

User Manual

DigiMano 2500 Series



Pressure / Vacuum - Dual Port Model



Pressure / Vacuum - Single Port Model

Netech Corporation www.PressureMeter.com

Manual P/N DigiMano User-manual, Rev 3/19/2014

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Warranty

Netech warrants the DIGIMANO 2500 against defects in materials and workmanship for one year from the date of the original purchase. The standard warranty is extended for a second year if the instrument is returned to Netech for its recommended yearly recalibration.

During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product shipping prepaid to Netech Corporation. Only serialized products are covered under this warranty.

This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than Netech Corporation, or if its serial number is defaced or removed.

Netech reserves the right to discontinue the DIGIMANO 2500 at any time and change its specifications, price, or design without notice and without incurring any obligation. Netech guarantees the availability of service parts for 5 years after the manufacture of the unit is discontinued.

The warranty is void if you elect to have the unit serviced and/or calibrated by someone other than Netech Corporation.

The warranty covering your product becomes void when the tamper-resistant Quality Seal is removed or broken without proper factory authorization.

We strongly recommend, therefore, that you send your instrument to Netech Corporation for factory service and calibration, especially during the original warranty period.

The purchaser assumes all liability for any damages or bodily injury, which may result from the use or misuse of the unit by the purchaser, his employees, agents, or customers.

In no event shall Netech Corporation be liable for consequential damages.

Warranty Registration

Please register to receive special offers, free software updates, and more. Plus, you will qualify for exclusive complimentary benefits that vary by region. Any failure to complete and submit this registration will not diminish your rights found in the limited warranty that accompanied your product at purchase.

Notices

Patents / Copyright

Copyright © 2014 by Netech Corporation. All rights reserved. No part of this publication may be reproduced or transmitted in any form other than for the purchaser's personal use without written permission from Netech Corporation.

Trademarks

Netech and DIGIMANO are trademarks of Netech Corporation. Any other trademark names used in this manual are only for editorial purposes and the benefit of the respective trademark owner with no intention of improperly using that trademark.

Quality Assurance

Netech is ISO 9001-2015 Certified. This instrument was thoroughly tested and inspected according to Netech's ISO 9001-2015 quality standards and test procedures and found to meet those specifications when it was shipped from the factory.

Calibration

DigiMano 2500 is calibrated using standards traceable to the National Institute of Standards and Technology (NIST) and the unit is shipped with a calibration certificate.

Safety Considerations

This manual contains operating and safety instructions for safe operation and how to maintain the equipment in safe condition. The safety instructions are either warnings or cautions to protect the user and the equipment from injury or damage. Do not use this equipment for any other purpose than stated.

Returns and Credits

Please note that only serialized products and their accessory items (i.e., products and items bearing a distinct serial number tag) are eligible for partial refund and/or credit. Non-serialized parts and accessory items (e.g., cables, carrying cases, auxiliary modules, etc.) are not eligible for return or refund. Only products returned within 60 days from the date of original purchase are eligible for refund/credit.

To receive a partial refund/credit of a product purchase price on a serialized product, the product must not have been damaged by the customer or by the carrier chosen by the customer to return the goods, and the product must be returned complete



with all manuals, cables, accessories, etc., and in "as new" and resalable condition.

Products not returned within 60 days of purchase, or products, that are not in "as new", and resalable condition, are not eligible for credit return and will be returned to the customer. The Return Procedure (see below) must be followed to ensure prompt refund/credit.

Restocking Charges

Products returned within 30 days of the original purchase are subject to a minimum restocking fee of 15 %. Products returned more than 30 days after purchase, but prior to 60 days, are subject to a minimum restocking fee of 20 %. Additional charges for damage and/or missing parts and accessories will be applied to all returns.

Return Procedure

All items being returned (including all warranty-claim shipments) must be sent freight prepaid to our factory location. When you return an instrument to Netech Corporation, we recommend using United Parcel Service, Federal Express, DHL, or Air Parcel Post. We also recommend that you insure your shipment for its actual replacement cost. Netech Corporation will not be responsible for lost shipments or instruments that are received in damaged condition due to improper packaging or handling. Use the original carton and packaging material for shipment.

