

# MIGHTY-5 SERIES OWNERS MANUAL

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This manual is intended to be used in conjunction with the Micro Series Micro-P, Micro-C or Micro-S Owners Manuals

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**ELECTRO-NUMERICS, INC.**

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All product owners manuals are available at  
[www.electronumerics.com](http://www.electronumerics.com)

Mighty-5 Series Owners Manual  
P/N **500-280** Revision **A**  
September 2011

## INTRODUCTION

Mighty-5 Series large display models Mighty-5, Mighty-5C and Mighty-5S offer versatile solutions to a wide variety of monitoring and control applications. This manual is intended to be used in conjunction with either the Micro-P Owners Manual (Mighty-5 displays), Micro-C Owners Manual (Mighty-5C) or Micro-S Owners Manual (Mighty-5S).

Front panel push-button or RS-232/RS-485 setup allow the user to customize the unit for a specific application. Access the front panel pushbuttons requires disassembly of the Mighty-5 enclosure however with an RS232/RS485 card installed, display customization can be done using a laptop and free Instrument Setup Software, available from our website [www.electronumerics.com](http://www.electronumerics.com).

These displays use high-efficiency switching power supplies that operate from either AC or DC voltages. The displays can be powered worldwide without changes to the supply from 100 to 240Vac, 50 to 60Hz. These supplies have isolated, jumper selectable 5 Vdc, 10 Vdc and 24 Vdc excitation supplies to power transducers. All output options are isolated from display and power ground by 250 Vac minimum.

Mighty-5 aluminum enclosures are designed for indoor or outdoor mounting and conform to NEMA-4X requirements.

### **Optional setpoints:**

Dual or quad setpoints plug-in cards provide form C (8A @ 240 Vac) relays or form A solid state relay outputs for alarm and control capabilities. Setpoint may be latching or nonlatching and may be separately configured to be energized above or below the setpoint or in a fail-safe mode. Outputs may also be selected to operate from the filtered signal to reduce relay chatter or from the unfiltered signal for fast response.

### **Optional analog outputs:**

0-20mA, 4-20mA, 0-10Vdc and -10 to +10Vdc outputs are offered and may be scaled by front panel push-buttons or RS-232/RS-485.

### **Optional digital interface:**

RS232, RS232-USB, RS485, RS485-Modbus, USB to RS485 converter, Ethernet and Ethernet to RS485 converter are offered. These displays offer RS-232 or RS-485 bidirectional communications to interface with computers, PLC's or other digital devices. Two communication protocols are available: a streamlined Custom ASCII protocol, or the more complex but industry standard Modbus protocol. PC-compatible software is available from Electro-Numerics for programming of the unit via either the RS-232 or RS-485 interface.

## RECEIVING AND UNPACKING

Your display was carefully tested and inspected prior to shipment. Should the display be damaged in shipment, notify the freight carrier immediately. In the event the display is not configured as ordered or the unit is inoperable, return the unit to the place of purchase for repair or replacement. Please include a detailed description of the problem.

## SAFETY CONSIDERATIONS

Warning : The use of this equipment in a manner other than specified may impair the protection of the device and subject the user to a hazard.

Visually inspect the display for signs of damage. If the display is damaged, do not attempt to operate.

This display must be powered with AC ( mains ) from 100 to 240Vac, 50 to 60Hz.

This display has no AC ( mains ) switch; it will be in operation as soon as power is connected.

