 227 MODBUS - OPTIONS PAGE

Step 5. Click in the Modbus Key text field.

Step 6. Enter the Modbus Key.

Step 7. Click on the Set Parameter button.

Step 8. This procedure activates the Modbus option in the instrument.

Step 9. The HI 4050 module is Modbus enabled.

Step 10. You can now map from your client (PLC) to the HI 4050 module via Modbus.

Installing Hardy Modbus-Link

If you do not have a PLC or other client, Hardy has provided the Hardy Modbus-Link Client to communicate with the HI 4050 module. For the sake of clarity the Client/Server definitions are as follows:

- Client - The module asking for data.
- Server - The module providing the data.

The Hardy Modbus-Link will not work without the key. To purchase the Modbus Option with the key, contact your local Hardy Instruments Representative or Hardy Instruments, Customer Service.

Step 1. On the Documentation CD you received with your HI 4050 Instrument you will find a copy of the Hardy Modbus-Link Software. If you do not have the CD that came with your instrument you can go to the HI 4050 Resources Web page and download the application from there.

Step 2. Double click on the Hardy Modbus-Link .exe file to install the software on your PC. Once the Installation is complete a Hardy Modbus-Link icon appears on your Desktop.

Step 3. Double click the Hardy Modbus-Link icon. The Hardy Modbus-Link display appears. (See Fig. 228)

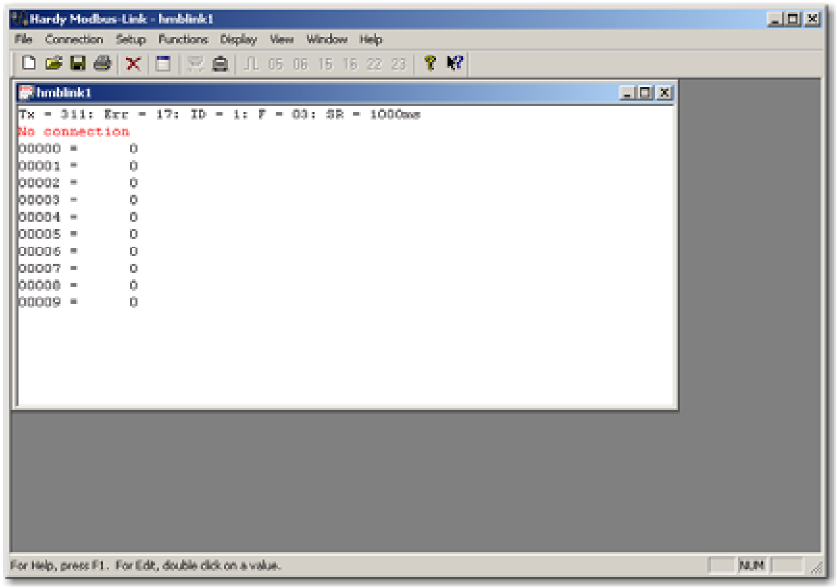


FIG. 228 HARDY MODBUS-LINK DISPLAY

Step 4. Click on the Connection pull down menu. (See Fig. 229)

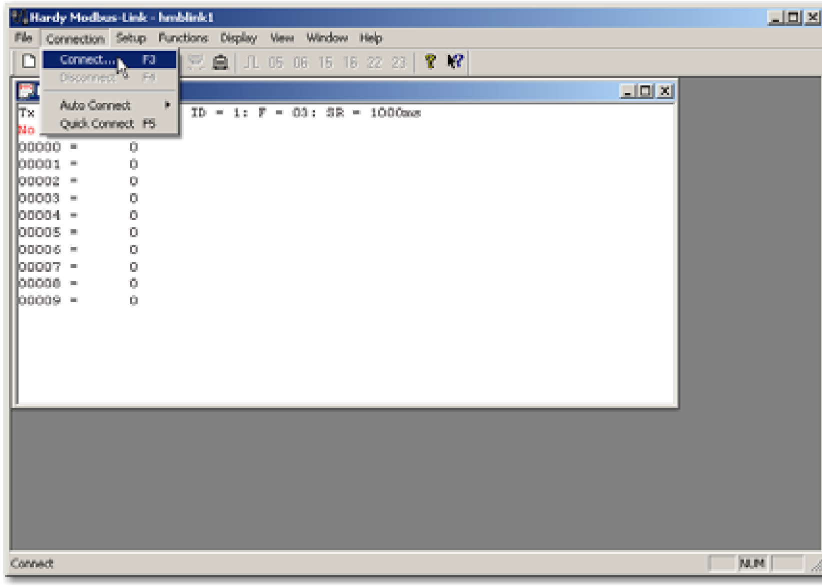


FIG. 229 HARDY MODBUS-LINK/SELECTING CONNECT

Step 5. Click on “Connect”, the TCP/IP Connection display appears. (See Fig. 230)

- If TCP/IP is not selected, click on the pull down list and select it. (See Fig. 231)

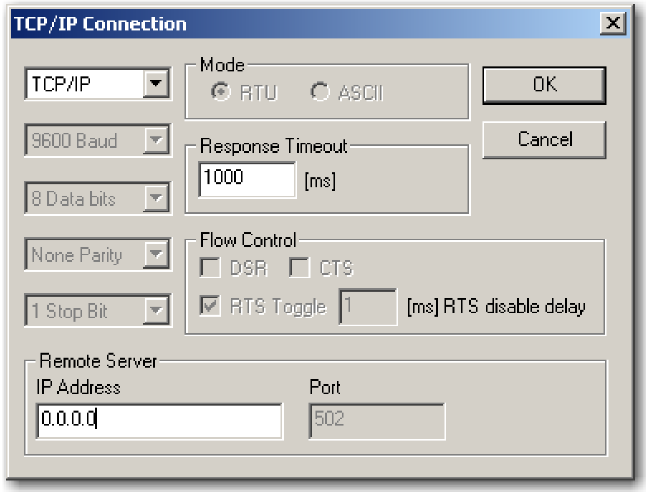


FIG. 230 TCP/IP CONNECTION DISPLAY

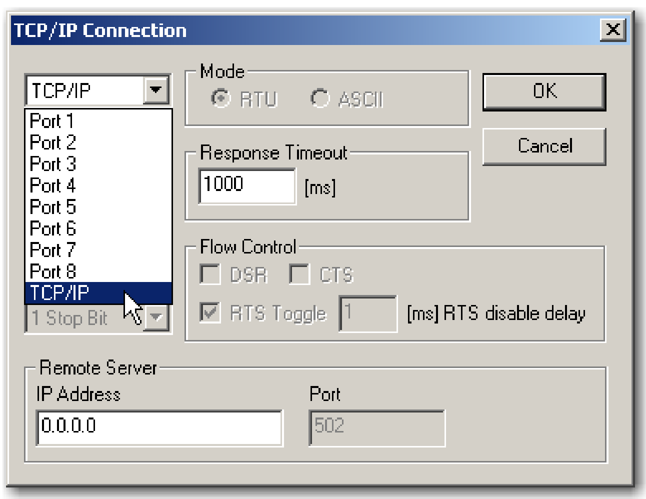


FIG. 231 TCP/IP CONNECTION DISPLAY/SELECTING TCP/IP

Step 6. Click in the IP Address text field and type in the IP address of the HI 4050 module you want to communicate with. (See Fig. 232)

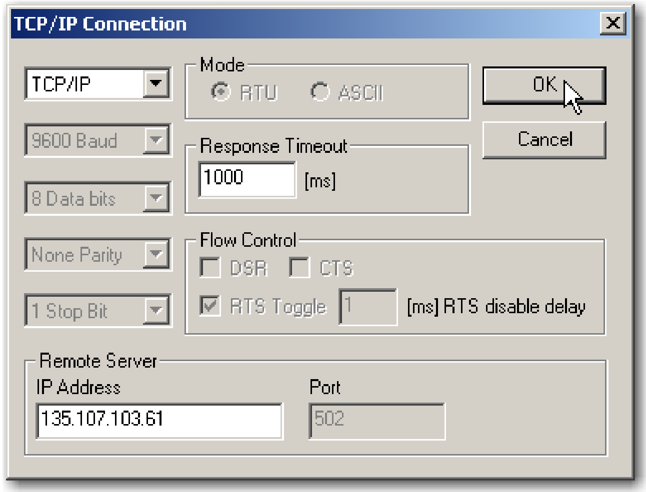


FIG. 232 TCP/IP CONNECTION DISPLAY/ENTERING THE IP ADDRESS

Step 7. Click on OK. The red "No Connection" disappears and the values at the top of the page start to change. (See Fig. 233)

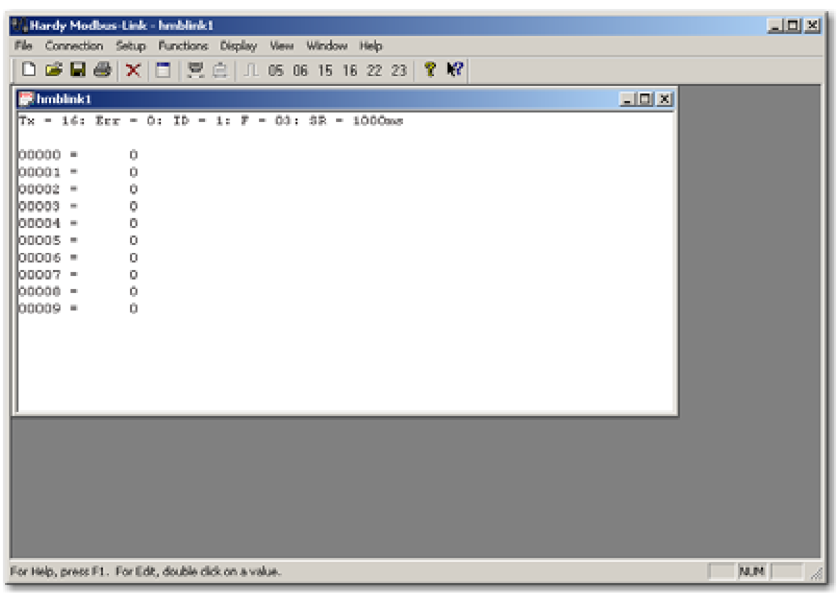


FIG. 233 HARDY MODBUS LINK CONNECTED

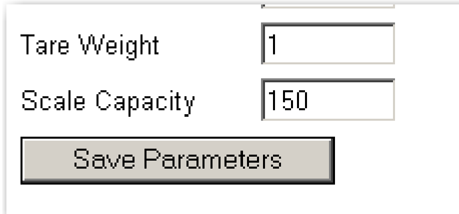


FIG. 234 INSTRUMENT SETUP/ENTERING TARE WEIGHT

Step 8. Type in the Capacity of the scale to which the instrument is connected. (See Fig. 234)

Step 9. Click on the Save Parameters button to save all the Instrument Parameters.

LCD Contrast Parameter

Step 1. You can change the contrast on the HI 4050 display from the Web Page by clicking on the Darker or Lighter buttons. (See Fig. 235)

FIG. 235 LCD CONTRAST ADJUSTMENT

Printer Configuration

Step 1. From the Instrument Setup page, click on the right arrow at the bottom of the page. The Printer Setup page appears.

Step 2. You are now connected from your PC to the HI 4050 module.

Step 3. To verify that you have two (2) way communication do the following:

- From the Mapping web page of the HI 4050 instrument you want to communicate with, click on the Destination Network pull down menu. (See Fig. 236)
- Click on “Modbus Float Out” (MFO). (See Fig. 236)

- Use the default word 0.
- Click on the Select button.

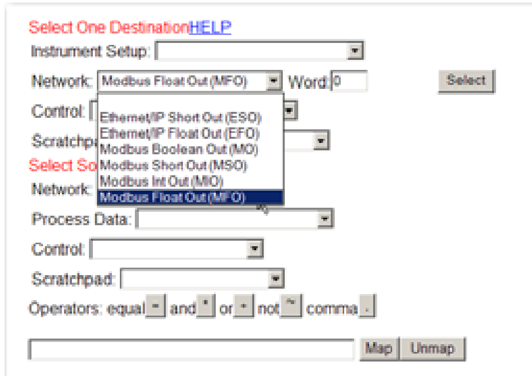


FIG. 236 DESTINATION NETWORK/MODBUS FLOAT OUT/WORD 0

- Click on the Select button. “MFO0=” appears in the Map: text field. (See Fig. 237)

FIG. 237 MAPPING DISPLAY/SELECTING DESTINATION: MFO0 (MODBUS FLOAT OUT - WORD 0)

- Click on the Select Source Scratchpad pull down list.
- Click on Float Variable O (HFO). (See Fig. 238)

- Keep the default word 0. (See Fig. 239)

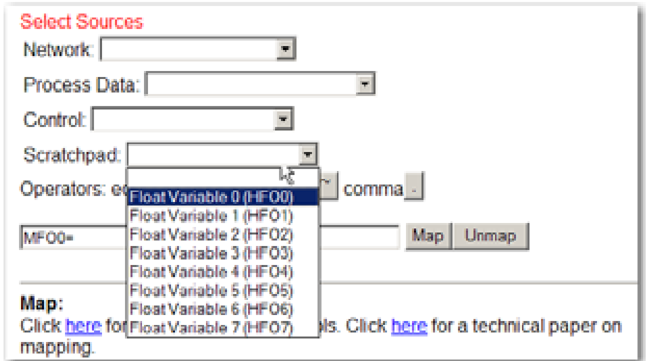


FIG. 238 MAPPING DISPLAY/SELECTING SOURCE - HFO0 (FLOAT VARIABLE)

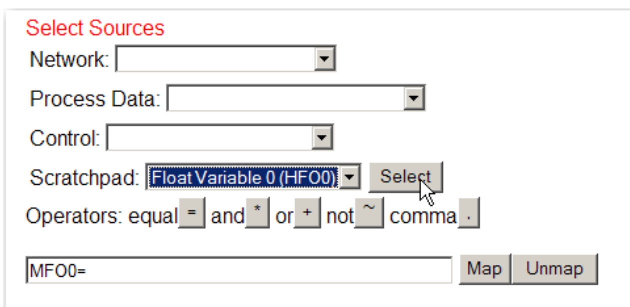


FIG. 239 SELECTING FLOAT VARIABLE O/WORD 0

- Click on the Select button. The Destination and Source appear in the Map: text field. (MFO0=HFO0) (See Fig. 240)

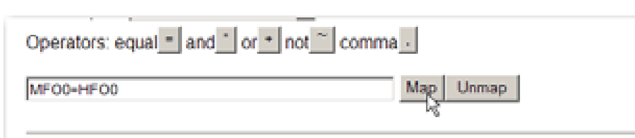


FIG. 240 DESTINATION AND SOURCE APPEAR IN MAP FIELD

- Click on the Map button. To recap we mapped the Float Variable O, word 0 to Modbus Float Out, Word 0). (See Fig. 240)
- Double click in the HFO (Hardy Float Out) text field 0.
- Type in a value. For our example we used the value “555.0000”. (See Fig. 241)

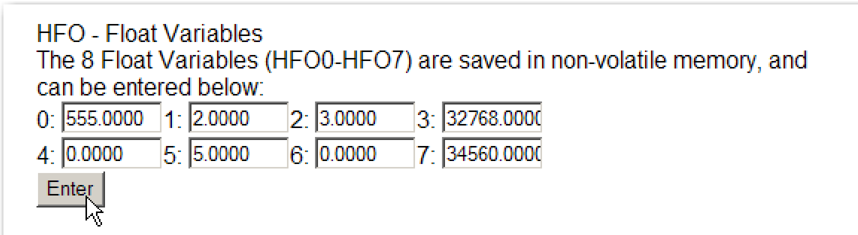


FIG. 241 MAPPING DISPLAY/HFO - FLOAT VARIABLES/ENTERING A VALUE FOR WORD 0

- Click on the Enter button.
- Go to the Hardy Modbus-Link Display. (See Fig. 242) Minimize the Web Page, do not close the browser.

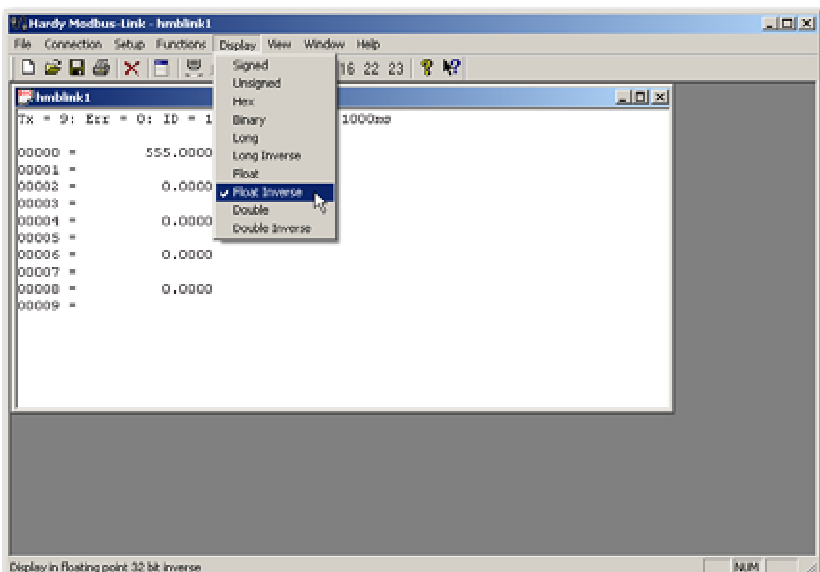


FIG. 242 HARDY MODBUS-LINK DISPLAY/SELECTING DISPLAY/FLOAT INVERSE

- Click on the Display pull down menu. (See Fig. 242)
- Click on Float Inverse. The value we entered from the Mapping page appears to the right of the “00000 =” which is “555.0000” (See Fig. 243)

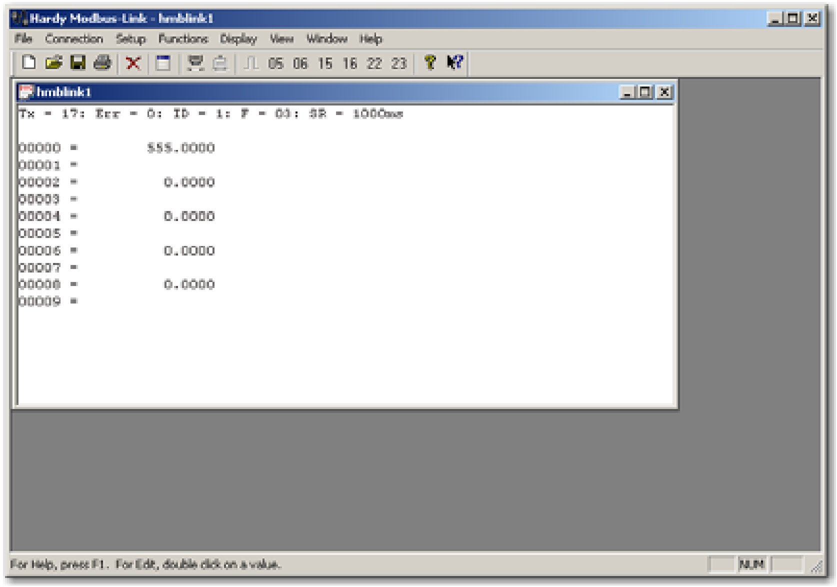


FIG. 243 HARDY MODBUS-LINK DISPLAY/555.0000 APPEARS

- Click on button 23, (See Fig. 244) the Read/Write Multiple Registers. The Write multiple registers display appears. (See Fig. 245)

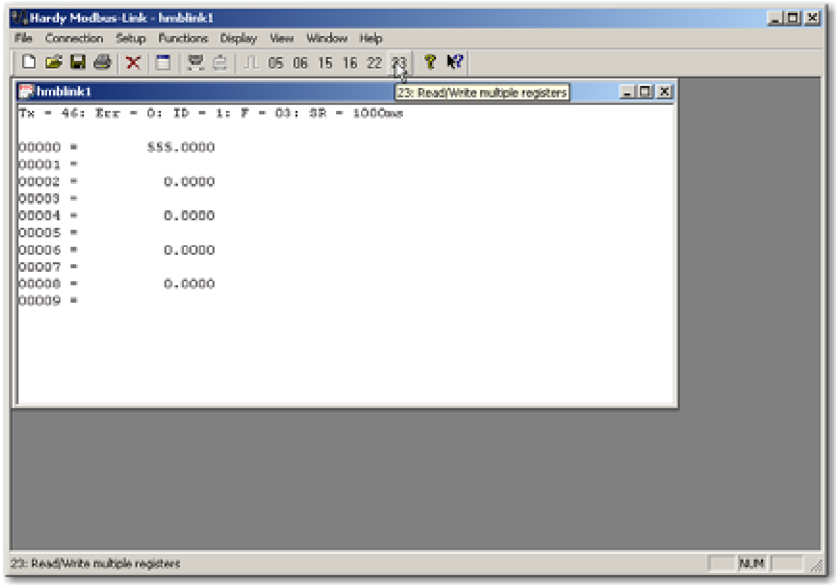


FIG. 244 HARDY MODBUS-LINK DISPLAY/SELECTING BUTTON 23 - READ/WRITE MULTIPLE REGISTERS

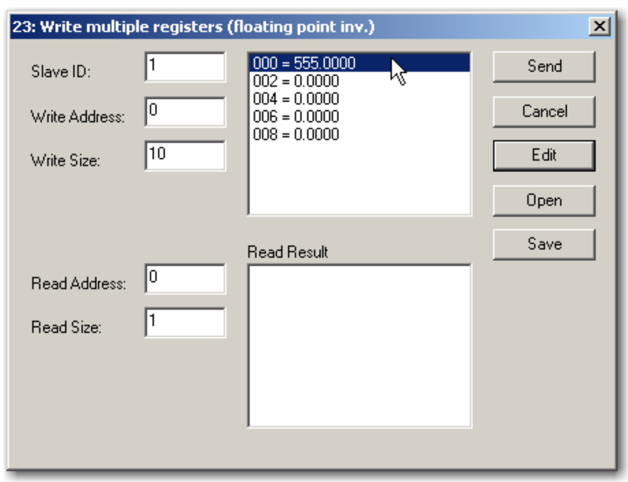


FIG. 245 HARDY MODBUS-LINK DISPLAY/WRITER MULTIPLE REGISTERS DISPLAY

- Double click on “555.0000”. (See Fig. 246) The Enter Value display appears with the value 555 which was sent from the HI 4050 module. (See Fig. 246)

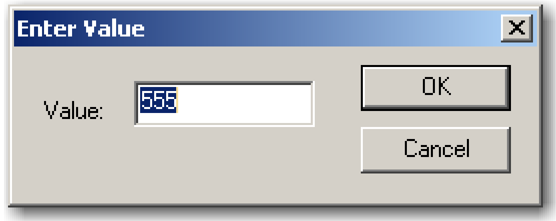


FIG. 246 HARDY MODBUS-LINK/ENTER VALUE DISPLAY

Step 4. Double click in the text field to highlight the value. In our example “555”.

Step 5. Enter a new number. We entered “999”. (See Fig. 247)

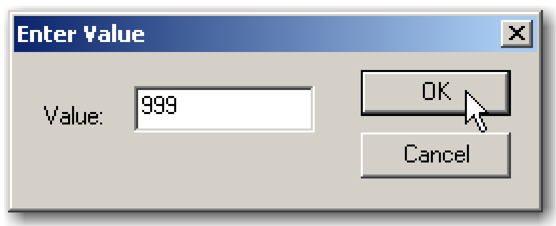


FIG. 247 HARDY MODBUS-LINK/ENTER VALUE DISPLAY/ENTERING 999

Step 6. Click on OK. The Write Multiple Registers display appears with “999.0000” in place of “555.0000”. (See Fig. 248)

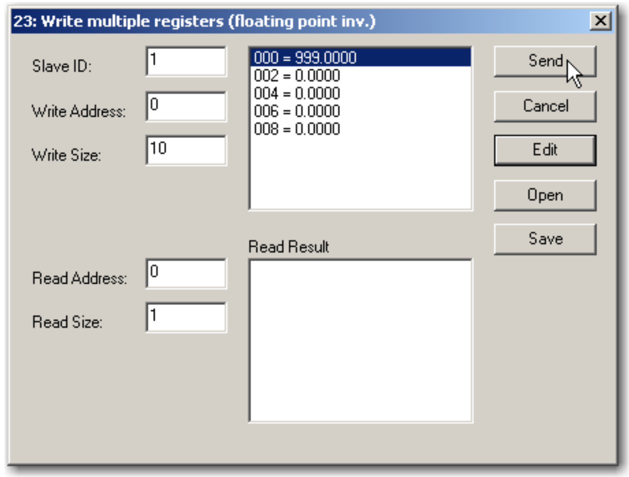


FIG. 248 HARDY MODBUS-LINK/WRITE MULTIPLE REGISTERS/SENDING NEW VALUE

Step 7. Click on the Send button. A Response pop up appears indicating that the Response from the HI 4050 module was received. (See Fig. 249)

FIG. 249 RESPONSE OK POP UP

- Click on OK.

Step 8. In the event you get an error message, check the following:

- Function Not Supported - Does not allow you to use the selected function. Use a different function.
- Address Error - Wrong IP address of the register you want to send the data. Get and enter the correct IP address Your can get the correct IP address from your Network Administrator.

- Byte Count Error - The Byte count is incorrect. Enter the correct byte count.
- Value Error - The Value entered does not match the variable type. Enter the correct a value that is equal to or less than the variable type.
- Request Error - Your want to Read and you select Write. Make sure you select the correct Request Error.

Configuring Rate of Change From the Browser

Step 1. From the HI 4050 Home Page, click on “Configuration”. (See Fig. 250) The Configuration page appears. (See Fig. 251)

FIG. 250 HI 4050 HOME PAGE/SELECTING CONFIGURATION

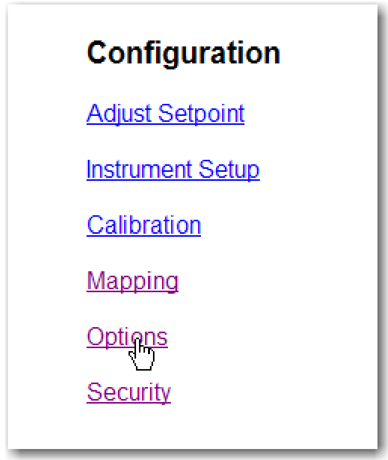


FIG. 251 CONFIGURATION MENU/SELECTING OPTIONS

Step 2. Click on Options. The Options page appears. (See Fig. 251)

Step 3. Click on “ROC”. (See Fig. 252) The Rate of Change page appears. (See Fig. 253)

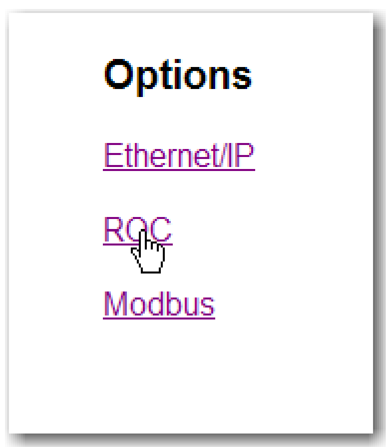


FIG. 252 CONFIGURATION - OPTIONS/SELECTING RATE-OF-CHANGE

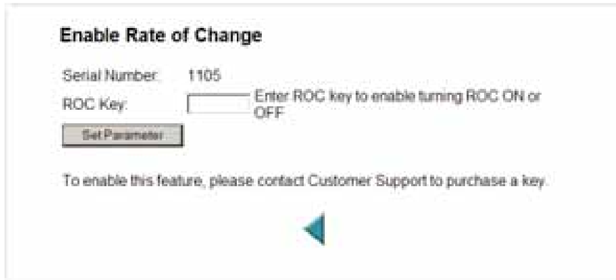


FIG. 253 RATE OF CHANGE DISPLAY/ENTERING DISPLAY FOR THE FIRST TIME

Step 4. Enabling Rate of Change requires a Key number. You can purchase a key number from the Hardy Service Center or contact your local Hardy representative.

Step 5. Click in the ROC key text field.

Step 6. Enter the Key number you received from Hardy. (See Fig. 254)

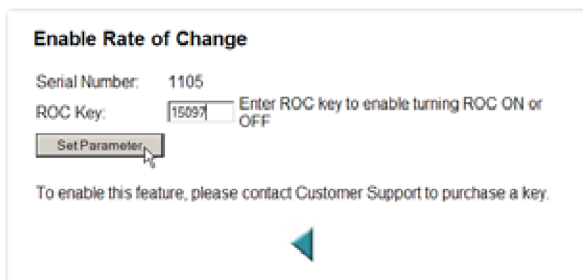


FIG. 254 ENABLE RATE OF CHANGE

NOTE *The key number in illustration 251 is for demonstration purposes only and does not resemble your key number. Your key number will vary.*

Step 7. Click on the Set Parameter button. Wait a few seconds for the parameter to be saved in the instrument.

Step 8. Click on the left arrow. The Rate of Change page appears again. (See Fig. 255)

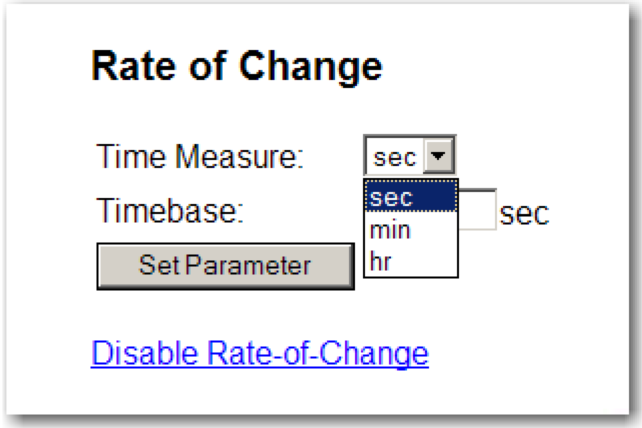


FIG. 255 RATE OF CHANGE PAGE

Step 9. To set the Time Measure click on the Time Measure pull down menu. (See Fig. 255)

Step 10. Click on the time measure you want. In our example we selected seconds (sec).

Step 11. To set the Timebase, double click in the Timebase text field. Type in the timebase you want the instrument to use when running a Rate of Change evaluation. (See Fig. 256) In our example we selected 20 seconds.

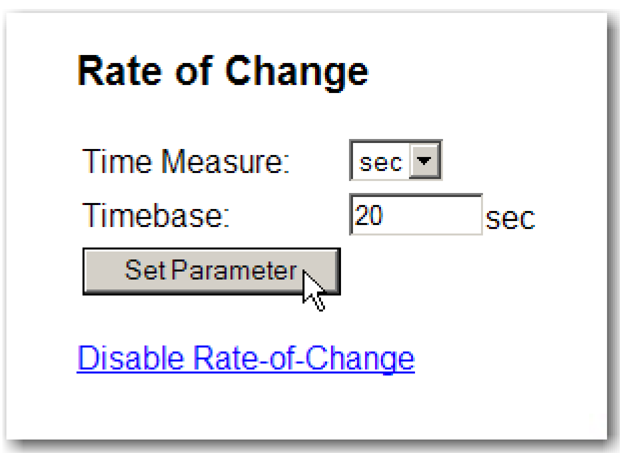


FIG. 256 RATE OF CHANGE/ENTERING THE TIMEBASE VALUE

Step 12. Click on the Set Parameter button to set the entry. (See Fig. 256)

Step 13. Click on the back arrow to return to the HI 4050 Home Page.

Configuring the Analog Card Option from the Web Page

Step 1. From the Home Page click on Configuration. The Configuration Page appears. (See Fig. 257)

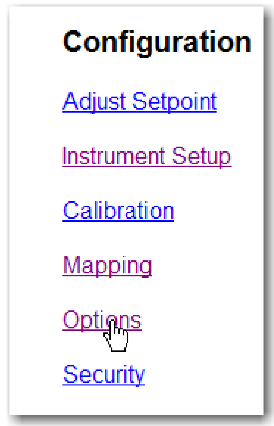


FIG. 257 CONFIGURATION PAGE/SELECTING OPTIONS

Step 2. Click on Options. The Options Page appears. (See Fig. 258)

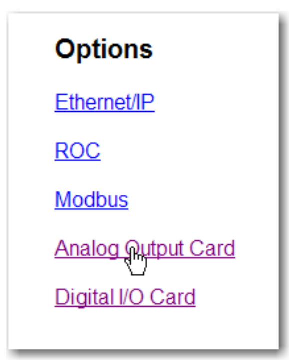


FIG. 258 OPTIONS PAGE/SELECTING ANALOG OUTPUT CARD

Step 3. Click on Analog Output Card. The Analog Output page appears. (See Fig. 259)

NOTE *The Voltage Low and High and Current Low and High are set to the default values. 0-10 Volts Output and 4-20 mA Output. If you don't want to change the values start with the Low and High Weight values for your application.*

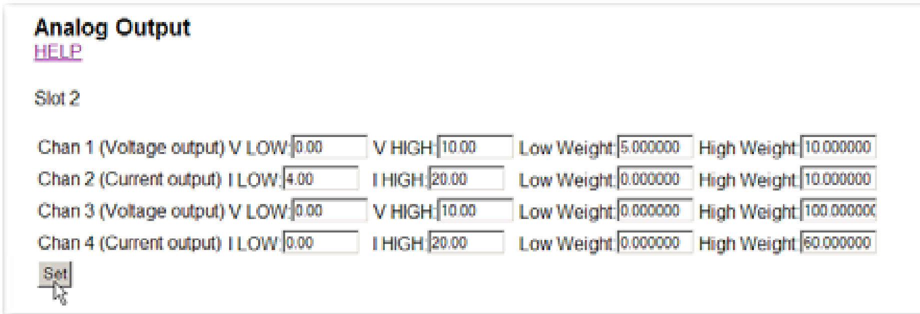


FIG. 259 ANALOG OUTPUT PAGE

Step 4. For assistance in configuring the Analog Output Card you can click on '**HELP**" at the top of the page.

Step 5. Slot 2 indicates that the Analog Card is installed in the Network Slot location. If the Analog Card was installed in the Option Slot location it would read Slot 1.

Step 6. To Configure Channel 1 (Voltage Output) rapidly click in the Chan 1 V LOW Text Field. until the entire value is highlighted. It may take a few clicks.

- Type in the value you want for your low voltage output.
- Rapidly click in the V HIGH Text Field.
- Type in the value you want for your high voltage output.
- Rapidly click in the Low Weight Field until you highlight the entire value.
- Type in the value you want for your Low Weight Setting.
- Rapidly click in the High Weight Field until you highlight the entire value.
- Type in the value you want for your High Weight Setting.

- You can click on the Set button to save the parameters at any time. However if you are configuring more than one channel it is best to wait until all the channels are configured and then press the Set button.

NOTE *In the event you want to refine a reading of say 10.02 and you want an output reading of 10 you will need to adjust the 0-10 values to get the correct output. The formula to do this is as follows:*

Expected Output/Actual Output x Expected Output = New Number

For example: (10/10.02) = .998 x 10 = 9.98

Reset your input numbers to 0-9.98.

This formula applies to all four channels.

Step 7. To Configure Channels 2, 3 and 4 repeat the procedures in Step 6. Remember that Channels 2 and 4 are current outputs.

Step 8. Click on the Set button to save the configuration.

Step 9. Click on “Home” to return to the Home Page.

Step 10. You can assign the input data to that analog output channels being used by going to the Mapping page and following the Instructions for Mapping in Chapter 6. For more information on Analog Card Mapping click on “**here**” for a technical paper on mapping.

- The analog output card's Output Settings are configured in MAPPING via the symbols HFO28,HFO29,HFO30, and HFO31. (See Fig. 260)

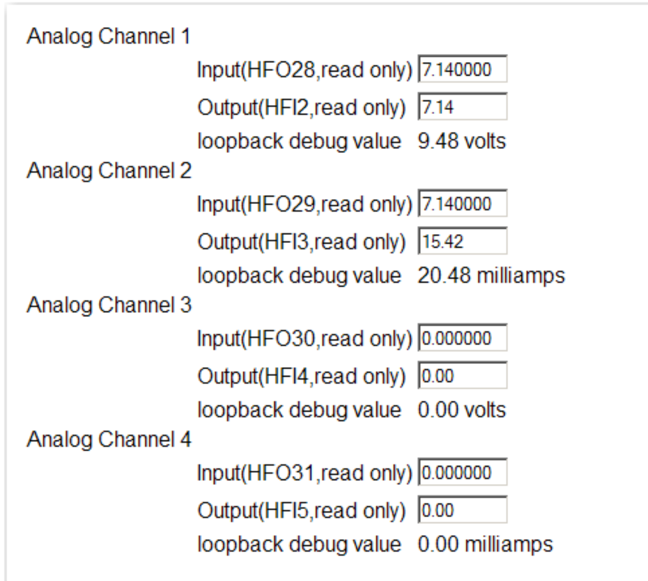


FIG. 260 OUTPUT CARDS SETTINGS

- These settings are scaled according to the following rules:

1. If the setting is less than the Low Weight, the analog output is set to V (or I) Low.
2. If the setting is greater than the High Weight, the analog output is set to V (or I) High.
3. Otherwise, the output is "V (I) Low" + (Setpoint - "Low Weight")*("V(I) High"-"V(I) Low")/("High Weight" - "Low Weight")

NOTE *The Loopback Debug Values are estimates only and may not match the actual outputs.*

Configuring the Digital I/O Option Card from the Web Page

Step 1. From the Home Page click on Configuration. The Configuration page appears.

Step 1. Click on Options. The Options Page appears. (See Fig. 261)

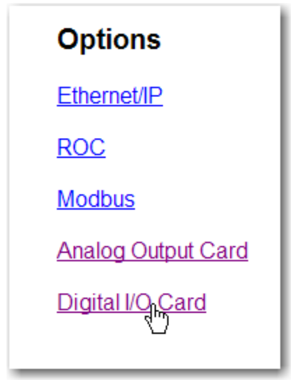


FIG. 261 OPTIONS PAGE/SELECTING DIGITAL I/O CARD

Step 2. Click on Digital I/O Card. The Digital Input/Output Page appears. (See Fig. 262)

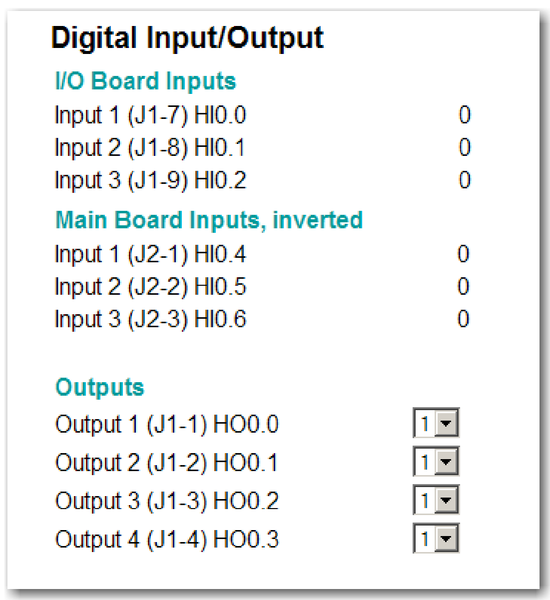


FIG. 262 DIGITAL INPUT/OUTPUT PAGE

Step 3. The I/O Board Inputs and Main Board Inputs are read only giving you the status of the input. If a voltage signal is being sent to the input the status is 1. If no voltage signal is connected to the input the status is 0. In out example there is no signal being sent to any of the inputs.

Step 4. You will need to Map the Control Source (Digital Input 1) to a Control Source (Tare) The Mapping instructions are as follows:

- Click on Configuration. The Configuration Page appears.
- Click on Mapping. (See Fig. 263) The Mapping Page appears. (See Fig. 264)

FIG. 263 CONFIGURATION PAGE/SELECTING MAPPING

• Click on the Control pull down menu.

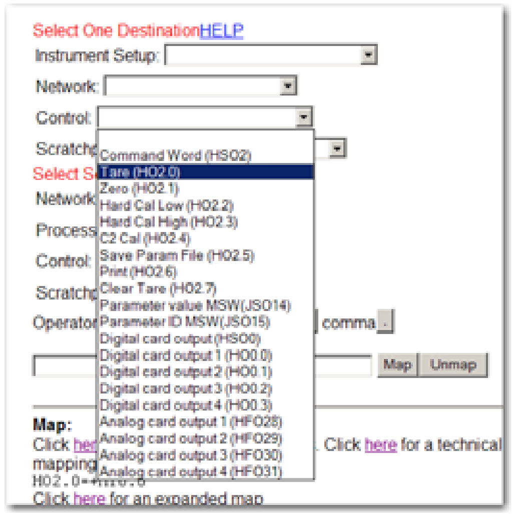


FIG. 264 DESTINATION/SELECTING TARE

• Click on Tare (HO2.0).