Returns for Refund / Credit

A Return Material Authorization (RMA) number must be obtained from our service or customer service dept before a product is returned for refund or credit. The RMA number should be clearly marked on the package along with a statement indicating the reason for the return.

Repair and Calibration

Products returned for repair or recalibration must obtain an RMA (Return Material Authorization) from our service department after completing a service request form our website http://www.netechcorporation.com/repair.php or contact:

Netech Corporation Service Dept. 110 Toledo Street New York, 11735

Email: Service@NetechCorporation.com

Models and Part Numbers

(Pressure and Vacuum Measurement –Dual Port)

| Part Number | Description |
|-------------|--|
| 250-2 PSI | -2 PSI Vacuum (Port 2) - 2 PSI Pressure (Port 1) |
| 250-10 PSI | -10 PSI Vacuum (Port 2) - 10 PSI Pressure (Port 1) |
| 250-25 PSI | -14 PSI Vacuum (Port 2) – 25 PSI Pressure (Port 1) |

Pressure /Vacuum Measurement - Single Port

| Part Number | Description |
|---------------|-------------------------|
| 250-60 PSI | -14 to 60 PSI Pressure |
| 250-100 PSI | -14 to 100 PSI Pressure |
| 250- 150 PSI | -14 to 150PSI Pressure |
| 250 – 200 PSI | -14 to 200 PSI Pressure |

Standard Accessories

The following standard accessories are included with each unit

| Part Number | Description |
|-------------------|--------------------------------------|
| 250-CASE | Die cut - Hard caring Case |
| 250- Quick-Con | Quick Connect (for Dual Port Models) |
| 250- PL-383562-3S | Polymer Li-Ion Battery Charger |
| 250-USER-MANUAL | User Manual CD |

Optional Accessories

Various optional Accessories including universal connector kits are available. Contact factory for part numbers.



General Overview

Introduction

DigiMano 2500 is a versatile, high-performance, microcontroller –based, pressure /vacuum meter. The precision instrument is designed for use in numerous laboratory, medical, and industrial applications involving testing and calibration of pneumatic systems.

DigiMano 2500 is compatible with a wide range of gases and fluids. It is housed in a rugged aluminum case with a sealed membrane keypad. The built-in serial port, real-time clock, dual relay control outputs (optional), real-time Data output, and internal Data storage memory, are ideal for industrial process control as well as automated pressure calibration and pressure control applications.

DigiMano 2500 is available in two different models, Dual port Pressure / Vacuum measurement model as well as Single port pressure /Vacuum model. (Refer to the Chart for Part Numbers and pressure ranges)

Features:

- Large Graphics Display
- High Accuracy 0.05% (0.1% Dual Port models)
- Menu-driven and user friendly
- Non-Corrosive Fluid & Gas
- User-selectable Engineering Units
- Peak Pressure Reading
- RS 232 Communication Port
- User selectable capture rate for real-time Data Out Put
- Real Time Clock
- Data storage and export records capability
- Rugged Aluminum Case
- Sealed Membrane Switches
- Rechargeable Li-Ion Polymer Battery
- Optional Pressure control dual Relay Output.

Specifications:

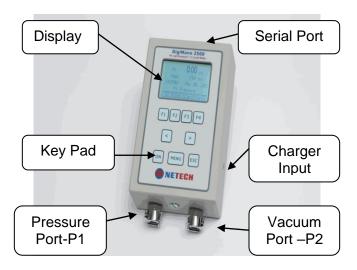
Display: Graphics: 128 x 64 LCD Model Types: Pressure/Vacuum and Gauge Pressure Models Pressure Ranges available: Form 2 PSI to 200 PSI Accuracy: Dual Port Models:.................................. 0.1 % full range, +/- 1 count. Accuracy: Single Port Models: 0.1% - 0.25% full range, +/- 1 count. (Includes combined effects of linearity, repeatability, hysteresis, and temperature). Zero Drift:+/- 0.015% of full scale Zeroing before measurement eliminates this effect. Media Compatibility:..... Non-corrosive fluids and gases. Media Compatibility (Port 2):..... Air (Pressure / Vacuum Models) Pressure Connection:Quick Connect (Pressure / Vacuum – Dual Port Models only) Power:Li-lon Polymer Battery & Charger Li-Iron Battery capacity800 mAh Hours of operation (after full Charge) 12 Hours Continuous Physical Dimensions: Size: 4.75 X 2.5 X 1.5 in



