

750 Series II CONDUCTIVITY/TDS & RESISTIVITY MONITOR/CONTROLLER Operation Manual

16 November 17

INSTALLATION • OPERATION • MAINTENANCE

Conductivity/TDS Models: 756II, 757II, 758II & 759II

Resistivity Models: 751II, 752II, 753II & 754II

ACCURACY • RELIABILITY • SIMPLICITY

MYRON L[®]
COMPANY
Water Quality Instrumentation
Accuracy • Reliability • Simplicity

750 Series II MONITOR/CONTROLLER QUICK REFERENCE GUIDE

If you read nothing else in this manual please read this Quick Reference Guide.

PLEASE READ and COMPREHEND ALL WARNINGS, CAUTIONS and ADVISEMENTS CONTAINED WITHIN THIS MANUAL.

Failure to comply is beyond the responsibility of the Myron L® Company.

WARNING: ALL MONITOR/CONTROLLERS ARE FACTORY SET TO OPERATE ON 115 VAC. BEFORE APPLYING POWER ENSURE THE INPUT POWER “115/230 VAC” SELECTION IS CORRECT FOR YOUR REQUIREMENTS. FAILURE TO DO SO IS BEYOND THE RESPONSIBILITY OF THE MYRON L® COMPANY. See section II.E.2. and figure II.E.1.

NOTE: SOME MODELS MAY HAVE EITHER A 24 VAC OR A 24 VDC INPUT POWER REQUIREMENT - CHECK LABELS CAREFULLY.

WARNING: ENSURE POWER IS OFF WHILE INSTALLING ELECTRICAL EQUIPMENT. IF MONITOR/CONTROLLER IS INSTALLED, ENSURE THE POWER IS OFF BEFORE SERVICING. FAILURE TO DO SO COULD CAUSE DAMAGE TO THE INSTRUMENT, AND COULD BE HARMFUL OR FATAL TO PERSONNEL. ONLY QUALIFIED PERSONNEL SHOULD INSTALL OR SERVICE ELECTRICAL EQUIPMENT.

WARNING: THE DISPLAY WILL BE IRREPARABLY DAMAGED IF THE DISPLAY HARNESS IS INSTALLED UPSIDE-DOWN OR MISALIGNED. THE HARNESS MUST BE INSTALLED AS SHOWN IN FIGURE II.E.8.

CAUTIONS:

Before installation, ensure you have the correct model (with options), AND it is ranged for your application. See sections I.A., I.B. & I.G. Do you have the correct sensor? See section I.E. Mounting requirements. What is needed? See section II.B.

The following will give the installer and user a quick overview. See the sections listed for details.

REMOVING FRONT PANEL

NOTE: When opening instrument, remove front cover with care; a ribbon cable connects the front panel and main board.

1. Ensure power is **OFF**.
2. Remove the four (4) screws on the front panel.
3. Carefully wiggle the front panel to loosen the gasket and pull gently toward you. Do not pull more than about 8 inches/20CM or you could damage the wiring harness.

REASSEMBLY

1. Carefully reinstall the front panel, bottom first. Ensure no wires have been pinched between enclosure and front panel.
2. Reinstall the four (4) screws and tighten.
3. To operate, turn power **ON**.

INTRODUCTION - Section I.

This section covers the specifications of your new Monitor/controller including sensor information.

INSTALLATION - Section II.

This section covers how to install your new Monitor/controller; mechanically and electrically.

OPTIONS & ACCESSORIES - Section III.

This section covers the specifications, installation, set up, and operation of each option.

QUICK LOCATOR

SC/SCO MODULE, (Second Relay), see section III.A.

4A/4AO MODULE (4-20mA), see section III.B.

TP/TPO MODULE (Temperature), see section III.C.

TH/THO MODULE (Alarm /control Harness), see section III.D.

DUAL (stacking) Temperature (TPO) & 4-20mA (4A/4AO), see section III.E.

3SO/3SE MODULE (3 Sensor option) , see section III.F.

3RO/3RE MODULE (3 Range option), see section III.G.

3SRO/3SRE MODULE (Combined 3 Sensor & 3 Range option), see section III.H.

PA/PAO (Piezo Alarm), see section III.I.

RA (Remote Alarm), see section III.J.

OPERATING PROCEDURES - Section IV.