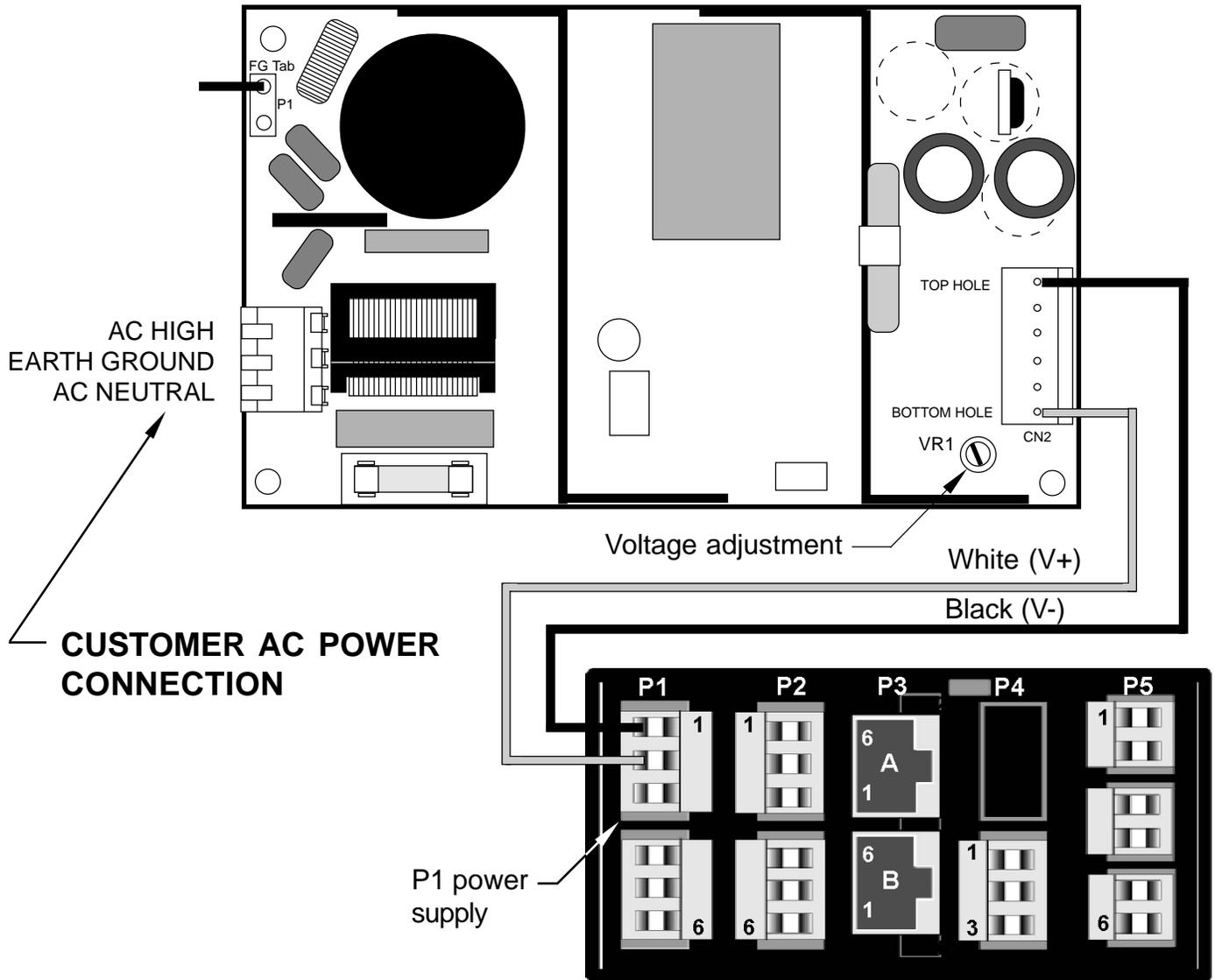
Do not make signal wiring changes or connections when power is applied to the display. Make signal connections before power is applied and, if reconnection is required, disconnect the AC mains power before such wiring is attempted.

To prevent electrical or fire hazard, do not expose the instrument to excessive moisture.

Do not operate the instrument in the presence of flammable gases or fumes; such an environment constitutes a definite safety hazard.

## POWER WIRING CONNECTIONS

The Mighty-5 Series uses a switching power supply that operates from 100 to 240Vac, 50 to 60Hz. See the diagram below when connecting power. This power supply is in addition to and works in conjunction with the P1 power supply shown below.



For P1 pins 4 to 6, P2, P3, P4 and P5 connections, refer to the Micro-P Owners Manual (Mighty-5 & Mighty-5S) or Micro-C Owners Manual (Mighty-5C). Selection of Excitation Output 5V, 10V or 24V and the Menu Lockout are accomplished by jumpers on the P1 power supply. Unless specified at time of order, the Mighty-5 Series displays are shipped with 10Vdc Excitation Output selected.

## DISPLAY BRIGHTNESS ADJUSTMENT

To adjust the display brightness on the Mighty-5 Series large digit displays, refer to the above diagram for the large internal power supply.

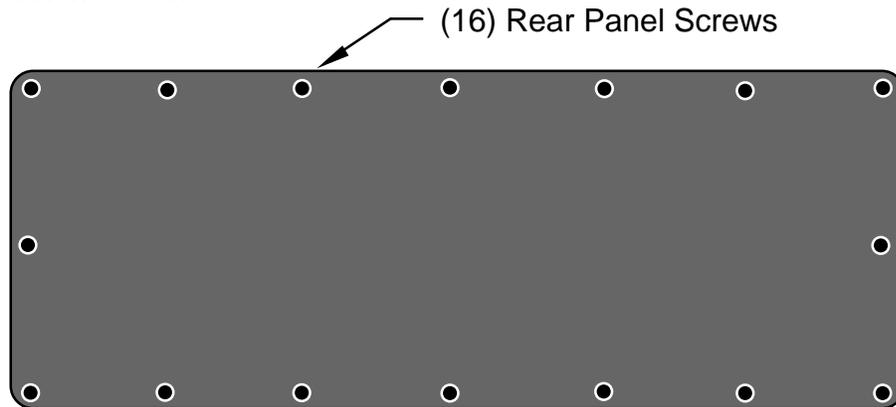
- 1) Remove the display back panel.
- 2) Connect a DC voltmeter to the two wire leads, black (V-) and white (V+).
- 3) Adjust potentiometer VR1 to the desired display brightness within the range of 16.5V maximum and 12V minimum.