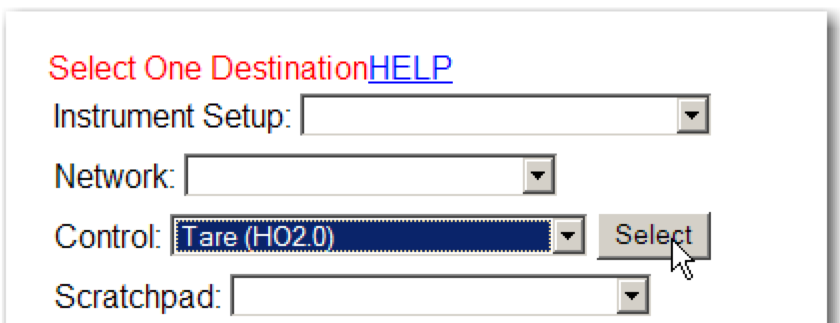


FIG. 265 SELECTING DESTINATION/TARE

- Click on the Select button. Tare (HO2.0) appears in the mapping field. (See Fig. 266)

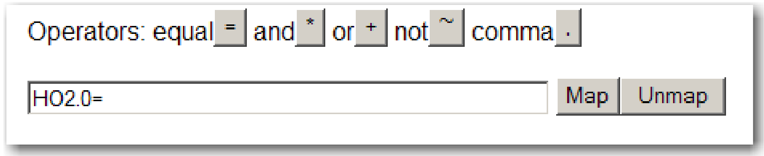


FIG. 266 TARE (HO2.0) AS DESTINATION IN MAPPING FIELD

- Click on the Sources Control pull down menu. (See Fig. 267)

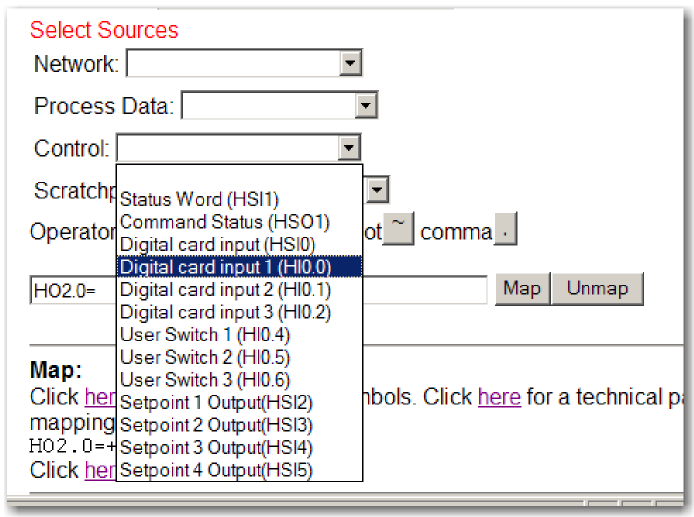


FIG. 267 SOURCES/SELECTING DIGITAL CARD INPUT 1

- Click on the Digital Card Input you want for this applications. In our example we selected Digital Card Input 1. (See Fig. 268)

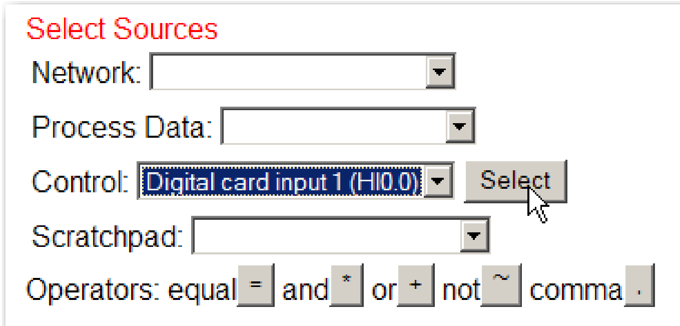


FIG. 268 SELECT SOURCES/SELECTING DIGITAL CARD INPUT 1

- Click on the Select button. The Source (Digital Card Input 1) appears in the Mapping field. (See Fig. 269)

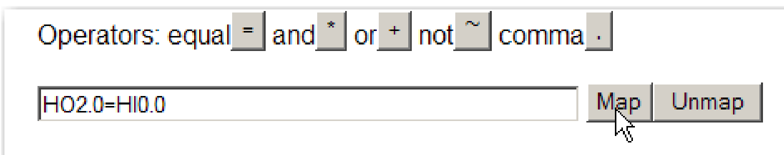


FIG. 269 MAPPING SOURCE TO DESTINATION

- Click on the Map button. Digital Card Input 1 is now mapped to Tare. (See Fig. 270)

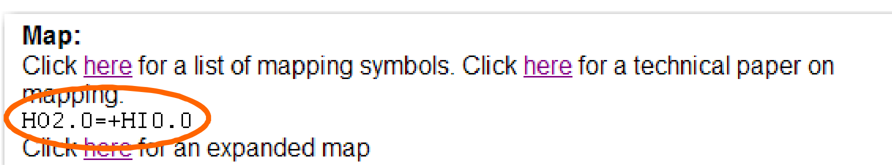


FIG. 270 MAPPING STATEMENT LISTED

- You will need to send a transition signal from low to high each time you want to Tare, Zero, or any other function.

- If you want to Map the inputs on the Main Board you will need to select User Switches 1, 2 or 3. (See Fig. 271)

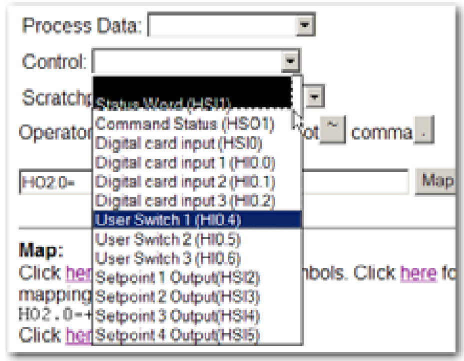


FIG. 271 MAPPING INPUTS ON THE MAIN BOARD

Step 5. The outputs 1-4 can be turned on or off from the Digital I/O Output page. To change the status of a Digital Output click on the pull down menu next to the Digital Output you want to change. (See Fig. 272)

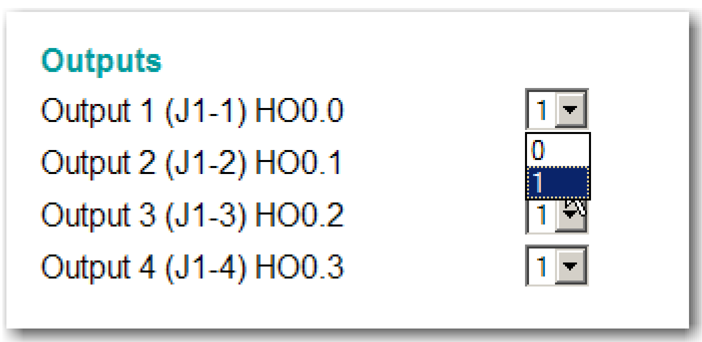


FIG. 272 DIGITAL OUTPUTS/SELECTING ON

Step 6. To toggle the output ON click on the number 1.

Step 7. To toggle the output Off click on the number 0.

Step 8. You need to map controls to the Digital Card Outputs. For example you might need to map a Setpoint (Setpoint 1 Output HSI2) to Digital Card Output 1 (HO0.0) you need to create this map: HO0.0 = HSI2 For Mapping click on configuration and Click on Mapping. Refer to Chapter 6 - Mapping for more instructions.

Configuring Network Option Cards

Configuring PROFIBUS From the Browser

Step 1. From the Home Page click on Configuration. (See Fig. 273) The Configuration Page appears. (See Fig. 274)

FIG. 273 HOME PAGE/SELECTING CONFIGURATION

FIG. 274 CONFIGURATION PAGE/SELECTING OPTIONS

Step 2. Click on Profibus Card. (See Fig. 275) The Profibus Card Option page appears. (See Fig. 276)

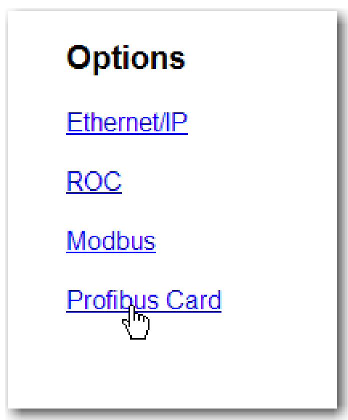


FIG. 275 OPTIONS MENU/SELECTING PROFIBUS CARD

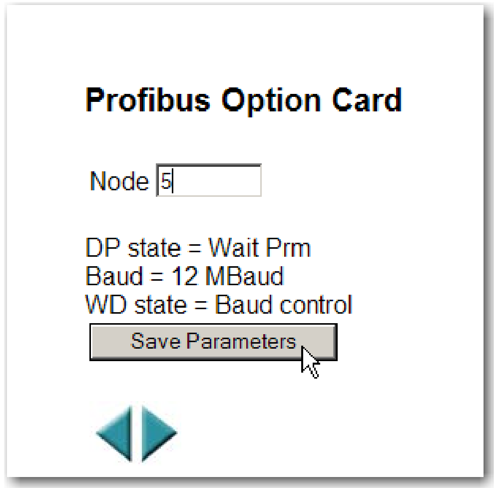


FIG. 276 PROFIBUS OPTION CARD/ENTERING NODE ADDRESS

Step 3. Double click in the Node text field to highlight the current entry.

Step 4. Type in the Node address of the HI 4050 you are currently configuring. In our example we entered the default address #5.

Step 5. Click on the Save Parameters button to save the entry.

Step 6. You can also read the communication status of the instrument.

Step 7. Click on the Home to return to the Home Page.

Configuring Security from the Front Panel

Step 1. From the Configuration Menu press the down arrow until the cursor is in front of Security. (See Fig. 277)

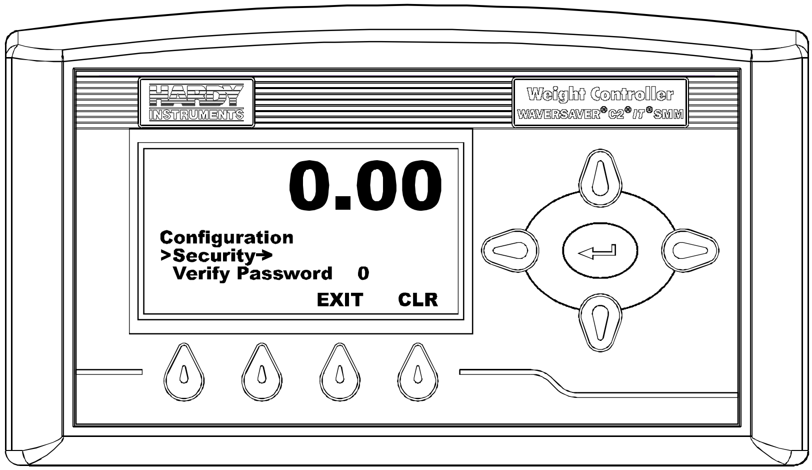


FIG. 277 CONFIGURATION MENU/SELECTING SECURITY

NOTE *The "Verify Password 0" appears if you have set a High or Medium password for Configuration.*

Step 2. Press the Enter button. The Security Menu appears. (See Fig. 278)

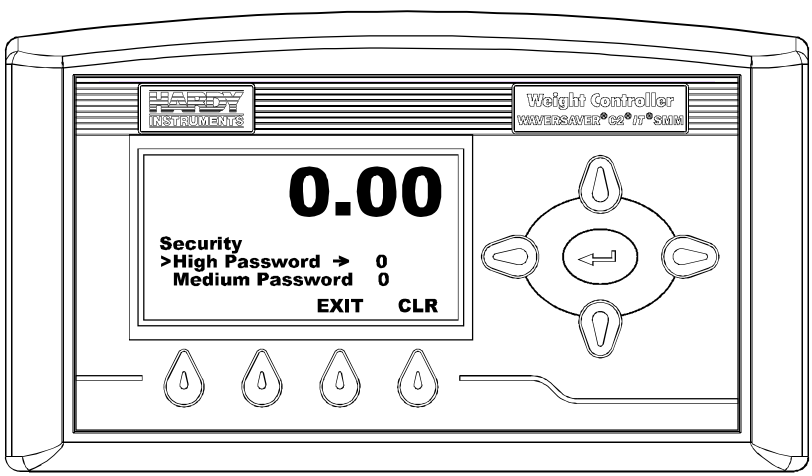


FIG. 278 SECURITY MENU/SETTING HIGH PASSWORD

Step 3. Press the Enter button. The High Password display appears. (See Fig. 279) The present password setting is displayed.

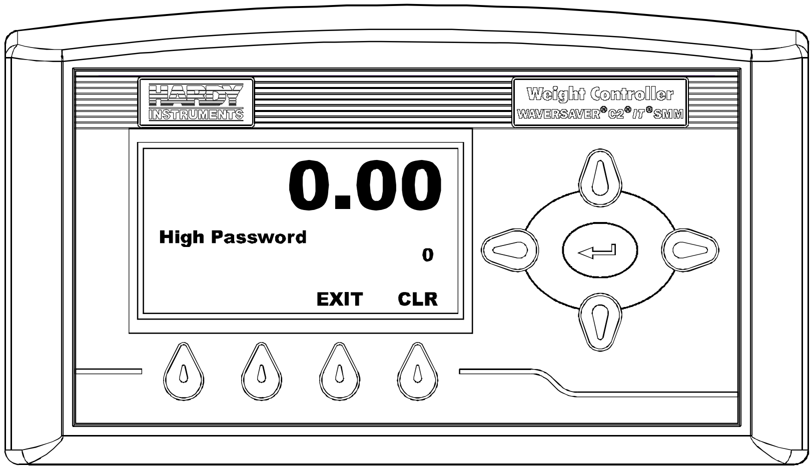


FIG. 279 HIGH PASSWORD DISPLAY

Step 4. Use the left or right arrows to move the cursor. If you want to delete an entry press the left arrow.

Step 5. Use the Up or Down arrows to enter the value. In our example we entered “123”. (See Fig. 280)

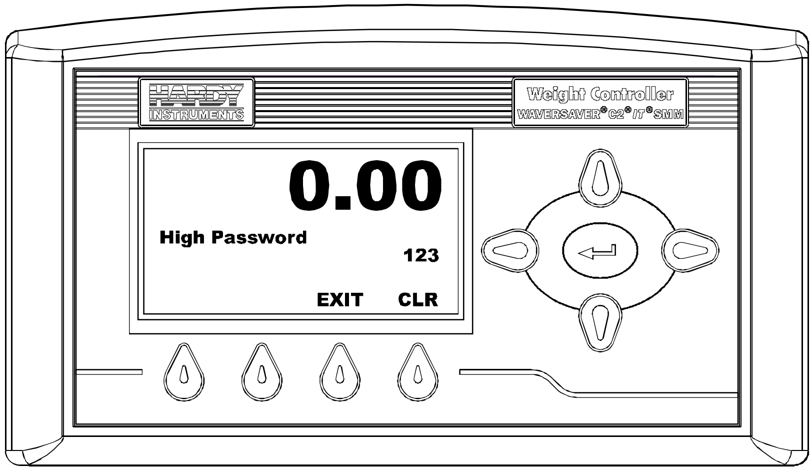


FIG. 280 ENTERING "123" FOR HIGH PASSWORD

NOTE *The values entered above are for illustration purposes only. Do not use this sequence for your application.*

Step 6. Press the Enter button. The password is saved to memory and you are returned to the Security Menu.

Step 7. Press the Down arrow button until the cursor is in front of Medium Password. (See Fig. 281) The present Medium Password setting is displayed.

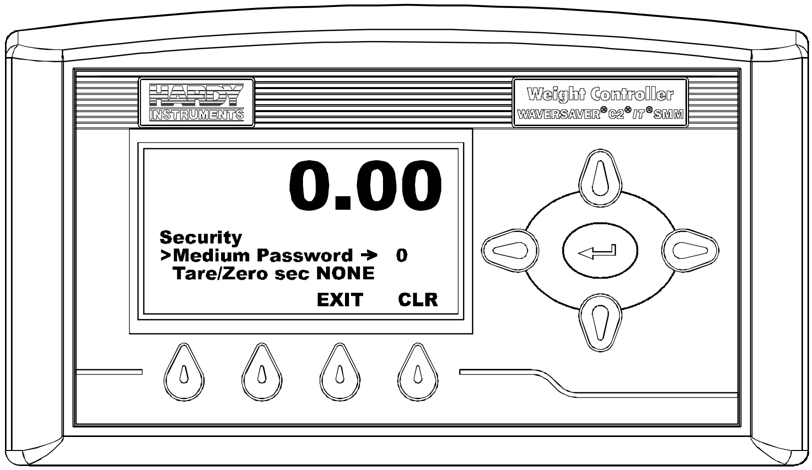


FIG. 281 SECURITY MENU/SELECTING MEDIUM PASSWORD

Step 8. Press the Enter button. The Medium Security display appears. (See Fig. 282)

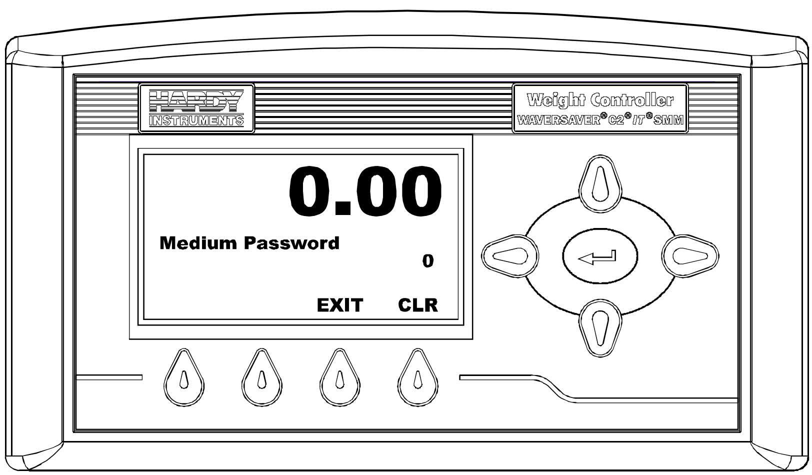


FIG. 282 MEDIUM PASSWORD DISPLAY

Step 9. Use the left or right arrows to move the cursor. If you want to delete an entry press the left arrow.

Step 10. Use the Up or Down arrows to enter the value. In our example we entered “456”. (See Fig. 283)

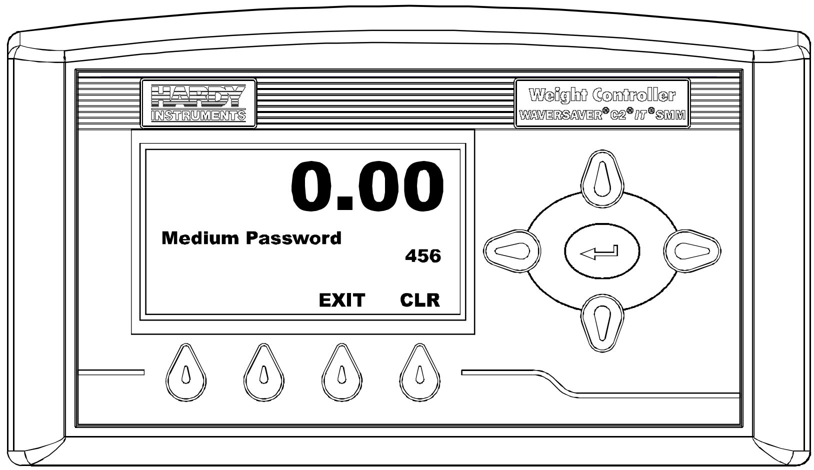


FIG. 283 ENTERING “456” FOR MEDIUM PASSWORD

NOTE *The values entered above are for illustration purposes only. Do not use this sequence for your application.*

Step 11. Press the Enter button. The password is saved to memory and you are returned to the Security Menu.

Step 12. To set security for the Tare/Zero functions, press the down arrow until the cursor is in front of “Tare/Zero Sec”. (See Fig. 284)

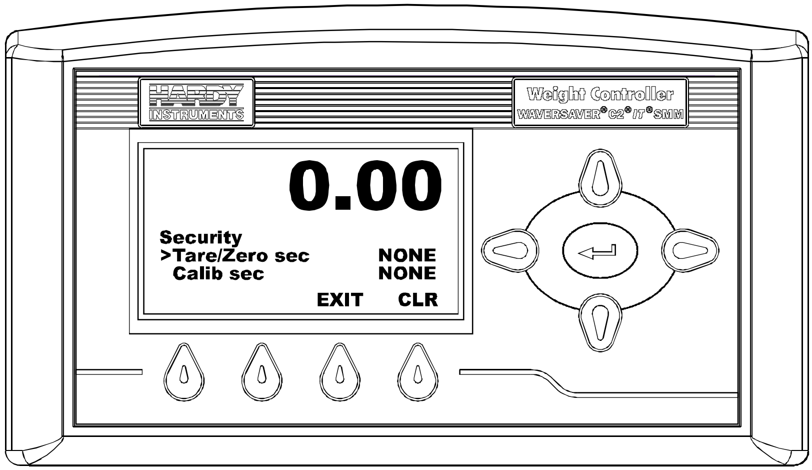


FIG. 284 SECURITY MENU/SOLACING SECURITY FOR TARE/ZERO

Step 13. Press the Right or Left arrow buttons to select NONE/MEDIUM/HIGH. In our example we selected MEDIUM. (See Fig. 285)

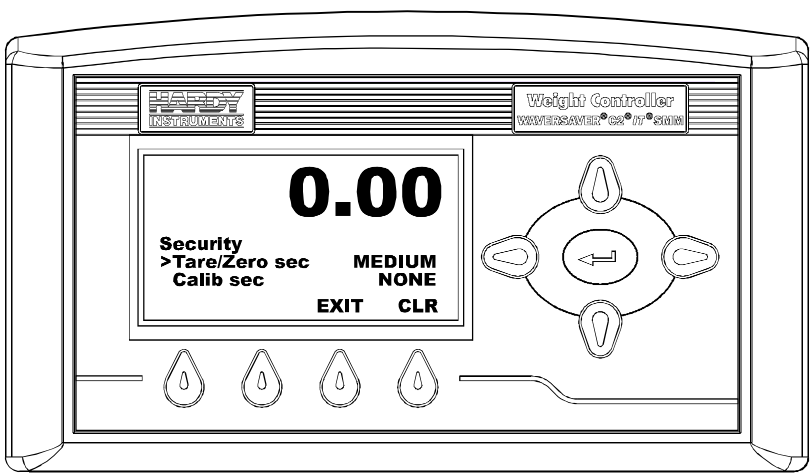


FIG. 285 SECURITY MENU/SELECING MEDIUM SECURITY FOR TARE/ZERO

- Now to Tare or Zero the instrument you need a password. When you Tare or Zero the instrument a “Verify Password” display appears. (See Fig. 286)

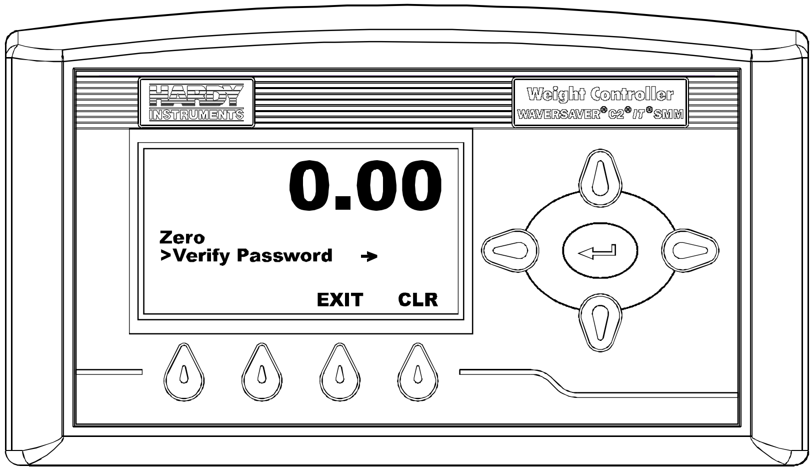


FIG. 286 ZERO MENU/VERIFYING PASSWORD

- Press the Enter button. The Verify Password display appears. (See Fig. 287)

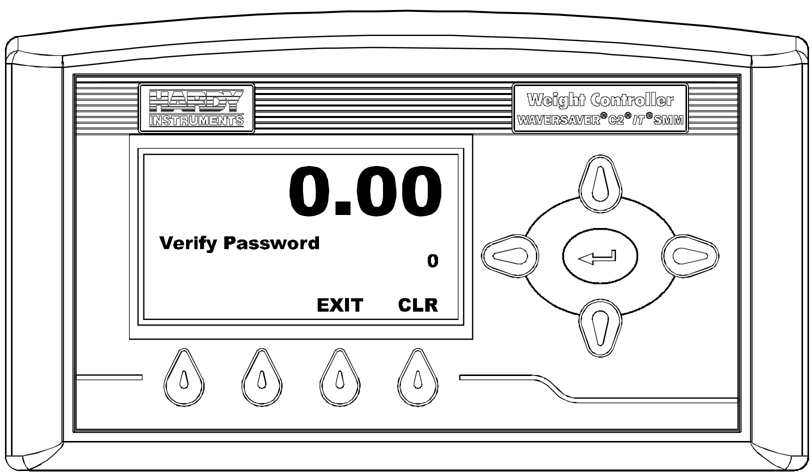


FIG. 287 VERIFY PASSWORD MENU

- Use the up or down arrows to enter the password that has been assigned. Either a High Password or a Medium Password. Since we assigned a Medium Password “456”.

- Enter “456”. (See Fig. 288)

NOTE *If Zero is assigned a High Password enter that if you know it.*

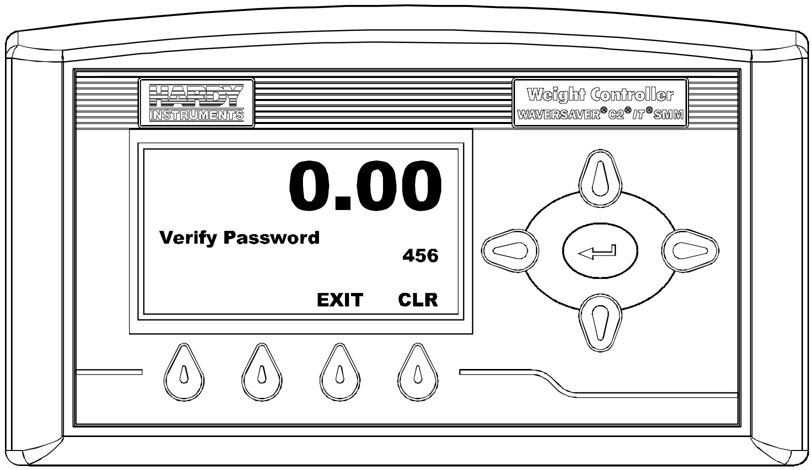


FIG. 288 VERIFY PASSWORD/ENTERING MEDIUM PASSWORD

- Press the Enter button.
- The Zero process proceeds.
- This is true for all Sections that are assigned a password.

Step 14. Press the Enter button. The password is saved to memory and you are returned to the Security Menu.

Step 15. You can assign a password to the Calibration Section and to the Web Page as well. (See Fig. 289)

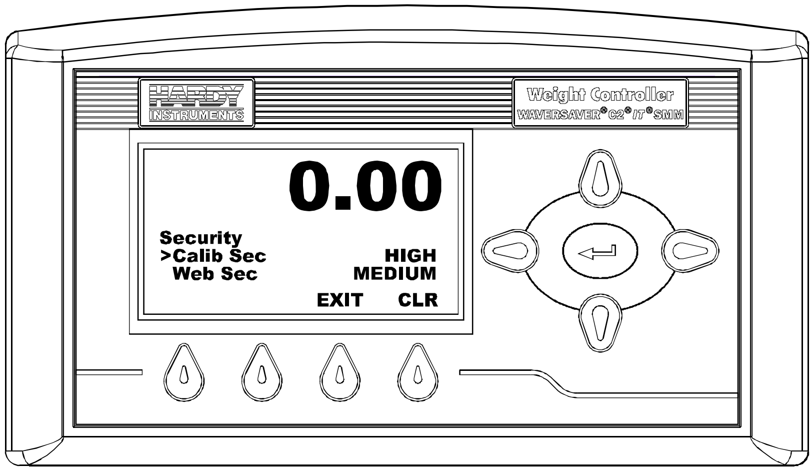


FIG. 289 SECURITY MENU/SETTING PASSWORDS FOR CALIB AND WEB SECTIONS

Step 16. Press the Exit button to return to the Summary Display.

Configuring Security for the Instrument from the Web Page

Step 1. From the Configuration Page click on Security. (See Fig. 290) The Security page appears. (See Fig. 291)

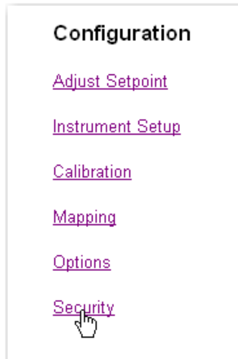


FIG. 290 CONFIGURATION PAGE/SELECTING SECURITY

FIG. 291 SECURITY PAGE

NOTE *The text field allows short integers which means you can only enter numbers and in any* *combination. Be sure to write down the codes you use and store them in a secure location in case you need to refer to them again.*

Step 2. Click in the High Security Code text field. (See Fig. 292)

Step 3. Type in the number code you want.

Step 4. Click in the Medium Security Code text field.

Step 5. Type in the number code you want.

Step 6. If you don't want to set High and/or Medium Security Codes enter "0". (See Fig. 292)

FIG. 292 SECURITY/ENTERING CODES

Step 7. Click on the "Front Panel TARE/ZERO Security" pull down list. (See Fig. 293)

Step 8. Click on the level of security you want for taring and zeroing the instrument from the front panel.

FIG. 293 SECURITY/SELECTION SECURITY LEVELS

Step 9. Click on the "Front Panel Calibration Security" pull down list.

Step 10. Click on the level of security you want for calibrating the instrument.

Step 11. Click on the “Web Page Security” pull down list.

Step 12. Click on the level of security you want for the Web Pages.

Step 13. Click on the Save Code button to save the security settings. (See Fig. 294)

FIG. 294 SECURITY/SAVING CONFIGURATION

Setting Parameter Security

Now that you have created a High and Medium Security Code you can now use a dollar sign notation to set security on any of the parameters you want. If you want to require a password for changing units you can enter one dollar sign $ for Medium Security Code or two dollar signs $$ for High Security Code. This can be done by editing the Parameter Dump.

- For example: If you want a high security code for Units simply enter the following:

  00000001 $$Unit=0 (lb)

Step 1. From the Home page click on Operation. (See Fig. 295) The Operation page appears. (See Fig. 296)

FIG. 295 HOME PAGE/SELECTING OPERATION

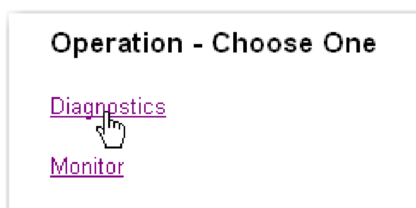


FIG. 296 OPERATION/SELECTING DIAGNOSTICS

Step 2. Click on Diagnostics. The Diagnostics page appears. (See Fig. 297)

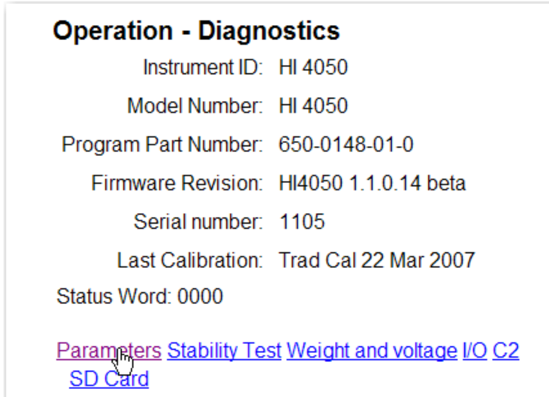


FIG. 297 DIAGNOSTICS/SELECTING PARAMETERS

Step 3. Click on Parameters to create a list of parameters and their configuration. The Parameter Dump page appears. (See Fig. 298)

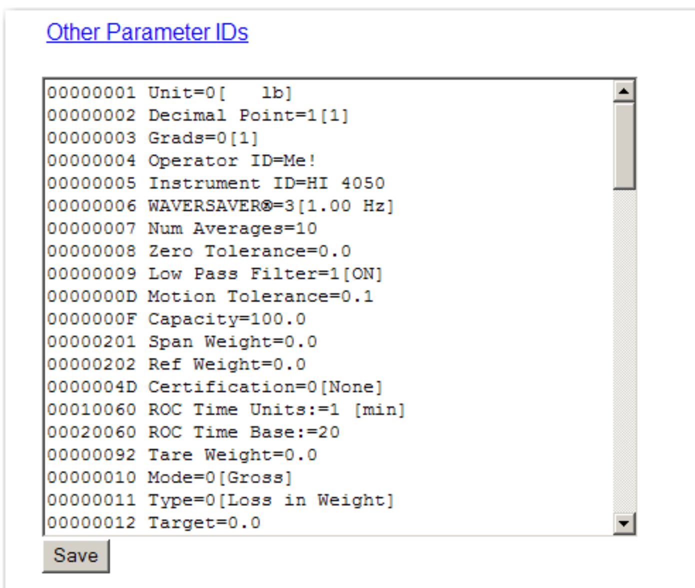


FIG. 298 PARAMETER DUMP

Step 4. Click next to the Parameter text you want to which you want to set a security code. (See Fig. 299)

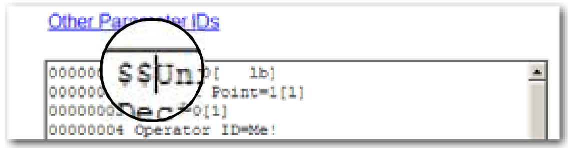


FIG. 299 ENTERING SECURITY FOR UNIT

Step 5. Type two dollar signs for High security or one (1) dollar sign for Medium security. In our example we entered two (2) dollar signs for High security. (See Fig. 300)

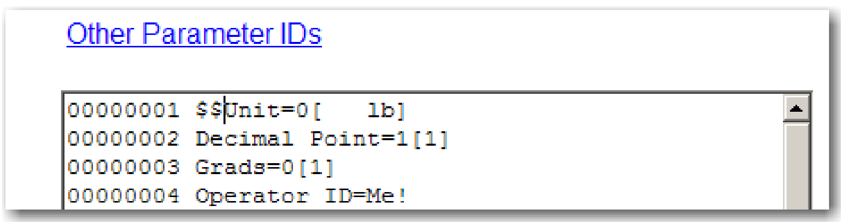


FIG. 300 PARAMETER DUMP/SECURING UNIT

Step 6. Click on the Save button to save the security changes. (See Fig. 301)

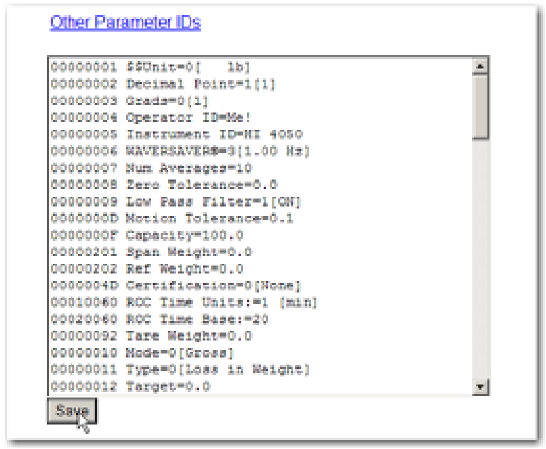


FIG. 301 PARAMETER DUMP/SAVING PARAMETER CHANGES

Step 7. Click on the back arrow until you return to the Home Page.

Step 8. When a user wants to change the Unit parameter they will have to know the High Security Code password.

NOTE *If you have not set a Medium or High Security Code and enter dollar signs for a parameter(s) the instrument disregards the security code. You must enter a High or Medium security code before entering the dollar signs.*

Chapter 5
Calibration

About Chapter 5

Chapter 5 pertains to the calibration procedures for the HI 4050 Weight Controller. Alternatives to any procedures implied or explicitly contained in this chapter are not recommended. In order for the Weight Controller to work properly, it must be calibrated prior to operation. All calibration should be done in the Gross mode. It is recommended that the instrument be re-calibrated periodically or when not in use for extended periods of time. Be sure to follow all the procedures completely to insure that the weights read by the controller are accurate. It is very important that the user and service personnel be familiar with the procedures contained in this chapter before installing or operating the HI 4050 Weight Controller.

Pre-Calibration Procedures

Mechanical Check Procedures

Step 1. Check to determine if the load cells have been installed properly.

- Refer to your load cell I&M manual for proper installation instructions.
- On some load cells there is an arrow that indicates the direction of the applied load. If the arrow is pointing in the wrong direction, change the position of the load cell so that it is mounted in the direction of the applied load. (See Fig. 302)

Step 2. Check for Binding on the Load Cell or other parts of the system.

CAUTION - Binding on a Scale/Vessel or Load Cell does not allow the load cell free vertical movement and may prevent the instrument from returning to the original zero reference point.

- A load cell must be mounted so that 100% of the load (Vessel + Contents) are vertically passing through a load cell. (See Fig. 302)

- Do a visual check to see that nothing is binding the load cell or other parts of the weighing system. Make sure that nothing is draped over the scale/vessel or the load cell, such as a hose, electrical cord, tubes, or other objects.

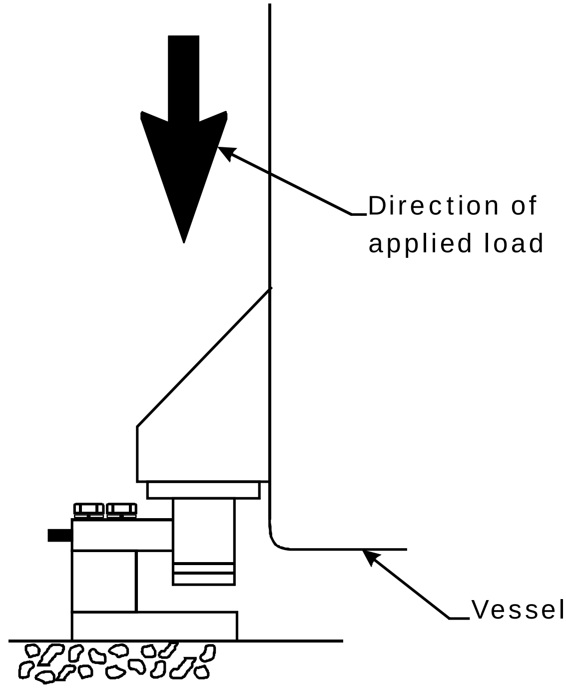


FIG. 302 PROPERLY INSTALLED LOAD CELL/NO BINDING

Step 3. Check to see that nothing comes in contact with the scale/vessel other than service wires and piping that have been properly mounted with flexible connectors.

Electrical Check Procedures

Step 1. Check to see that there is power to the Weight Controller.

- If there is power to the controller the front panel display should be lit.
- If the display appears with a value the unit is ready for calibration.

Step 2. Typical Load Cell/Point Input/Output Measurements (EXC & SIG outputs)

- The HI 4050 Weight Controller is designed to supply 5 VDC excitation to as many as eight (8) 350 ohm load cells/points.
- The expected output from each load cell/point depends on the mV/V rating of the load cell/point and weight.

- For example a 2 mV/V load cell/point will respond with a maximum of 10 mVDC at full weight capacity of the system which includes the weight of the vessel and the weight of the product as measured by the load cell/point.
- If the load cell/point weight capacity is rated at 1000 pounds, the load cell/point output will be 10 mVDC at 1000 pounds, 3.6 mVDC at 750 pounds, 5 mVDC at 500 pounds and so on.
- A zero reference point will vary from system to system depending on the “Dead Load” of the vessel. “Dead Load” is the weight of the vessel and appurtenances only, with no product loaded. In our example below we assume the dead load to be 500 lbs. (See Fig. 303)

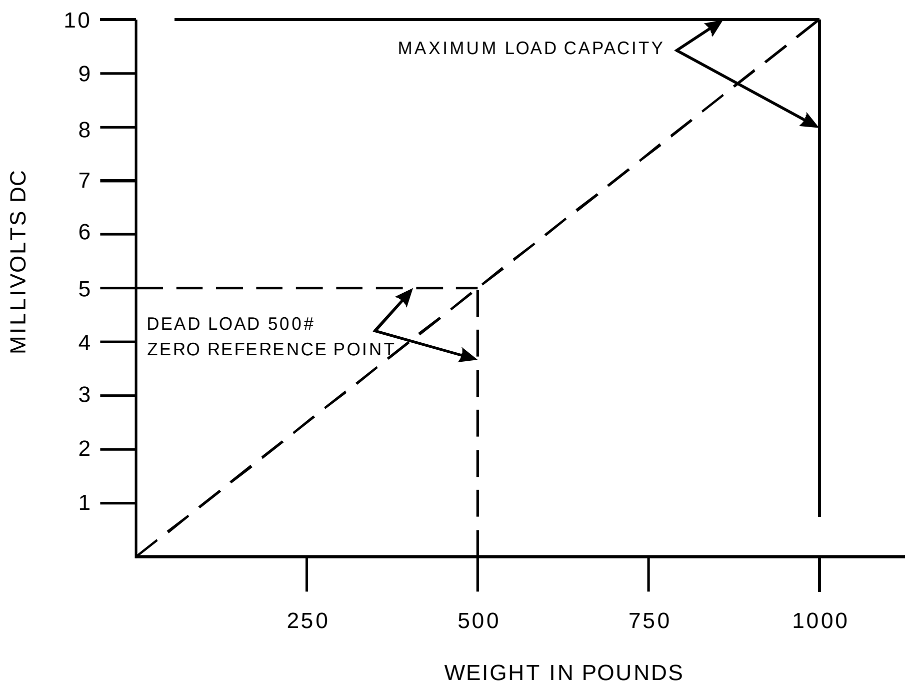


FIG. 303 MILLIVOLTS/WEIGHT SCALE

- Based on the example, the operating range for this scale is 5-10 mVDC with a 500 pound weight. Understand that after zeroing the instrument the 0 reading on the instrument refers to the zero reference point and not absolute 0 mVDC or absolute 0 weight.

NOTE *Load cell/point measurements can be checked with a digital voltmeter at the J1 connector on the rear panel or at the summing box of the HI 4050 or use Integrated Technician if you are using the IT Junction Box.*

Step 3. Allow the instrument to warm up for about 15 minutes before doing the calibration procedures.