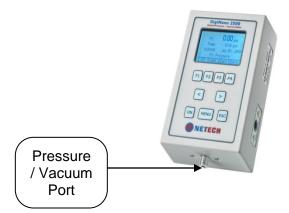
Getting Familiar with the unit

Before getting started, please read the manual and get familiar with the controls and operation. This manual covers both the dual port Models and Single port models. The operation of both Models is identical except for the setup for measuring vacuum.

Display and Keypad



Pressure / Vacuum Model - Dual Port



Pressure/Vacuum Model - Single Port

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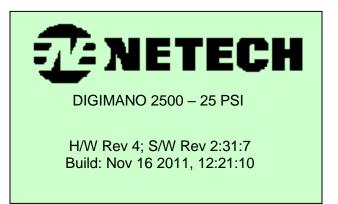
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Menu Descriptions

On power up the display shows the Model of the unit, the pressure range, software version, build number and the date. The display remains on for about 5 seconds and switch to the main menu as shown below.

All the screen shots shown are representation only.

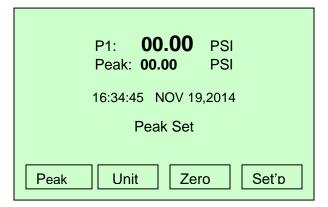
Power up Display



Main Menu

In the main menu, the top line shows the pressure value in large digits and the measurement unit in small characters. The second line shows the peak pressure value. The third line shows the time, date and the year. At the bottom there are four square boxes with texts such as "Peak", "Unit", "Zero", "Setup "respectively. These are the interactive menu selections that are activated by pressing corresponding keys F1, F2, F3, F4.

Main Menu Display





Menu Functions:

Peak: This indicates the peak capture function. The default setting is Peak set and the peak reading is displayed. By pressing F1 the previous peak reading is reset and a new Peak reading is captured and displayed.

Unit: Pressing F2 will set the unit selected. There are 10 engineering units available for selection. These are 'atm', 'kg/cm2', 'inHg', 'inH2O', 'psi', 'mbar', 'mmH2O', 'mmHg', 'cmH2O' and 'kPa'.

The unit selected will be saved to the memory before power down as the default value on the next power-up. This function is useful when dealing with only one engineering unit.

Zero: Pressing F3 will set the reference pressure to zero. Before setting the zero-reference pressure, all pressure sources should be disconnected from the unit. This is useful if the zero pressure reading changes due to atmospheric pressure variations and sudden changes in operating temperature.

Setup: Pressing F4 will toggle the display to the setup menu. There are four selections similar to the main menu. For details follow the setup menu descriptions below.

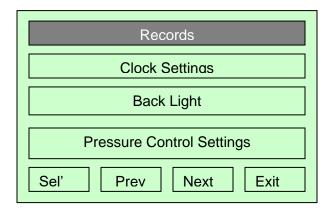
Setup Menu

The setup menu has many options such as Saving and exporting data, setting the clock, backlight, and Relay control Setting (Machine Setting).

The following is the screenshot of the Setup Menu. Four menu selections are available on this menu. These are "Records", "Clock Settings", "Back Light", and "Machine Setting". The default selection is highlighted with a blue background.

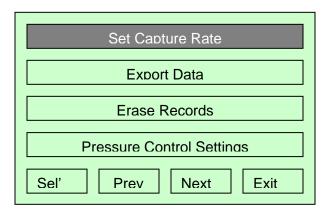
Menu selections are interactive. Each of these can be selected from top to bottom by pressing F3 ("Next") or using right arrow (>) or bottom to top by pressing F2 ("Prev") or left arrow (<). To select the highlighted function press F1 ("Sel"). To exit the menu press F4 "(Exit") or press key "ESC". Screenshots of each of these menu selections are shown below.