# MECHANICAL ASSEMBLY

**NOTE:** To make setup changes to the display using the display board mounted pushbuttons, it is necessary to remove the display board assembly from the case, remove the lockout jumper and unlock the pushbuttons to access the menu items. (See Appendix A)

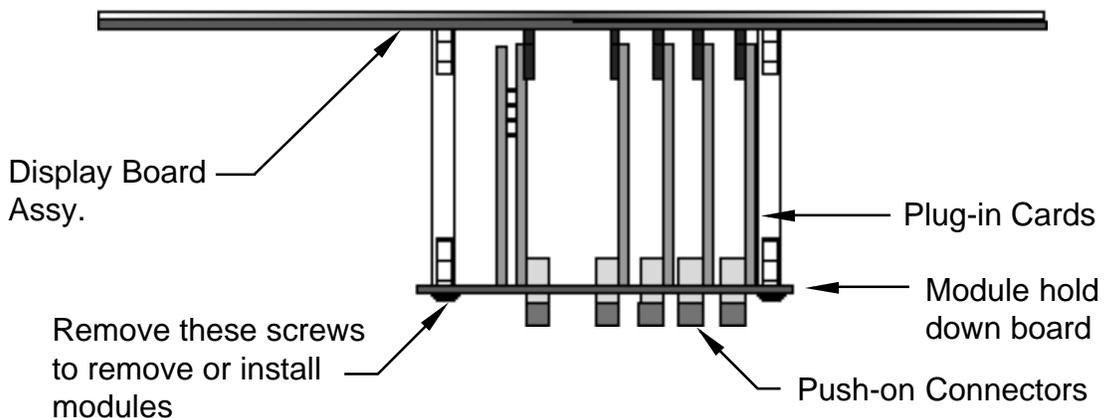
## OPENING THE CASE

To remove the display board assembly from the case, loosen the outside nut on the cable feed-through located on the end of the case so the cable is free to move. Remove the (16) rear panel screws from the rear of the case. Remove the rear panel. Using a 3/8" nut-driver, remove the (16) hex nuts holding the display assembly to the window studs. The display board assembly may now be removed from the main portion of the case.



## ACCESSING THE WIRING CONNECTORS

After removing the display board assembly, all plug-in boards and their wiring connectors are accessible. Boards may be added or deleted by first removing the plug-in wiring connectors and then the (4) screws securing the module hold-down board.

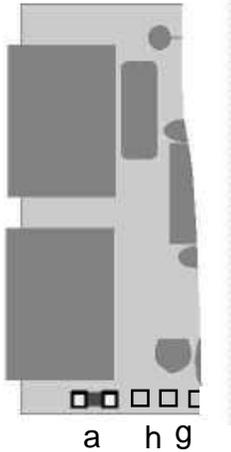


## REASSEMBLING THE DISPLAY

Reverse the preceding procedures to reassemble the case. First install the display board assembly and the (16) hex nuts, do not over-tighten. Next, using the (16) rear panel screws, install the rear panel being careful that the gasket remains in place.

# DISPLAY LOCKOUT SETTINGS

## SETTING HARDWARE LOCKOUT JUMPER (see Appendix A)



*P1 power supply board*

### Lockout Jumper

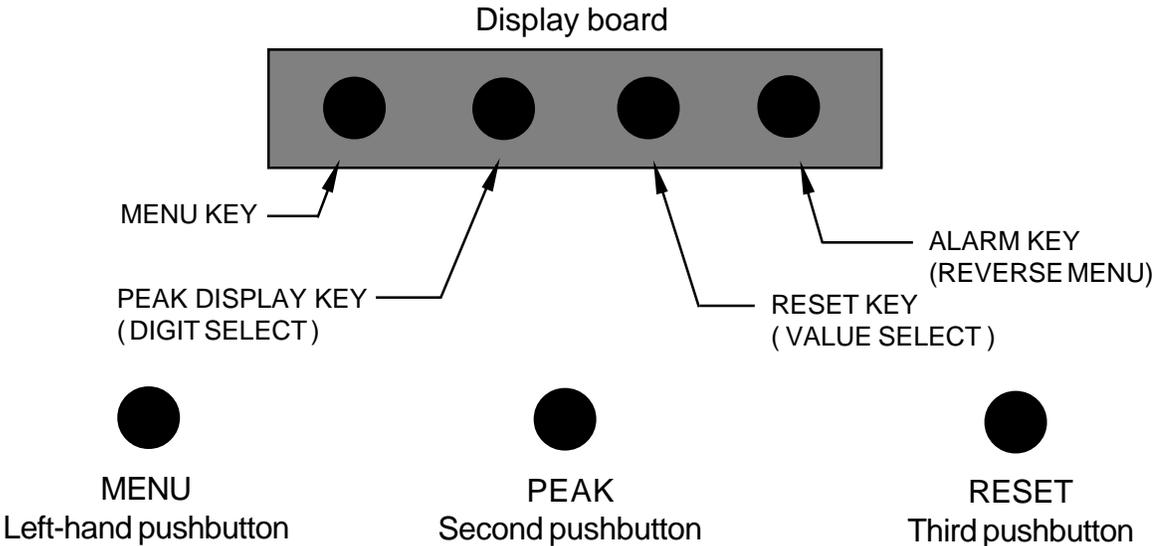
To access the jumper, disassemble the display (see Page 5). Remove jumper "a" located on the lower portion of the power supply board next to the input connectors (see figure at left) to enable the software lockouts. This power supply may also be identified by the green AC power plug-in connector. Replace the jumper to disable software lockouts.