Load Check

Step 1. Put a load (weight) on the scale or vessel. For a full load test you can put 80% to 100% of the expected weight you will see in your process on the scale or vessel.

Step 2. Check to see if the weight reading changes on the display in the proper direction.

- For example, if the display reads 100 pounds and a 20 pound load is placed on the vessel or scale, the display should read 120 or some value over 100.
- If the display reads 80 pounds and a 20 pound load is placed on the vessel or scaled, the reading is going in the wrong direction and indicates some problem with the system. (See Chapter 8, Troubleshooting for corrective action)
- If the display is reading improperly or shows no change there is something wrong with the configuration or the load cells.

Step 3. If the display changes in the proper direction, remove the weight and proceed to calibrate the Weight Controller.

Calibration Procedures From the Front Panel

NOTE *When calibrating the HI 4050 for the first time, go from one sub-menu to the next in sequence.*

NOTE *The example settings provided below are for illustrations purposes only your, setting requirements will vary.*

Step 1. Make sure you have configured the instrument for your application. This includes setting the units, decimal point, scale capacity, averages etc. For instructions please see Chapter 4, Configuration.

Step 2. From the Summary display press the Enter button. The Configuration Menu appears.

Step 3. Press the Down Arrow button until the cursor is in front of Calibration. (See Fig. 304)

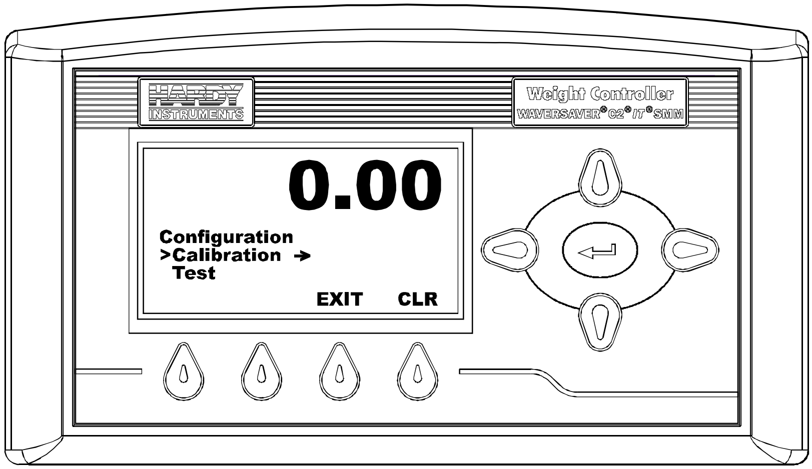


FIG. 304 CONFIGURATION MENU/SELECTING CALIBRATION

Step 4. Press the Enter button. The Calibration menu appears. (See Fig. 305)

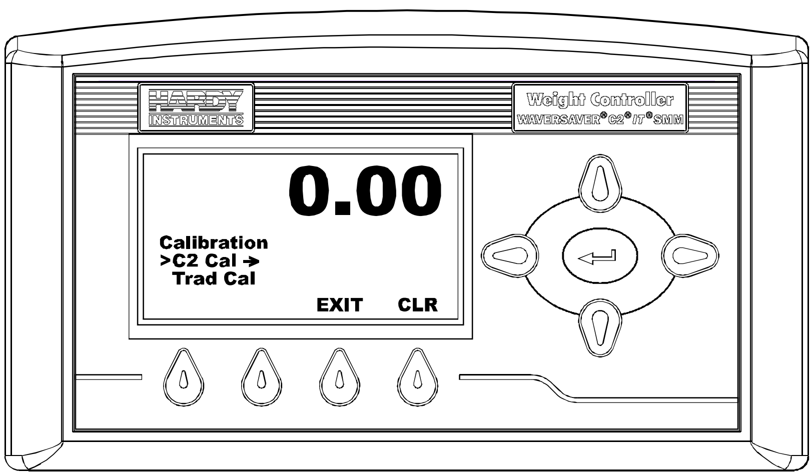


FIG. 305 CALIBRATION MENU/SELECTING C2 CAL

C2 Calibration Procedures From the Front Panel

Step 1. Press the Down Arrow button until the cursor is in front of C2 Cal.

Step 2. Press the Enter button. The C2 Calibration Menu appears with the cursor in front of Num C2. (See Fig. 306)

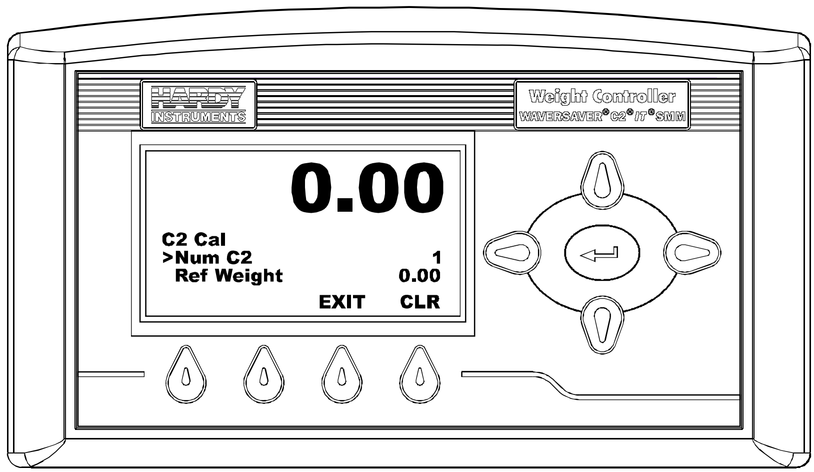


FIG. 306 C2 CALIBRATION MENU/SELECTING NUMBER OF C2 LOAD CELLS

Step 3. Check the C2 Load Cell count.

- The Num C2 is read only and lists the number of C2 load cells installed on the system which have been detected by the instrument. Check to see that the load cells detected match the number of C2 load cells actually installed.
- If the load cells detected do not match the load cells installed in the system do the following:

1. Physically check each load cell/point cable connection to make sure they are securely fastened.
2. Check each load cell/point cable to make sure they are not broken.
3. If you have the ability to connect to the instrument via ethernet, open the HI 4050 web page and select Operations/Diagnostics/C2 and Weight and Voltage to determine which load cell/point is malfunctioning.

Step 4. Press the Down Arrow button until the cursor is in front of Ref Weight (Reference Weight). (See Fig. 307)

- The Reference Weight is the total live load that is currently on the scale.
- If you have nothing on the scale then the Reference Weight is 0.00. If you have 5 lbs on the scale the Reference Weight is 5.00 lbs.

NOTE *Normally the scale system is clean and ready to receive product. This step establishes the gross zero reference.*

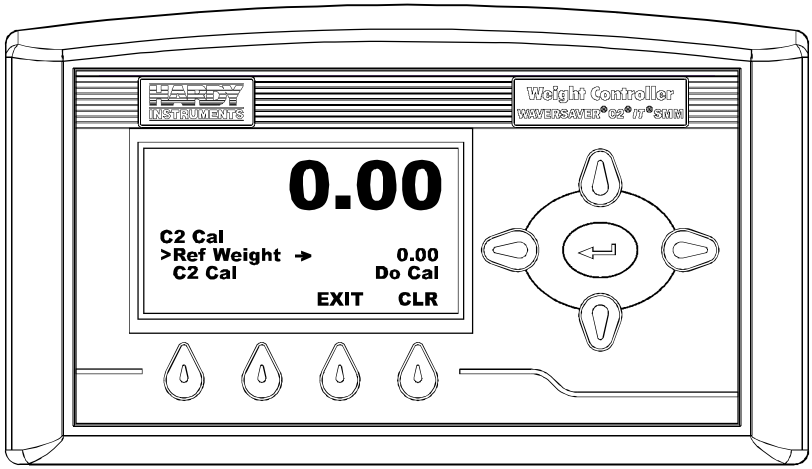


FIG. 307 C2 CAL MENU/SELECTING REF WEIGHT

Step 5. Press the Enter button. The Ref Weight Menu appears. (See Fig. 308)

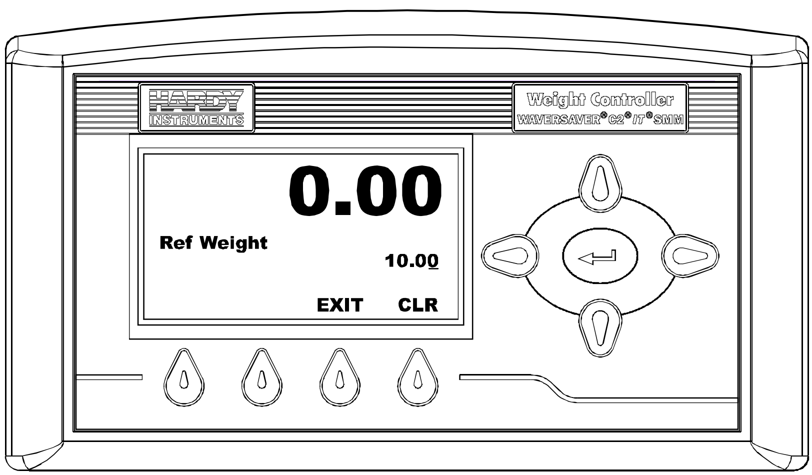


FIG. 308 REF WEIGHT MENU

Step 6. Press the CLR button to clear the current value.

Step 7. Use the Left and Right Arrow buttons to position the cursor. Use the Up or Down Arrow buttons to enter the Reference Weight for this instrument.

Step 8. Press the Enter button to save the Reference Weight.

Step 9. Press the Down Arrow button until the cursor is in front of C2 Cal. (See Fig. 309)

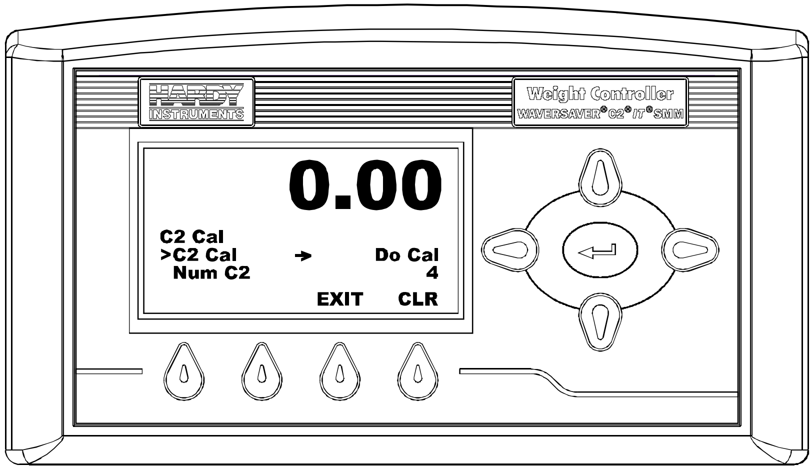


FIG. 309 C2 CAL MENU/SELECTING C2 CAL

Step 10. Press the Enter button to perform the C2 Calibration.

Step 11. A “Cal Completed OK” briefly appears on the screen indicating the C2 calibration was successful.

- A “Cal Failed” message briefly appears with the error number if the C2 Calibration was not successful. Check Chapter 7, Troubleshooting for corrective action.
- A “Security Violation” message briefly appears if the user does not have the security level required to do a calibration.

Step 12. Press the Exit button to return to the Calibration Menu.

Traditional Calibration from the Front Panel

Traditional Calibration is the method of calibration that uses test weights. We recommend that the test weights total 80 to 100% of the scale live load capacity and the weights be distributed uniformly on/in the scale.

Step 1. From the Summary display, press the Enter button. The Configuration Menu appears.

Step 2. Press the Down Arrow button until the cursor is in front of “Calibration”.

Step 3. Press the Enter button. The Calibration Menu appears.

Step 4. Press the Down Arrow button until the cursor is in front of "Trad Cal". (See Fig. 310)

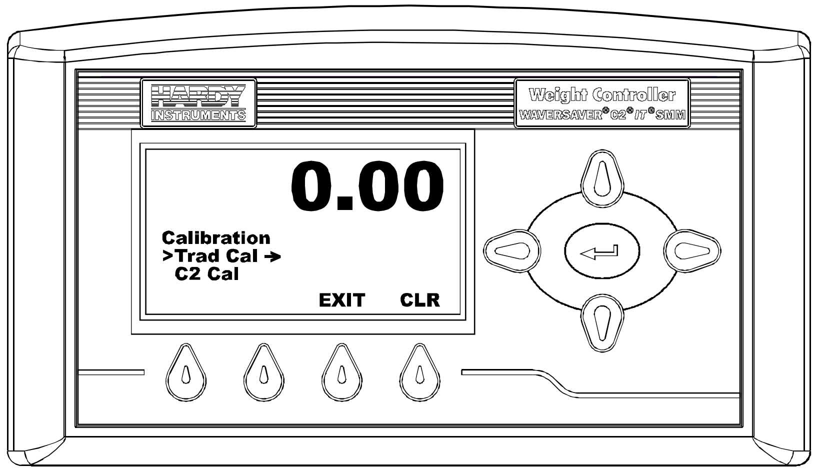


FIG. 310 CALIBRATION MENU/SELECTING TRAD CAL

Step 5. Press the Enter button. The Trad Cal menu appears. (See Fig. 311)

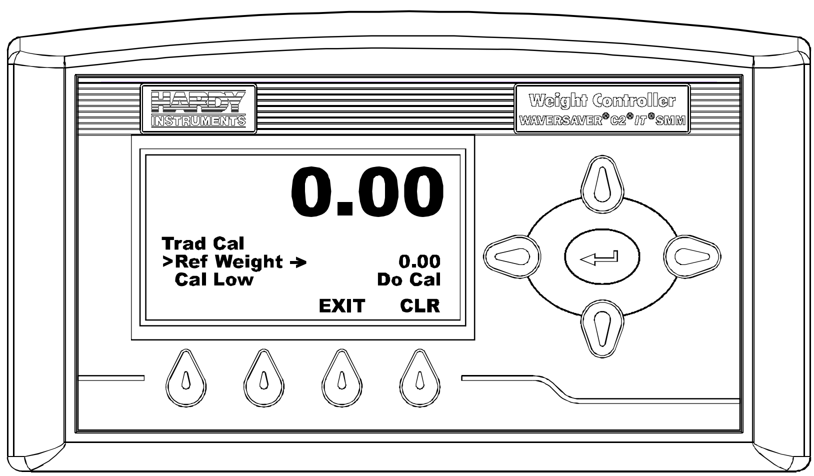


FIG. 311 TRAD CAL/SELECTING ZERO VALUE

Step 6. Press the Enter button. The Reference Weight menu appears. (See Fig. 312)

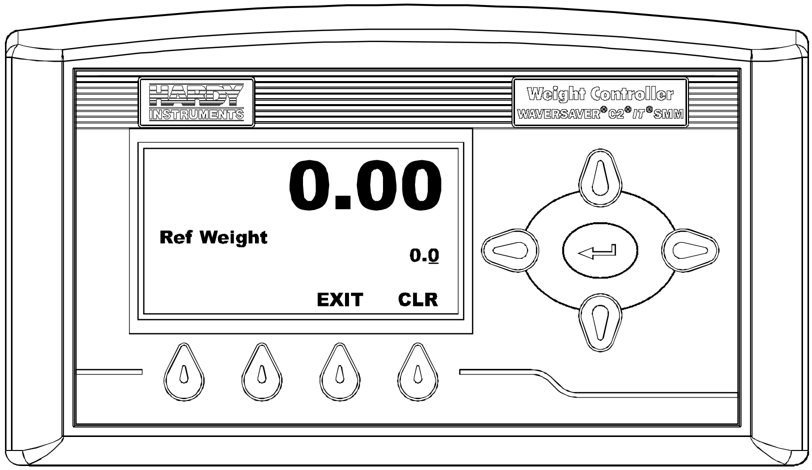


FIG. 312 REFERENCE WEIGHT MENU

Step 7. Traditional Calibration requires a zero point and the physical placement of test weights on the scale. To set the Reference Weight:

- Remove all weight “live load” from the Scale. The Ref Weight should be 0.0.

CAUTION - The Scale must be empty.

- Wait 12 seconds or more.

Step 8. Use the Left and Right Arrow buttons to position the cursor. Use the Up or Down Arrow buttons to enter the Reference Weight for this instrument.

Step 9. Press the Enter button to save the entry.

Step 10. Press the Down Arrow button until the cursor is in front of “Cal Low Do Cal”. (See Fig. 313)

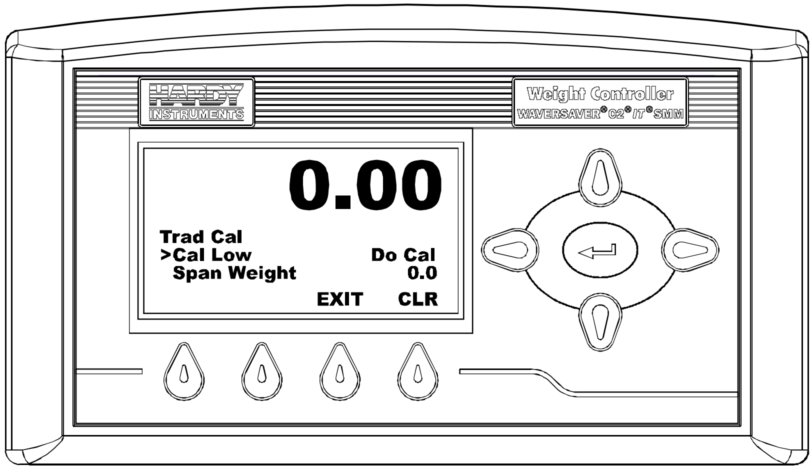


FIG. 313 TRAD CAL MENU/DO CAL LOW

Step 11. Press the Enter button to do the Cal Low.

- A “Cal Completed OK” message appears briefly if the calibration was successful.
- An Error number appears if the calibration was not successful. There is an Error list in Chapter 7, Troubleshooting. Refer to this list in order to correct the error.

Step 12. Press the Down Arrow button until the cursor is in front of Span Weight. (See Fig. 314)

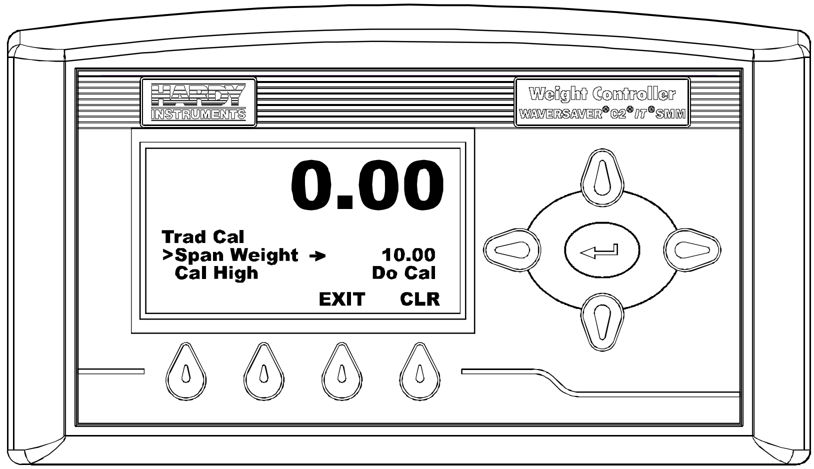


FIG. 314 TRAD CAL MENU/SELECTING SPAN WEIGHT

Step 13. Press the Enter button. The Span Weight Menu appears. (See Fig. 315) The last Span Weight is displayed.

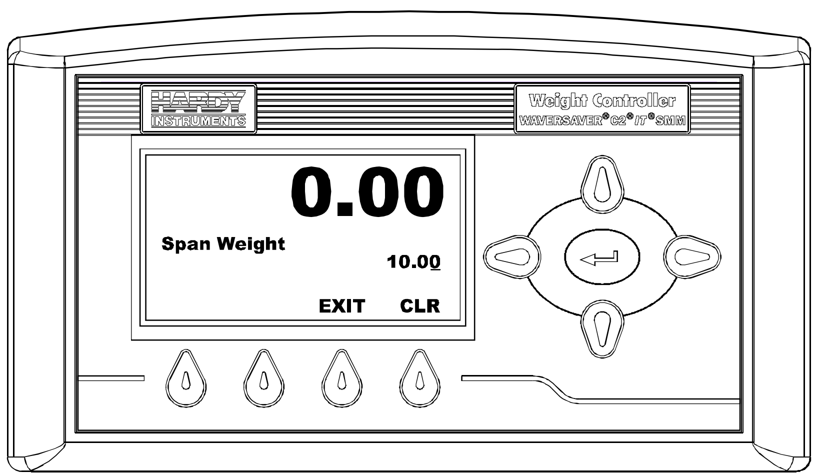


FIG. 315 SPAN WEIGHT MENU

Step 14. To set the Span Weight:

- Place a certified test weight on the scale.

- Use the Left and Right arrows to position the cursor and the Up or Down arrows to enter the value of the test weight. If a 10 lb. weight is used, enter 10.00)
- Press the Enter button to save the entry.

Step 15. Press the Down Arrow button until the cursor is in front of “Cal High”. (See Fig. 316)

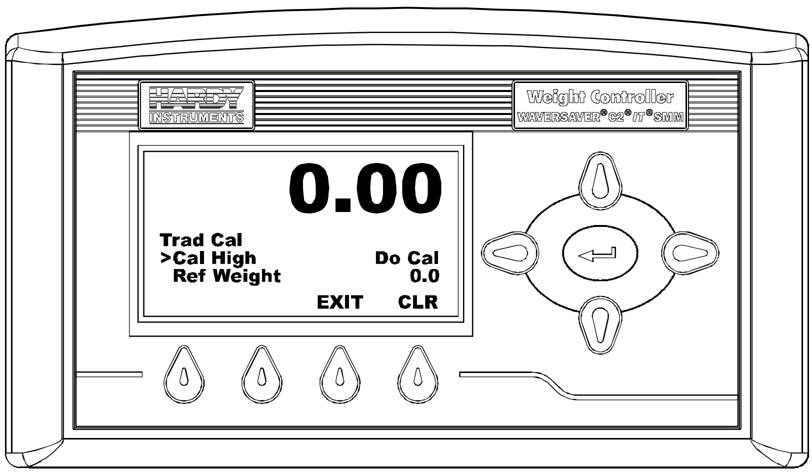


FIG. 316 TRAD CAL MENU/SELECTING CAL HIGH

Step 16. Press the Enter button to do the Cal High.

- A “Cal Completed OK” message appears briefly if the calibration was successful.
- An Error number appears if the calibration was not successful. There is an Error list in Chapter 7, Troubleshooting. Refer to this list in order to correct the error.

Step 17. The scale is now calibrated.

Calibrating Procedures From the Web Page

C2 Calibration

Step 1. Perform all the pre-calibration procedures.

Step 2. Make sure you have configured the instrument for your application. This includes setting the units, decimal point, scale capacity, averages etc. For instructions please see Chapter 4, Configuration.

Step 3. From the Home Page Click on Configuration. The Configuration page appears. (See Fig. 317)

NOTE *Any values that appear in this chapter are for illustration purposes. Your requirements will vary.*

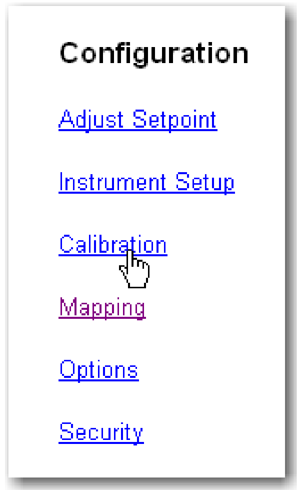


FIG. 317 CONFIGURATION PAGE/SELECTING CALIBRATION

Step 4. Click on Calibration. The Calibration page appears. (See Fig. 318)

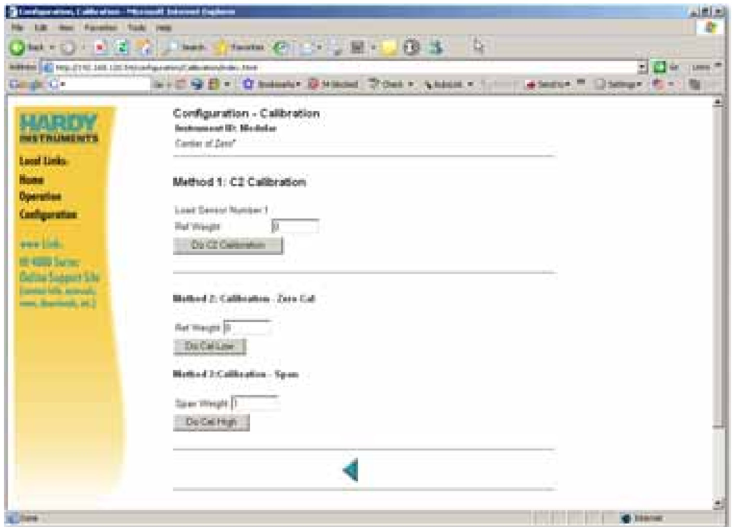


FIG. 318 CALIBRATION PAGE

Step 5. Click in the “Ref Weight” text field. (See Fig. 319)

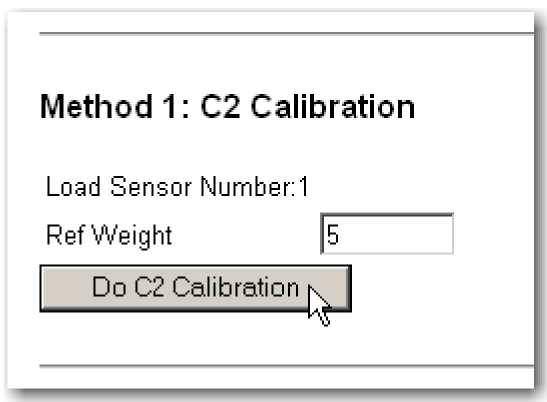


FIG. 319 C2 CALIBRATION/ENTERING REFERENCE WEIGHT

- The Reference Weight is the total live load that is currently on the scale.
- If you have nothing on the scale then the Reference Weight is 0.00. If you have 5 lbs on the scale the Reference Weight is 5.00 lbs.

NOTE *Normally the scale system is clean and ready to receive product. This step establishes the gross zero reference.*

Step 6. Enter the reference weight for your application. In our example we entered 5 lbs.

Step 7. Click on the “Do C2 Calibration” button.

Step 8. Wait a few seconds and the results will appear.

- If the Calibration was successful a Cal completed OK appears. (See Fig. 320)

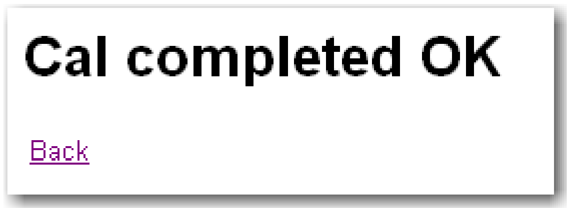


FIG. 320 CAL COMPLETED OK

- If there are no load points connected to the instrument a Cal Failed: A to D Converter Error appears. (See Fig. 321) To correct this error check the cable and connectors of the load point(s) and re-calibrate.

FIG. 321 CAL FAILED NO LOAD SENSORS CONNECTED

NOTE *You will also see that the Load Sensor Number reads “0”. (See Fig. 322)*

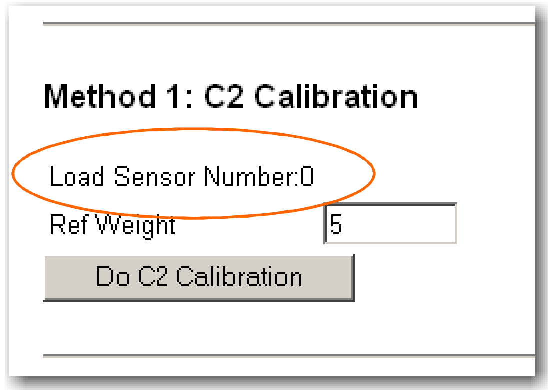


FIG. 322 LOAD SENSOR NUMBER READS "0"

- If there are no C2 load points connected to the instrument a Cal Failed: No C2 sensors found appears. (See Fig. 323) This requires that you do a traditional calibration of the instrument or connect C2 load sensors to the instrument. Also see note above.

FIG. 323 CAL FAILED NO C2 LOAD SENSORS CONNECTED

Step 9. Click on "Back" to return to the Calibration page.

Traditional Calibration

Traditional Calibration is the method of calibration that uses test weights. We recommend that the test weights total 80 to 100% of the scale live load capacity.

Step 1. Traditional Calibration requires a zero point and the physical placement of test weights on the scale. To set the Zero Value:

- Remove all weight "live load" from the Scale. The Zero Value should be 0.00.

CAUTION - The Scale must be empty.

- Wait 12 seconds or more.

Step 2. Click in the Ref Weight text field and enter the reference weight you want. In our example we entered 0 lbs. (See Fig. 324) If you want the reference weight to be 5.0 lbs enter “5.0”.

Step 3. Click on the Do Cal Low button to do the Trad Cal Zero.

- A “Cal Completed OK” message appears briefly if the calibration was successful.
- An Error number appears if the calibration was not successful. There is an Error list in Chapter 7, Troubleshooting. Refer to this list in order to correct the error.

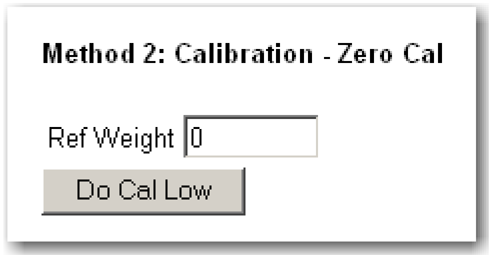


FIG. 324 TRADITIONAL CALIBRATION/ENTERING REFERENCE WEIGHT

Step 4. To set the Span Weight:

- Place a certified test weight on the scale.
- Click in the Span Weight text field. If a 10 lb. weight is used, enter 10. In our example we entered 5 lbs. (See Fig. 325) You can also enter 2.3 lbs etc.

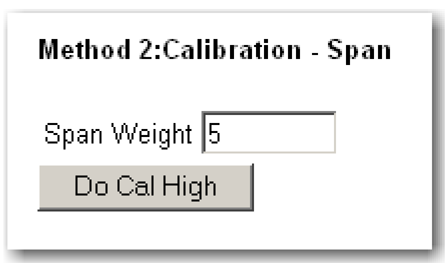


FIG. 325 SPAN WEIGHT/5 LBS

- Click on the Do Cal High button.

1 A “Cal Completed OK” message appears briefly if the calibration was successful.

2 An Error message appears if the calibration was not successful. (See Fig. 326) There is an Error list in Chapter 7, Troubleshooting. Refer to this list in order to correct the error.

FIG. 326 CAL FAILED NOT ENOUGH ADC COUNTS BETWEEN HIGH AND LOW

Step 5. The scale is now calibrated.

Chapter 6 Mapping

About Mapping

Mapping is a simple process where you connect input (called a "Source") to an output (called a "Destination"). You can map any of the parameters to the Outputs and Inputs. The benefit of Mapping is that it requires no programming whatsoever. Simply select a Destination and a Source and your in business.

Mapping to an Output

In English we might say: "Connect Gross Weight to Ethernet/IP Float Out.

- Ethernet/IP Float Out is the Destination.
- Gross Weight is the Source.

In Assignment Statement form this mapping would look like this:

- Destination = Source or
- Ethernet/IP Float Out (EFO) = Gross Weight (HF10)

From the Web Browser let's go through the process:

Step 1. From the HI 4050 Home Page click on Configuration. (See Fig. 327) The Configuration Page appears. (See Fig. 328)

FIG. 327 HOME PAGE/SELECTING CONFIGURATION

Step 2. Click on Mapping. (See Fig. 328) The Configuration Mapping Setup Page appears. All the pull down menus include all the Destinations and Sources for the HI 4050. (See Fig. 329)

FIG. 328 CONFIGURATION PAGE/SELECTING MAPPING

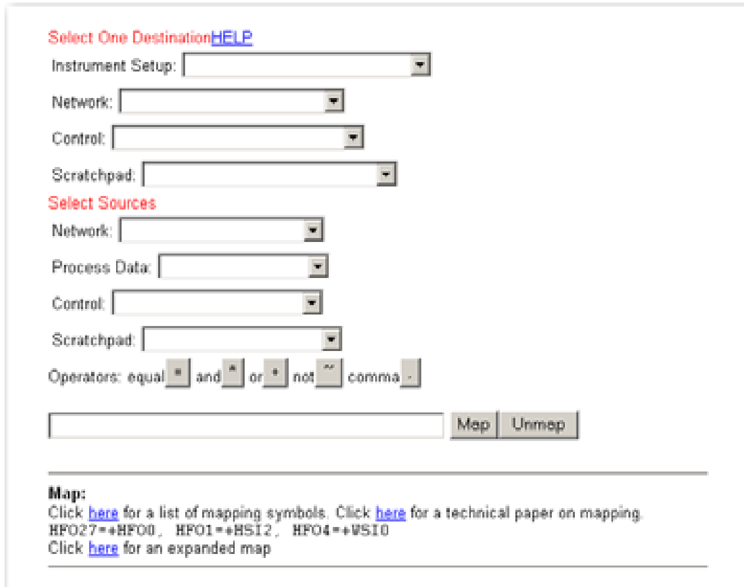


FIG. 329 CONFIGURATION MAPPING/SELECTING A DESTINATION

Step 3.Lets take a moment to take a look at this page.

Destination:

- Instrument Setup include parameters for setting up the instrument itself and includes the following which is only a partial list:

1. **WAVERSAVER®**
2. **Grad Size**
3. **Zero Tolerance**
4. **Motion Tolerance**
5. **Setpoint 1 (Deadband)**

NOTE *WAVERSAVER® is a registered trademark of Hardy Instruments Inc.*

- Network includes the network outputs for DeviceNet, Ethernet/IP Profibus® and Modbus®. DeviceNet and Profibus can also be listed. Click **here** for a list of Mapping Symbols to get the entire list of the mapping symbols for network options.

1. **Ethernet/IP Boolean Out (EO)**

2. **Ethernet/IP Short Out (ESO)**
3. **Ethernet/IP Int Out (EIO)**
4. **Ethernet/IP Float Out (EFO)**
5. **Modbus® Boolean Out (MO)**
6. **Modbus® Short Out (MSO)**
7. **Modbus® Int Out (MIO)**
8. **Modbus® Float Out (MFO)**

NOTE *Modbus® is a registered trademark of Modicon Inc.*

NOTE *The Network Options must be installed to appear in the Network pull down list.*

- Control includes parameters that control the instrument which includes the following which is only a partial list:

1. **Tare**
2. **Zero**
3. **C2® Calibrate**
4. **Traditional Calibrate High**

NOTE *C2® is a registered trademark of Hardy Instruments Inc.*

- Scratchpad which are empty registers you can do whatever you want with.

Source:

- Network includes the network inputs for DeviceNet and Ethernet/IP. DeviceNet and Profibus can also be listed. Please Click **here** for a list of Mapping Symbols to get the entire list of the mapping symbols for network options.

1. **Ethernet/IP Boolean In (EI)**
2. **Ethernet/IP Short In (ESI)**
3. **Ethernet/IP Int In (EII)**
4. **Ethernet/IP Float In (EFI)**
5. **Modbus Boolean In (MI)**
6. **Modbus Short In (MSI)**
7. **Modbus Int In (MII)**
8. **Modbus Float In (MFI)**

NOTE *The Network Options must be installed to appear in the Network pull down list.*

- Process Data includes Gross Weight and Net Weight:

  1. **Gross Weight (HF10)**
  2. **Net Weight (HF11)**

- Control includes parameters that control the instrument which includes the following which is only a partial list.

  1. **Status Word**
  2. **Command Status**
  3. **Setpoint 1 Output**

- Scratchpad which are empty registers you can do whatever you want with.

NOTE *The lists above do not include all the parameters. For a list of all the parameters and their addresses please see Appendix A.*

Step 4. Back to our example. We want to select "Ethernet/IP Float Out" as our destination. Click on the Network pull down menu. (See Fig. 330)

Step 5. Click on "Ethernet/IP Float Out (EFO)". (See Fig. 330) After you click on "Ethernet/IP Float Out (EFO)" it is selected and a Select button appear to the right of the Network pull down menu. (See Fig. 331)

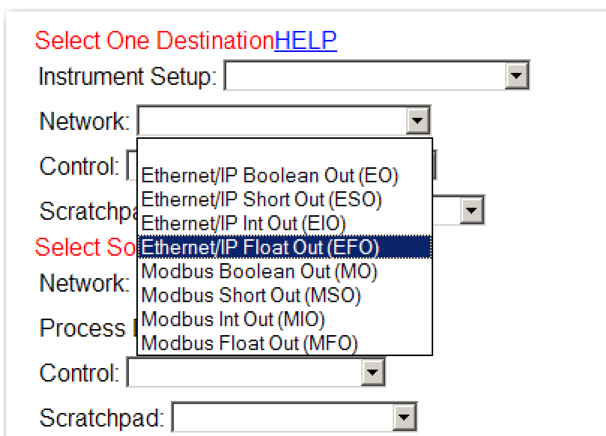


FIG. 330 NETWORK/SELECTING ETHERNET/IP FLOAT OUT (EFO)

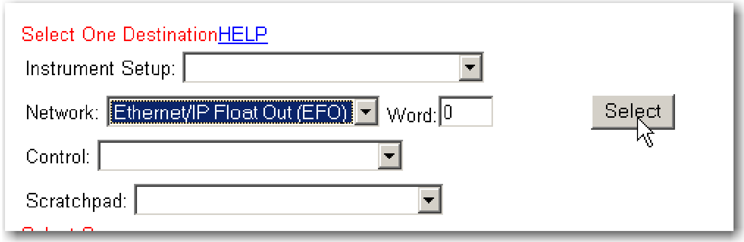


FIG. 331 DESTINATION/SELECT BUTTON

Step 6.Click on the Select button. An address appears in the text box below. You will have to scroll down to see it. In our example we selected “Ethernet/IP Float Out” which has an address of: “EFO0”. An equal “=” sign also appears. (See Fig. 332)

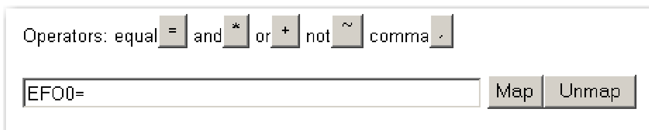


FIG. 332 ETHERNET/IP FLOAT OUT/ADDRESS EFO0

Step 7. You have now selected the Destination.

Step 8. Now we want to select the source “Gross Weight” which is Process Data. Click on the Process Data pull down menu. (See Fig. 333)

Step 9. Click on “Gross Weight”. A Select button appears to the right of the Process Data pull down menu. (See Fig. 334)

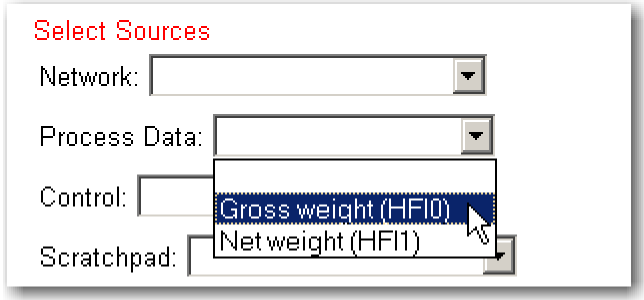


FIG. 333 PROCESS DATA PULL DOWN MENU/SELECTING GROSS WEIGHT (HFI0)

FIG. 334 SELECTING SOURCE

Step 10.Click on the Select button to select “Gross Weight as the Source.

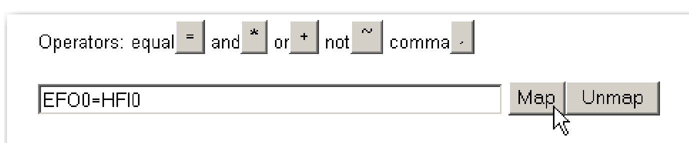


FIG. 335 ASSIGNMENT STATEMENT IS COMPLETE

Step 11. The Assignment Statement is complete. You now see in the Mapping text box: “EFO0=HFI0” (See Fig. 335)

Step 12. Click on the Map button. You have now mapped Gross Weight to Ethernet/IP Float Out. The Gross Weight that is stored in the input table is now assigned to the Ethernet/IP Float Out output table and to the Ethernet/IP Network. Notice that the new mapping is included in the Map list. (See Fig. 336)

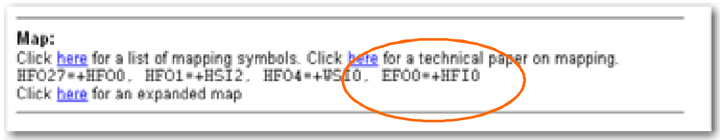


FIG. 336 MAPPED GROSS WEIGHT TO ETHERNET/IP FLOAT OUT

Example #2 Mapping an Input

If you want to connect a remote switch to the instrument to Tare the instrument. You can map “User Switch 1” (1 of 3 inputs to the HI 4050) to “Tare” in order to Tare the instrument from the switch. The Assignment Statement is:

- Destination = Source
- Tare (HO2.0) = User Switch 1 (HI0.4)

Step 1. Under Destination click on the Control pull down menu. (See Fig. 337)

Step 2. Click on Tare. A Select button appears.