This section covers a brief description of different models and their features; how they work, and how to set them up for your particular use.

QUICK SET POINT CONVERSION (SPC) /

REVERSING SET POINT - See Section IV.C.1.

Conductivity/TDS Monitor/controllers are configured to trigger the alarm relay as the conductivity/TDS reading increases.

Resistivity Monitor/controllers are configured to trigger the alarm relay as the resistivity reading decreases.

To reverse:

1. Locate the jumper block for the alarm to be configured. See figure V.A.1.
2. Remove and rotate the jumpers 1/4 turn and reinstall them on their posts.

QUICK CHECK-OUT PROCEDURE -

See Section IV.C.2.

It is assumed that the Monitor/controller power is ON, that it is

connected to an appropriate Sensor, and that the Sensor is immersed in water within the range that the Monitor/controller will be required to read; and the front panel is removed.

1. Make a note of the reading on the display.
2. While pressing the Calibration/Full Scale Test Switch (FSSW), verify that the front panel display is indicating a full scale reading. If not, see Calibration, section V.C.
3. Press and hold the "SET POINT" switch on the front panel. Using a tweaker or a small screwdriver, adjust the Set Point trimmer adjustment screw on the circuit board to sweep the display from zero to full scale. (A digital display may be blank at the full scale end. This is normal.) Listen for the alarm relay to click on and off as the alarm set point moves past the water reading.
4. Adjust the alarm to the desired set point value. Release the "SET POINT" switch.

NOTE: For Models with SC/SCO module, repeat STEPS 3 & 4 to check out Set Point #2.

QUICK SET POINT ADJUSTMENT -

See Section IV.C.3.

The set point setting is based upon the user's particular water purity specifications or requirements. **NOTE:** The optional **second** relay/alarm is "stacked" on the first relay/alarm, therefore, when setting the optional **second** relay/alarm Set Point, the #1 Set Point must be 'set' first.

1. While pressing the "SET POINT" switch, turn the Set Point #1 adjustment screw (see figure V.A.1) until the desired set point value is indicated on the display.

HYSTERESIS (DEAD BAND) ADJUSTMENT -

See Section IV.C.4.

PRIMARY COMPONENT IDENTIFICATION - Section V.A.

Review the figure below to familiarize yourself with the Main circuit board assembly. The diagram has the second alarm/control module option installed.

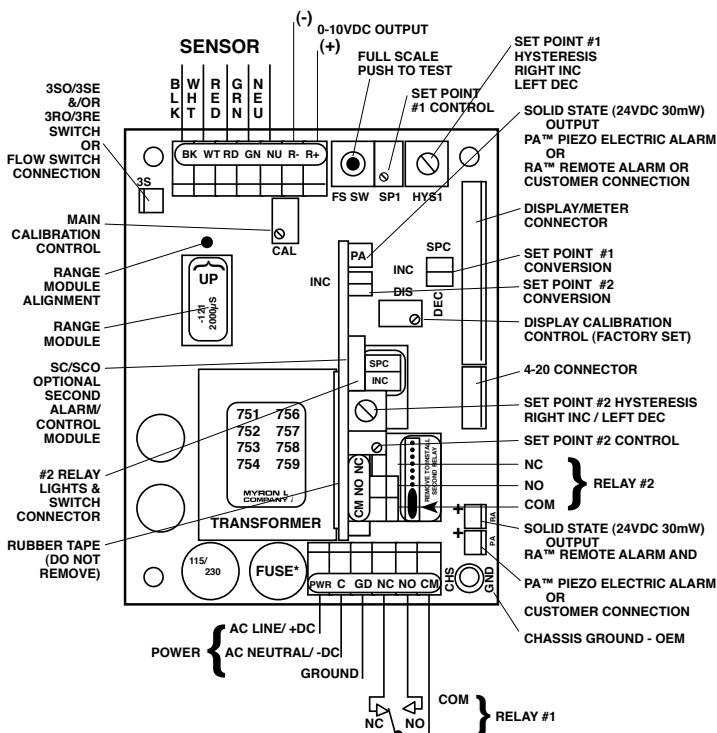


Figure V.A.1

QUICK CALIBRATION - Section V.C.

WARNING: When performing calibration procedures, the technician must take extreme care to avoid contacting the circuitry other than the **CAL**ibration control. Failure to do so could result in damage to the equipment, property and/or personal injury.