**Jumper Removed** - Loc 1, 2, 3 & 4 (Mighty-5C) are displayed as menu items and allow other menu items to be locked out or enabled.

**Jumper Installed** - Loc1, 2, 3 & (Mighty-5C) are not displayed on program menu

## SETTING SOFTWARE LOCKOUTS (see Appendix A)

When setting up the display, it is necessary to enable the menu items. Any digit set to "1" in Loc 1, Loc2, Loc3 or Loc4 (Mighty-5C) indicates that item is locked out. By setting the digit to "0", the item will appear in the menu. Be sure to reset all lockout digits to "1" after changes have been made to menu items.



<p>Press the left-hand panel pushbutton until Loc 1 is displayed.</p>	<p>Press the second from the left panel pushbutton to display status and select left digit. Press again to select another digit. Selected digit will flash. "1" indicates the menu item is disabled. "0" indicates the item is enabled.</p>	<p>Press the third from the left panel pushbutton to select "0" or "1" for flashing digit</p>
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*Display lockout settings cont.*

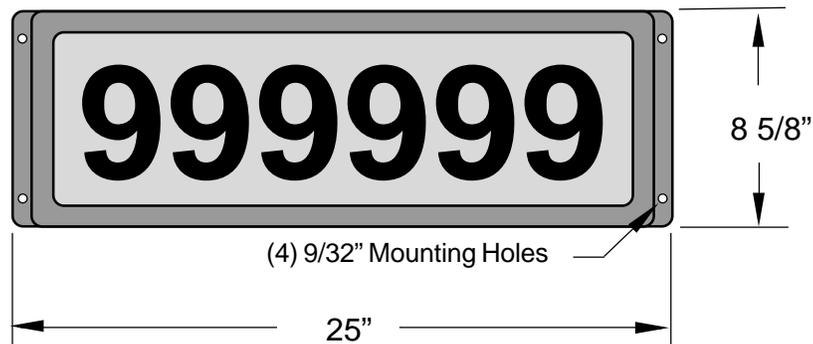
Refer to the Micro-P, Micro-C or Micro-S Owners Manual for specific items to be unlocked or change all digits to a "0" to unlock all items. After selections have been made to Loc 1, again press the left-hand pushbutton to display Loc 2 and then Loc 3 and then Loc 4 (Mighty-5C), each time changing "1" settings to "0" to unlock those items. After the display is unlocked, menu items set to "0" will display and changes to those menu items may be made. Once menu items have been changed and verified, again relock the display by accessing Loc 1 thru Loc 4 (Mighty-5C) and changing "0" items to "1". It is a good idea to replace the lockout jumper on the small power supply as described above.

## MOUNTING AND DIMENSIONS

If the display was ordered with rear panel mounting ("W" wall-mount option), the mounting holes in the rear panel may be used to mount the display to a wall or panel. If optional mounting brackets were ordered ("B" bracket-mount option), they may be used to adjust the viewing angle of the display when mounted to a wall or ceiling.