Setup Menu Screen



Records Menu

From the Setup Menu select the "Records" by pressing F1. The screen shot for the Records Menu is as shown below. In this menu Data capture rate, Export saved data to the PC, Erase saved data records and Machine Settings (optional) are available.





Initial Setup

Prior to using the unit, make sure the internal LI-lon Polymer battery is fully charged. It takes about 3-4 hours using the charger supplied with the unit. When the battery is fully charged the red LED on the charger will turn to green.

DigiMano 2500 Pressure /Vacuum differential models are equipped with two ports at the bottom of the unit. The Left Port marked 'Port 1' is for measuring positive Pressure and the right port marked 'Port -2' is for measuring Vacuum.

Whereas DigiMano 2500 Gauge Pressure /Vacuum models have only one pressure port that is compatible with non-corrosive gases and fluids.

Precautions



Caution:

DigiMano 2500 Pressure Vacuum Dual Port Models:

Only Port 1 (pressure) is fluid-compatible. Introducing fluid into Port 2 (vacuum) will damage the transducer and thereby void the warranty. Do not attempt to measure differential pressure as one port needs to be open to atmosphere for making measurements.

All DigiMano 2500 Gauge Pressure Models:

Do not exceed the maximum pressure. When the pressure reaches the maximum limit the display flashes "Over Pressure" and will hear a beep till the pressure reaches below the range.

Do not use any corrosive fluids that might damage the transducer.

The unit is supplied with a Li battery charger. Do not use any other Power supply or charger as it will damage the battery.

Getting Started

Pressure Connection

DigiMano 2500 (Pressure /Vacuum Dual Port Model) is provided with two ports, Port 1 and Port 2 fitted with quick connect fittings. Port 1 is for positive pressure measurements and Port 2 is for Vacuum measurements. When making Pressure measurements Port 2 must be left open to atmosphere and vice versa when making vacuum measurement.

DigiMano 2500 Gauge pressure /Vacuum single port models have only one port with 1/8"-27 NPT pressure connection.

Measurements

Turn unit power on by pressing the "ON" key. On power up, the display shows the model and software revision for about 5 seconds and switch to the main menu similar to the one shown below.

P1: **00.00** PSI Peak: **00.00** PSI 16:34:45 NOV 19,2014 Peak Set Peak Unit Zero Set'p

Main Menu Display

Select the desired engineering unit by pressing F2. The selected engineering unit is saved in the nonvolatile internal memory as default selection on the next power up. The following engineering units are available.

| 1. | InH2O | .Inches of Water Column (20°C) |
|-----|--------|--------------------------------------|
| 2. | PSI | Pounds per Square Inch |
| 3. | mBar | Milli Bar |
| 4. | mmH2O | Milli Meter of Water (20°C) |
| 5. | mmHg | . Millimeters of Mercury Column 0°C) |
| 6. | cmH2O | . Centimeter of Water |
| 7. | kPa | . KiloPascals |
| 8. | atm | Standard Atmosphere |
| 9. | kg/cm2 | .Kilograms per Centimeter squared. |
| 10. | inHg | . Inches of Mercury Column (0°C) |



Pressure Measurement - DigiMano 2500 Dual port Models

Connect the pressure line (if going to read positive pressure) to Port 1 (using the male quick connect supplied with the unit) till it locks in place. Leave the Port 2 open. With no pressure applied the reading should be zero. If not zero the unit by pressing F3 key. Apply the pressure and the pressure reading will be displayed along with the peak pressure. The peak reading can be reset by pressing F1 (Peak). This will be useful if the pressure is changing rapidly or detecting a leak in the system.

Vacuum Measurement- DigiMano 2500 Dual Port Models

Connect the vacuum line to Port 2 (using the male quick connect) till it locks in place. Leave the Port 1 open. Apply vacuum and the vacuum reading will be displayed.