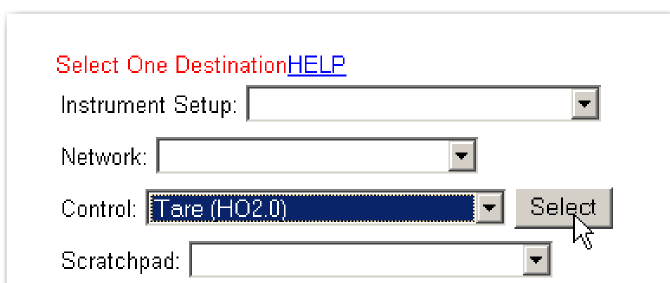


FIG. 337 DESTINATION/TARE

Step 3. Click on the Select button. The Destination address appears in the Mapping text field.

Step 4. Under the Source Section click on the Control pull down menu.

Step 5. Click on “User Switch 1”. A Select button appears. (See Fig. 338)

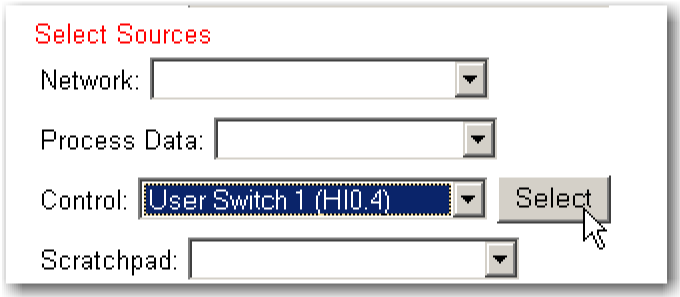


FIG. 338 SOURCE/SELECTING USER SWITCH 1

Step 6. Click on the Select button. The Source address appears in the Map text field. (See Fig. 339)

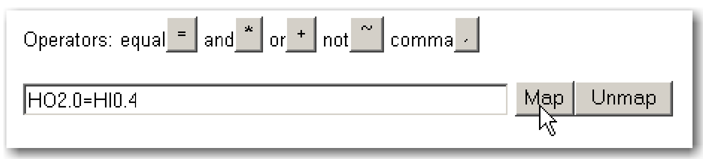


FIG. 339 ASSIGNMENT STATEMENT IS COMPLETE

Step 7. The Mapping Assignment Statement is complete. (See Fig. 339) Tare (HO2.0) = User Switch 1 (HI0.4)

Step 8. Click on the Map button. The Input Contact #4 is now mapped to Tare. (See Fig. 340)

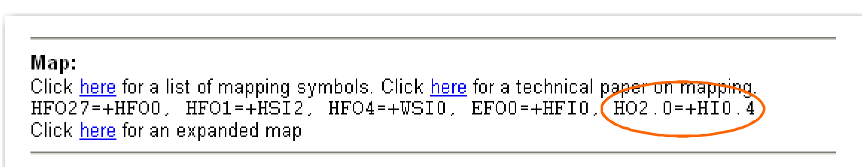


FIG. 340 USER SWITCH 1 MAPPED TO TARE

Simple Network Mapping

Mapping to a Network Output

If you want to send data to a PLC from the HI 4050 you need to map the data to a network output. Here is the process:

Step 1. From the Mapping page, click on the Network pull down menu and select DeviceNet Float Out. (See Fig. 341)

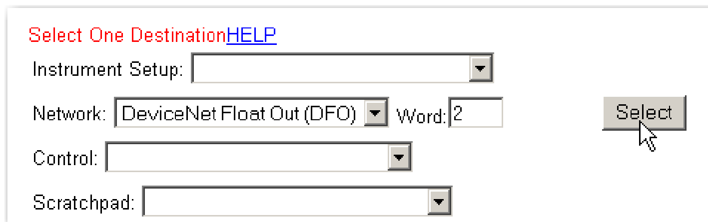


FIG. 341 NETWORK/SELECTING DEVICENET FLOAT OUT

Step 2. Double click in the Word text box and type in the number 2.

Step 3. Click on the Select button to set the Destination. The “DeviceNet Float Out” address appears on the left side of the Assignment Statement. (See Fig. 342)

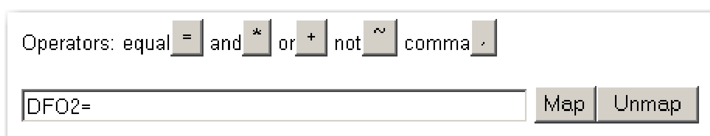


FIG. 342 DEVICENET FLOAT OUT (DFO2) SET AS DESTINATION

NOTE *The DeviceNet Float Out address DFO2 means the following. DFO = **D**eviceNet **F**loat **O**ut*. 2 = Word 2.

Step 4. Click on the Process Data pull down menu. (See Fig. 343)

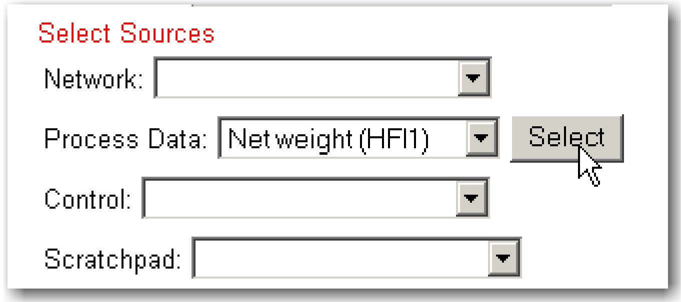


FIG. 343 PROCESS DATA/SELECTING GROSS WEIGHT CHANNEL 1

Step 5. Click on Net Weight (HFI1).

Step 6. Click on the Select button to enter Net Weight as the source of the Assignment Statement.

Step 7. The Net Weight address appears on the right side of the Assignment Statement. (See Fig. 344)

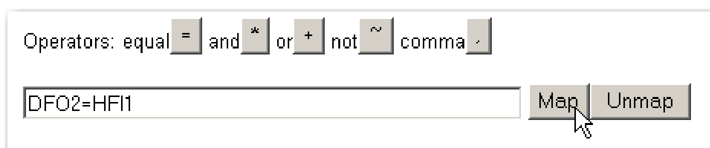


FIG. 344 ASSIGNMENT STATEMENT MAPPING NET WEIGHT (HFI1) TO DEVICENET FLOAT OUT WORD 2 (DFO2)

Step 8. The Net Weight is now available to the PLC via the DeviceNet Scanner. (See Fig. 345)

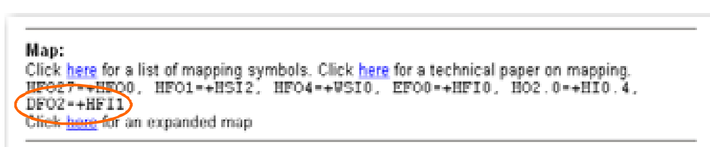


FIG. 345 SIMPLE NETWORK MAP/NET WEIGHT TO DEVICENET FLOAT OUT

Mapping a Network Input to a Local Output

If you want a PLC to send instructions to an HI 4050 you will have to map the local Output to a network input. Here is the process:

NOTE: Keep in mind that the network input on the HI 4050will now be the source for the PLC output. This enables the PLC to send instructions to the network input on the HI 4050 and in turn to the HI 4050 output.

Step 1. From the Mapping page, under Destination click on the Control pull down menu and select Zero (HO2.1). (See Fig. 346)

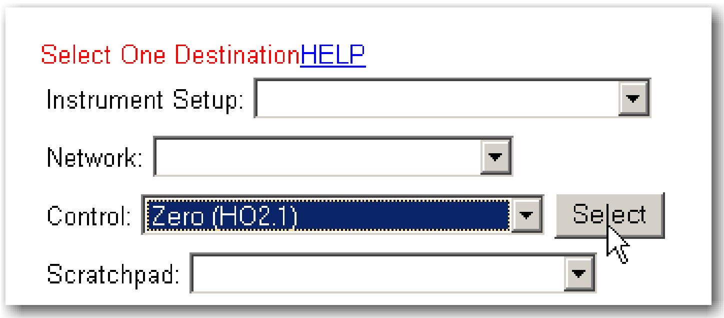


FIG. 346 LOCAL OUTPUT/SELECTING OUTPUT #2

Step 2. Click on the Select button to set the Destination. The “Zero (HO2.1)” address appears on the left side of the Assignment Statement. (See Fig. 347)

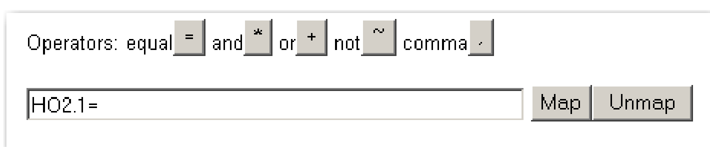


FIG. 347 ZERO (HO2.1) SET AS THE DESTINATION

Step 3. Click on the Networks pull down menu. (See Fig. 348)

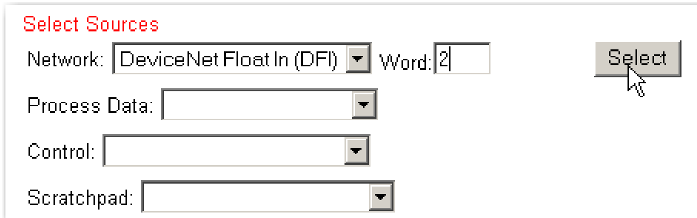


FIG. 348 NETWORK/SELECTING DEVICENET BOOLEAN IN

Step 4. Click on “DeviceNet Float In” to select it as the Source for the Assignment Statement. (See Fig. 348)

Step 5. Double Click in the Word text box and type in the number “2”.

Step 6. Click on the Select button to assign the source to the right side of the assignment statement. (See Fig. 349)

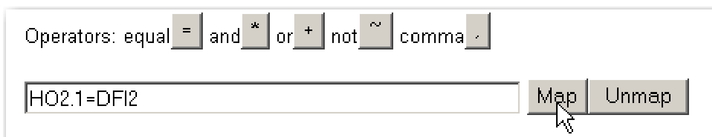


FIG. 349 ASSIGNMENT STATEMENT MAPPING DEVICENET FLOAT IN (DFI2) TO ZERO (HO2.1)

Step 7. Click on the Map button. The new mapping appears below the Map text field. (See Fig. 350)

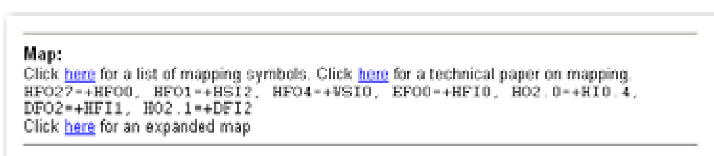


FIG. 350 DEVICENET FLOAT IN CONNECTED TO ZERO

Step 8. Now you can zero the instrument from a PLC.

More Advanced Mapping

This section is for those who have some or a lot of experience Addressing I/O (mapping) or for those who want more information as to how the mapping works locally and on the network. We go into much more detail as to how the mapping works and include instructions for Boolean, Analog, Mixed and Special Command mapping procedures.

Mapping is similar to Addressing I/O's in a PLC except there are no predefined mappings in the HI4050 Instrument and you are not mapping the physical location of an I/O module terminal to a bit location in the processor, you are actually mapping values or states in memory to another memory location. This difference is important to understand and will be explained later in this chapter. In order to understand Mapping we first need to define some of the terms and understand the structure of an Assignment Statement.

In short mapping is nothing more than assigning data from an address (Source) to another address (Destination) to be used by the controller in ways that meet your process requirements. Since the HI 4050 does not have any predefined Addressed I/O you are free to Address I/O in any fashion that meets your needs.

Glossary of Mapping Terms

Assignment Statement - The assignment statement is an order to the computer to change the value stored in the variable (Memory Address) on the left-hand side of the assignment operator (i.e. the = sign). For example: i = a + b, means get the value stored in "a" and add it to the value stored in "b" and store the sum value at memory address "i". The left hand side of the operator sign (=) is the address where you want the values on the right hand side of the operator sign (=) to be stored.

Destination - This is the destination memory address to which data will be moved. Left Hand Side

I/O Interface - The section of the instrument that communicates with the "outside world".

Input Contact - Inputs interface selector switches, push buttons, limit switches and other sensors to the HI 4050. Each input has an address associated with it which describes the physical location that the input device is connected to.

Input Image Table - A data table containing addressed memory where the states of the input devices and parameter values are stored. The state of each input device is transferred to the input image table from the input point during the I/O scan.

Local Mapping - This is mapping within an HI 4050 module, primarily mapping internal memory locations of parameter values or device states to locations in the local Input Image Table or Output Image Table.

Network Mapping - This is mapping between the master and slave devices in the case of a DeviceNet network.

Node Number - This is the physical address of a device in a network.

Output Image Table - The data table containing addressed memory where the desired state of the output devices and parameter values are stored. The desired state or parameter value of each output is transferred from the output image file to the output point during the I/O scan.

Source - This is the memory address of the data you want to assign to the destination. Right Hand Side

Local Input

Inputs interface with selector switches, push buttons, limit switches and other sensors connected to the HI 4050. When the firmware is initiated it assigns the physical input contact to a memory address (Remember Inputs = User Switches) can only be a Source when mapping. (See Source definition in the Glossary of Mapping Terms)

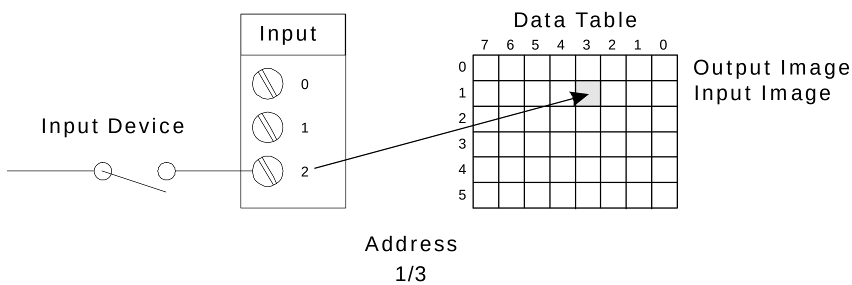


FIG. 351 INPUT FUNCTION

- Each input has an address associated with it.
- The address describes the physical location that the input device is connected to.
- The address also describes the Input Image Table location where the STATE of the input device is stored.
- The state of each input is transferred to the Input Image File from the input point during the I/O scan every 1/55th of a second. (See Fig. 351)
- When you are mapping an Input to some other Destination you are assigning the value in the Input Image Table (for that Input) to an Address in the Output Image Table.
- For example: **Tare Button = Input #3** means assign the state (Open (0) or Closed (1)) of Contact #3, contained in the Contact Closure input #3 memory address, in the Input Image Table and move it to the Tare address in the Output Image Table. (See Fig. 351)

Volatile and Non-Volatile Memory

It is important to understand that the data stored in the Output and Input Image Tables are stored in volatile memory. This means, when you power off the HI 4050 you lose the data. The Addressing I/O (Mapping) is saved in non-volatile memory and is not lost when you power off.

A Definition of Mapping

Mapping (Addressing I/O) is the same as using an Assignment Statement. The Destination is located on the left hand side of the equals (=) sign and is a memory address (variable). The Source is the data located on the right hand side of the equals (=) sign at a memory address. So when you refer to the right hand side of the Assignment Statement you are referring to the data only and not the address even though the address is listed.

- Memory Address (Variable) = Data (Values, states)

The equals (=) sign assigns the data on the right side of the Assignment Statement to the Memory Address on the left side of the Assignment Statement.

This is exactly what you are doing when you map a source to a destination.

The things that can be mapped are organized into Input Image Tables and Output Image Tables, which are arrays of variables (i.e. memory locations of a certain size based on the type assigned to the variable) with addresses where data is stored.

A table is called an "output" image table if the items in the table are permitted to be on the left hand side of an Assignment Statement. The Output variables are also further identified by the first two letters of the variable:

- HO - Hardy Output Image Table
- DO - DeviceNet Output Image Table
- EO - Ethernet/IP Output Image Table

If the items in the table are only permitted on the right hand side of an Assignment Statement, we call it an "input" image table:

- HI - Hardy Input Image Table
- DI - DeviceNet Input Image Table
- EI - Ethernet Input Image Table

For example, the digital inputs on the Weight Controller are found in an input image table, as are the items in the DeviceNet input image table.

The HI 4050 scans through the I/O image tables 110 times a second and reads any values that are contained in the tables. If there is nothing stored in the tables the controller does nothing with it. If there are state values or other values stored in the tables, the firmware processes the data and outputs it to an output device or the screen.

Network Input

PLC's also have Input Image Tables and Output Image Tables. The HI 4050 is a node in a total network and you assign the HI 4050 a node address so the Network scanner can identify the instrument.

WARNING: **YOU CANNOT ASSIGN THE SAME ADDRESS TO TWO DIFFERENT NODES. THE PLC CANNOT DETERMINE WHICH NODE IT IS COMMUNICATING WITH. THIS CAN RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY.**

The Network scanner, scans each node's Output Image Table to read the values that are located there. If there are values in the nodes' Output Image Table it reads the values to the PLC's Input Image Table which makes the data available to the PLC for processing.

Here again you can assign the data in the node's output image table to an address in the PLC input image Table. So if you want the Net Weight to be displayed in the PLC's output (screen) you have already assigned the Net Weight value located in the Input Image Table to the Output Image Table. The PLC Scanner reads the Net Weight value in the nodes's Output Image Table and moves the value to a word location in the Input Image Table on the PLC. The Input Image Table Net Weight value is then output let's say to the PLC screen.

Network Output

When the Network Scanner writes values to the nodes it does this by taking the data located in the PLC Output Image Table and writes the values to another nodes' Input Image Table. Once the value is in the node's Input Image Table it becomes a source and can be mapped to any destination in the HI 4050. (See Fig. 352)

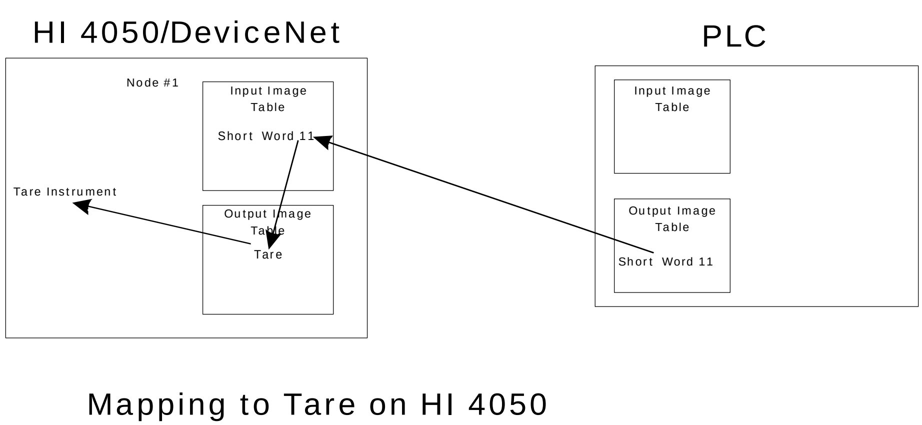


FIG. 352 DEVICENET OUTPUT

Boolean Mapping

A Boolean variable is a variable that can have the value 0 (FALSE) or 1 (TRUE). In the HI 4050 there are 3 boolean operations supported:

- AND - The symbol for "AND" in a Boolean Assignment Statement is "*".
- OR - The symbol for "OR" in a Boolean Assignment Statement is "+".
- NOT - the symbol for "NOT" in a Boolean Assignment Statement is "~".

The Boolean image tables are arrays of short (2 byte) integers. An individual Boolean variable in the image table is located by its word offset and its bit offset. Boolean image tables are given 2 letter names as follows:

- DI is the DeviceNet input image table.
- DO is the DeviceNet output image table.
- HI is the Hardy input image table.
- HO is the Hardy output image table.

DeviceNet input and output image tables are mapped to physical external devices using Rockwell Software's RS NetWorx®. The Hardy input and output image tables have pre-defined meanings for certain bits within the tables.

NOTE *RS NetWorx® is a registered trademark of the Rockwell Corporation.*

A Boolean variable is addressed with the syntax below:

[tablename][word offset].[bit offset]

Example:

DI0.3 is bit #3 in the DeviceNet input table, word #0.

Analog Mapping

An analog variable is one that can have many different values. The 4000 supports float, 16 bit integer, and 32 bit integer analog variable types.
There are 3 analog operations supported. The symbols are the same as the Boolean operations, but with different meaning.

- 1: Multiply. The symbol for "multiply" is '*'
- 2: Add. The symbol for "Add" is '+'
- 3: Negate. The symbol for "Negate" is '~'

Analog tables are given 3 letter names as follows:

DFI,DFO,DSI,DSO,DII,DIO all refer to DeviceNet tables, where the item is a float, a short integer, or a 32 bit integer depending on the second letter in the table name.

- S,H - 16 bit signed integer
- F, D, R - float
- I - 32 bit signed integer

An analog variable is addressed with the syntax below:

[tablename][offset]

The offset is an offset in words in the case of the DeviceNet tables. The offsets in Hardy tables have various predefined meanings.

When an analog equation is evaluated, all terms get converted to float. The final result is then converted to the type of the LHS (left hand side).

Mixed Mapping

An equation is said to be an analog equation if the term on the left side of the equals sign is an analog variable. The equation is said to be a boolean equation if the term on the left side is a boolean variable. It is permissible to have analog variables to appear in Boolean equations and to have Boolean variables in analog equations. (We call a mixed equation "Boolean" if its LHS is a Boolean term and "Analog" if its LHS is an analog term). the interpretation is the following:

A Boolean variable in an analog equation is converted to 1.0 or 0.0.

An analog variable in a Boolean equation is TRUE if it is greater than zero and FALSE if it is less than or equal to zero.

Special (Command) Mapping

There is a command interface to do special things like setting a parameter value. the table CMD can appear only on the left hand side of an equation and the right hand side of a "command" equation has 1 or 2 terms. The first term on the right hand side defines the table and offset (in words) where the command data comes from and the second term defines the table and offset where the response to a command is written.

The Command Interface

The HI 4050 may receive "commands" over any of its network (DeviceNet, Ethernet/IP) interfaces. A "command" consists of a four-byte "command number" which it receives through its network input data. The instrument responds with a four-byte response.

To read the value of any parameter, send the four byte PARAMETER ID. In both DeviceNet and Ethernet/IP the byte order is BIG ENDIAN, that is least significant byte first. The instrument returns the value of the parameter which will be either an integer or a floating point value. You may find the PARAMTER IDS on the OPERATION/DIAGNOSTICS/PARAMETERS web page.

To write the value of a parameter is a little more complicates because the PARAMETER ID is 4 bytes long and the parameter value is also 4 bytes long if it is a floating point number but each command is only 4 bytes long. Most integer valued parameters are only 2 bytes long. Also the most significant two bytes of a PARAMETER ID is usually zero.]

To set the value of a two byte parameter with a two byte PARAMTER ID send these four bytes:

- byte 0: The least significant byte of the PARAMTER ID
- byte 1: The next byte of the PARAMTER ID but with the highest order bit set.
- bytes 2,3: The value you want to set the parameter to.

For example:

To set the value of NumAverages to 3, send this command - <0x8005><0x003>

Here the <0x005> is the lowest 2 bytes of the PARAMETER ID or NumAverages which becomes 0x8005 after you set the most significant bit and <0x0003> is the value you want to set the parameter to.

If the parameter is 4 bytes long, as all floating point values are, you must first set the upper 2 bytes. There is a special PARAMETER ID (0x4000 or 0xC000 with the upper bit set) for doing this. Also if the upper two bytes of the PARAMTER ID are not zero, use the special parameter ID (0x4001 or 0xC001 with the upper bit set) to set the upper bytes.

All write commands are 1-shots

The first 2 bytes of the response to a write command are an echo of the first two bytes of the command. the next 2 bytes are either the 2 MOST SIGNIFICANT bytes of the parameter or if the parameter was in fact a command like ZERO or TARE a status code indicating whether the command succeeded or failed.

If the PARAMETER ID is not valid, the instrument will return 4 zero bytes.

A parameter writing example: Setting Setpoint 2 Target to 1.0

Setpoint 2 Target has a PARAMTER ID of 0x00010012 (hexadecimal). The number 1.0 in hexadecimal is 0x3F800000.

Step 1. Set the upper two bytes of the parameter value with the command <0xC000><0x3F30>

Step 2. Set the upper two bytes of the PARAMETER ID with the command <0xC001><0x0001>

Step 3. Write the Setpoint 2 Target with the command <0x8012><0x0000>

Setting up the Command Interface Mapping

Use an equation of the form CMD = (in_table)*(out_table)

In_table is an input table defining where the command is written.

Out_table defines where the replay data is written.

Example:

CMD0=DSI0*DSO0

This equation says the command will be written to the DeviceNet input table at word offset 0 and the reply data is written to the DeviceNet output table at word offset zero.

The upper two bytes of PARAMETER ID (JSO15) and the upper two bytes of the parameter value (JSO14) can also be mapped. By doing this you can set 4 byte parameter values using a single command rather than the 3 commands required above.

Performing a Parameter List (Dump)

Step 1. On the Home Page click on Operation. The Operation Page appears. (See Fig. 353)

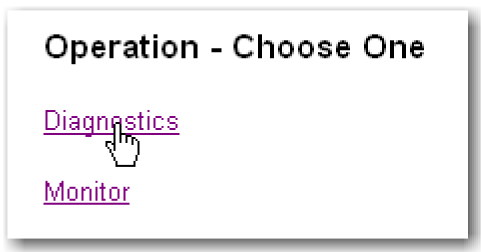


FIG. 353 OPERATION PAGE/SELECTING DIAGNOSTICS

Step 2. Click on Diagnostics. The Diagnostics Page appears. (See Fig. 354)

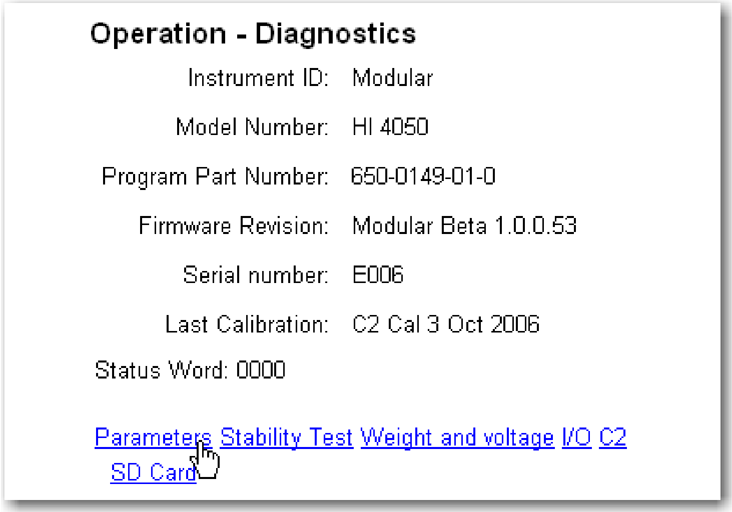


FIG. 354 DIAGNOSTICS PAGE/SELECTING PARAMETERS

Step 3. Click on Parameters. A list of the parameters and their settings appears.

00000001 $Unit=4[kg]*

00000002 $$Decimal Point=0[0]*

00000003 $$Grads=0[1]*

00000004 Operator ID=Me!

00000005 Instrument ID=Modular

00000006 WAVERSAVER®=3[1.00 Hz]

00000007 Num Averages=15

00000008 $Zero Tolerance=5

00000009 Low Pass Filter=1[ON]

0000000D Motion Tolerance=1

0000000F Capacity=125

00000201 Span Weight=1

00000202 Ref Weight=0

0000004D Certification=0[None]

00000092 Tare Weight=1

00000010 Mode=0[Gross]

00000011 Type=0[Loss in Weight]

00000012 Target=3

00000013 Preact=0

00000014 Deadband=0

00010010 Mode=1[Net]

00010011 Type=0[Loss in Weight]

00010012 Target=0

00010013 Preact=0

00010014 Deadband=0

00020010 Mode=0[Gross]

00020011 Type=0[Loss in Weight]

00020012 Target=0

00020013 Preact=1

00020014 Deadband=1

00030010 Mode=0[Gross]

00030011 Type=0[Loss in Weight]

00030012 Target=0

00030013 Preact=0

00030014 Deadband=0

0000001A AutoZero=0[OFF]

0000000E AutoZero Tolerance=0

0000002A Baud Rate:=4[9600]

0001002A Data bits:=1[8]

0002002A Parity:=0[NONE]

0003002A Printer Mode=2[TARE]

000002F2 scratchpad=3.000000

000102F2 scratchpad=1.000000

000202F2 scratchpad=1.000000

000302F2 scratchpad=3.000000

000402F2 scratchpad=3107.000000

000502F2 scratchpad=3110.000000

000602F2 scratchpad=0.000000

000702F2 scratchpad=0.000000

00000036 DNET Baud=2[500k]

00010036 DNET Node=3

00020036 DNET Bytes In=32

00030036 DNET Bytes Out=32

00020037 EIP key=1288042

00000037 EIP Bytes In=256

00010037 EIP Bytes Out=256

00000208 Calibration Date=C2 Cal 3 Oct 2006

00000203 Cal Low Counts=768413

00000204 Cal High Counts=795421

00000205 Cal Span Factor=3.623863085522E-05

00000206 Zero Counts=768413

00000209 Cal Zero Counts=768413

0000020A ITECH=768291 770281 770549 770941 772737 5 1

0000001D zone=3[PST(GMT-8h)]

000002F0 MAP:=HFO27=+HFO0, HFO1=+HSI2, HFO4=+WSI0, EFO0=+HFI0, HO2.0=+HI0.4, DFO2=+HFI1, HO2.1=+DFI2

00000300 Display Mode=0

00000301 Display Line=1

0000002D High Security Code=1

0001002D Medium Security Code=2

0000002E FPSecurity=2[HIGH]

0000002F Calibration Security=0[NONE]

00000030 Web Page Security=1[M

NOTE ** The dollar signs indicate that the parameters have a security code. One (1) dollar sign for Medium Security and two (2) dollar signs for High Security.*

Chapter 7
Operation

About Chapter 7

Chapter 7 contains step-by-step instructions for operating the Hardy Instruments HI 4050 Weight Controller. The procedures include complete instructions for operating the Weight Controller from the Front Panel and from the Web Page Operating procedures primarily include Taring and/or zeroing the instrument and creating setpoints. We highly recommend reading the procedures before operating the Weight Controller. Being familiar with the operating procedures insures that the Controller will provide trouble free service.

Getting Started

Before operating the Hardy HI 4050 Weight Controller, check to make sure the following procedures have been performed:

- Power and Load Point cables properly installed.
- Communication cables properly installed.
- Calibration Performed.

Operating the Weight Controller from the Front Panel

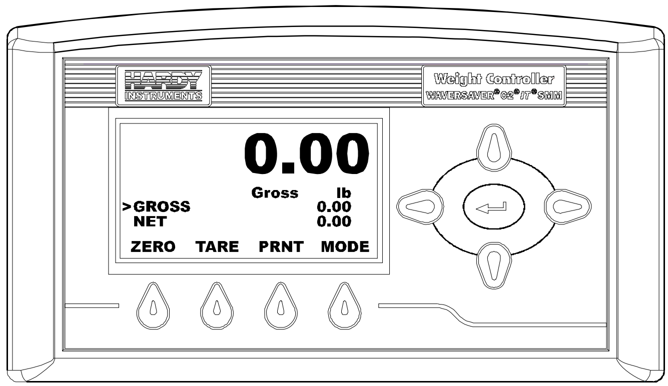


FIG. 355 SUMMARY DISPLAY/PANEL/GROSS MODE

Front Panel Summary Display

The Front Panel Summary Display is a 128 x 64 Backlit LCD Graphic Display. The Summary Display shows the current weight in Gross or Net Mode and includes the functional buttons for operating the HI 4050 Weight Controller. In addition the Summary Display continuously shows the Gross and Net Weights while operating the instrument.

Button Functions

Tare Button

Tares the selected scale. The Tare button sets the Tare Weight equal to the Gross Weight and makes the Net Weight equal to 0. When you are in Net Mode (i.e. NET is displayed in the Summary display, you will see the weight change to 0.00. If you are in Gross mode you will not see anything happen, but the Net weight is changed to 0.00. (See Fig. 355)

Zero Button

Used in Gross mode to zero the selected scale to within the tolerance level. (See Fig. 355)

- This function can be used as many times as desired as long as the total does not exceed the value entered as the zero tolerance.

Print Button

The Print Button when pressed prints the Gross, Net and Tare weights to an attached printer. If the Scoreboard is activated the Print Button does not function. (See Fig. 355)

Mode Button

Toggles the Summary Display between Gross and Net Weight. (See Fig. 355)

Up/Down Arrow Buttons

The Up/Down arrow buttons move the cursor vertically allowing the user to scroll through each item of a menu. They also enter alphanumeric characters and punctuation. By pressing the Up Arrow moves you up the alphabet (in both lower case and upper case) then numbers from 0-9, then symbols such as a decimal point, minus sign and so on. Pressing the Down Arrow moves you down the alphabet, number etc. (See Fig. 356)

Left/Right Arrow Buttons

The Left/Right arrow buttons move the cursor horizontally left and right. The Left arrow button has an added backspace function. For example if there are Alpha/Numeric characters that appear in the display, as you press the left button it erases the characters. The Right arrow button moves the cursor to the right in the display and does not erase a alphanumeric entry. The Left/Right arrow buttons also move the cursor through a pick list. (See Fig. 356)

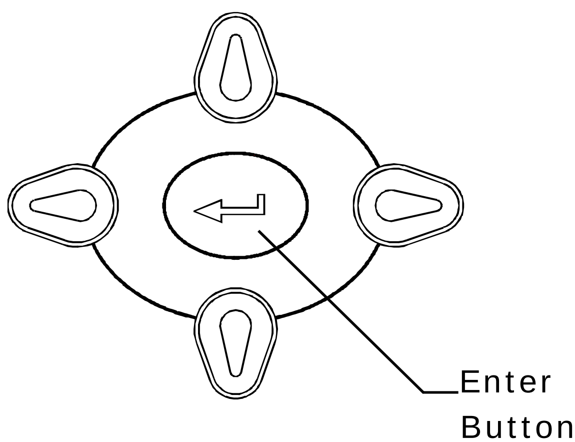


FIG. 356 LEFT AND RIGHT ARROWS/ENTER BUTTON

Enter Button

The Enter button saves the Alpha/Numeric and symbols value entered for a configured menu item in the display. The Enter button also saves a selection from a pick list. Use the Left and Right arrow buttons to select items from the list.

Exit Button

Takes you back to the previous menu. (See Fig. 357)

NOTE *The Exit and Clear buttons only appear in Menus and Sub-Menus, not in the Summary Display.*

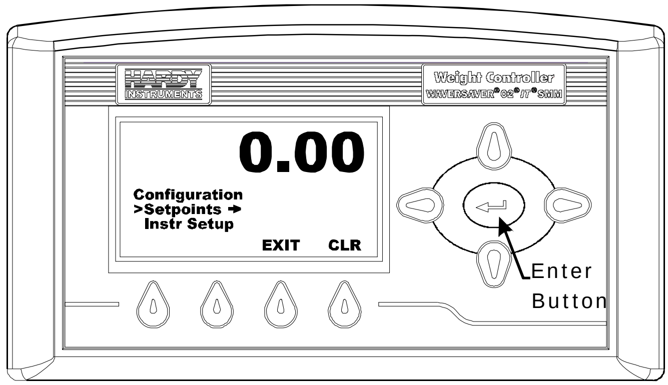


FIG. 357 EXIT AND CLEAR BUTTONS

Clear Button

The Clear button clears the total Alpha/Numeric Entry and repositions the cursor for the first entry.

Starting Up for the First Time

When the HI 4050 Weight Controller powers up after delivery from the factory, a Summary display appears. (See Fig. 358)

Step 1. The Summary Display displays the weight in Gross or Net mode.

Step 2. To change from Gross, Net or ROC (Rate of Change) mode press the Mode button.

WARNING After configuring your system and turning the instrument off, make sure that the SMM-SD is installed correctly before powering up. If the SMM-SD is not installed, the instrument returns to a default condition which probably does not meet your process requirements and could result in product/property damage or personal injury.

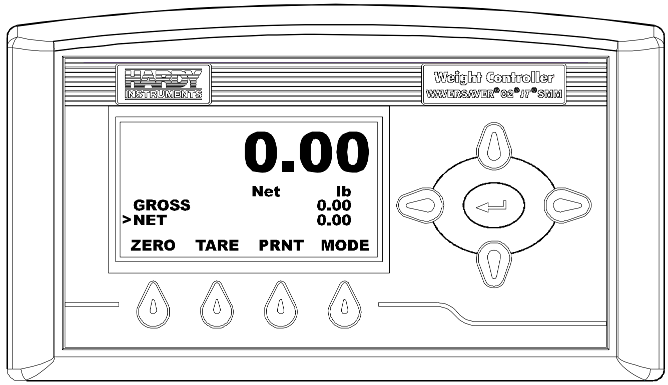


FIG. 358 SUMMARY DISPLAY/1 CHANNEL

Step 3. To Tare the Scale press the Tare button.

- If the Tare was successful you will get a message: "Tare OK".
- If the Tare was not successful you will get a message "Tare Failed". Check the Motion Tolerance parameter. Instructions for Motion Tolerance Parameter Setup is in Chapter 4.

Step 4.To Zero the Scale press the Zero button.

- If the Zero was successful you will get a message: "Zero OK"
- If the Zero was not successful you will get a message: "Zero Failed". Check the Zero and AutoZero Tolerances parameters. Instructions for Zero Tolerance and AutoZero Tolerance Parameter Setup is in Chapter 4.

Step 5. To Print Gross, Net, Tare or All depending what you configured when setting the Print parameters, press the Print button.

Set Points Configuration

About Set Points

The set point value is the target weight or level. It may be set in either net, gross weight or available rate of change units.

Set Point Limits

Dead Band Limits

- The Dead Band limit is the difference between the set point and the reset.

- The dead band value under normal operations will always be a positive value however the dead band value can be set as a negative value should your application require it. Dead Band limits are used to prevent rapidly fluctuating setpoint states once the set point is reached.
- For example: If a set point value was 1000 pounds and the dead band was set to 5 pounds, the relay would close at 1000 pounds but not open until the weight dropped to 995 pounds. You need to select the Type: Loss in Weight. This would be used if a set point is a high trip limit. Selecting the Type: Gain in Weight and dead band would be used for a low trip limit. Examples are show for Low and High Trip Limits. (See Figs. 359& 360)

Three General Rules for Set Points

1. **Set points activate at the set point plus the preact.**
2. **Set points deactivate at the set point plus the deadband.**
3. **The deadband should be numerically larger than the preact to prevent rapidly fluctuating setpoint states.**

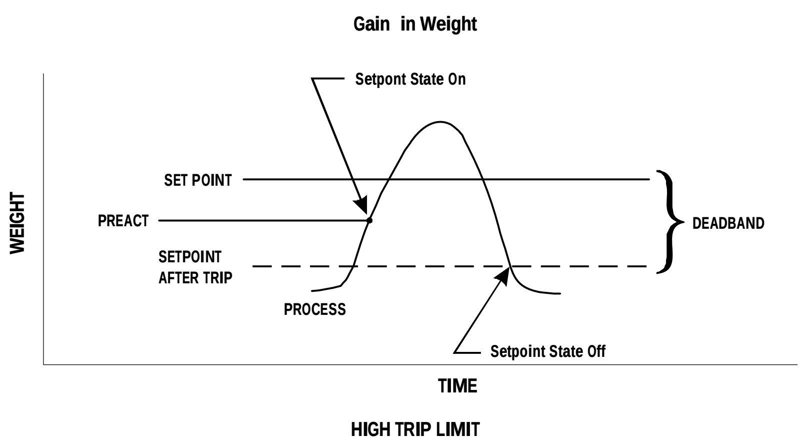


FIG. 359 GAIN IN WEIGHT/HIGH TRIP LIMIT

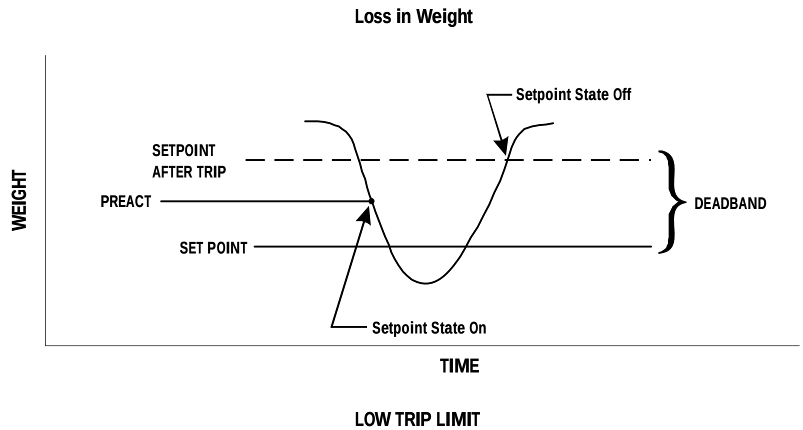


FIG. 360 LOSS IN WEIGHT/LOW TRIP LIMIT

Preact Limits

- The preact value is the difference between the set point and the trip point.
- It is used as an "in-flight" compensation value when filling a vessel. If set to zero, there will be no compensation.

Mode

Specifies which weight source is used as the set point input.