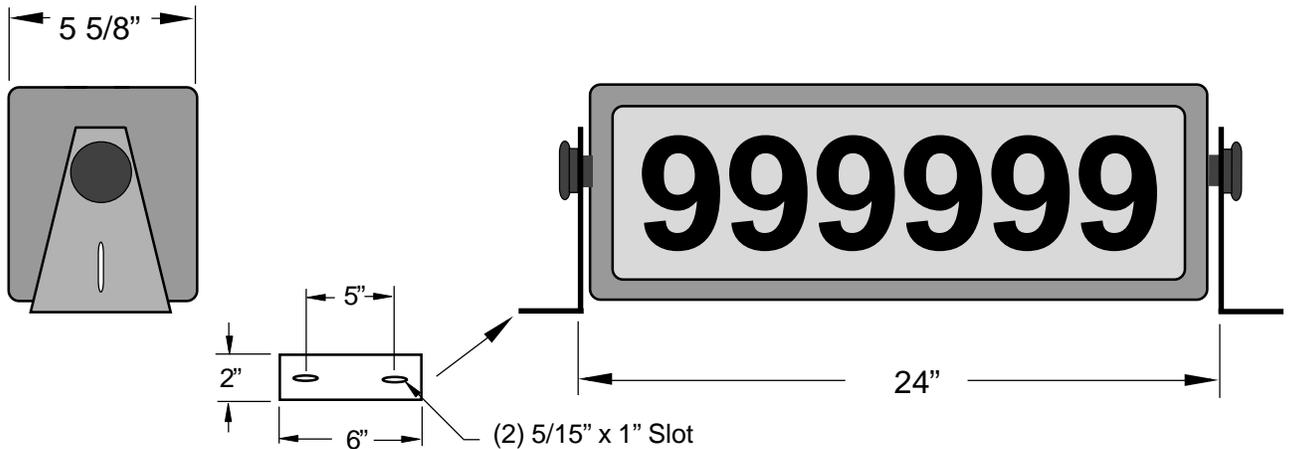
### M5W, M5CW and M5SW models

#### *Option 1:* Surface Mount Back Panel



### M5B, M5CB and M5SB models

#### *Option 2:* Universal Mounting Brackets





## **ELECTRO-NUMERICS INC. PRODUCTS**

Electro-Numerics family of Digital Panel Meters and Large Digit Indicators are high quality, accurate, solid state instruments designed for years of trouble free operation. Over 35 years of digital instrumentation experience has resulted in a series of displays recognized in the field as reliable, well designed instruments. From our compact sized DPM's with 0.56" LED digits to our Large Digit Indicators with 1" & 5" LEDs or 6" & 9" tall LED digits, we cover most applications in process measurement and display. For full product information and prices, visit our web site at [www.ElectroNumerics.com](http://www.ElectroNumerics.com).

## **WARRANTY (2 YEARS)**

Electro-Numerics, Inc. warrants these products to be free in defects in workmanship and materials for two years from the date of shipment to the original customer. This warranty on workmanship and materials may be considered as unconditional provided that, in the opinion of Electro-Numerics, Inc., the equipment has not been mechanically, environmentally, or electrically abused and has been installed, maintained and operated within the limits of rated or normal usage.

Defective products must be sent, transportation charges prepaid with notice of the defect, to our plant in Temecula, CA.

This warranty is limited, at the option of Electro-Numerics, Inc., to repair, replacement, or an appropriate credit adjustment not to exceed the original equipment sales price. All warranty freight charges are F.O.B. our plant, Temecula, CA.

Electro-Numerics, Inc. assumes no responsibility in connection with the sale of its products beyond that stated above and is not responsible for any incidental or consequential loss or damage which might result from a failure of any Electro-Numerics, Inc. product.

## **REPAIR POLICY**

Direct all warranty and out-of-warranty requests/inquiries to Electro-Numerics, Inc., Customer Service Repair Dept., Telephone: 800-854-8530 (U.S.A.) or 951-699-2437, Fax: 951-695-7246, Email: [Sales@ElectroNumerics.com](mailto:Sales@ElectroNumerics.com). Repair work will be handled at the factory or an authorized Electro-Numerics, Inc. repair service center.

All items sent in for service are subject to a minimum evaluation charge of \$65.00 in the event that the product is found to be out-of-warranty or, if under warranty, not in need of additional service. Out-of-warranty service and repair charges will be quoted on a case by case basis. All repaired products will be shipped to you F.O.B., Temecula, CA.

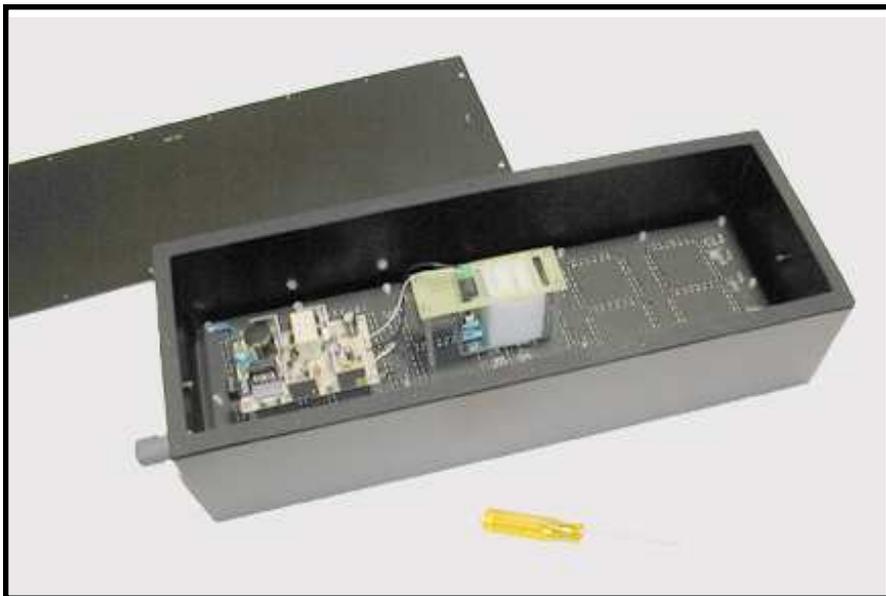
## APPENDIX A DISASSEMBLY & UNLOCK PICTORIAL

Mighty-5 Series displays are setup and programmed at the factory per customer specifications prior to shipment. This pictorial procedure may be used in the event that programming changes are necessary. **Note:** With an RS232 or RS485 card installed in the display, programming changes may be made using a computer and free “instrument setup” software available at [www.electronumerics.com](http://www.electronumerics.com). This software overrides the hardware and software lockouts.