If vacuum is applied to the pressure port (P1) a warning beep and the message "Switch Port" will be displayed.



Caution: Port 2 is air only. Inadvertently Introducing fluid Port 2 (vacuum) will damage the transducer and thereby void the warranty.

Pressure /Vacuum Measurement – DigiMano 2500 Single port Models

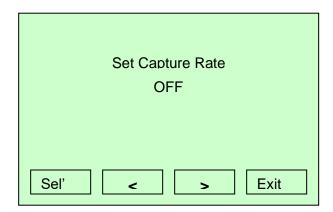
Connect the pressure line to the 1/8"-27NPT pressure port using the necessary adapters supplied. With no pressure applied the reading should be zero. If not press F3 and zero the pressure. Apply the pressure and the pressure reading will be displayed along with the peak pressure. The peak reading can be reset by pressing F1 (Peak). This will be useful if the pressure is changing rapidly or detecting a leak in the system.

Data Capture

Measurement data can be saved to the internal memory as well as uploaded to the PC through the RS 232 port at selected intervals for record keeping. To set the capture rate follow the procedure.

The default capture rate setting is set to 'Off'. To change the time intervals follow the procedure below.

- a. From the Main Menu select "Setup" by pressing F4.
- b. Select "Records" by pressing F1 ('Sel').
- c. Select "Set Capture Rate" by pressing F1.
 - d. The data capture rate can be selected from 0.5 Seconds to 15 Minutes or it can be turned off. Use the keys '<' or '>' for increasing or decreasing or decreasing the capture rate. The selections are 05 Seconds, 1 Seconds, 10 Seconds, 15 seconds, 30 Seconds, 1 Min, 5 Minutes, 10 Minutes and 15 Minutes



Connecting DigiMano to PC

DigiMano 2500 can be connected to a PC using a standard 9-pin RS 232 cable. However, those DigiMano 2500 units with the optional (Machine Setting) pressure control relay output must use the optional serial Port interface adapter PN: 250-RS232-INTF) and a standard serial RS232 cable.



Real-time data can be uploaded to the PC using HyperTerminal or any serial data Capture utility software. The data flow control is as follows:

Baud Rate: 9600Data Bits: 8 BitsParity: NoneStop Bit: One

Flow Control: Hardware.

Note: For PCs without serial ports use any serial port to USB adapter cable. Follow the operating system for the PC to set up the HyperTerminal or other data capture software.

Once the HyperTerminal is set up (or any data capture software is set up and ready to use) connect the DigiMano 2500 to the PC using the 9 Pin RS 232 cable or the RS 232 to USB interface cable. Turn the unit ON. If the communication settings are correct, as specified above, a header will appear in the capture window on the PC with the following information as below. The data capture rate, the interval, and the unit selected will appear below the header. The data will be output at the interval selected in the "set capture rate" screen. The following is a sample of the print header.

DigiMano 2500 Model 250-100PSI-G Software version = 1 Revision = 8

CAL ZERO_OFFSET_COUNT: 10012

DIGIMANO 2500 (c)Copyright 2010 NETECH CORPORATION S/W Rev 1:8, Build: Mar 13 2014 00:35:30

1) PSI 2) mbar 3) mmH20 4)mmHg 5) cmH20 6)kPa

7)Atm 8)kg/cm2 9) inHg 10)inH20

>Data Rate: 1 Sec Units: psi

-0.0109

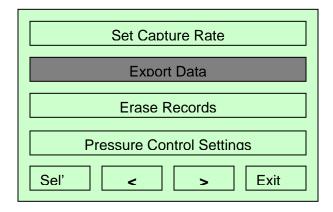
Measurement data is also saved into the internal EEPROM memory (1M) at the elected data capture rate (0.5 seconds to 15 minutes). Even though more than 10,000 records can be saved in the memory, it will get full if the data capture rate is set at a fast rate. When the internal memory is full the data gets overwritten. Therefore, it is advisable to export the data periodically to the PC for future analysis.