Type

Determines whether the set point turns on when the weight is greater than the set point **target** minus the **preact** and off when the weight is less than the target minus the deadband (Gain in Weight) or if it turns on when the weight is less than the set point target plus the preact and off when the weight is greater than the set point minus the preact (Loss in Weight)

Entering Set Points from the Front Panel

Step 1. From the Summary Display, press the Enter button. The Configuration Menu appears with the cursor in front of Setpoints. (See Fig. 361)

NOTE *On the right hand side of "Setpoints" you will see an arrow. The arrow indicates there are sub-menus for this menu.*

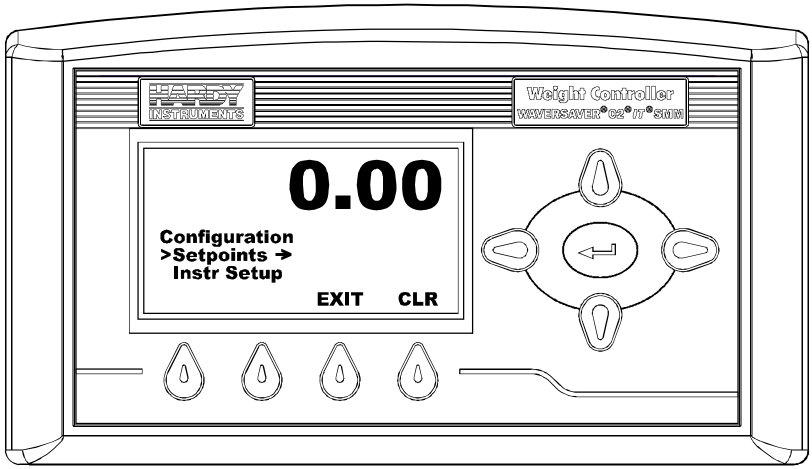


FIG. 361 CONFIGURATION MENU

Step 2. Press the ENTER button. The Set Point Menu appears with Set Point 1 selected. (See Fig. 362)

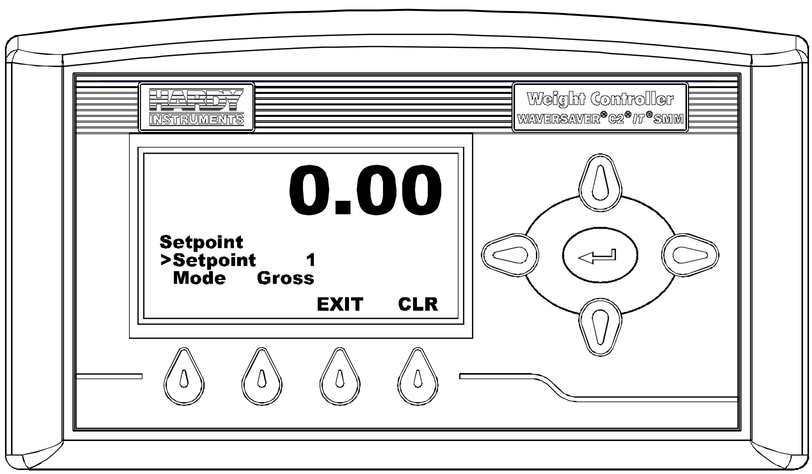


FIG. 362 SET POINT MENU/SELECTING SETPOINT 1

Step 3. There are 4 Set Points. Press the Left or Right Arrow buttons to select the Set Point you want to configure. Pressing the Right arrow button moves up the list and pressing the Left Arrow button moves down the list. In our example we selected Set Point 2. (See Fig. 363)

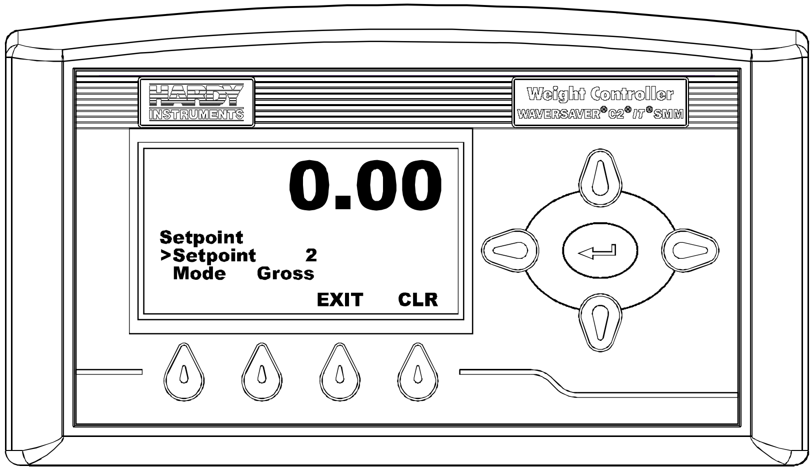


FIG. 363 SET POINT MENU/SELECTING SET POINT 2

Step 4. Press the Enter button to save the selection. You will briefly see a message “Entry Accepted”. (See Fig. 364)

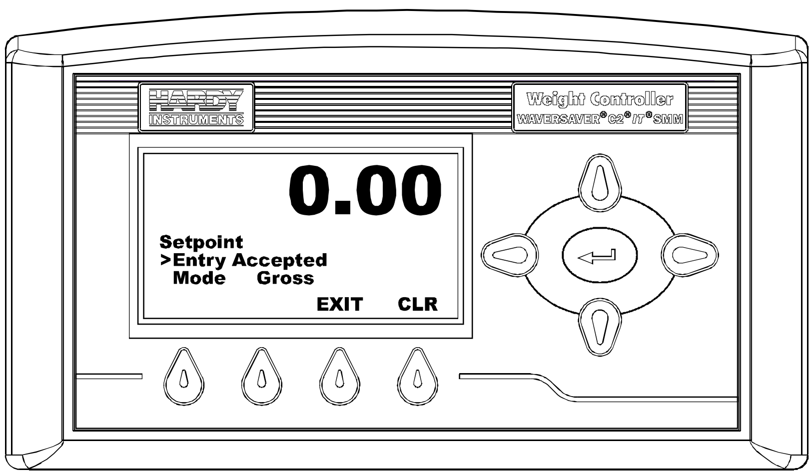


FIG. 364 SET POINT SELECTED/ENTRY ACCEPTED

NOTE *The Entry Accepted appears every time you press the Enter button to save a setting. If the Entry is not accepted an error message appears. For definitions of the error message go to Chapter 7, Troubleshooting.*

Step 5. Press the Down Arrow button until the cursor appears in front of Mode. (See Fig. 365)

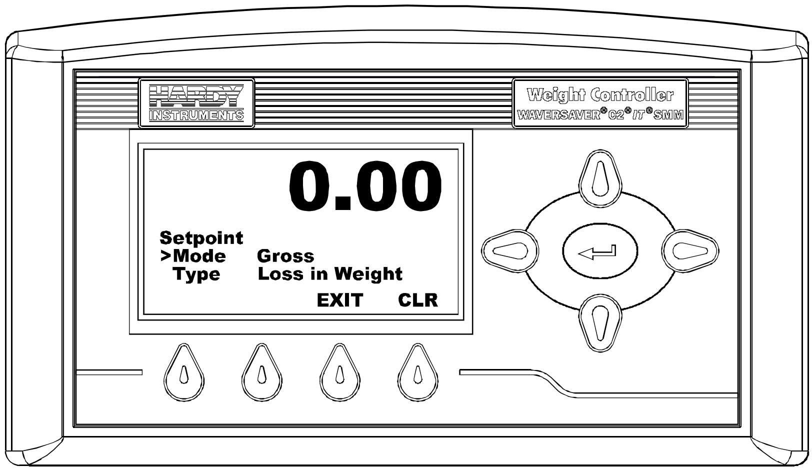


FIG. 365 SET POINT MENU/SELECTING MODE/GROSS

Step 6. Use the Right or Left Arrow to toggle between Gross, Net or available Rate of Change. In our example we selected "Gross".

Step 7. Press the Enter button to save the selection.

Step 8. Press the Down Arrow button until the cursor is in front of "Type". (See Fig. 366)

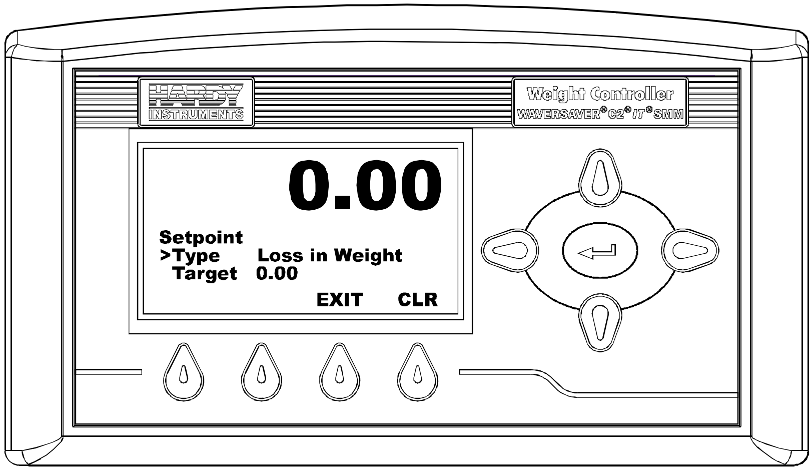


FIG. 366 SET POINT MENU/SELECTING LOSS IN WEIGHT

Step 9. Use the Right or Left Arrow buttons to toggle between "Loss in Weight" and "Gain in Weight". In our example we selected "Loss in Weight".

Step 10. Press the Enter button to save the setting. "Entry Accepted" appears briefly.

Step 11. Press the Down arrow button until the cursor is in front of "Target". (See Fig. 367)

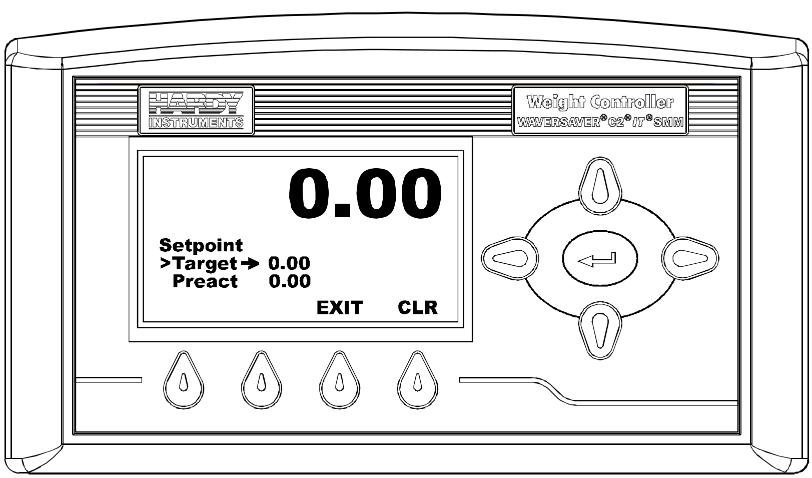


FIG. 367 SET POINT/SELECTING TARGET

Step 12. Press the Enter button. The Target Menu appears. (See Fig. 368)

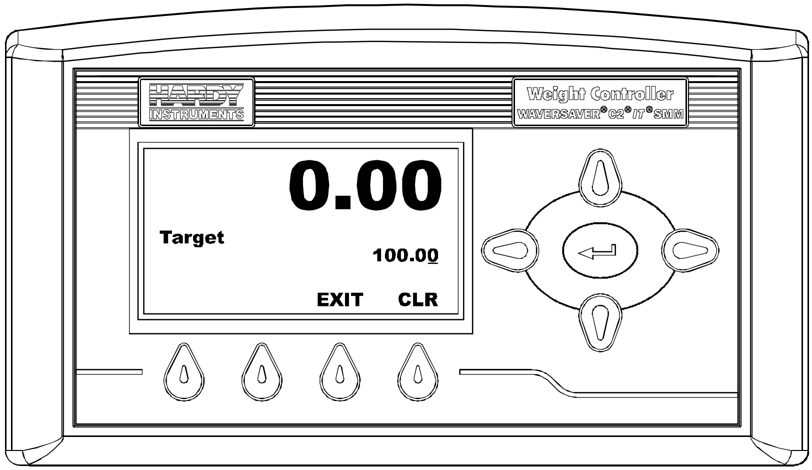


FIG. 368 SET POINT/TARGET MENU

Step 13. Press the Clear (CLR) button to clear the existing Target value.

Step 14. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number, letter or punctuation. In our example we entered 100.00 for our target weight. The weight is in the units you select when you configure the instrument.

Step 15. Press the Enter button. “Entry Accepted” appears briefly. The target weight is saved and the Setpoint Menu appears.

Step 16. Press the down arrow button until the cursor is in front of “Preact” (See Fig. 369)

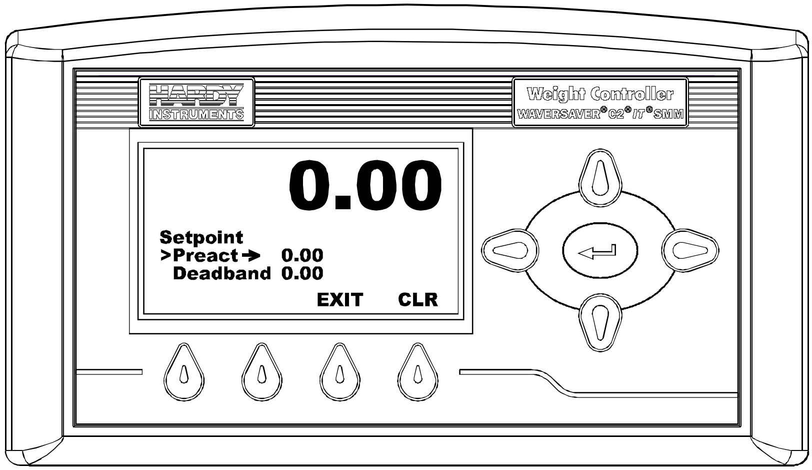


FIG. 369 SET POINT MENU/SELECTING PREACT

Step 17. Press the Enter button. The Preact Menu appears. (See Fig. 370)

Step 18. Press the CLR button to clear the current value.

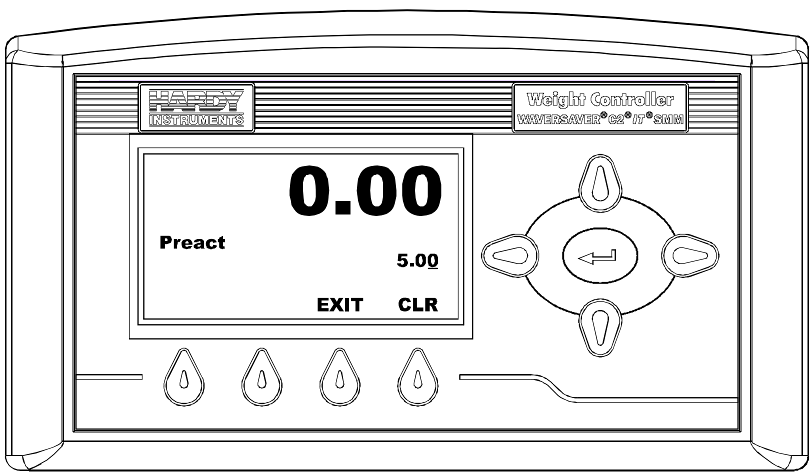


FIG. 370 PREACT MENU/ENTERING PREACT VALUE

Step 19. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number, letter or punctuation. In our example we entered 5.00 for our Preact limit. The weight is in the units you select when you configure the instrument.

Step 20. Press the Enter button. “Entry Accepted” appears briefly. The Preact value is saved and the Setpoint Menu appears.

Step 21. Press the down arrow button until the cursor is in front of “Deadband” (See Fig. 371)

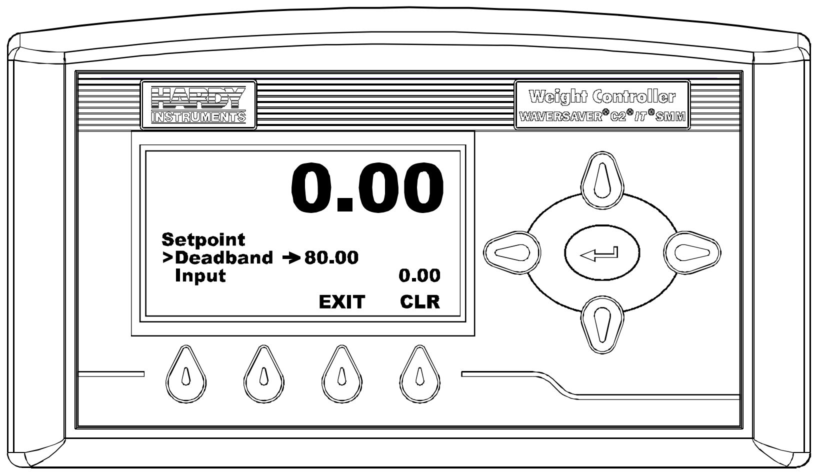


FIG. 371 SET POINT MENU/SELECTING DEADBAND

Step 22. Press the Enter button. The Deadband menu appears. (See Fig. 372)

Step 23. Press the CLR button to clear the current value.

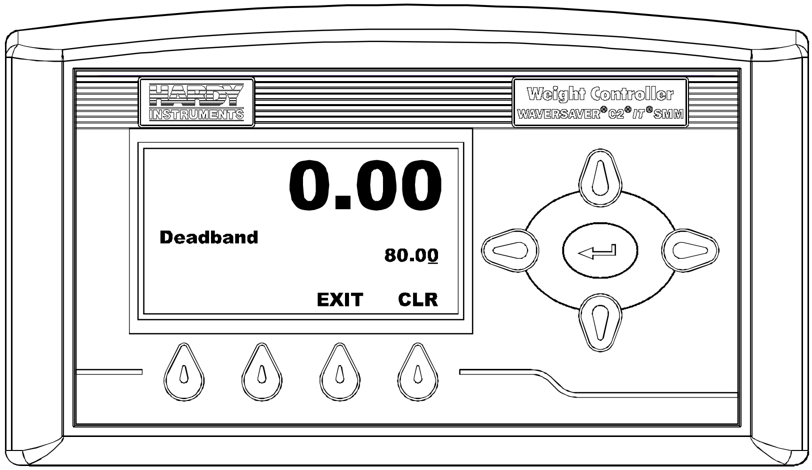


FIG. 372 DEADBAND MENU/ENTERING DEADBAND VALUE

Step 24. Use the left or right arrow buttons to move the cursor. When you have placed the cursor in the location you want, use the up or down arrows to enter the number, letter or punctuation. In our example we entered 80.00 for our Deadband limit. The weight is in the units you select when you configure the instrument.

Step 25. Press the Enter button. “Entry Accepted” appears briefly. The Preact value is saved and the Setpoint Menu appears.

Step 26. Press the down arrow button until the cursor is in front of “Input”. (See Fig. 373)

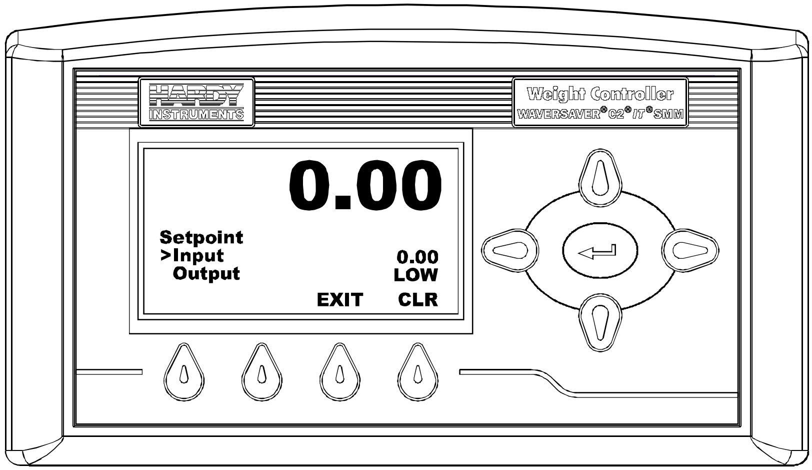


FIG. 373 SETPOINT MENU/READING INPUT

Step 27. The Input reads the Mode. Input is a read only value, you cannot not change it directly.

Step 28. Press the down arrow button until the cursor is in front of "Output". (See Fig. 374)

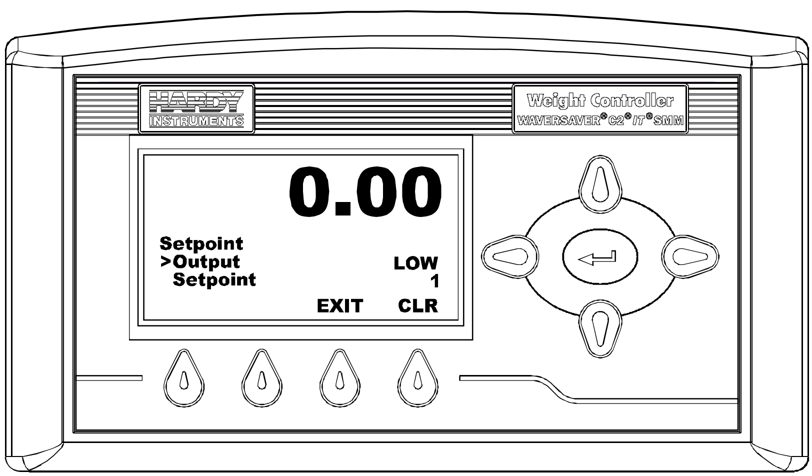


FIG. 374 SETPOINT MENU/READING OUTPUT

Step 29. The Output reads the Set Point as either high or low relative to the Target weight. If the target weight is lower than the Set Point, Output reads HIGH. If the target weight is higher than the Set Point, Output reads LOW.

Step 30. Output is read only and cannot be changed directly.

Step 31. All Set Points are configured the same. To configure the rest of the Setpoints repeat the procedures in this section.

Entering Set Points from the Web Page

Set Point Limits

Dead Band Limits

- The Dead Band limit is the difference between the set point and the reset.
- The dead band value under normal operations will always be a positive value however the dead band value can be set as a negative value should your application require it. Dead Band limits are used to prevent rapidly fluctuating setpoint states once the set point is reached.
- For example: If a set point value was 1000 pounds and the dead band was set to 5 pounds, the relay would close at 1000 pounds but not open until the weight dropped to 995 pounds. You need to select the Type: Loss in Weight. This would be used if a set point is a high trip limit. Selecting the Type: Gain in Weight and dead band would be used for a low trip limit. Examples are show for Low and High Trip Limits. (See Figs. 375 & 376)

Three General Rules for Set Points

4 **Set points activate at the set point plus the preact.**

5 **Set points deactivate at the set point plus the deadband.**

6 **The deadband should be numerically larger than the preact to prevent rapidly fluctuating setpoint states.**

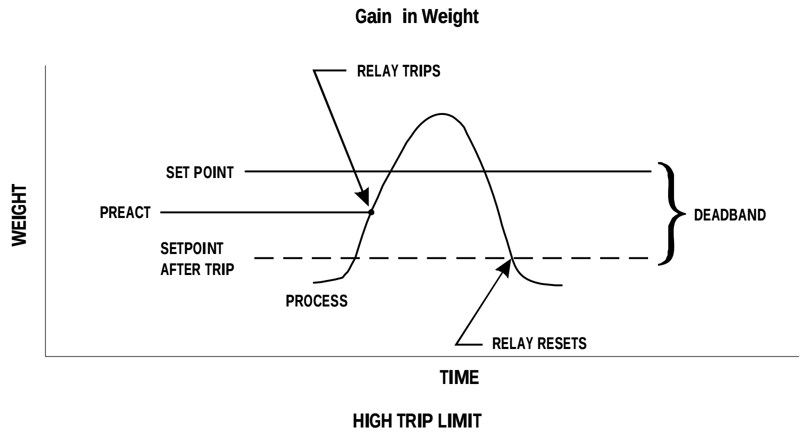


FIG. 375 GAIN IN WEIGHT/HIGH TRIP LIMIT

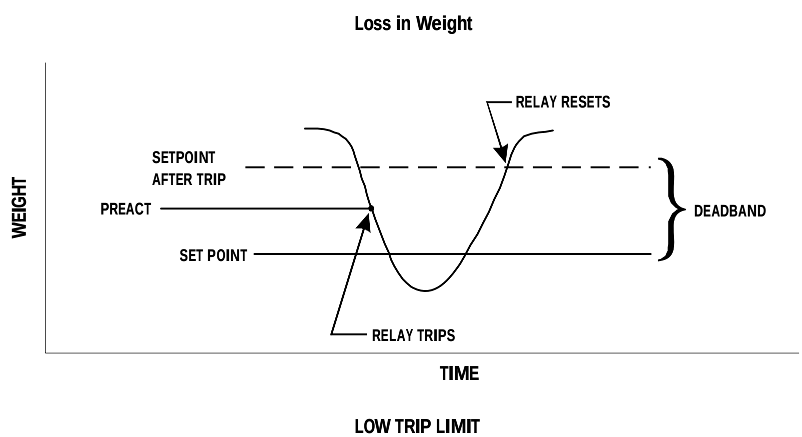


FIG. 376 LOSS IN WEIGHT/LOW TRIP LIMIT

Preact Limits

- The preact value is the difference between the set point and the trip point.
- It is used as an “in-flight” compensation value when filling a vessel. If set to zero, there will be no compensation.

Mode

Specifies which weight source is used as the set point input.

Type

Determines whether the set point turns on when the weight is greater than the set point **target** minus the **preact** and off when the weight is less than the target minus the deadband (Gain in Weight) or if it turns on when the weight is less than the set point target plus the preact and off when the weight is greater than the set point minus the preact (Loss in Weight)

Step 1. From the Home Page click on Configuration. (See Fig. 377) The Configuration Page appears. (See Fig. 378)

FIG. 377 HOME PAGE/SELECTING CONFIGURATION

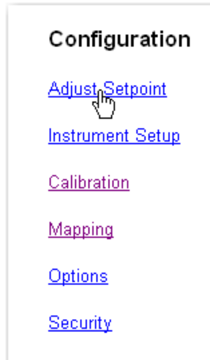


FIG. 378 CONFIGURATION PAGE/SELECTING ADJUST SETPOINT

Step 2. Click on Adjust Setpoint. The Setpoint page appears. (See Fig. 379)

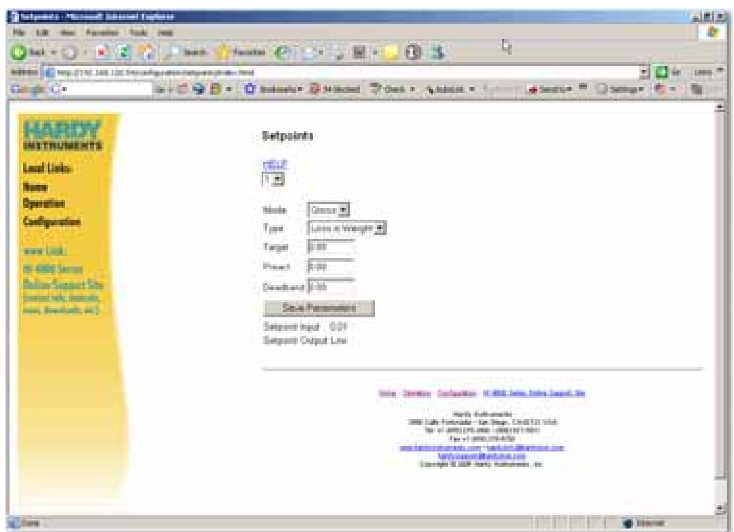


FIG. 379 SETPOINTS PAGE

NOTE *You can Save parameters two ways. One is to save each parameter after you select them or wait until you have selected all the parameters and save all the parameters at once. You save the parameters by pressing the Save Parameters button. In our instructions we recommend waiting until all parameters are selected before saving them.*

Step 3. To select the Setpoint you want to configure, click on the number pull down list. (See Fig. 380)

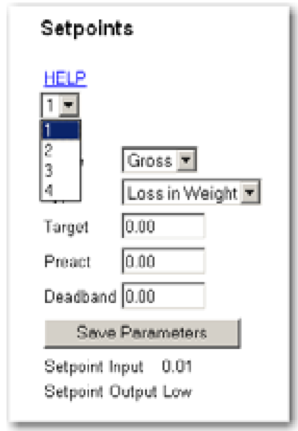


FIG. 380 SETPOINT PAGE/SELECTING SETPOINT NUMBER

Step 4. Click on the Setpoint number you want to configure. In our example we selected Setpoint 1. The Setpoint number appears in the text field.

Step 5. Click on the Mode pull down list. (See Fig. 381)

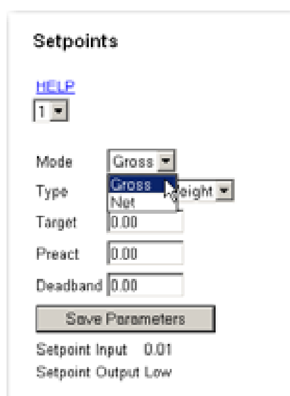


FIG. 381 SETPOINTS/SELECTING MODE

Step 6. Click on the mode you want. In our example we selected Gross.

Step 7. Click on the Type pull down list. (See Fig.381)

Step 8. Click on the Type of control you want for your application. In our example we selected “Loss in Weight”. (See Fig. 382)

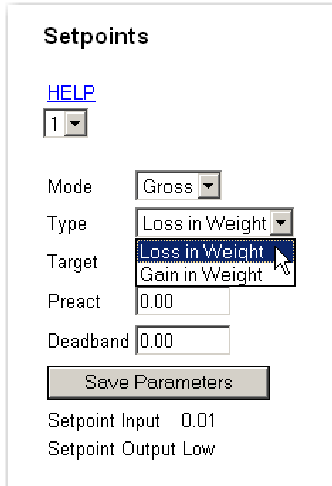


FIG. 382 SETPOINTS/SELECTING TYPE

Step 9. Click in the Target text field until the target weight is highlighted. (See Fig. 383)

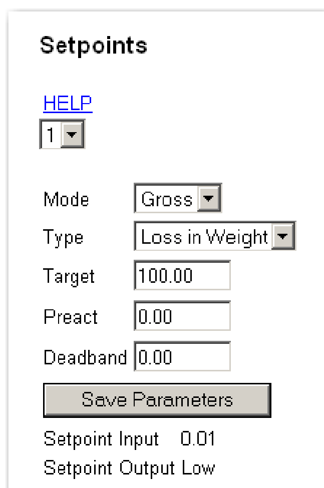


FIG. 383 SETPOINTS/ENTERING TARGET WEIGHT

Step 10. Type in the Target weight you want for your application. In our example we entered 100.00 lbs.

Step 11. Click in the Preact text field until the Preact value is highlighted. (See Fig. 384)

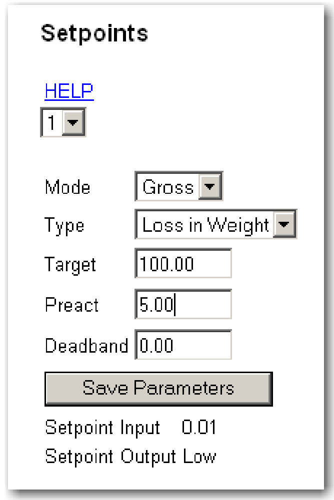


FIG. 384 SETPOINTS/ENTERING PREACT

Step 12. Type in the Preact value you want for your application. In our example we entered 5.00 lbs.

Step 13. Click in the Deadband text field. (See Fig. 385)

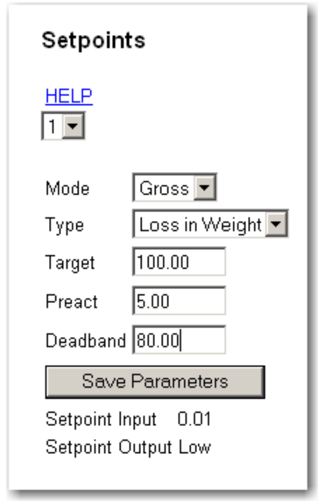


FIG. 385 SETPOINTS/ENTERING DEADBAND

Step 14. Type in the Deadband value you want for your application. In our example we entered 80.00 lbs.

Step 15. Click on the Save Parameters button. (See Fig. 386) The Setpoint parameters are save to non-volatile memory.

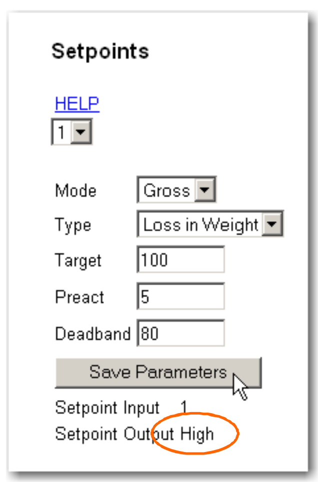


FIG. 386 SETPOINTS/SAVING PARAMETERS

Step 16. Note that the Setpoint Input number is listed below the Save Parameters button. This is read only and indicates the Setpoint you currently configuring.

Step 17. The Output reads the Set Point as either high or low relative to the Target weight. If the target weight is lower than the Set Point, Output reads HIGH. If the target weight is higher than the Set Point, Output reads LOW.

Step 18. Output is read only and cannot be changed directly.

Step 19. All Set Points are configured the same. To configure the rest of the Setpoints repeat the procedures in this section.

Step 20. Click on Configuration to return to the Configuration page.

Chapter 8
Troubleshooting

About Chapter 8

Chapter 8 consists of all the procedures for troubleshooting the electrical, mechanical and firmware elements of the HI 4050 Weight Controller in the event of a malfunction. Included in Chapter 8 is a comprehensive flow chart to provide a road map for troubleshooting an entire Weight Controller system, including load cells weight controller and cabling. Furthermore Chapter Eight also provides instructions for using Hardy's Integrated Technician (IT®) software utility to isolate problems that might occur in a weight system.

Disassembly and Reassembly Notes, Warnings and Cautions

WARNING - EXPLOSION HAZARD - DO NOT REPLACE COMPONENTS UNLESS POWER HAS BEEN SWITCHED OFF OR AREA IS KNOWN TO BE NON-HAZARDOUS.

ADVERTISSEMENT RISQUE D'EXPLOSION - COUPER LE COURANT OU S'ASSEUR QUE L'EMPLACEMENT EST DÉSIGNE NON DANGEREUX AVANT DE REPLACER LE COMPOSANTS.

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS

ADVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DÉCONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX.

- Always disconnect the power cord before disassembling.

- Make sure that any disassembly is done in a clean, well ventilated, properly controlled static environment.
- Always make sure that the assemblies and sub-assemblies are well supported and insulated when doing any repairs on the HI 4050 Weight Controller.
- Place small fasteners, connectors and electrical parts in closed containers so as not to lose parts during reassembly.
- Read all the disassembly instructions before any disassembly begins. Be sure that you are familiar with the procedures. If any of the instructions for disassembly are unclear, contact Hardy Instruments, Technical Support Department for additional information and assistance.
- Do not disconnect any electrical plug, connector or terminal unless an identification tag is present or one is attached. Always note where the connector or plug was attached to the electrical component or wiring harness.
- Always install complete hardware groups (Screws, Washers, Lock Washers, Spacers, Etc.) back to the original point of removal.
- Always replace broken or damaged modules or hardware immediately!
- Always check to be sure that no loose parts are sitting on printed circuit boards or electrical connectors or wires when disassembling or reassembling.
- Always protect printed circuit boards from electrostatic discharge (ESD). Always use approved ESD wrist straps and anti-static pads.
- Always perform a final inspection after completing any reassembly to be sure that all fasteners are tight, all connectors are secure and there are no loose parts on any of the printed circuit boards in the Weight Controller.
- Always follow proper safety procedures when working on or around the Weight Controller.
- Learning to use these tests shortens system troubleshooting time. The faster you can determine the problem and finish repairs the faster production can resume.
- Most problems require the use of two or more tests to determine the cause.
- A problem may be isolated to a load cell but this does not mean the load cell is the damaged component. Mechanical imbalances and system piping stress (lack of piping vibration isolators, cables draped over pipes etc.) can make a load cell seem to be the problem.
- If you are in doubt as to how to resolve a problem or if you need assistance, Hardy Instruments has a knowledge based Web-tech located on our web site at http://www.hardyinst.com. Web-tech contains several frequently asked questions that are formatted to aid in your troubleshooting. Web-tech also has a request form to request additional information and answering new questions. The Web-tech is updated often. This helps you avoid waiting on hold trying to reach a live tech support agent and is available 365 days a year 24/7.
- For direct factory support call Hardy Instruments Customer Service at:

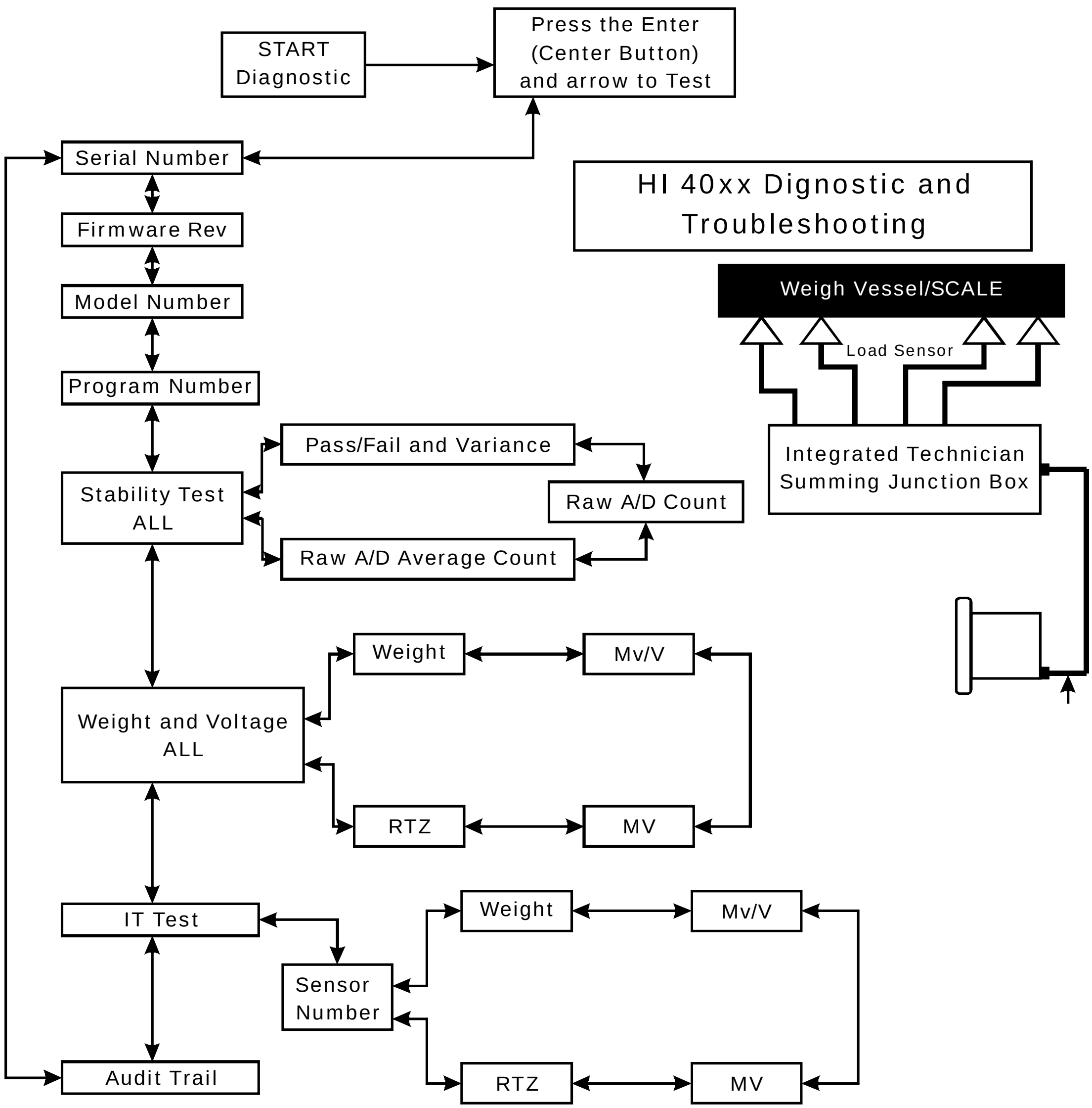
1. Customer Service s available from 6 AM to 6 PM Pacific Standard Time.
2. Factory Technical Support in the US and Canada call: 1-800-821-5831, Ext. 1757.

3 Factory Technical Support outside the US and Canada call: 1-858-278-2900 Est. 1757.

Error Messages

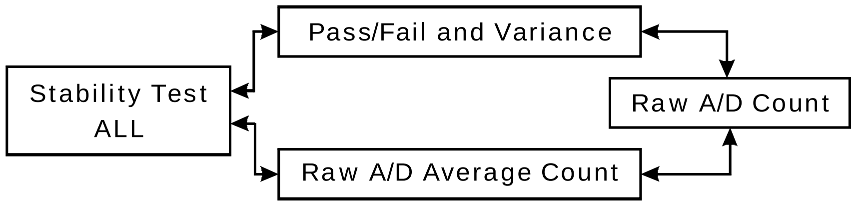
- A/D Failure Error! - Internal Electronics Error, Retry.
- A/D Convert Error! - Load Cells input out of range.
- Motion Error! - Check Motion Tolerance Settings and Retry
- Trad Cal Error! - Error occurred during calibration, re-calibrate.
- C2 Cal Error! - Error occurred during calibration, re-calibrate.
- Too Lo Error! - Verify that the load cell signal level is 0-15 mV. Verify that there is enough weight on the scale. Perform Span than go back and Zero.
- Too Hi Error! - Verify that the load cell signal level is 0-15mV. Verify that there is enough weight on the scale. Perform Span than go back and Zero.
- No C2 Sensor! - Instrument did not detect a C2 Load Sensor
- CAL Failed! - Too few counts between Zero and Span.
- C2 Caps Unequal! - Different load cell capacities (For example 50 lbs capacity load cell and 100 lbs capacity load cell on one system. Make the load cells even be removing the uneven load cell and replacing it with a load cell that is equal to the others capacity.
- HI/LO Too Close! - Zero and Span are not more than 1,000 counts from each other or there is no change or negative change. Reset either so the counts are more than 1,000 counts of each other.
- Function Error! - Pressed a function button and the Function did not work. Try again. Cycle power.
- Not Allowed! - Value entered is outside the range allowed. Try another value.
- Security Violation! - User signed in with a password that does not allow performance of a certain function or entry to certain menus. Security level of the user identified in the User ID, too low for the menu or function.
- Overrange - Weight over the setpoint target.
- Need Cal with ITJBOX - IT summing card is not installed in the instrument. You need to install an IT summing card then do a Calibration with the card installed in you instrument to access the IT informaiton.