The following assumes the front panel has been removed and the power is ON.

ELECTRONIC CALIBRATION (CIRCUIT ONLY) -

See Section V.C.1.

Full Scale Adjustment

1. Press and hold the Full Scale Test switch. The display should indicate Full Scale for the particular range selected, i.e. 0-500 ppm should indicate 500. If not, set to Full Scale with the **CAL**ibration control.
2. Turn power **OFF**.
3. Re-install front panel as described in "REASSEMBLY".
4. To operate, turn power **ON**.

10VDC Calibration - See Section V.C.1.b.

Using Standard Solutions - Section V.C.2.

The **BEST** method of verifying and recalibrating your conductivity/TDS Monitor/controller is with NIST traceable Standard Solution (available from the Myron L® Company). Because it includes the sensor, the entire system is recalibrated.

NOTE: Since standard solution calibrations are NOT practicable with resistivity models, another means of verification or calibration of resistivity models is to use the transfer standard method, using a hand-held or portable instrument capable of resistivity measurements, i.e. the Myron L Ultrameter II™. See section V.C.4 for description.

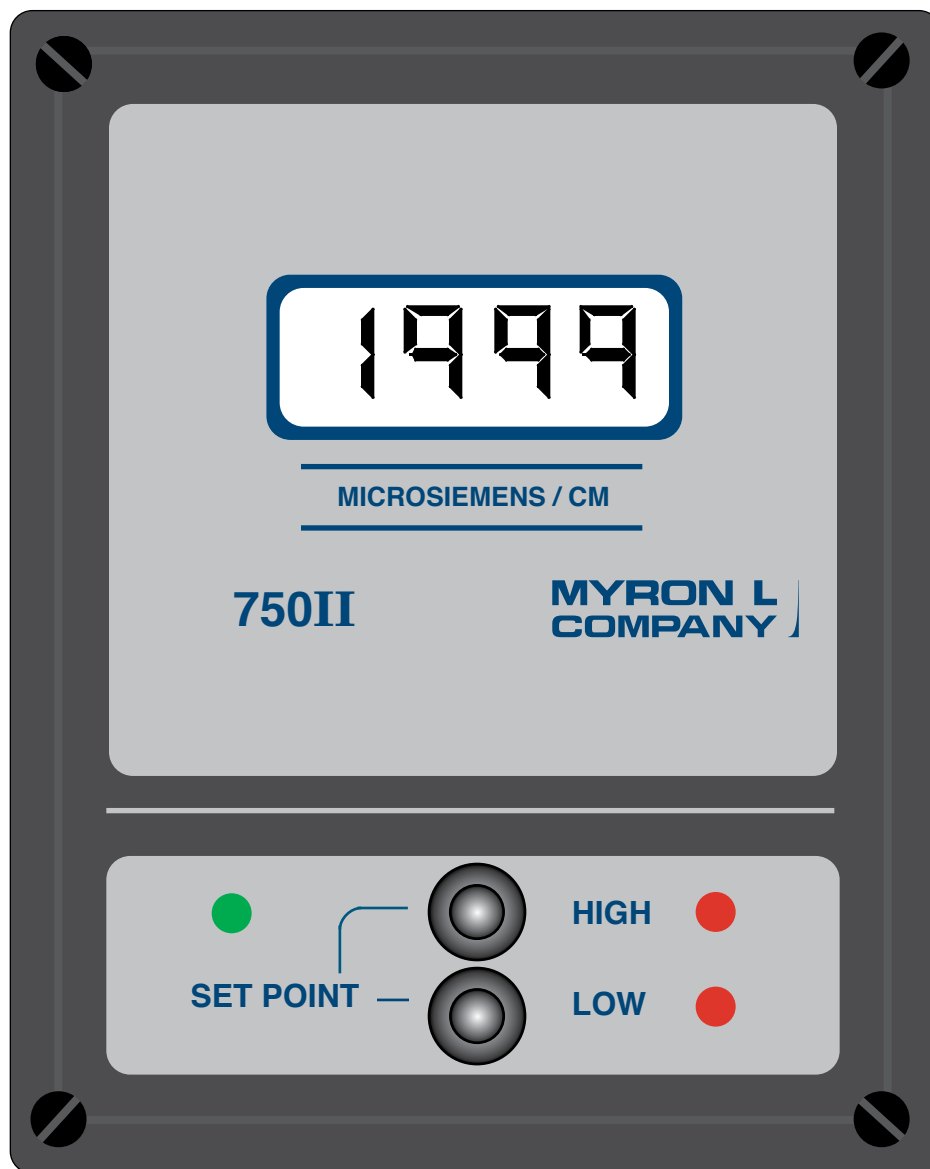
The following procedure describes the easiest method for standard solution calibration of your Conductivity/TDS Monitor/controller.