- 1) Using a philips screwdriver, remove the screws that attach the rear panel



- 2) Remove the rear panel being careful not to damage the gasket.



- 3) If installed, unscrew the bracket-mount knobs. Next, remove the 16 nuts holding the display board to the enclosure.



If installed, unscrew the hand knobs



Using a 3/8" nut-driver, remove the 16 display board nuts.

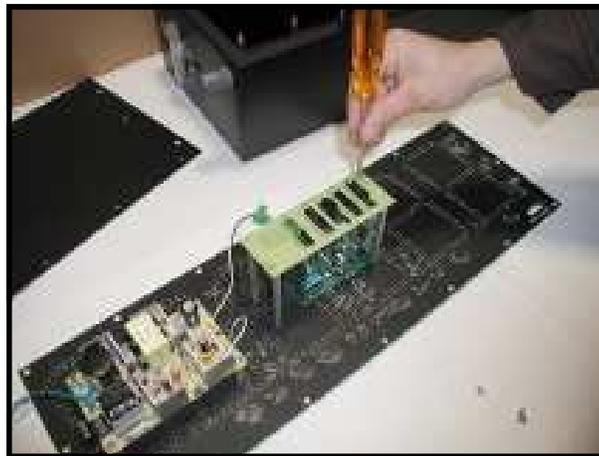


Remove the display board from the enclosure.

- 4) To activate the front panel pushbuttons, it is necessary to temporarily remove the lockout jumper located on the small power supply board identified with the green plug-in connector. Because it is difficult to access this jumper, it is easiest to remove the power supply module from the display.



Unplug the brown and green connectors.

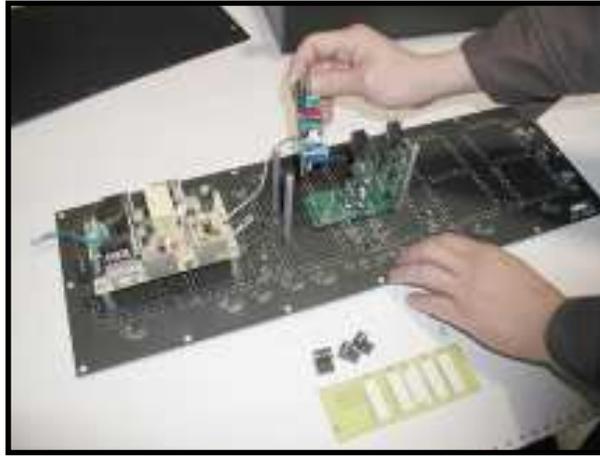


Remove the 4 module hold-down plate screws.

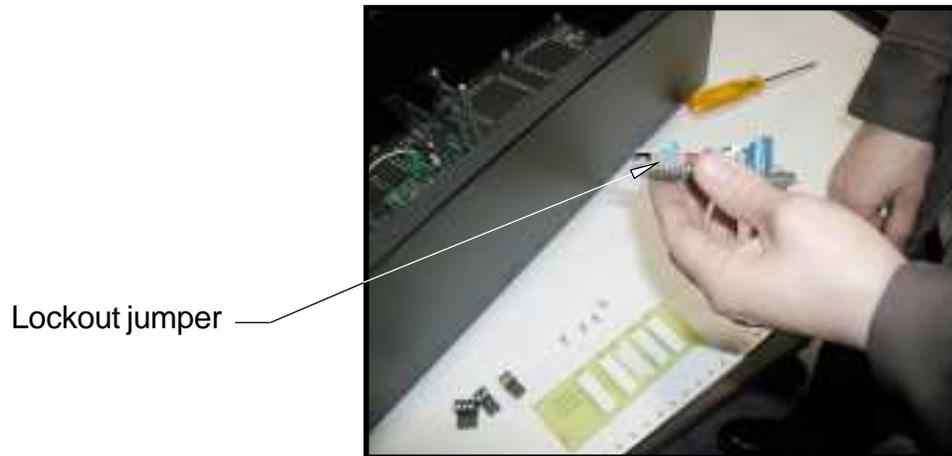


Remove the module hold-down plate.