Trouble Shooting Using Integrated Technician (IT®)



A more detailed explanation of each section of the test follows below:

Stability Test ALL



PASS/FAIL and Variance Test

This test looks at the variation of the A/D converted which is compared to an internal standard. The results are posted as pass or fail and the given variance. This variance is derived from internal calculations based on settings and not any outside input. So this test is valid to help divide the problem into smaller divisions. Unstable test results can be caused by and internal A/D processor fault, grounding, power connection or EMI/RFI above specified CE limits.

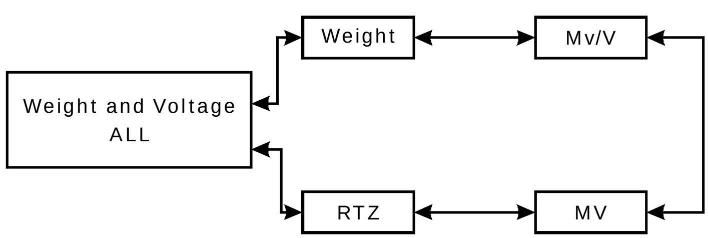
Raw A/D Count

These numbers are reflecting weight change at the smallest measurement, the internal analog to digital converter computer register.

Raw A/D Average Counts

These numbers are reflecting weight change at the smallest measurement, the internal analog to digital converter computer register. Except this reading is averaged using the AVERAGES setting parameter from the controller's configuration. Using the maximum number of internal Vegas and the 10ms update equals a maximum delay of 2.55 seconds

Weight and Voltage ALL



This test section looks at the readings from ALL the load cells. This test works for all varieties of load cell connection systems. This will test overall system performance and signal voltage readings. Further investigation to isolate system problems require the use of hand tools and multi-meters or the Integrated Technician Summing Junction Box and using the IT© Test section.

NOTE *IT ®is a registered trademark of Hardy Instruments Inc.*

Weight:

This displays the amount of force seen by all load cells installed in the summing junction box. This force can show an imbalance or weight distribution problems. Review your system to insure proper balance and loading. Further investigation to isolate system problems will require the use of hand tools and Multi-meters or the Integrated Summing Junction box and using the IT test section.

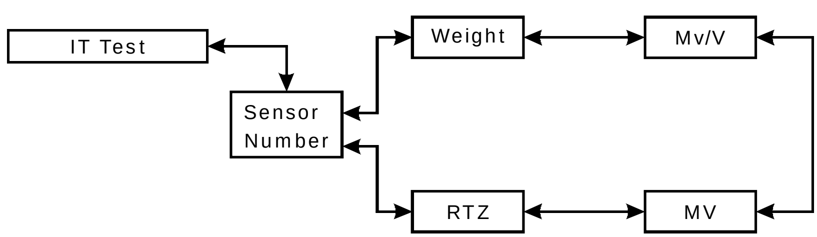
mV/V and mV:

DC voltage signals are between 0-15 millivolts. Overloads and negative millivolt readings are not shown as actual readings but 15.3 for over voltage and 0.0 for negative voltage. You will need to use a multimeter with a 200 or 300mVDC range to view the out of range voltages. Millivolt/Volt equals the output from a load cell per each volt of excitation. The HI 4050 reads the load cell output in mV/V which is a higher resolution (4 decimal places) reading than a mV reading, thereby providing more sensitivity to enable you to troubleshoot the condition of the load cell in question under certain conditions. Load Cells are rated in Millivolts/Volts.

RTZ (Return to Zero) Tests:

This test is only run when the scale is empty. When the scale is calibrated at the **ZERO** or Reference zero there is a **WAIT** period. During this **WAIT** period the **WEIGHT** readings are collected. When this test is run, after a valid calibration has been completed, there is a comparison of the original weight reading collected and current. If the difference is more than the combined Motion and the Zero Tolerance parameters the test will fail.

IT Test



If your system is equipped with an Integrated Technician Summing Junction box the IT test can help identify individual load cell problems up to a maximum of four load cell selections.

Sensor Number:

Indicates which sensor is under test. Using the up or down arrow selects the target sensor to be tested.

Weight:

Displays the amount of force seen by a selected load cell. This force can show an imbalance or weight distribution problem. Review your system to insure proper balance. Motors can account for this problem. Piping should not apply any appreciable force on the scale.

Mv/V and MV:

DC voltage signals are between 0 and 15 millivolts. Overloads and negative millivolt readings are not shown as actual readings but 15.3 for over voltage and 0.0 for negative voltage. You need to use a multi-meter with a 200 or 300mV range to view the out of range voltages.

RTZ (Return to Zero) Tests:

This test is only run when the scale is empty. When the scale is calibrated at the ZERO or Reference zero there is a WAIT period. During this WAIT period the WEIGHT readings are collected for each load point. When this test is run, after a valid calibration has been completed, there is a comparison of the original weight reading collected and current. If the difference is more than the combined Motion and the Zero Tolerance parameters the test fails. This is a great test to determine which load cell is malfunctioning in a drifting weight problem.

Audit Trail

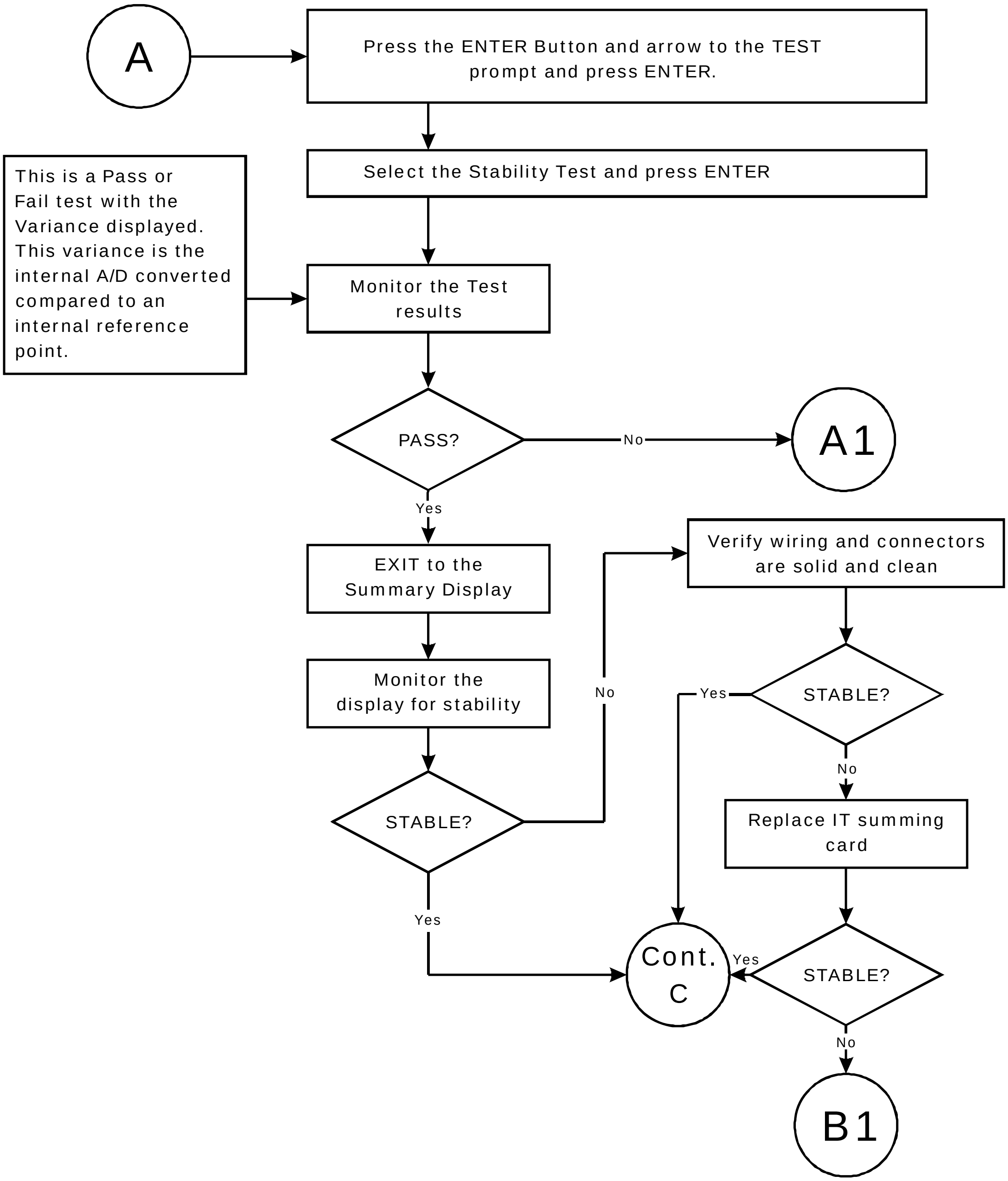
Audit Trail

- A list of the parameters and successful calibration events are logged into the audit trail section.
- Formats an Event with time and date stamp.
- Log entries cannot be erased and are stored in the Secure Memory Module

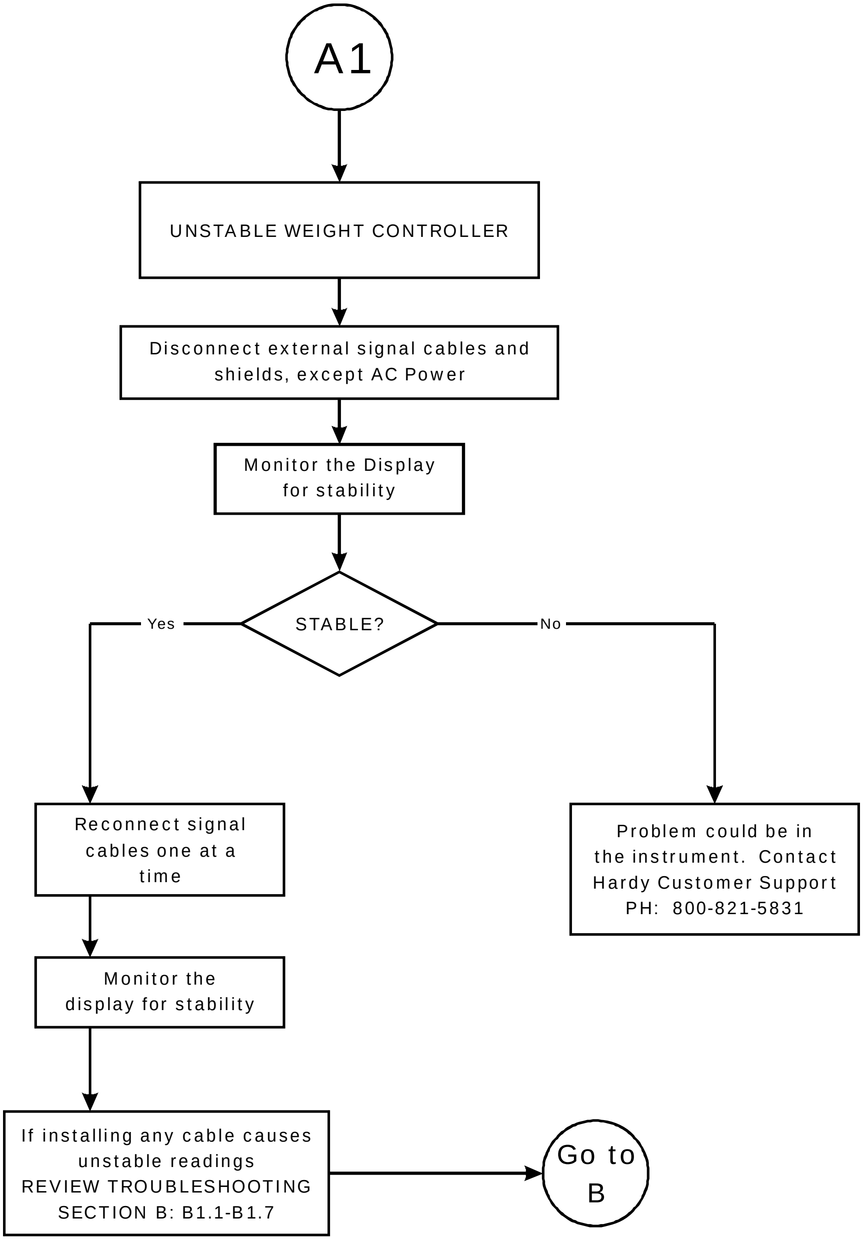
General Troubleshooting Flow Chart Index

Drifting or unstable weight readings	A
Electrical, Mechanical and Configuration reviews	B
Weight indication will not return to zero	E
Verify individual load sensor operation	F
Mechanical Inspection	H
Trad. Cal - A/D Failure Error	G
Mechanical Inspection	H
Electrical Inspection	J
Load Sensor Installation	K
Exceeds the Millivolt range. Out of range condition.	M
Blank Display	N
SD Card Diagnostics and losing memory at power cycles	P

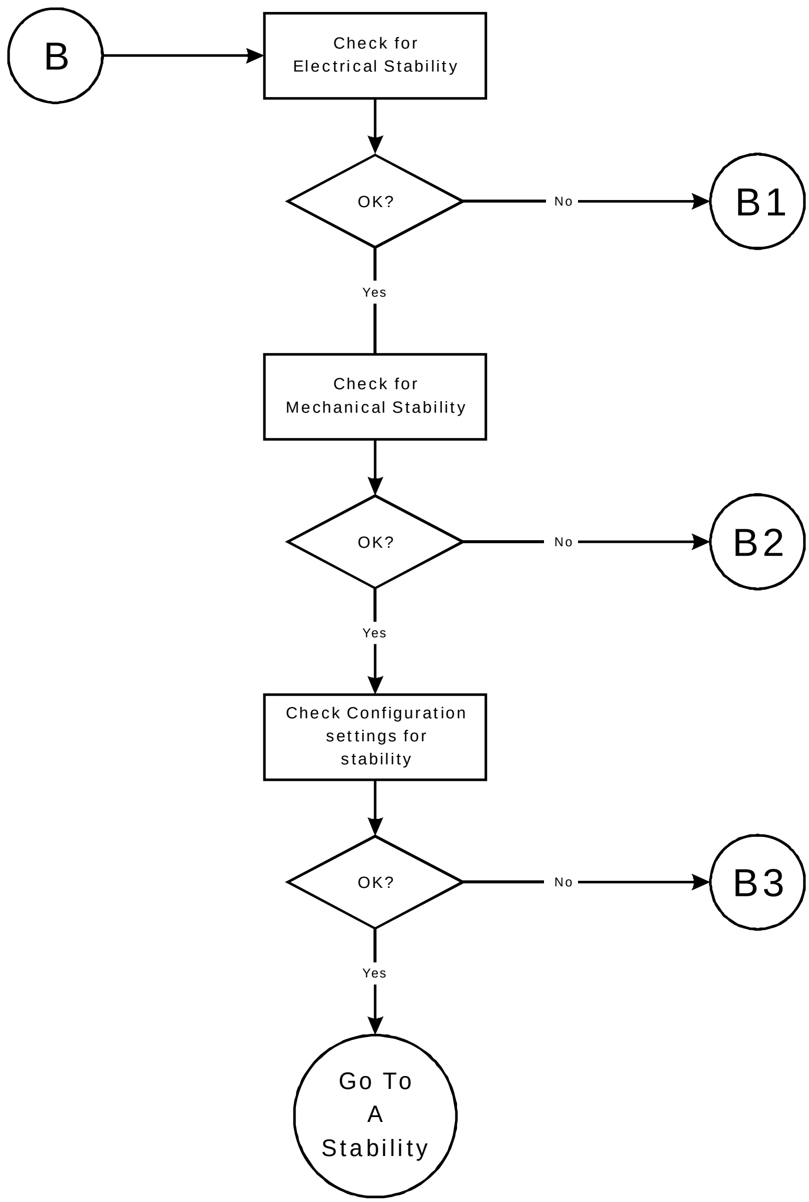
A - Guidelines for Instabilities on Formerly Operating Systems



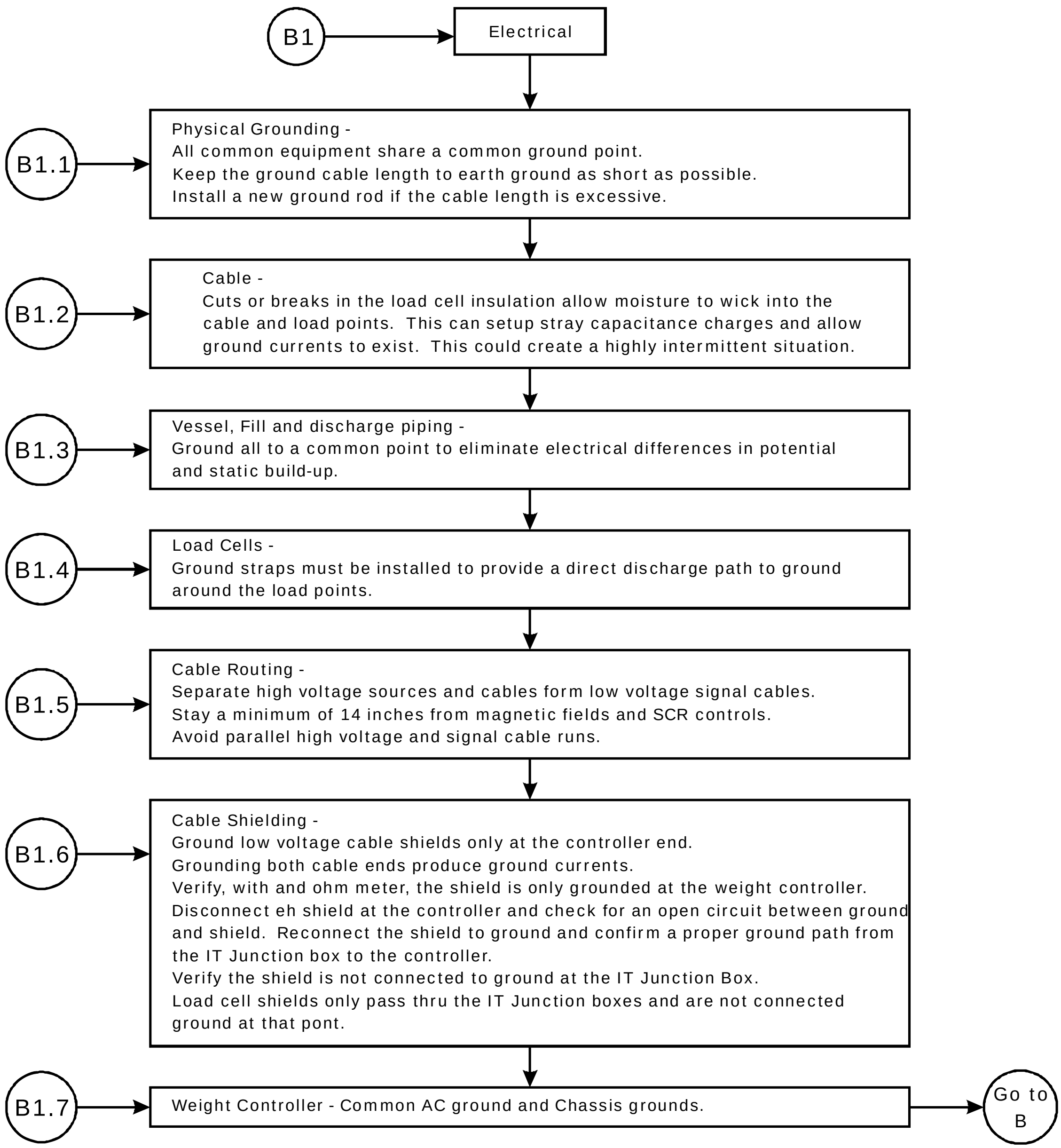
A1 - Guidelines for Instabilities on Formerly Operating System (Cont'd)



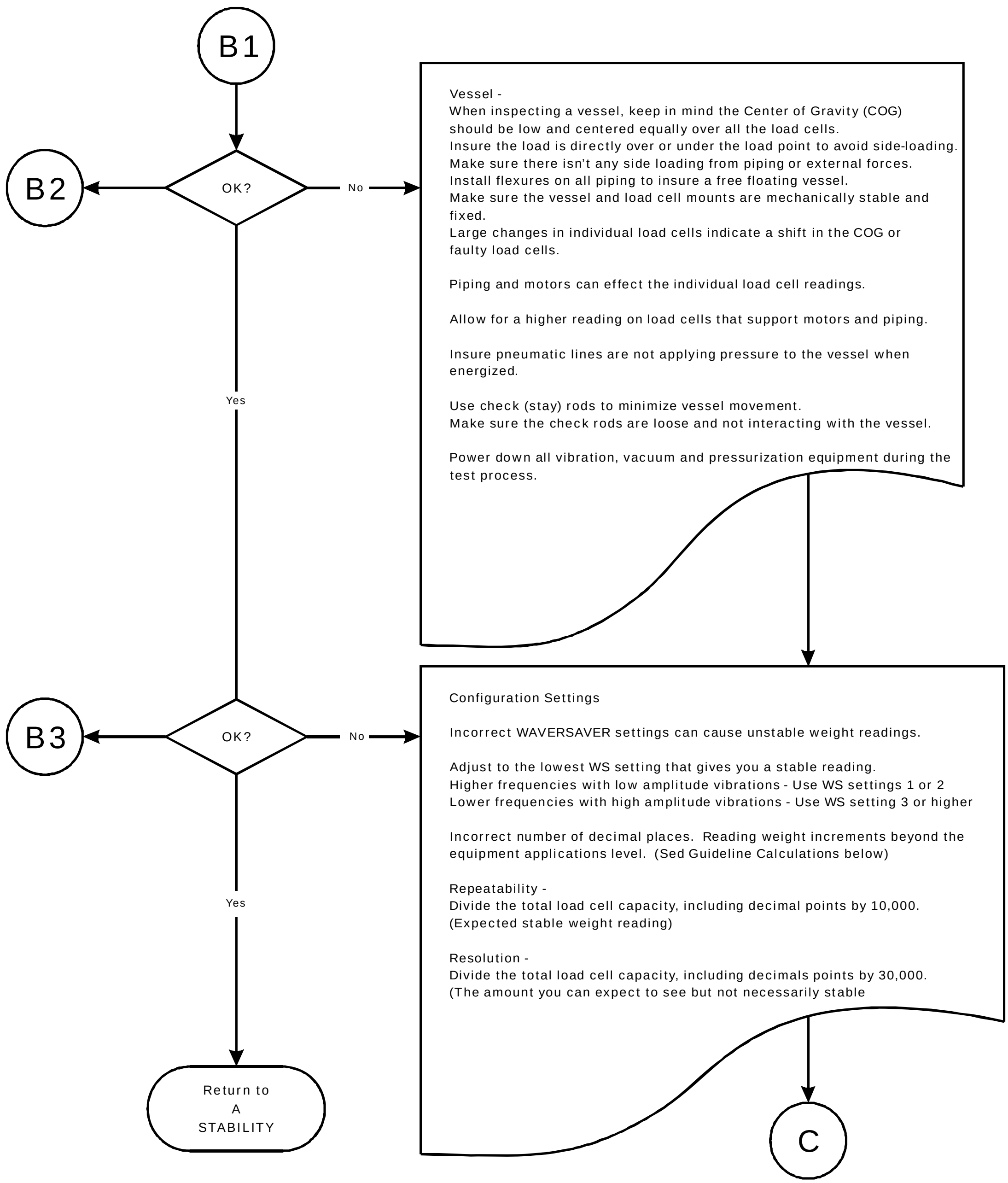
B - Guidelines for Instabilities on Formerly Operating Systems (Cont'd)



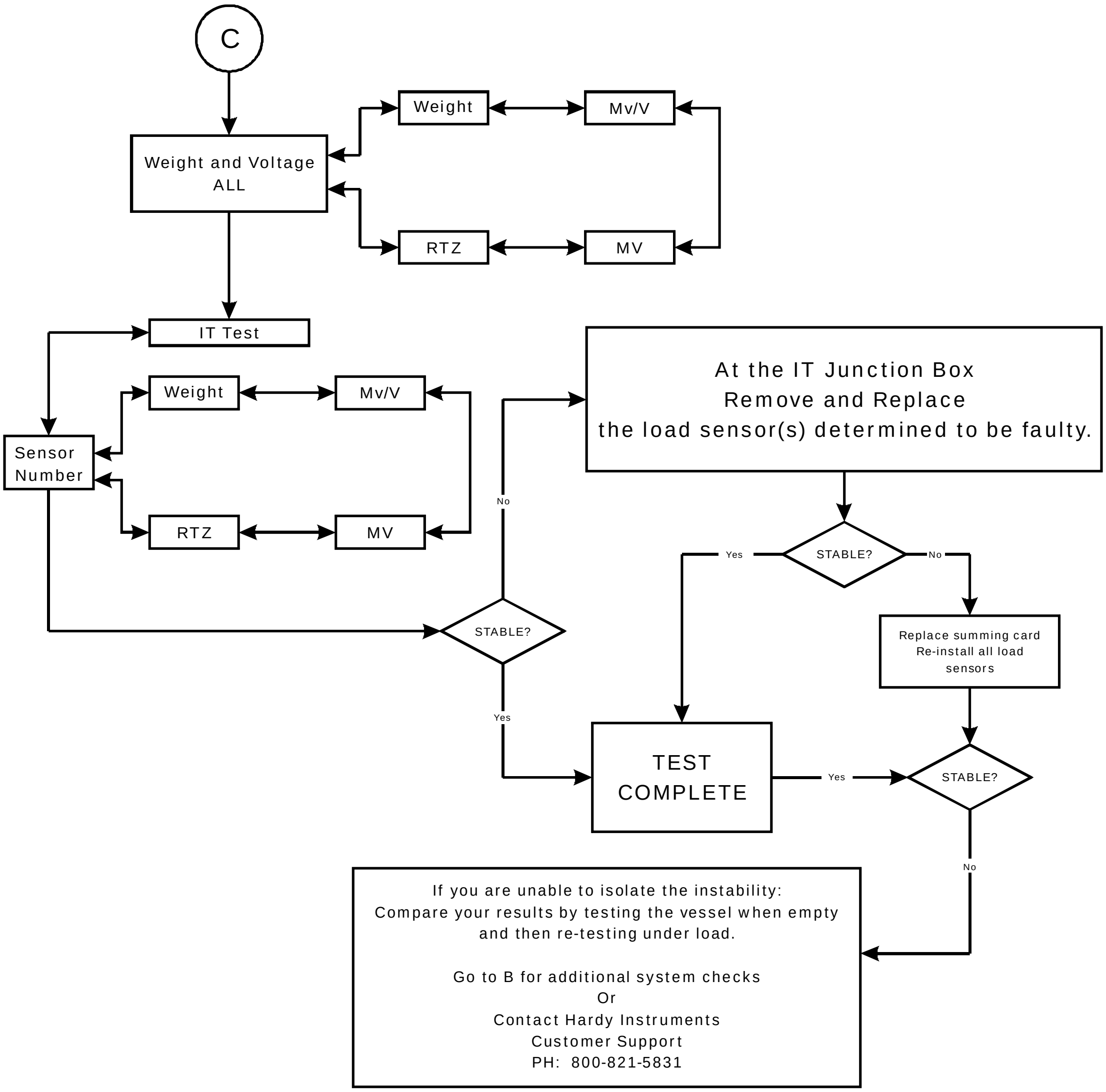
B1 - Guidelines for Instabilities on Formerly Operating Systems (Cont'd)



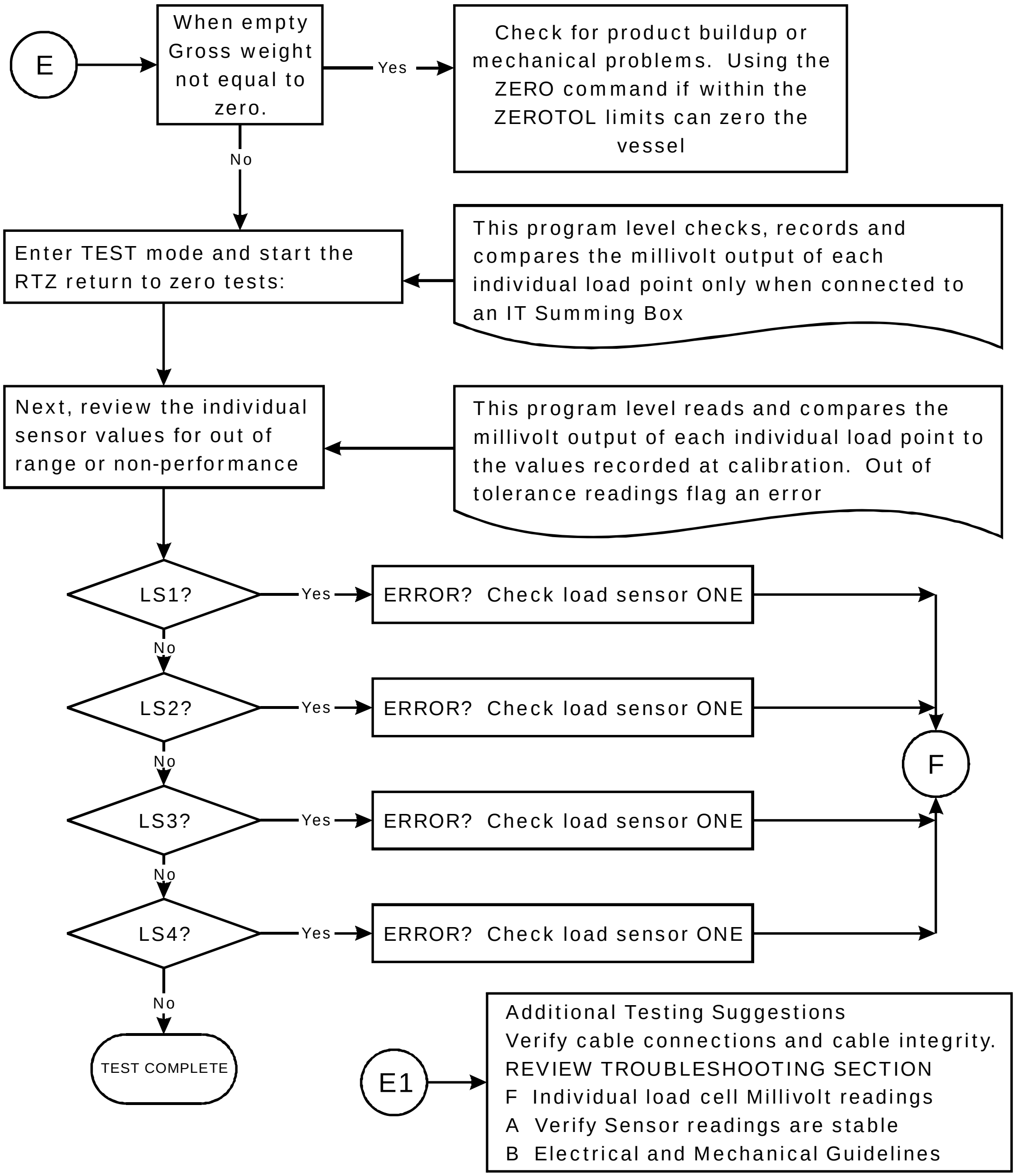
B1 - Guidelines for Instabilities on Formerly Operating Systems (Cont'd)



C - Guidelines for Instabilities on Formerly Operating Systems



E - Non-Return to Zero (Must be connected to an IT® Summing Box

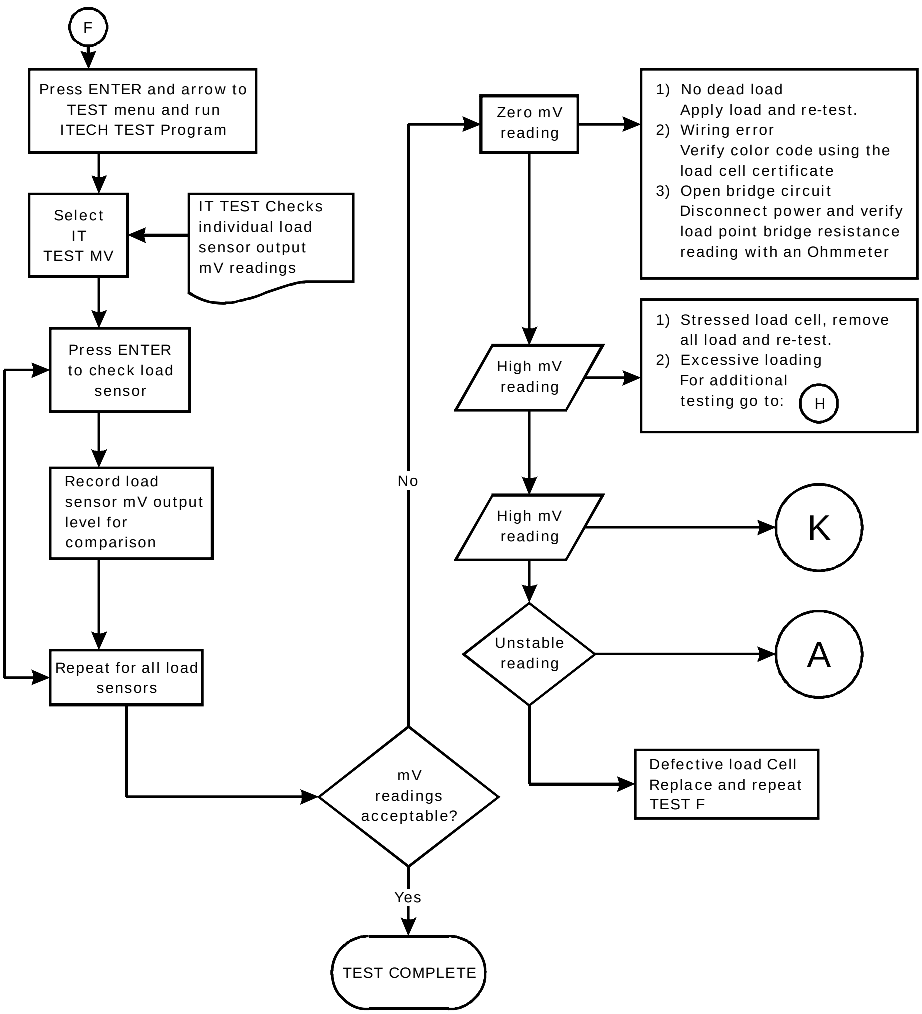


F - Verify Individual Load Cell Millivolt Readings

- Testing an individual load cell signal output requires an IT Summing Junction box or millivolt meter.
- Use the load cell certificate to verify the millivolt per volt (mV/V) rating:

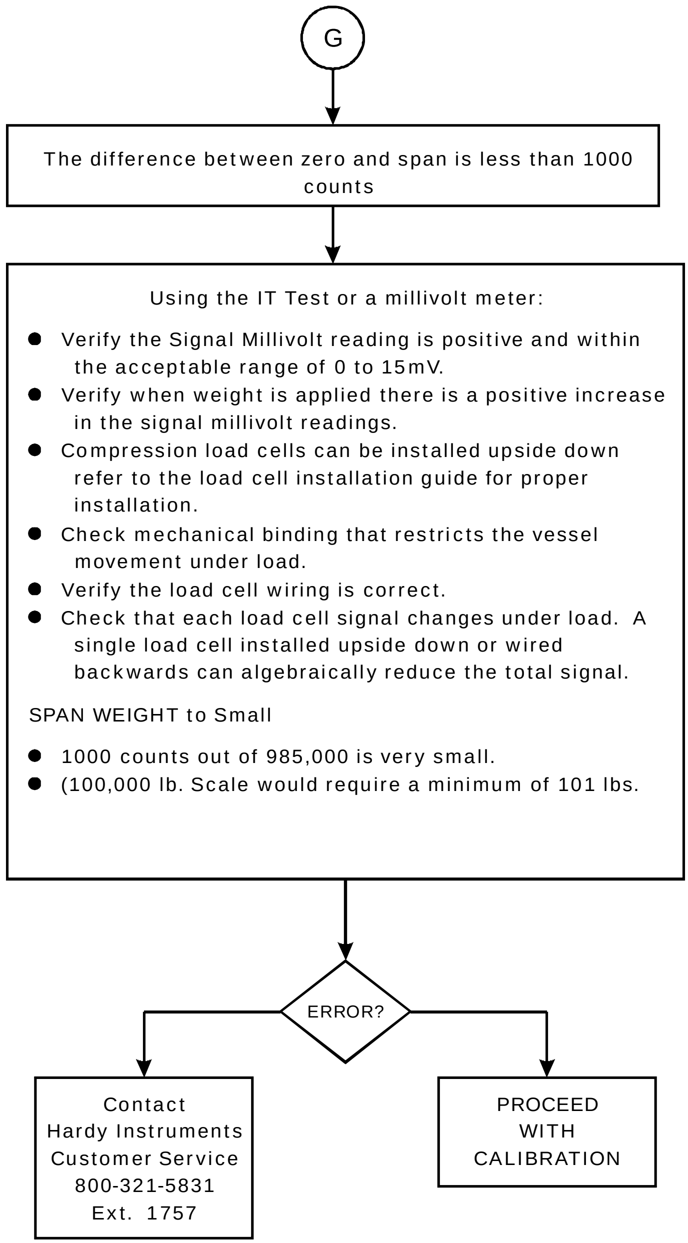
Example: 3mV/V load cells produce approximately 15mV at full load.

That is 5 volts excitation x 3 mV/V. A scale capacity of 1,000 lbs. with 100 lbs. of deadload when empty, the load point mV reading should measure 1.5mV.

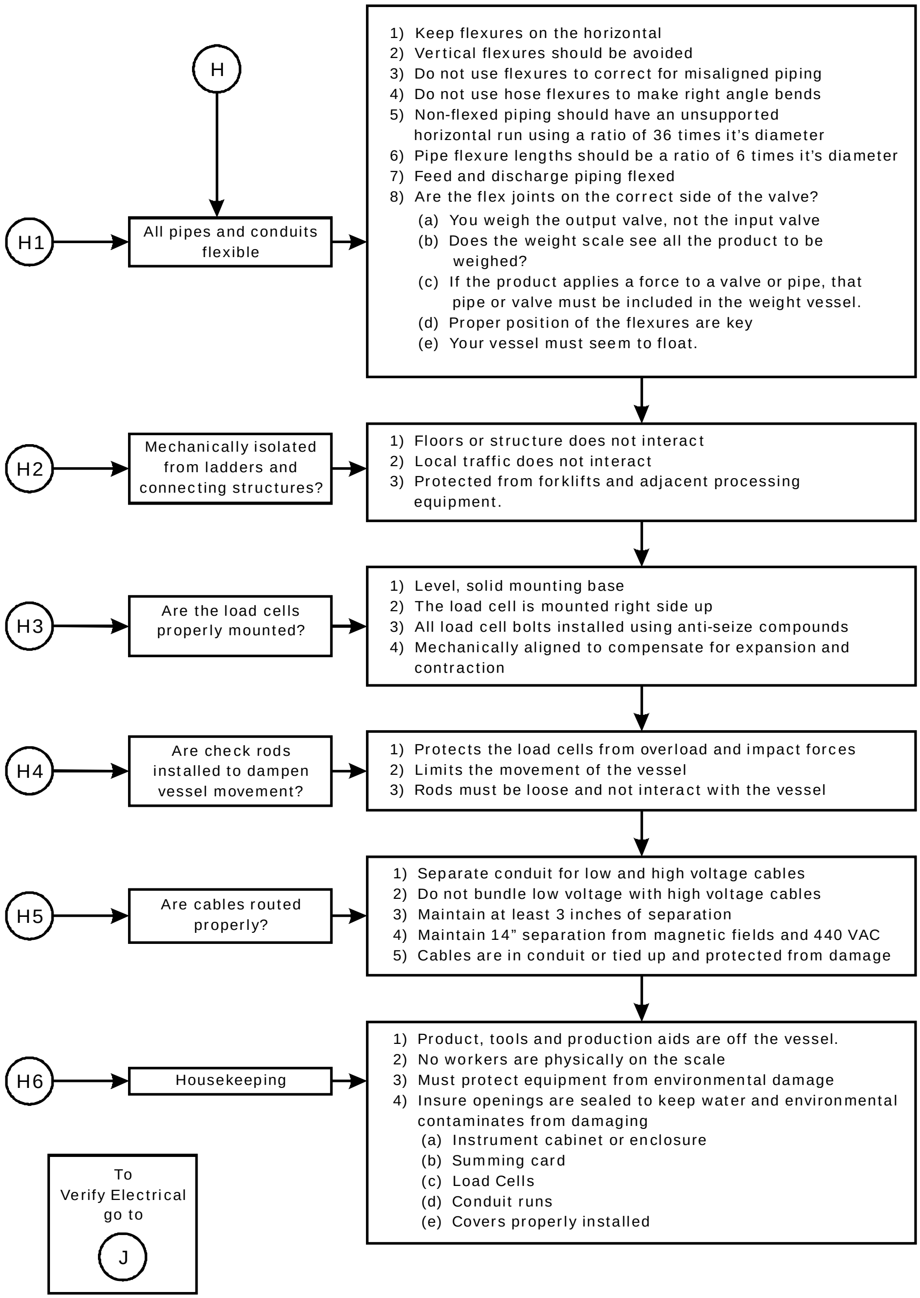


G - Calibration Failed: Not Enough Counts Between ZERO and SPAN

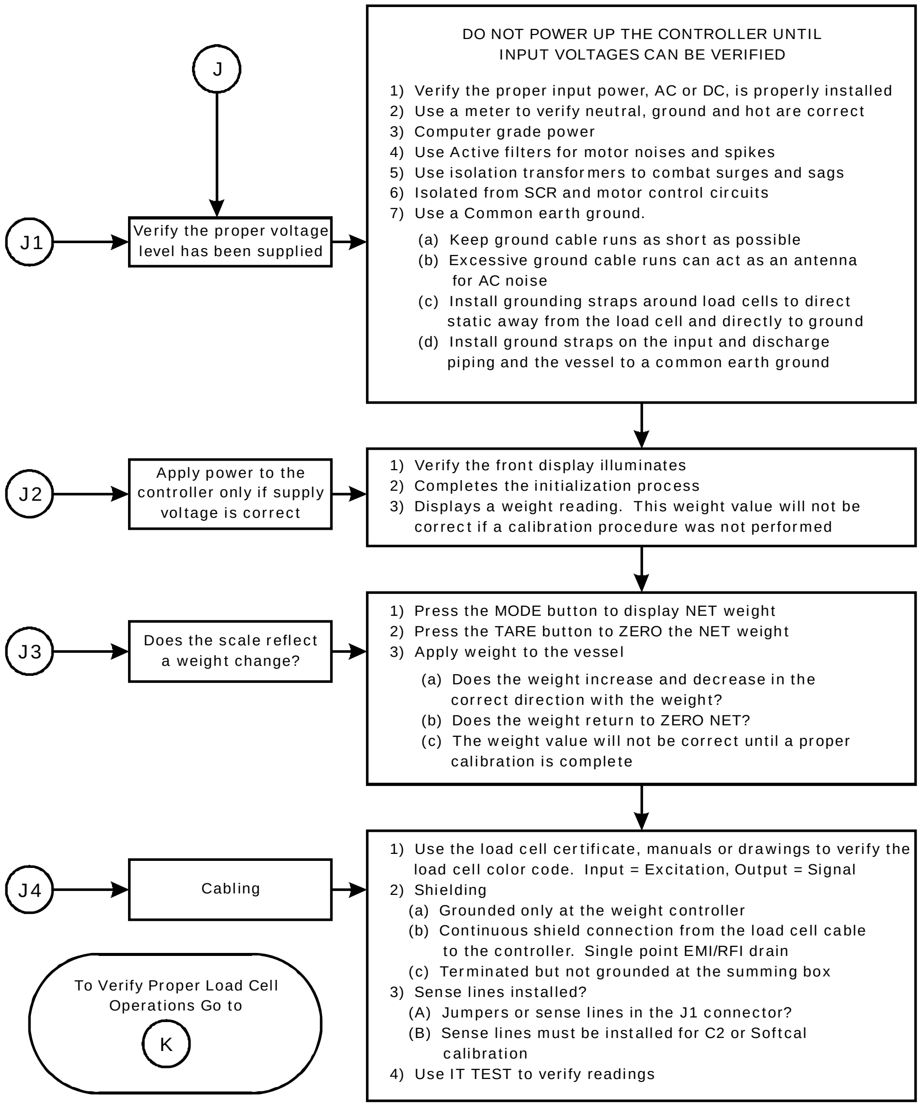
- This error only occurs at the SPAN parameter. You may ZERO out chains and temporary calibration equipment to hold or hoist test weights. Zeroing the temporary weight does not effect the calibration.