Export Data

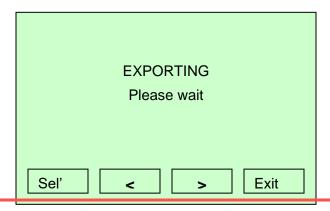
From the "Setup" Menu select records by pressing F1 Key.



From the "Records" Menu select "Export Data" by pressing > Key.



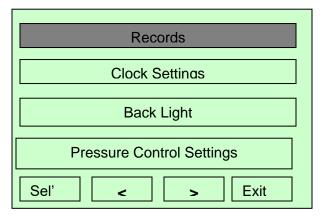
Select ("SEL") "Export Data" by pressing F1. The data will be exported to the PC and the following message will be displayed till the export completes and reverts the menu back to the "Records Menu"





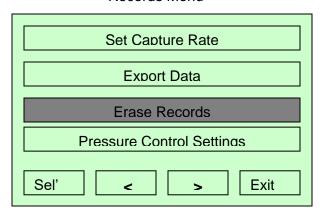
Erase Data

The data saved in the internal memory can be uploaded to the PC by following the procedure. Set up the HyperTerminal or data capture software in the PC. Connect the DigiMano 2500 to the PC using the standard 9 Pin Rs 232 cable. From the "Setup" Menu select records by pressing F1 Key.



From the "Records" Menu select "Erase Records" by pressing > Key.

Records Menu

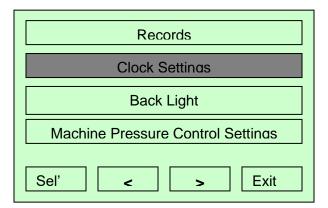


Select (("SEL") "Erase Records" by pressing F1. The following message will be displayed, "warning that the data will be permanently deleted. Press F2 ("Yes") to erase the data.

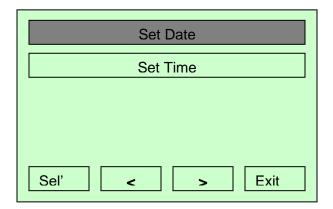


Clock Setting

The following are the procedures for setting the clock time date month and year. From the "Setup" Menu select records by pressing F1 Key.



To set the Date, select "Set Date" by pressing F1. To set the Time, select "Set Time "using > Key. Follow the screen prompt to change the parameters.

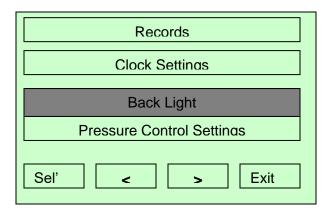




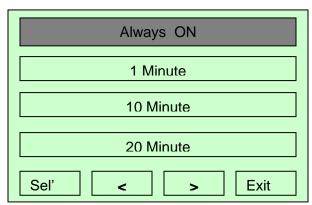
Back Light Setting

The display Back Light is set to be ON as default. In order to save the battery from draining, the Back Light can be turned off after a preselected time as shown in the screenshot below.

From the "Setup" Menu select "Back Light" using the > Key. Select "Back Light" Menu by pressing the F1 Key.



The default Back Light setting is always ON. Back Light utilizes consumes more power than the rest of the electronics. To prevent the Battery drain, the Back Light can be turned off at the priest times as shown below. To change, the power turn-off time, select the desired time using the > Key. The backlight will be turned off after the set time till the next power-up.

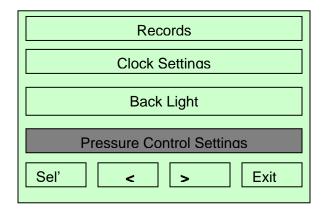


Pressure Control Settings (Optional Function)

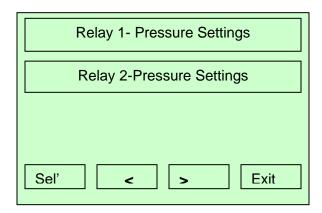
This is a very unique function available as an optional upgrade to the standard units. Two pressure-controlled relay outputs are available through the optional relay control interface box (PN: 250-OUTPUT-NT).

The Pressure settings for the control of each relay can be individually set. The menu selections are interactive. Follow the following procedure to set the pressure for each of the relay controls.