- 5) Carefully unplug the power supply card and remove the lockout jumper.  
(See page 6)

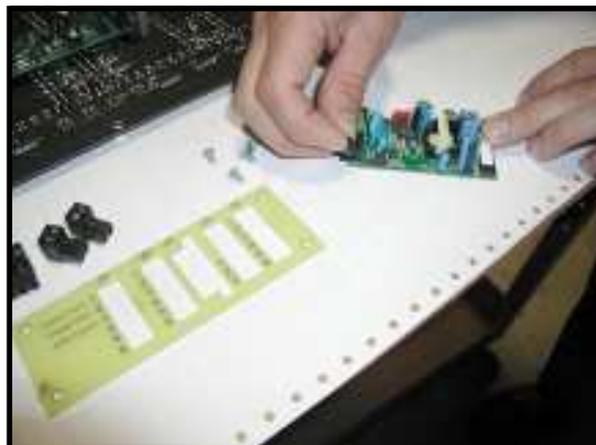


Unplug the power supply card.



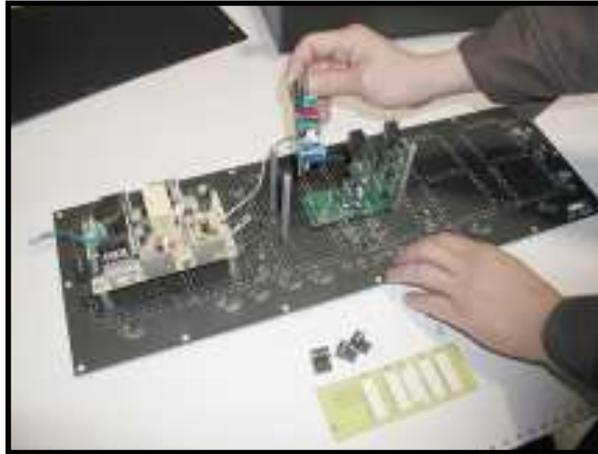
Lockout jumper

Lockout jumper installed.

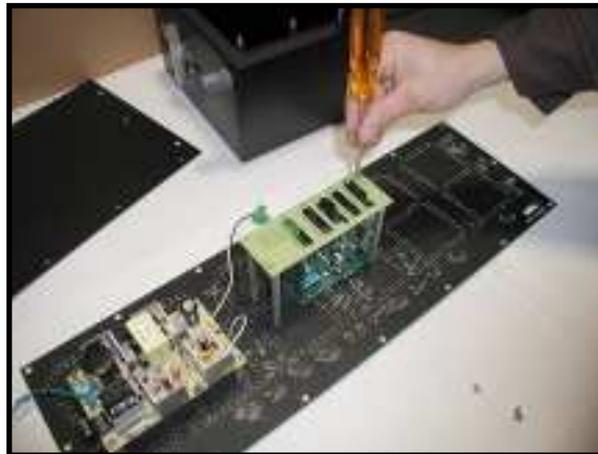


Remove the lockout jumper.

- 6) With the lockout jumper removed, plug in the power supply card, install the module hold down plate with the 4 screws and plug in the green power supply connector.



Plug in the power supply card.

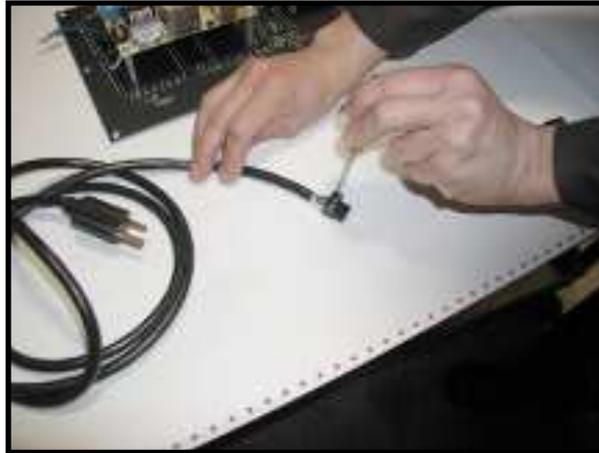


Install the module hold down plate and screws.

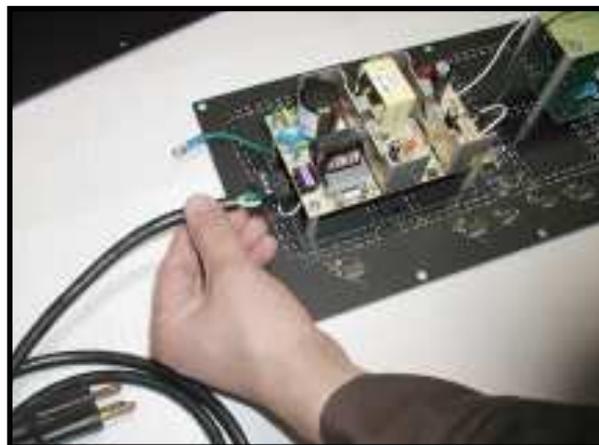


Plug in the card connectors.