H - Mechanical Inspection



J - Electrical Inspection



K - Load Sharing and Load Sensor Checkout

K

K1

Load Cell wiring is complete and correct?

1) Does the mV signal increase in a positive direction
2) If you receive a negative result, check if load cell is mounted correctly.
   (a) The arrow goes with the direction of force
   (b) If there isn't an arrow, you must manually verify the correct direction. A negative reading indicates the load cell is upside down
   (c) Load cells in tension will not reflect a negative reading if installed upside down. If upside down, only the force applied by the cable will be included in the weight reading
   (d) If you are still receiving a negative signal, verify load cell wire color code

K2

Multiple load cells MAP the mV reading. Balance the load

1) Verify a positive mV reading from each load sensor using IT TEST, mV
2) Record the mV reading and compare each corner for proper load sharing
   (a) For proper load sharing you should see only a difference of +/- .5mV
   (b) Larger differences due to motors and piping should not exceed +/- 2mV
   (c) If there aren't any motors, valves or piping to explain the mV difference, adjust the corners and balance the mV readings
   (d) Use shims or if equipped adjusting bolts on the load cell mounting hardware
   (e) Drawing a load cell map helps determine the correct leg to adjust and in which direction

Three load cells balance like a three legged chair

1) Using a spirit level, verify the vessel is vertically and horizontally correct
2) Verify if any height change effects the attitude of adjacent vessels or piping
3) Adjust each leg to dynamically match mV outputs
4) Verify the mV readings and physical level when complete

Four or more load cells present a challenge

1) Use the Weight and Voltage test to determine the sum of the load cell signals to set your target mV reading for each load cell
2) Read the output of individual load cells
3) Adjust the load cell with the lowest reading to dynamically match the target mV readings obtained in Step 1
4) Read the mV readings from each load cell to verify a proper correction
5) Repeat steps 3 and 4 to achieve a proper load sharing vessel
6) Verify the mV readings and vessel level when complete

Monitor system for proper operation
Check out completely

M - (*******) or (- - - - - - -) ERROR

M

- - - - - - - or * * * * * *
The load sensor output signal has exceeded the millivolt limits set in Configuration and/or the internal factory setting.

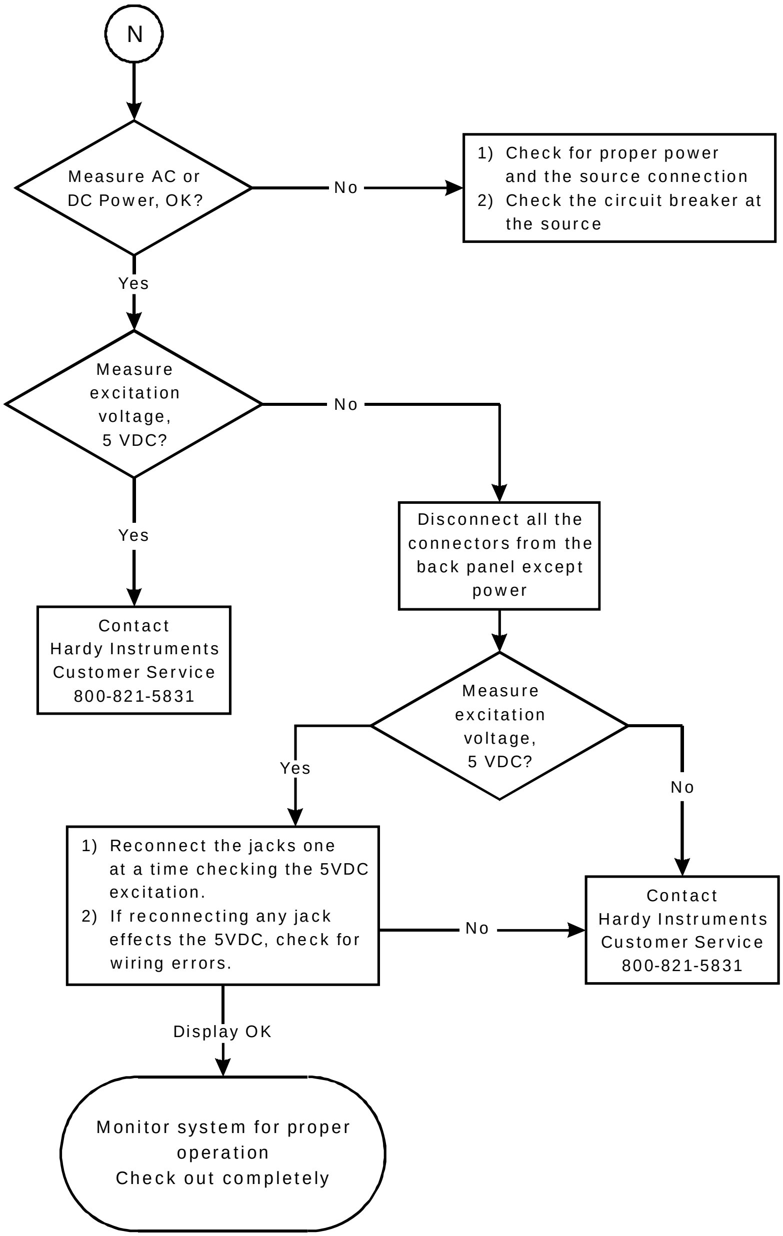
1) Verify the signal wires are properly connected
   (a) Verify load cell cable color code
      (1) Load Cell Certificate
      (2) Installation Manual
      (3) Cable marking strips
   (b) Broken signal wires act as antenna for EMI/RFI
   (c) Load cell cable shields must be grounded only at the Weight controller to dampen EMI/RFI signals
2) The load cell output signal voltage has exceeded 15mVDC or is negative
   (a) Use IT Test to verify mV levels
      (1) Verify total millivolt signal level
      (2) Verify individual load cell millivolt signals
         a) An individual load cell may be over-ranged and and exhibit high millivolt readings
         b) Possible physical damage to the load cell
         c) Internal strain gauge bond broken
         d) Moisture in the load cell cable or body
3) Weight in the hopper exceeds the configured Scale Capacity setting
   (a) Under configuration verify the Scale Capacity setting
   (b) 105% of the Scale Capacity setting causes a HI indication
   (c) This is used only as a warning and does not effect calibration
   (d) Optional communication signals are unaffected by this indication
4) Weight in the hopper exceeds the load cell capacity
   (a) Mechanical forces or product acting on the scale overloads the load cells
   (b) Use IT TEST to verify Millivolt levels
5) Review Mechanical and Electrical Flow charts for additional tips. B1

HI ERROR?

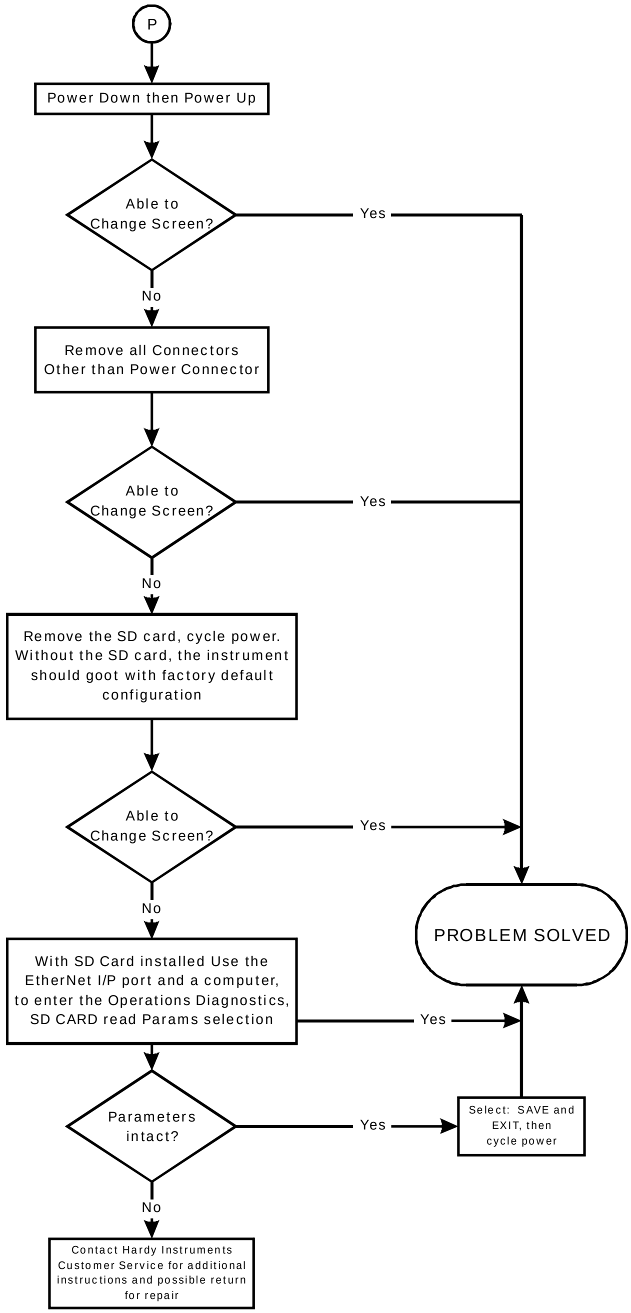
Contact Hardy Instruments Customer Service 800-321-5831

PROCEED WITH WEIGHING PROCESS

N - Weight Controller's Front Display is Blank



P - SD Card Diagnostics and Losing Memory at Power Cycles



System Integrity Check and Fault Determination From the Front Panel

To determine if an instrument or cabling problem exists, verify the basic operation of the system by performing the following system checks.

Test

NOTE *For more extensive information about the Weight Controller and scale operation go to Operation/Diagnostics under the "System Integrity Check and Fault Determination from the Web Page" below.*

About Test

The Test menus enable the technician to get a quick view of how the Weight Controller and scale are working. For example you can check the Serial Number of the instrument, Model number, Firmware revision number or Program Part Number if you need to download these files from the Hardy Instruments Web Site. By performing the Stability Test you can check the A/D Raw count and average. The Test Menus allow you to perform a Weight and Voltage Test which provides the total scale input to the instrument such as mV, mV/V and Weight in the units selected (i.e. lbs, kg, oz, g). INTEGRATED TECHNICIAN (IT® Test) enables you to test each load sensor to determine the source of a problem should one occur.

Step 1. From the summary display press the Enter button. The Configuration Menu appears.

Step 2. Press the down arrow button until the cursor is in front of Test. (See Fig. 387)

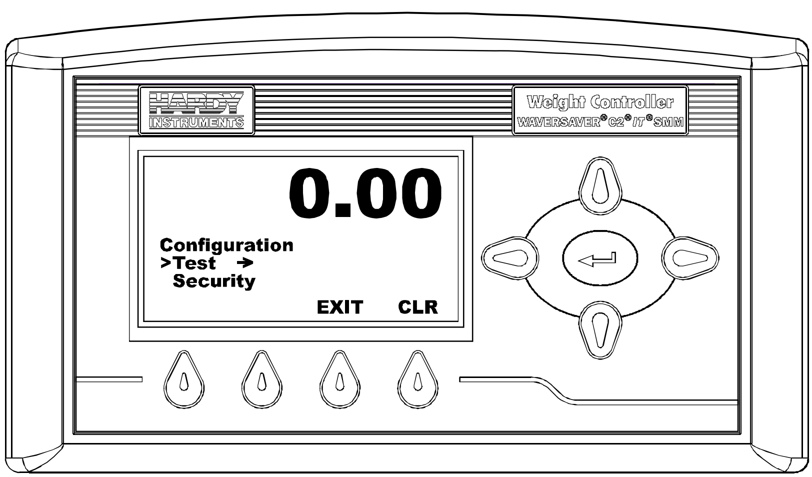


FIG. 387 CONFIGURATION MENU/SELECTING TEST

Step 3. Press the Enter button. The Test Menu appears. (See Fig. 388)

Step 4. Some of the Test Menus are read only displays. This information is important:

- Serial Number - To make sure you have all the correct downloads for the instrument a Hardy Support Technician will need the serial number of the instrument. You can find the serial number here.

NOTE *The values entered in the Test Menu are for illustration purposes only. Your values will vary.*

- Firmware Revision - Often a technician needs to know the program version to determine if the correct version is being used. A Hardy Technical Support Technician will ask what version of software you are currently using to determine the source of a problem. You can find the version here.
- Model Number - Lists the model number of the instrument.
- ProgPn# = Program Part Number. This is the part number of the firmware. To order additional copies of the firmware you will need this number. This is also additional information available to a service technician for troubleshooting. (See Fig. 388)

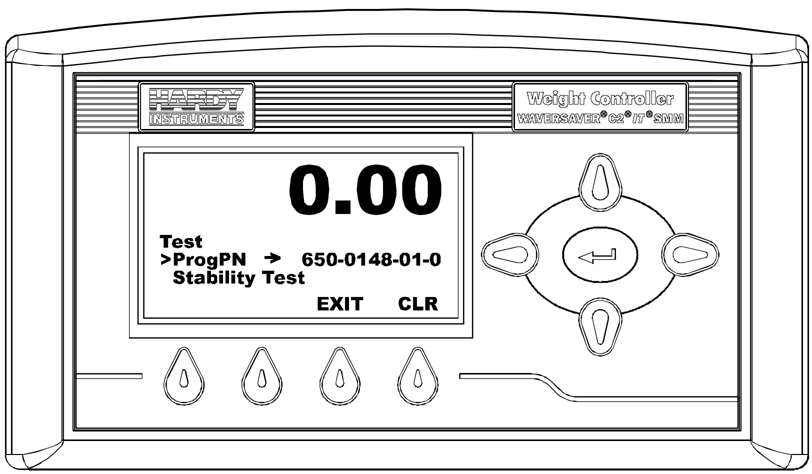


FIG. 388 TEST MENU/SELECTING PROGRAM PART NUMBER

Step 5. To see the Firmware Revision number, press the down arrow button until the cursor is in front of Firmware Revision. (See Fig. 389)

Step 6. Press the Enter button. The Firmware Version is displayed. (See Fig. 390) This sub-menu is read only and is changed automatically when you download later versions of the firmware. To download the latest firmware version go to the Hardy Instruments Web Site/HI 4050/Downloads. (See Firmware Installation in Chapter 3 for instructions on installing Firmware.)

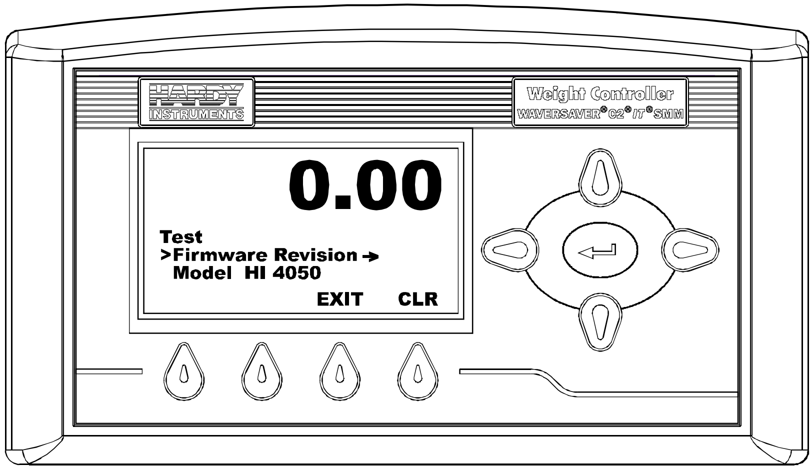


FIG. 389 TEST MENU/SELECTING FIRMWARE REVISION NUMBER

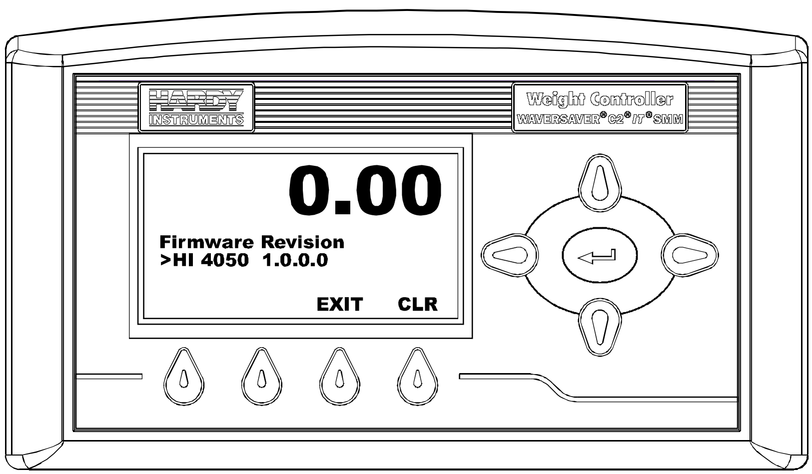


FIG. 390 FIRMWARE REVISION DISPLAY

Step 7. Press the Exit button to return to the Test Menu.

Step 8. To view the Model Number, press the down arrow button until the cursor is in front of Model. (See Fig. 391)

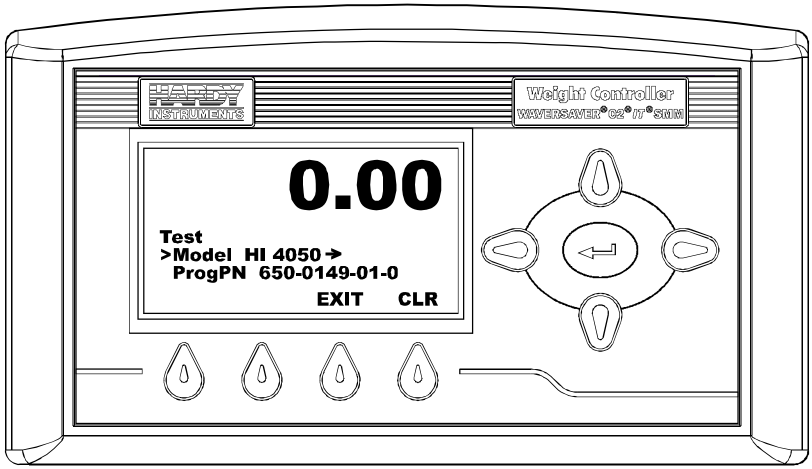


FIG. 391 TEST/VIEWING MODEL NUMBER

Step 9. To view the Program (Firmware) Part Number press the down arrow button until the cursor is in front of ProgPN. (See Fig. 392)

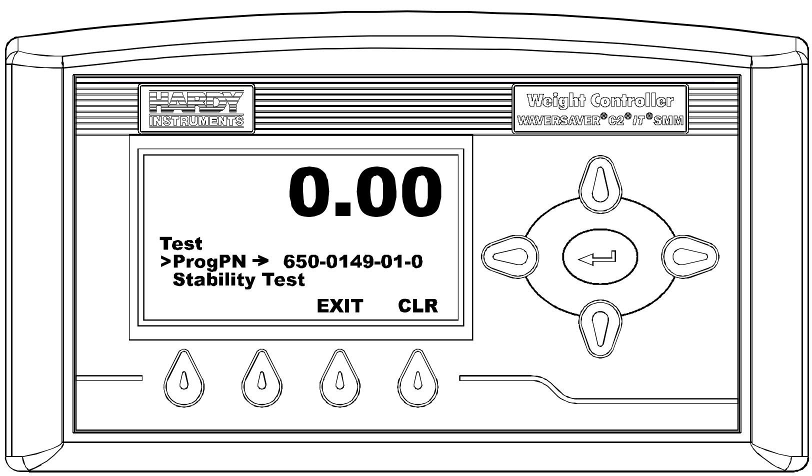


FIG. 392 TEST/VIEWING PROGRAM PART NUMBER

Step 10. To perform the Stability Test press the down arrow until the cursor is in front of Stability Test. (See Fig. 393)

Stability Test

The Stability Test switches a fixed signal into the analog to digital convertor, and calculates the mean squared variation from the average reading, using 100 samples.

The test passes if the mean squared variation is less than 5.0, and the average reading is between 30237 and 36955.

CAUTION: **Do not perform the Stability Test while in operation. The system is checking various elements in the system during the test and may weigh incorrectly.**

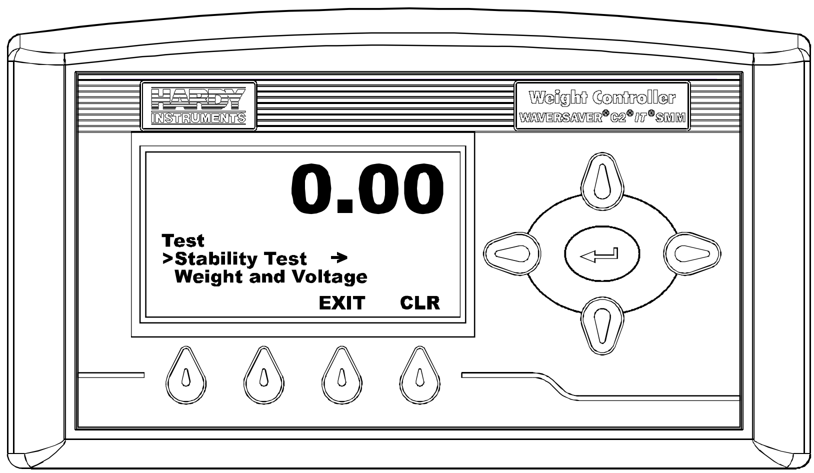


FIG. 393 TEST/SELECTING STABILITY TEST

Step 11. Press the Enter button. The instrument performs the test and displays the results. (See Fig. 394)

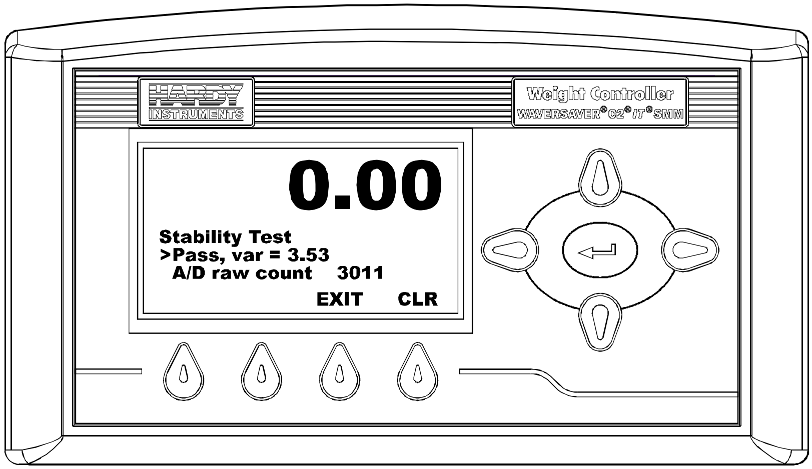


FIG. 394 STABILITY TEST/RESULTS

- If the test indicates “Pass” the instrument is stable. The variation is listed in the results of the test.
- If the test indicates “Fail” the instrument is unstable. (See Fig. 395) This means that the Mean Squared Variation is greater than 5.0 and/or the average reading is not between 30237 and 36955. This test examines the internal electronics and not the load cells input signal. Refer to the Troubleshooting Section if needed.

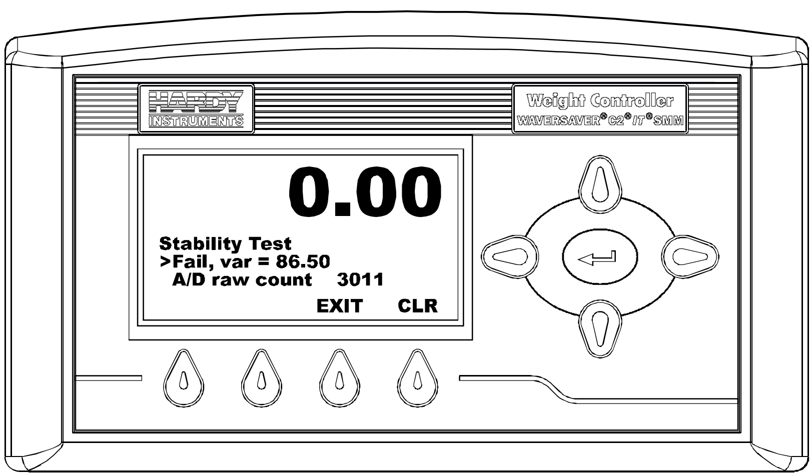


FIG. 395 STABILITY TEST/FAILED TEST

Step 12. To see the AD/Raw Count and the A/D Average press the down arrow button until the cursor is in front of A/D raw count. (See Fig. 396)

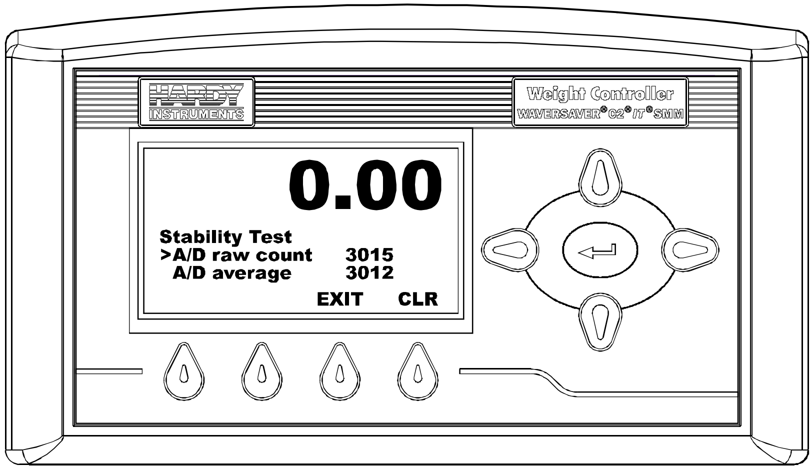


FIG. 396 STABILITY TEST/READING A/S RAW COUNT & AVERAGE

Step 13. Press the Exit button to return to the Test Menu.

Step 14. To perform the Weight and Voltage test for the system, press the down arrow until the cursor is in front of "Weight and Voltage". (See Fig. 397)

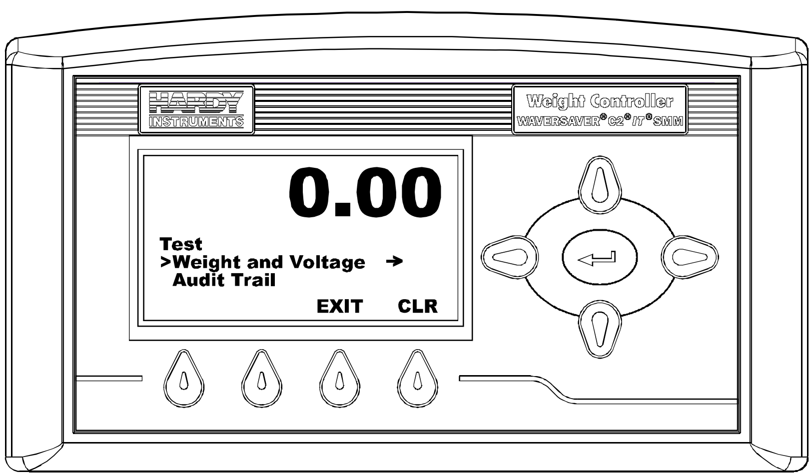


FIG. 397 TEST MENU/SELECTING WEIGHT AND VOLTAGE

Step 15. Press the Enter button to perform the test. The results appear. (See Fig. 398)

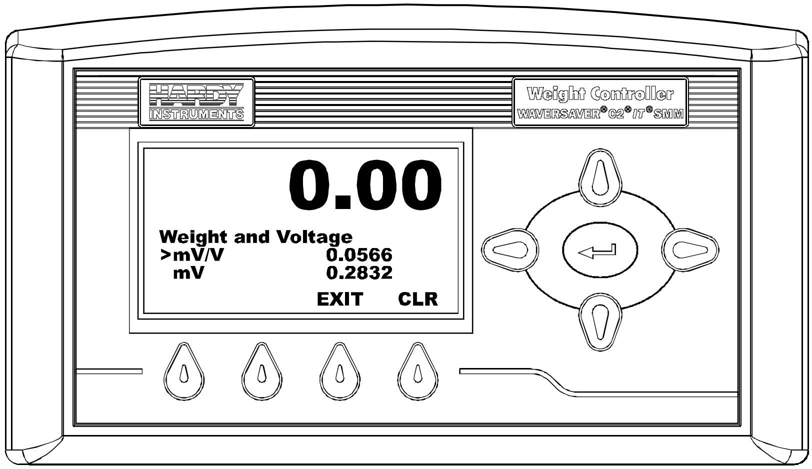


FIG. 398 WEIGHT AND VOLTAGE TEST/MV/V AND MV READING

Step 16. To read the rest of the results, press the down button. (See Figs. 399 & 400)

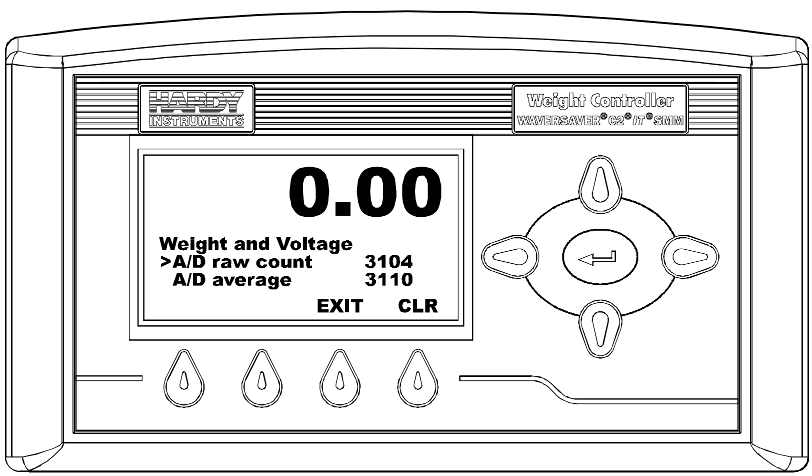


FIG. 399 WEIGHT AND VOLTAGE/READING RAW COUNTS AND AVERAGE

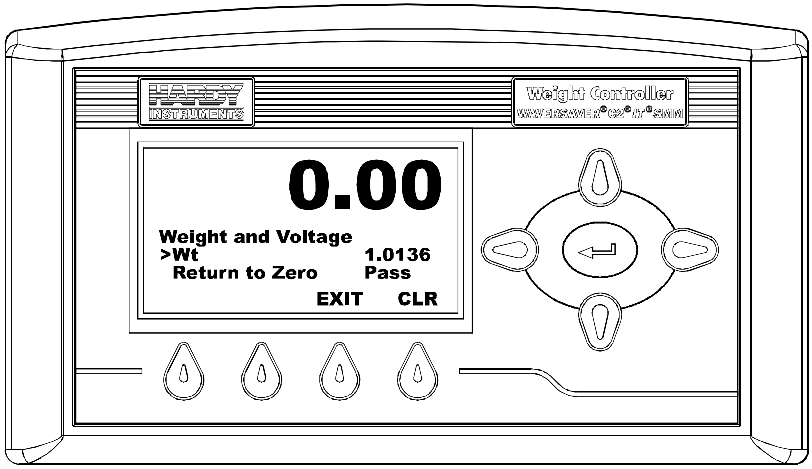


FIG. 400 WEIGHT AND VOLTAGE TEST/WEIGHT AND RETURN TO ZERO RESULTS

Return to Zero Test

The Return to Zero Test is used to determine whether the instrument returns to a starting zero point or not. If you pass the Return to Zero Test you are within the sum of the preset Motion and Zero Tolerance settings. If you fail you are outside the sum of the preset Motion and Zero Tolerance settings. If you Fail the test there may be too much build up on the scale and you need to clean the scale or you have scale problems. You should do this test whenever you cannot zero the scale.

- In the event that the Return to Zero test should fail. (See Fig. 401) Go to the E Flow Char - Non Return to Zero, to troubleshoot the system.

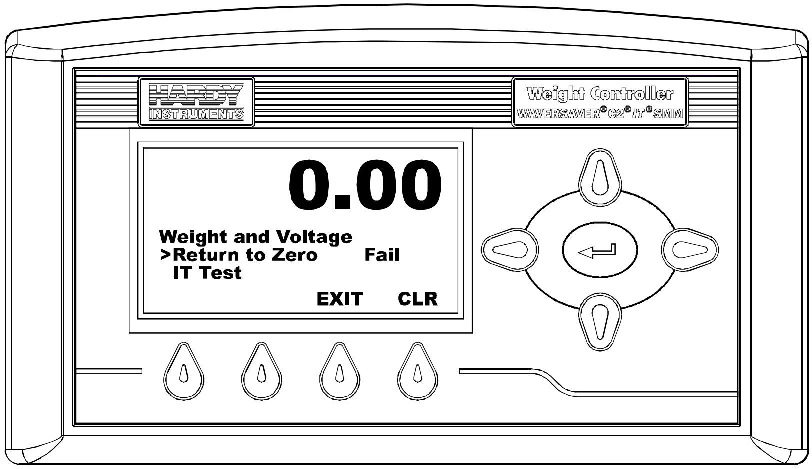


FIG. 401 RETURN TO ZERO/FAIL

Step 17. Press the down arrow button until the cursor is in front of IT Test.

INTEGRATED TECHNICIAN (IT®)

INTEGRATED TECHNICIAN (IT®) is a built-in system diagnostics utility that enables the operator to rapidly troubleshoot a weighing system from the front planner Web Page of the HI 4050. Used with an HI 215IT Junction Box you can read each individual load cell in mV, mV/V, and weight to determine if a load sensor is malfunctioning or not connected.

Using IT From the Front Panel

Step 1. With the cursor in front of "IT Test", press the Enter button. (See Fig. 402) The Sensor selector display appears with sensor 1 the default selection. (See Fig. 403)

NOTE *The Number for a Load Sensor are based on the connections in the IT Summing Junction box configuration. Check the installation sequence in the IT Junction Box to determine which load sensor is number 1, 2 and so on.*

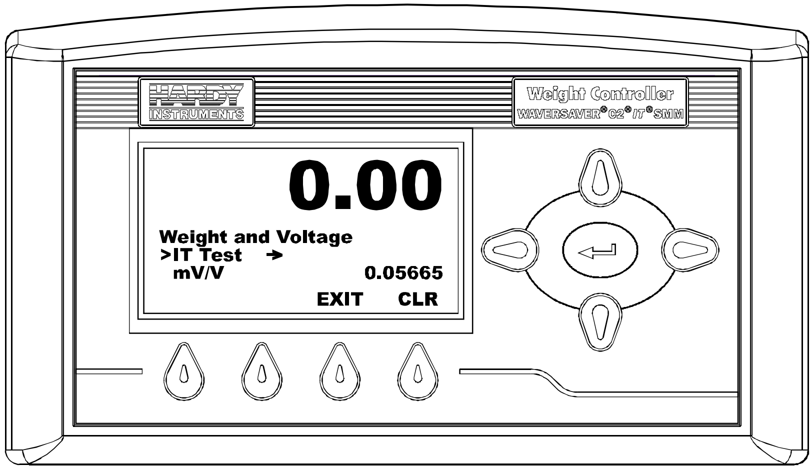


FIG. 402 SUMMARY DISPLAY/SELECTING SCALE NUMBER 1

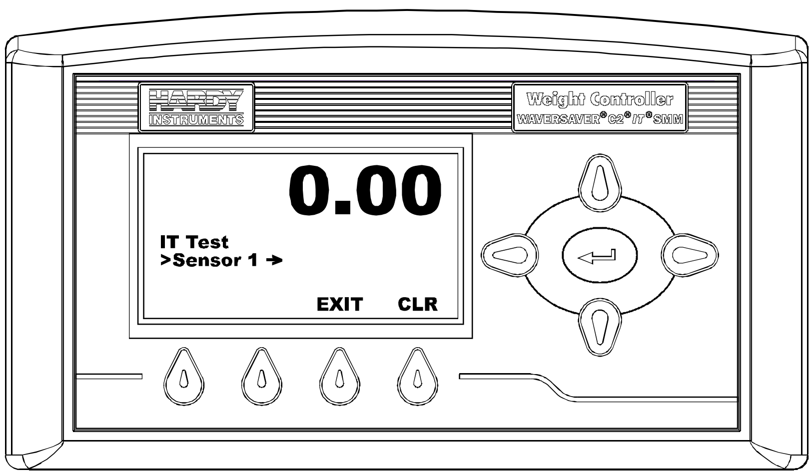


FIG. 403 IT TEST/SELECT SENSOR 1

Step 2. To select a Sensor use the up or down arrows to move through the list. In our example we want to look at Sensor number 1.

Step 3. Press the Enter button. The sensor IT Test results appears with the mV/V and weight displayed. (See Figs. 404 & 405)

Step 4. To read the mV or Return to Zero results press the down arrow button.

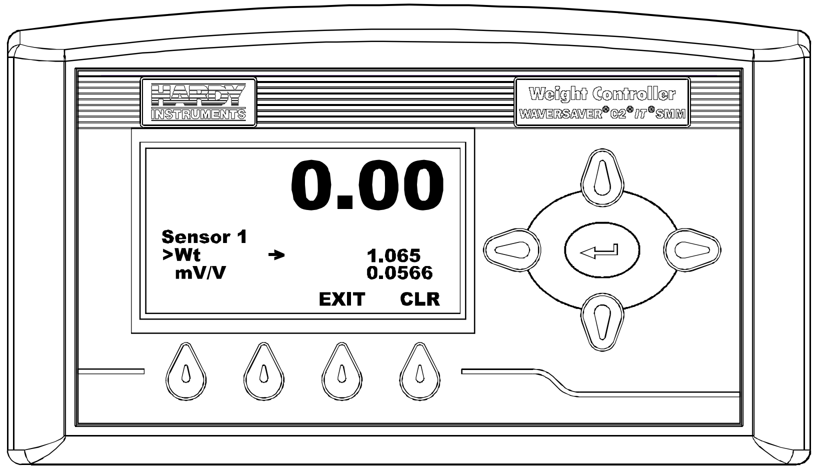


FIG. 404 SENSOR 1/IT TEST RESULTS

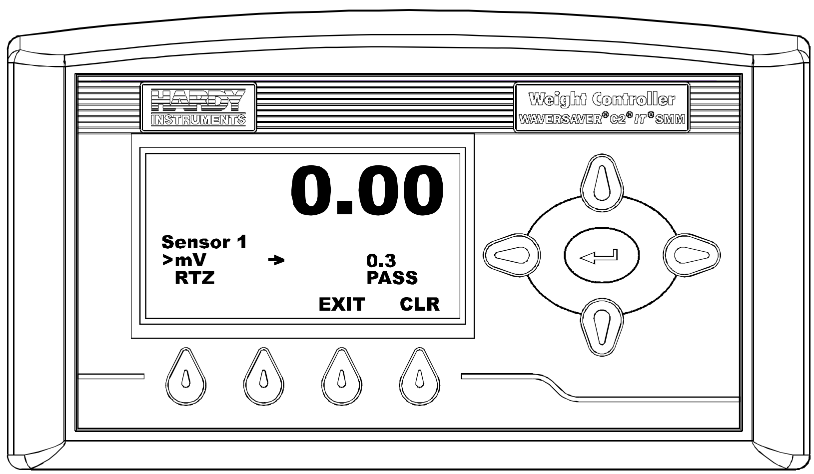


FIG. 405 SENSOR 1 MENU/SETTING MILLIVOLTS

Step 5. The IT Junction box enables you to read each individual load sensor's Millivolt/Volt Millivolt, Weight Reading and Return Zero test results.