The following is a screenshot representation of the setup menu. Use the < > arrow or "F2, F3 keys to scroll down or up and press F1 to select the highlighted "Pressure Control Settings".



The following is a screen shot representation of the "Pressure Control Settings" Menu.

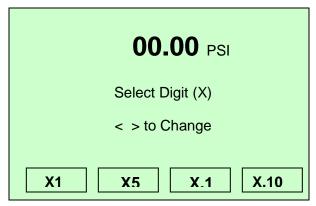


Use the <, > arrow key or F2 or F3 to highlight the "Relay 1-Pressure Settings" or "Relay 2-Pressure Settings".

The following is a screenshot of the "Relay 1-Pressure Control Settings". The pressure readings are displayed in PSI.



The pressure settings can be changed in increments by selecting the Digit (X) and using arrow keys.



For example: to change the pressure setting in increments of "1" select digit "X1" by pressing F1 and use the right arrow (>). To decrease by "1" use the left arrow key.

To change the settings in increment of "5" select "X5" by pressing F2 and right arrow (>). To decrease by "5" digits select.

To change the decimal values select F3 or F4 and use arrow keys. When done press "ESC" key.

For setting the pressure values for the Relay 2 follow the same procedure as above.

The pressure settings for the Relay 1 and Relay 2 (if already set) are saved in the memory. When the pressure reading is equal to the setting the relay output is enabled.

For the detailed specification of the relay and external power supply interface please refer to the wiring diagram and instructions provided with the optional relay interface box (PN:250-OUTPUT-INT).

Maintenance and Storage

Recommended Procedures and Precautions

Maintenance of DigiMano 2500 is straightforward, requiring little more than keeping it clean. It is important to keep dust and dirt from getting inside the unit or into the inlet ports.

Following precautions are to be observed while using the unit.

- Do not exceed the maximum rated pressure. Although a transient pressure (hammer pressure) of three times the rated maximum can generally be tolerated without recalibration, prolonged exposure to higher pressure will cause sensor damage and recalibration may be required.
- Do not connect directly to any strong corrosive gases or fluids.
- Do not connect pressure line to the vacuum port 'Port 2' (dual port Models)
- Do not use when the low battery warning comes on.
- Make sure the built in LI-lon polymer is fully charged prior to use.
- Do not use any other charger other than the one provided with the unit.

Calibration / Service

The mechanical assembly of DigiMano 2500 contains no parts that can be serviced by the user. The unit should be returned to Netech Corporation for repair or calibration. The alignment and adjustment parameters are critical to the robust and efficient performance of the unit and can be performed only at the factory.

The unit is factory calibrated with NIST traceable standards and recommended to be calibrated once a year.

Netech maintains a complete repair and recalibration service at a very low cost and fast turnaround. Estimates for repair and recalibration are available upon request.

DigiMano 2500 contains **NO USER SERVICEABLE PARTS** and calibration/ service should be performed only by Netech. **Attempt to repair / service the unit outside Netech voids the warranty.**



Returning the DigiMano for Re-Calibration

Products returned to Netech for repair or recalibration require an RMA (Return Authorization Number) for speedy processing of the service required.

To obtain an RMA number follow the link http://www.PressureMeter.com and fill in the required information, Email service@netechcorporation.com or call 800-547-6557 (US & Canada), International 631-531-0100.

When shipping units to the factory enclose a copy of the RMA and the number should be on used as the reference in the shipping label.

The shipment should be addressed to:

Attn: Service Department Netech Corporation 110 Toledo St. Farmingdale, New York 11735.

Battery Charging and Replacement

DigiMano 2500 is supplied with a LI-Ion polymer battery and an external charger. The battery pack contains a PCB with a special protection circuit.

Caution: Do not use any other charger other than the one supplied. It takes approximately 3 hours to fully charge the battery. When the battery is fully charged the LED indicator on the charger turns green.

Appendix

This section is intentionally left blank for future use

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Accuracy: Single Port Models: 0.1% -0.25% full range +/- 1 count