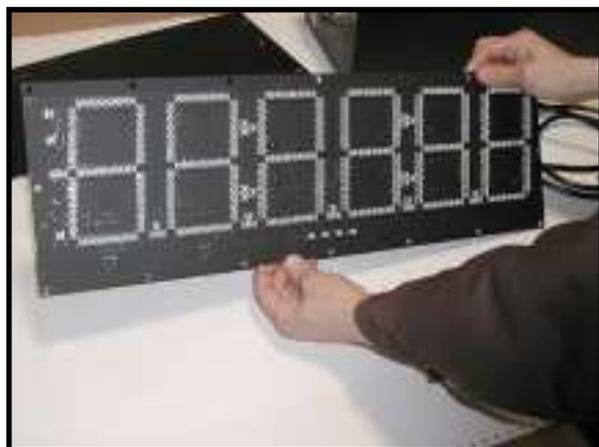
- 7) To program the display, it is necessary to temporarily apply AC power to the unit. Remove the plug from the large power supply and referencing to Page 4, connect an AC power cord.



Remove the AC power plug and connect an AC power cord.



Plug the power connector into the power supply.



Turn over the display to access the front panel programming push-buttons.

- 8) Apply AC power to the display. Push the left hand push-button to access and unlock the Loc-1 menu.

(See page 6)



Push the Menu (left hand button) to access the Loc-1 menu.



Change the "1"s to "0"s in each position.



With all "0"s showing, the Lock-1 menu is completely unlocked.

- 9) Unlock the remaining Loc menus. Mighty-5 displays have 3 Loc menus while the Mighty-5C displays have 4 Loc menus.  
(See page 6)



Push the Menu (left hand button) to access the Lock-2 menu and change all "1"s to "0"s.



Push the Menu (left hand button) to access the Lock-3 menu and change all "1"s to "0"s.



With all "0"s showing, the Loc-2 to Loc-4 menus are completely unlocked.

10) Referencing the appropriate Owners Manual, access the various menus to make setup changes.



Push the Menu (left hand button) to access the InPut Menu and make any necessary changes.



Push the Menu (left hand button) to access the SETuP menu and make any necessary changes.



Push the Menu (left hand button) to access the ConFG menu and make any necessary changes.

- 11) After completing program setup changes, again enter the Loc menus and relock the program by changing all “0”s to “1”s, reversing the steps taken in paragraph 9.



Push the Menu (left hand button) to access the Loc-1 menu.

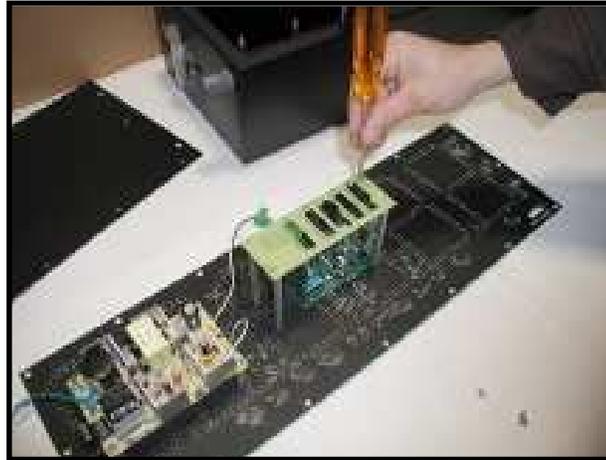


Change all “0”s to “1”s to lockout the menu items.

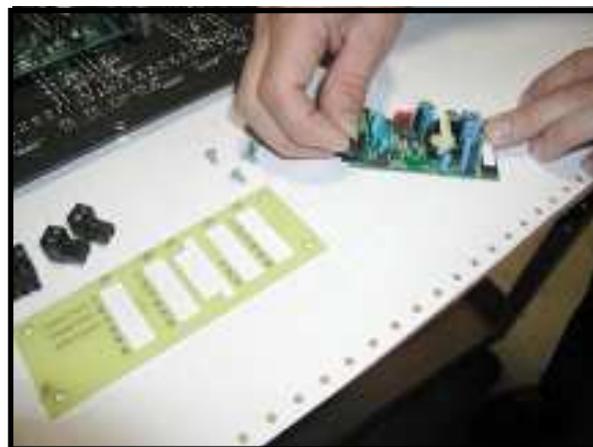


Continue through all Loc menus changing all “0”s to “1”s.

12) Remove power from the display and install the power supply lockout jumper.  
(See page 6)



Remove the module connectors, and the module hold-down plate.



Install the lockout jumper.



Install the power supply, module hold-down plate and module connectors.

- 13) Place the display board assembly into the case, install the 16 nuts being careful to place the green ground wire on the stud as shown.



Place the display board assembly into the case over the 16 studs.



Install the 16 nuts on the studs.



Be sure the green jumper wire is installed on the stud under the nut as shown.

- 14) Connect AC power wiring, signal input wiring and any other required wires to the plug-in module connectors. AC power is wired to the plug-in connector on the large power supply.



Connect internal wiring.



Replace the rear panel and screws.



**\*\*\* Procedure Complete \*\*\***



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