- The mV reading is a coarser reading than the mV/V or Weight. The mV reading is sufficient to balance the corners of your scale or vessel.

- These readings allow you to determine if the problem is in the instrument (internal) or in a load sensor(s) (external). The specification range for the Weight Controller is 0-15 mV. If you are getting a reading outside this range (15.5 mV, 3.1 mV/V Maximum or any negative values) the problem is exterior to the Instrument (most likely improper wiring). If you are getting a reading between 0-15 mV the reading is normal.
- If all the load sensor readings are 0.00 mV there is something wrong between the HI 4050 and the HI 215IT Junction Box or with the Junction Box itself. The cable is disconnected or something is wrong with the Junction Box such that it is not transmitting the Millivolt readings to the HI 4050 Weight Controller.
- If you do not get a reading for one or possibly two or more load sensors (Sensor 3 for example reads 0.00 mV or the millivolt reading is either larger or smaller than it should be) and you know that the Load Sensors are connected to the Junction Box, the individual load sensor cable is disconnected from the junction box or the load sensor is malfunctioning.

Step 6. Press the Exit button to return to the Sensor Menu. If you want to test other load sensors select the sensor and repeat steps 1 through 5 above.

Step 7. Press the Exit button again to return to the It Test Menu.

Step 8. Press the Exit button again to return to the Test Menu. (See Fig. 406)

Audit Trail

The Audit Trail is a log of changes made to select parameters and calibration that are monitored for NTEP rated instruments. The Audit Trail lists the date and time and whatever transaction performed.

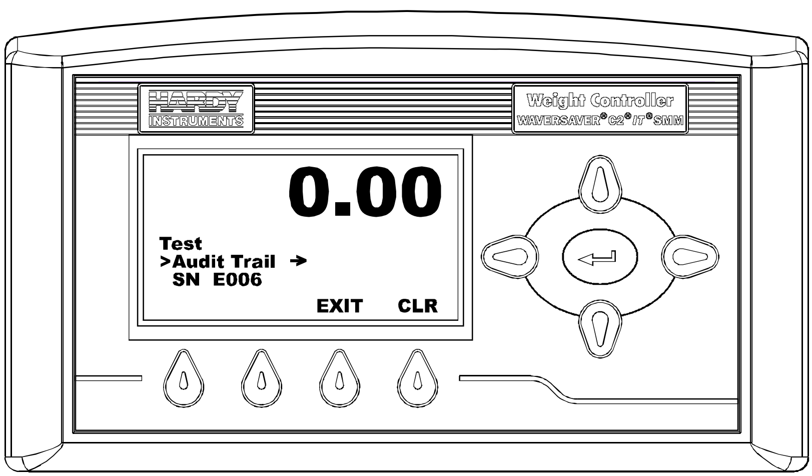


FIG. 406 TEST MENU/SELECTING AUDIT TRAIL

Step 1. To see the Audit Trail press the Enter button. The Audit Trail display appears with the time and date displayed. (See Figs. 407 & 408)

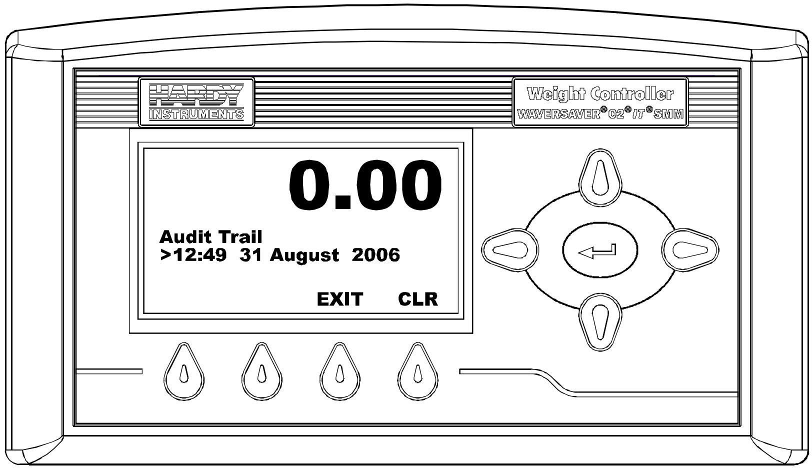


FIG. 407 AUDIT TRAIL/TIME AND DATE

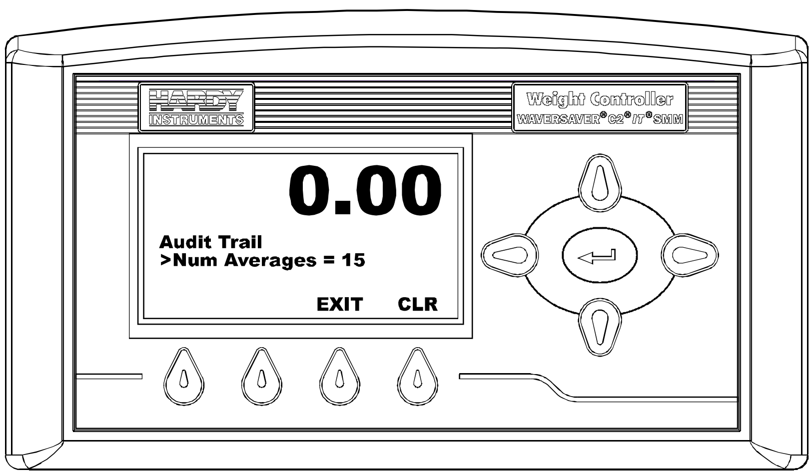


FIG. 408 AUDIT TRAIL/PARAMETER TRANSACTION

Step 2. To see the transaction press the down arrow button.

Step 3. To view the rest of the Audit Log press the up or down button.

Step 4. To return to the summary display press the exit button until the summary display appears.

System Integrity Check and Fault Determination from the Web Page

Diagnostics

Diagnostics is used to troubleshoot the Weight Controller. A complete Troubleshooting Guide is available in this Service Manual. What is important for Operational purposes is to be able to see the information about this instrument. Setting Default Settings is also useful to operators.

The Diagnostics menus enable the technician to get a more complete view of how the Weight Controller and scale are working. For example you can check to see the last Calibration, the type of calibration and when the last Calibration was performed. You can view the Serial Number assigned to the instrument or Program Part Number. You can also check the last graduation size, Units selected, Operator ID and more information about the configuration of the instrument you are checking. You can get information about each individual Load Sensor. The Diagnostic Menus allow you to perform a Stability Test which provides the total scale input to the instrument. The Weight and Voltage Test with INTEGRATED TECHNICIAN enables you to totally diagnose a weighing system to determine the source of a problem should one occur.

Using IT From the Web Browser

Step 1. From the Home Page click on Operation. (See Fig. 409) The Operation Choose One page appears. (See Fig. 410)

FIG. 409 HOME PAGE/SELECTING OPERATION

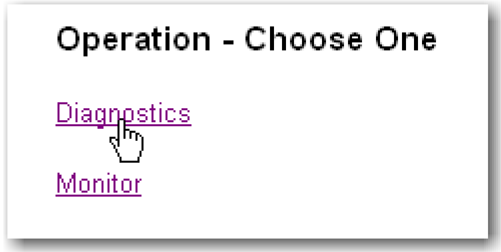


FIG. 410 OPERATION - CHOOSE ONE/SELECTING DIAGNOSTICS

Step 2. Click on Diagnostics. The Operation-Diagnostics Page appears. (See Figs. 411 & 412)

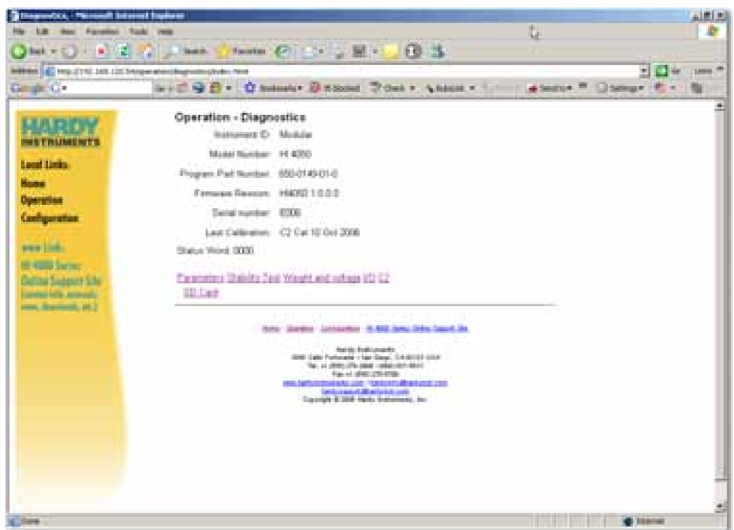


FIG. 411 OPERATION/DIAGNOSTICS

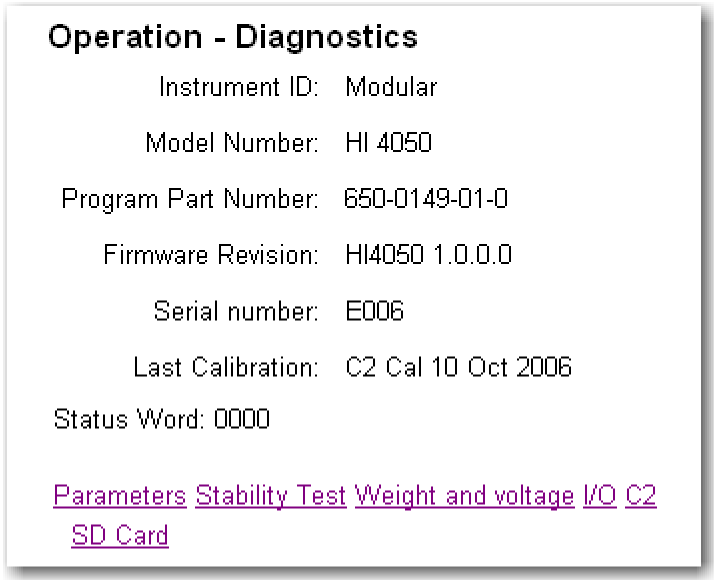


FIG. 412 OPERATION - DIAGNOSTICS

Step 3. The page lists the Instrument ID, Model Number, Program Part Number, Firmware Revision, Serial Number, Last Calibration and Status Word at a glance.

Step 4. To view all the parameter settings for this instrument, click on "Parameters" located at the bottom of the page. (See Fig. 413) The Parameter Dump appears. (See Fig. 414)

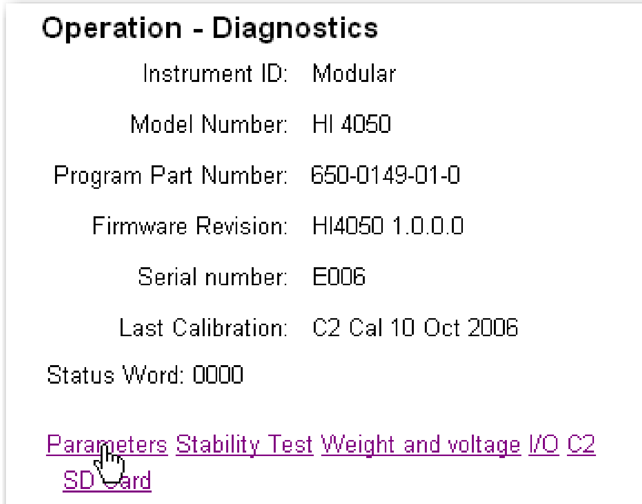


FIG. 413 DIAGNOSTICS/SELECTING PARAMETERS

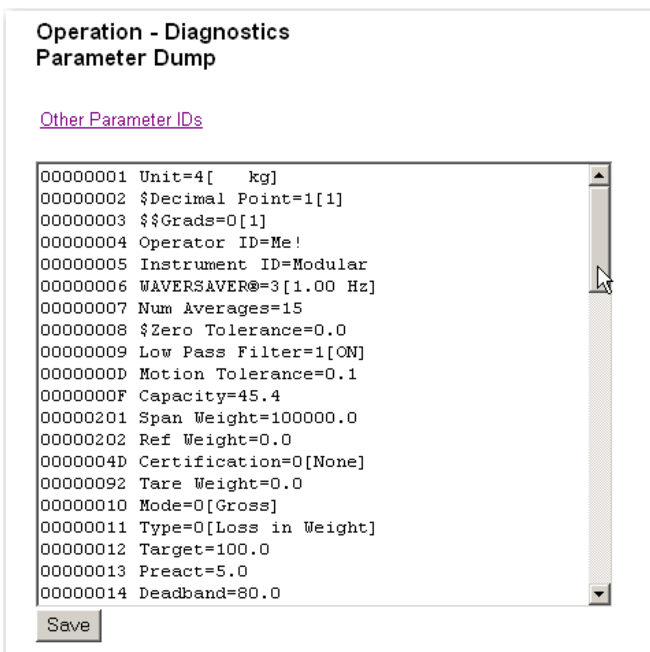


FIG. 414 DIAGNOSTICS/VIEWING PARAMETER SETTINGS

Step 5. To view all the parameter settings click and drag the scroll bar up or down on the right side of the list.

Step 6. To view the Command Interface Parameter IDs click on "Other Parameter IDs" above the Parameter list. (See Fig. 415)

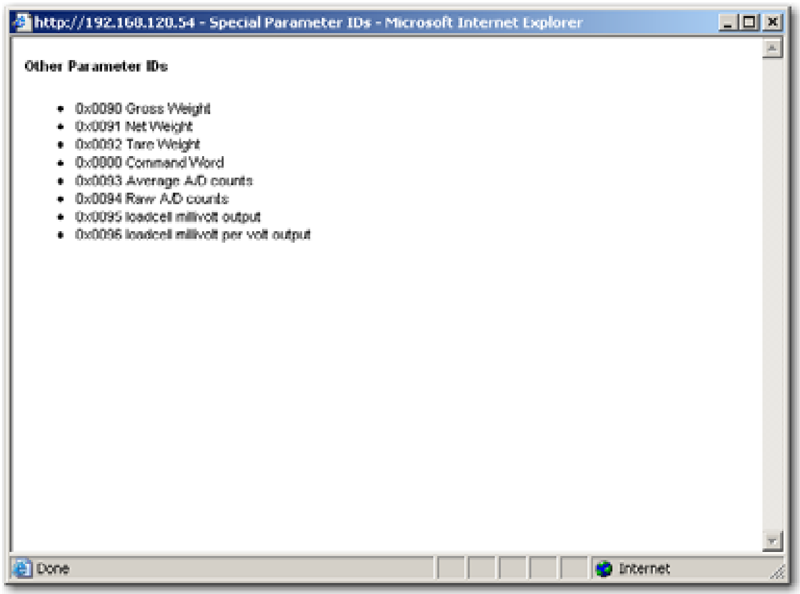


FIG. 415 COMMAND INTERFACE PARAMETER IDS

Step 7. If you want to duplicate the configuration of this HI 4050 in another HI 4050:

- Right click in the parameter list.
- Click on "Select All".
- Right click again.
- Click on Copy.
- Now go to the instrument you want to configure by entering the IP address of that instrument. The Home Page appears.
- Click on Operation.
- Click on Diagnostics.
- Click on Parameters.
- Right Click in the Parameter list.
- Click on "Select All".

- Right click again in the Parameter List.
- Click on paste to replace the existing parameter settings with the parameters settings of the instrument you copied.
- You now have an exact duplicate of the preconfigured instrument.
- If you need to make any modifications to the parameter settings go to Chapter 4 - Configuration for more instructions.

Step 8. To perform the Stability Test, click on Stability Test at the bottom of the page. (See Fig. 416) The instrument performs the Stability Test and post the results in a few seconds. (See Fig. 417)

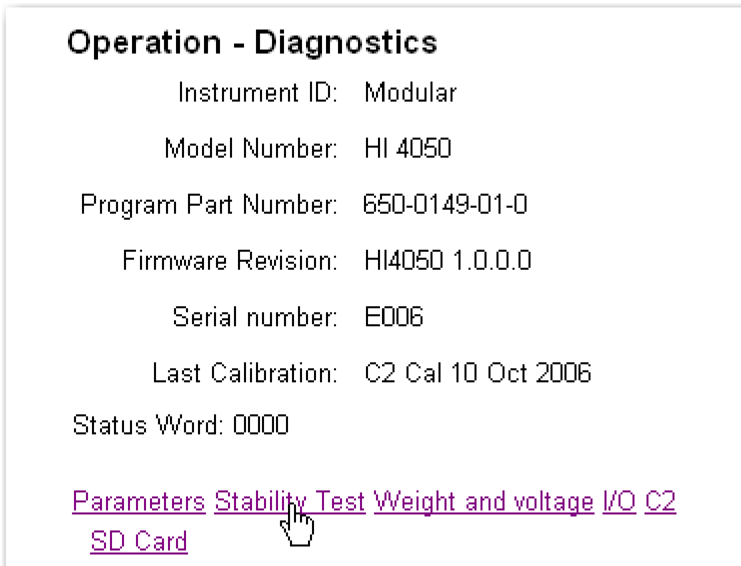


FIG. 416 DIAGNOSTICS/SELECTING STABILITY TEST

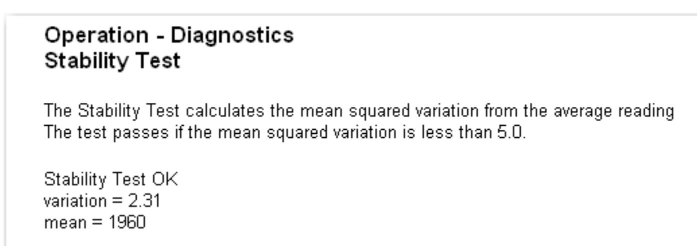


FIG. 417 DIAGNOSTICS/STABILITY TEST RESULTS/OK

- If the weighing system passes the stability test the results read OK, with the variation and mean results posted as well.
- If the test indicates “Fail” the instrument is unstable. (See Fig. 418) This means that the Mean Squared Variation is greater than 5.0 and/or the average reading is not between 30237 and 36955. This test examines the internal electronics and not the load cells input signal.

Step 9. Go to the Troubleshooting Flow Charts Section.

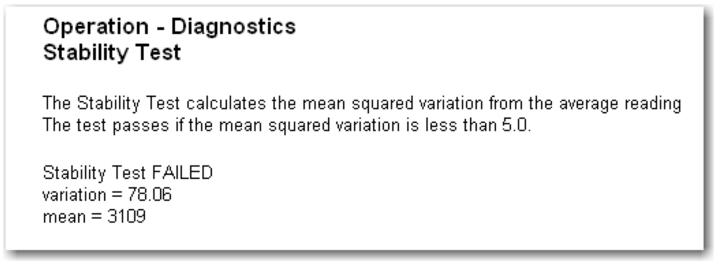


FIG. 418 DIAGNOSTICS/STABILITY TEST RESULTS

Step 10. Click on Weight and Voltage. (See Fig. 419) The Operation/Diagnostics - Weight & Voltage page appears. (See Fig. 420)

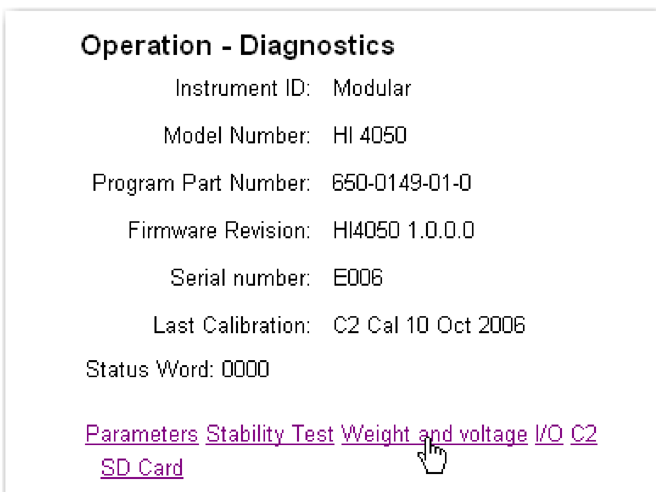


FIG. 419 OPERATION - DIAGNOSTICS/SELECTING WEIGHT AND VOLTAGE

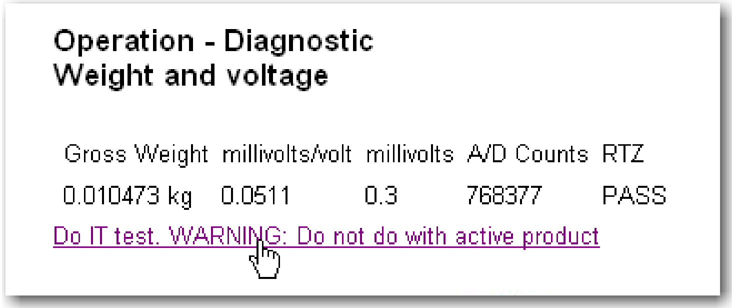


FIG. 420 WEIGHT AND VOLTAGE/PASSED/SELECTING IT TEST

Step 11. To view individual load sensor data click on "Do IT Test". The IT Test results appear. (See Fig. 421) If there were two (2), three (3) or four (4) load sensors connected to the IT Junction box all connected load sensor results appear.

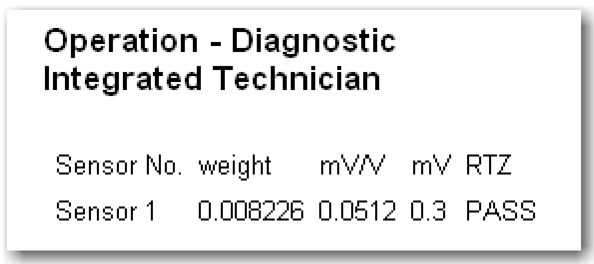


FIG. 421 IT TEST/SENSOR 1 RESULTS

NOTE *The IT Web page shows all the Weight and Voltage values at once. So if you want to save time use the Web Browser IT page for troubleshooting.*

- The mV reading is a coarser reading than the mV/V or Weight readings. The mV reading is sufficient to balance the corners of your scale or vessel.
- These readings allow you to determine if the problem is in the instrument (internal) or in a load sensor(s) (external). The specification range for the Weight Controller is 0-15 mV. If you are getting a reading outside this range (15.5 mV, 3.1 mV/V Maximum or any negative values) the problem is exterior to the Instrument (most likely improper wiring). If you are getting a reading between 0-15 mV the reading is normal.

Step 12.Check the results:

- If all the load sensor readings are 0.00 there is something wrong between the HI 4050 and the HI 215IT Junction Box or with the Junction Box itself. The cable is disconnected or something is wrong with the Junction Box such that it is not transmitting the readings to the HI 4050 Weight Controller.
- If you do not get a reading for one or possibly two or more load sensors (Sensor 3 for example reads 0.00 or the reading is either larger or smaller than it should be) and you know that the Load Sensors are connected to the Junction Box, the individual load sensor cable is disconnected from the junction box or the load sensor is malfunctioning.

Step 13. To return to the Diagnostics page click on the back arrow.

Checking Inputs and Optional Outputs

NOTE *Outputs are an option.*

You can check to see which inputs or outputs are operating by clicking on I/O.

Step 1. Click on "I/O" at the bottom of the page. (See Fig. 422) The Input and Output page appears. (See fig. 423)

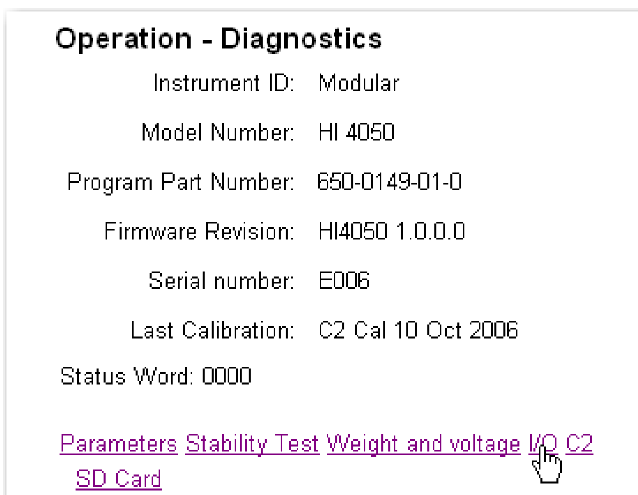


FIG. 422 DIAGNOSTICS/SELECTING I/O

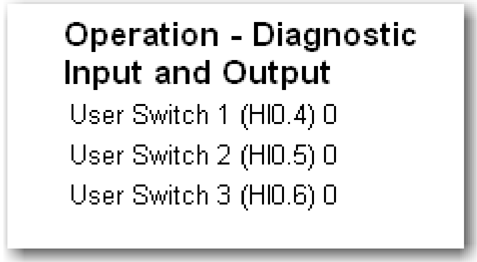


FIG. 423 INPUT AND OUTPUT PAGE LISTING INPUTS

Step 2. If an Input or Output is in use the I/O reads 1.

Step 3. If an Input or Output is not in use the I/O reads 0. In our example none of the inputs (User Switches) are being used so they all read 0.

Step 4. To return to the Diagnostics page click on the back arrow.

Viewing System C2 Load Sensors

To check the C2 Load Sensors that are being used in the Weighing System click on “C2” at the bottom of the page. The C2 Sensor page tells you how many C2 load cells are used and which C2 version, Serial Number, Output Resistance, Output Voltage and Capacity of the load sensor. The Read Sensor button allows you to read this information for every C2 load sensor that is installed in the system. When you press the Read Sensor button it receives the information from the first load sensor to respond. The serial number is important if you need to contact Hardy Instruments Technical Support. You do not need an IT summing box.

Step 1. Click on “C2” at the bottom of the page. (See Fig. 424) The C2 Data page appears listing the number of C2 load sensors that are found in the weighing system. (See Fig. 425) In our example there is only one (1) C2 load sensor found.

- If there are no C2 load sensors installed on this system the “C2 Sensors Found” reads 0”.

NOTE *The information on this page is C2 load sensor data only. It does not refer to any position on the IT Junction box nor does it tell you the operating condition of the load sensor. To determine the condition of a load cell and its position you must go to Weight and Voltage/IT Test.*

Step 2. To return to the Diagnostics page click on the back arrow.

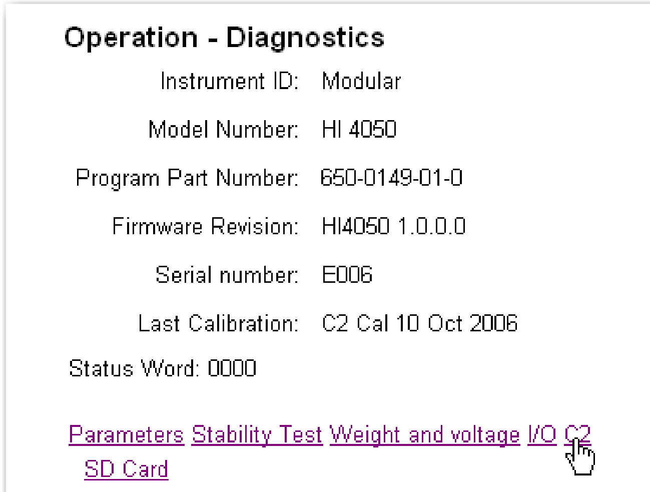


FIG. 424 DIAGNOSTICS/SELECTING C2

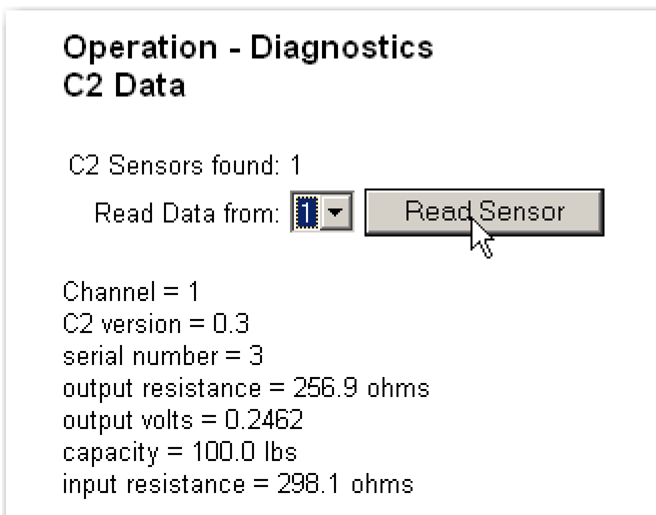


FIG. 425 DIAGNOSTICS/C2 DATA PAGE

Step 3. Click on the "Read Data from:" pull down list.

Step 4. Click on the C2 load sensor you want to view. In our example we selected Sensor 1.

Step 5. Click on the back arrow to return to the Diagnostics page.

Viewing the SMM-SD Card

If your computer is equipped with an SD card reader you can read and modify the contents of the base (PARAMS.TXT) files.

Step 1. Click on “SD Card”. (See Fig. 426) The SD Card page appears indicating the Write Protect status and listing the base directory with the files where the non-volatile memory is located for the HI 4050. (See Fig. 427)

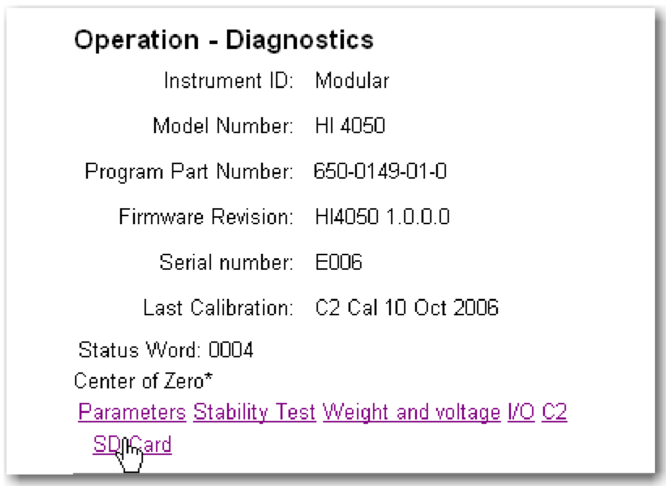


FIG. 426 DIAGNOSTICS/SELECTING SD CARD

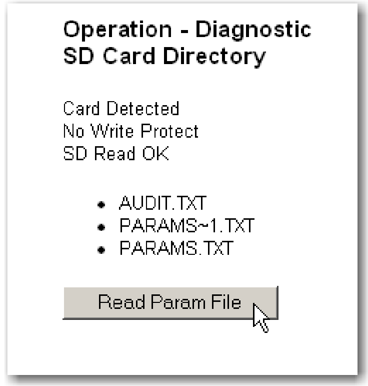


FIG. 427 SD CARD DIRECTORY/READ PARAM FILE

Overview of Typical Load Cell System

Step 1. The typical system consists of one or more load cells/points, a summing junction box, and an HI 4050 Weight Controller. (See Figure 428).

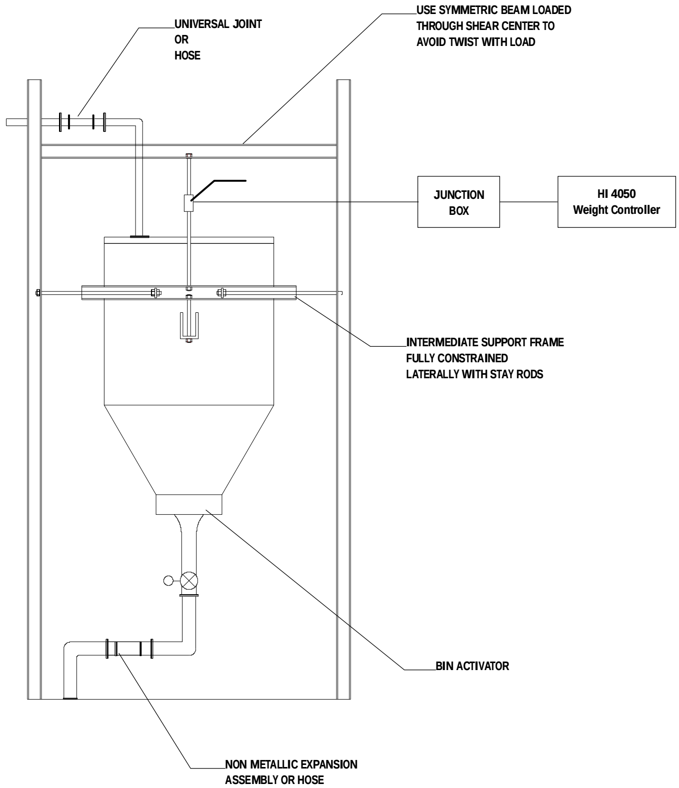


FIG. 428 TYPICAL LOAD CELL SYSTEM

- Load Cell/Sensor/Point - is a strain gauge based force transducer, which generates an electrical signal proportional to the load applied to the scale. Load cells/points can be used any place a person needs to measure pressure, load, or torque. This can be accomplished by either Tension or Compression type load cells/points. The load cell/point takes as an input the 5 volts DC Excitation Voltage generated by the HI 4050, and depending upon how much weight is applied to the scale, generates a millivolt output (proportional to the weight, 0-10mv DC for 2mv/V load cells/points or 0-15mv DC for 3mv/V load cells/points).
- Weight Controller - is part of the HI 4050 instrument which, among other functions, is used to power the load cell(s)/point(s), take the millivolt signal output from the load cell(s)/point(s), and digitize, interpret, communicate and display the results as a weight indication.

Troubleshooting The Network Connections and Configuration with the "Ping" Tool

Step 1. The Ping Tool is used from the root directory of the PC. Get to the Root directory. The Root Directory is the “C:/” Prompt.

Step 2. If you do not know how to get to the Root Directory, check your Operating System User Guide or Manual for information on how to get to the root directory.

Selecting the module by number for Testing

NOTE *You can only ping from the PC you cannot ping from an instrument.*

Step 1. Type PING <space>IP address of the instrument you want to test. For Example:

C:/PING 192.168.110.99

- In our example we used the default address for all HI4050 Series Instruments. The IP address you are testing will be different.

Step 2. Press the Enter key on the PC.

Step 3. The PING utility starts sending out a packet to a specified address and gets a reply if the unit is functioning correctly.

- If the instrument or network are configured incorrectly and cables are loose or not connected correctly, nothing prints out after the first line. Do the following:

1. Check the Network cables and connectors to be sure they are tightly fastened and the correct cables for this application.
2. Check the configuration to be sure that the instrument is configured correctly. (See Configuration IP Address in Chapter 4)

- If the unit is configured correctly and Ethernet functioning correctly and the cables are the correct ones for this application and are securely fastened, 64 signals should be returned and the print out will reflect this fact.

NOTE *The Ping utility continues to send out packets (pings) until you exit the Ping Tool.*

- Simultaneously press the <Ctrl> key and the letter <C> key to stop the signals.

Exiting the Root Directory

Step 1. Type exit at the root directory prompt.

C:/exit

Step 2.   Press the Enter key.

General Policies and Information

With over 70 years of industrial weighing experience and products in the field, Hardy Instruments continues to design, manufacture, install and support Hardy products worldwide. The following paragraphs describe Hardy's customer support services and equipment warranty.

NOTE *Before returning any product to Hardy Instruments, call the Technical Service Department listed below for a Return Authorization Number. Have your company name, address, telephone number, equipment model number, S/N, and a brief description of the problem ready to give to him. In addition, please have Appendix A completed and ready to FAX to us before calling. For all non-warranty repairs a purchase order or credit card information is required.*

FOR FURTHER INFORMATION CONTACT:

North America:

Technical Service Manager
Hardy Instruments, Inc.
3860 Calle Fortunada, San Diego, CA 92123-1825
Telephone: (858) 278-2900
FAX: (858) 278-6700
Web Site: http://www.hardyinst.com
E-Mail: hardysupport@hardyinst.com

Europe:

B+L Industrial Measurements
Hans-Bunte-Strasse 8-10
D- 69123 Heidelberg
Tel: +49-622-177-2277
Fax: +49-622-170-7325
Web Site: http://www..BL-IM.de
E-Mail: info@BL-IM.de

Asia/Pacific

ABTEC ELECTRONICA
273 THOMSON RD.#04-01
SINGAPORE, 307644
TEL: +65 6258 9218
FAX: +65 6251 0353

E-Mail: hardy@abtec-abk.com

Ordering Replacement Parts

Contact the Hardy Instruments Sales Department to order replacement parts and option boards. Have your equipment model number and serial number ready.

System Support (Requires Purchase Order or Credit Card)

Technical Service is provided as follows:

- New system start-up: Ensure that the installation is checked and correct; instruments are calibrated, and operators trained.

1. Service: Engineers are trained and qualified to provide on-site installation, calibration, and maintenance.
2. On-site training: A Hardy Support Representative can be scheduled to train your operations and maintenance personnel. This can be as simple as basic load cell theory or as complete as troubleshooting techniques which allow you to service your equipment.

Warranty

A warranty problem may be handled by returning the product to the factory for repair or replacement under warranty. In the event you experience a problem with this instrument contact your local Hardy Representative or the Hardy Instruments Service Center to determine if the problem is covered under warranty.

HARDY
HI 4050
User's Guide

Appendix A
About Timezones

Greenwich Mean Time

There are 25 integer World Time Zones from -12 through 0 (GMT) to +12. Each one is 15° of longitude as measured East and West from the Prime Meridian of the World which is at Greenwich, England. Some countries have adopted non-standard time zones, usually a 30 minute offset.

Each Time Zone is measured relative to Greenwich, England. Civilian designations are typically three letter abbreviations (e.g. EST) for most time zones. Below is a list of the abbreviated time zones with the GMT time adjustment.

GMT	Civilian Time Zones	Cities
GMT	GMT: Greenwich Mean UT: Universal UTC: Universal Co-ordinated WET: Western Europe	London, England Dublin, Ireland Edinburgh, Scotland Reykjavik, Iceland Casablanca, Morocco
	EAST OF GREENWICH	
+1	CET: Central Europe	Paris, France Berlin, Germany Amsterdam, Holland Brussels, Belgium Vienna, Austria Madrid, Spain Rome, Italy Bern, Switzerland Oslo, Norway

GREENWICH TIME ZONES (GMT)

GMT	Civilian Time Zones	Cities
+2	EET: Eastern Europe	Athens, Greece Helsinki, Finland Istanbul, Turkey Jerusalem, Israel Harare, Zimbabwe
+3	BT: Baghdad	Kuwait Nairobi, Kenya Riyadh, Saudi Arabia Moscow, Russia
+3:30		Tehran, Iran
+4		Abu Dhabi, UAE Muscat Tblisi Volgograd Kabul
+4:30		Afghanistan
+5		
+5:30		India
+6		
+6:30		Cocos Islands
+7		
+8	CCT: China Coast	Shanghai, China Hong Kong, China Beijing, China
+9	JST: Japan Standard	Tokyo, Japan Osaka, Japan Taipei, Taiwan
+9:30	Australian Central Standard	Darwin, Australia Adelaide, Australia
+10	GST: Guam Standard	
+10:30		Lord Howe Island
+11		
+11:30		Norfolk Island
+12	IDLE: International Date Line East NZST: New Zealand Standard	Wellington, NZ Fiji Marshall Islands

GREENWICH TIME ZONES (GMT)

GMT	Civilian Time Zones	Cities
+13		Rawaki Islands
+14		Line Islands
	WEST OF GREENWICH	
-1	WAT: West Africa	Azores Cape Verde Islands
-2	AT: Azores	
-3		Brasilia, Brazil Buenos Aires, Argentina Georgetown, Guyana
-3:30		Newfoundland
-4	AST: Atlantic Standard	Caracas, Venezuela La Paz
-5	EST: Eastern Standard	Bogota, Colombia Lima, Peru New York, NY, USA
-6	CST: Central Standard	Chicago, Illinois, USA Mexico City, Mexico Saskatchewan, Canada
-7	MST: Mountain Standard	Phoenix, Arizona Denver, Colorado
-8	PST: Pacific Standard	Seattle, Washington Portland, Oregon San Francisco, CA
-9	AHST: Alaska-Hawaii Standard CAT: Central Alaska HST: Hawaii Standard	Anchorage, Alaska Honolulu, Hawaii
-11	NT: Nome	Nome, Alaska
-12	IDLW: International Date Line West	

GREENWICH TIME ZONES (GMT)

Step 1. Check the Greenwich Time Zones Table for the time zone you are in.

Step 2. Press the right or left arrow until the correct time zone appears. For example Pacific Standard Time is -8.

Step 3. Press the Enter button to save the entry.

Step 4. Press the Down arrow until the cursor is in front of Time-Year. (See Fig. 73)

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Hardy Instruments Document Number: 0596-0303-01 REV J