1. Using a standard solution which is 60-90% of full scale of the instrument, rinse thoroughly and fill a clean glass beaker with the standard solution.
2. Place sensor in the beaker of standard solution. The level of standard solution must be high enough to cover at least 1/2" above cross hole.
3. Slowly shake the sensor to remove air bubbles from inside the sensor bore hole.
4. Allow 5-10 minutes for temperature to equilibrate. For the quickest and the best results, both the sensor and solution should be at the same temperature.
5. Turn power **ON**.
6. If the reading is different from the standard solution, adjust **CAL**ibration control on the main circuit board until the reading matches the solution value.
7. After adjustment, turn power **OFF**.
8. Re-install front panel as described in "REASSEMBLY".
9. To operate, turn power **ON**.

SENSOR SUBSTITUTE CALIBRATION -

See Section V.C.3.

TRANSFER STANDARD METHOD - See Section V.C.4.



750 Series II

Model 758 II -121-SC

(A Digital Conductivity
Monitor/controller,
with a Range of 0-2000 μ S,
and a Second Alarm/control,
Displaying Full Scale)

G. 750 SERIES II RANGE SELECTION GUIDE CONDUCTIVITY/TDS & RESISTIVITY

Add Range NUMBER below to instrument model number, i.e. 758II-"112" = 0-50 ppm Digital Monitor/controller.

756II, 757II, 758II & 759II

751II, 752II, 753II & 754II

RANGE	CONDUCTIVITY/TDS Dash #	RESISTIVITY Dash #
Resistivity		
0-20 MΩ		-11
0-10 MΩ†		-12
0-5 MΩ†		-13
0-2 MΩ		-14
0-1 MΩ†		-15
0-500 KΩ†		-16
0-200 KΩ		-17
Conductivity		
0-1 μS*†	-101	
0-1 ppm*†	-102	
0-2 μS*†	-103	
0-2 ppm*†	-104	
0-5 μS*†	-105	
0-5 ppm*†	-106	
0-10 μS†	-107	
0-10 ppm†	-108	
0-20 μS	-109	
0-20 ppm	-110	
0-50 μS	-111	
0-50 ppm	-112	
0-100 μS	-113	
0-100 ppm	-114	
0-200 μS	-115	
0-200 ppm	-116	
0-500 μS	-117	
0-500 ppm	-118	
0-1000 μS	-119	
0-1000 ppm	-120	
0-2000 μS	-121	
0-2000 ppm	-122	
0-5000 μS††	-123	
0-5000 ppm††	-124	
0-10,000 μS/0-10 mS††	-125	
0-10,000 ppm/0-10 ppt††	-126	
0-20,000 μS/0-20 mS††	-127	
0-20,000 ppm/0-20 ppt††	-128	
0-50,000 μS/0-50 mS**††	-129	
0-50,000 ppm/0-50 ppt**††	-130	
0-100 mS**††	-131	
0-100 ppt**††	-132	
0-200 mS**††	-133	
0-200 ppt**††	-134	

*CS51LC conductivity sensor (0.1 constant) required for these ranges.

**CS52 conductivity sensor (10.0 constant) required for these ranges.

† Available in Digital models only.

†† Available with 4 1/2 Digit Backlit LCD. Other ranges available as OEM ONLY. Price & delivery on request.

Except as noted, Conductivity/TDS Monitor/controllers require a sensor with a cell constant of 1.0. The Model CS51 is the most commonly selected sensor due to its ease of use and low cost.

Resistivity Monitor/controllers require a sensor with a cell constant of 0.05. The Model CS10 is the most common selected due to its ease of use and low cost.

NOTE: UNLESS ppm/NaCl is specified with order, TDS/ppm type conductivity instruments will be calibrated to the Myron L "442™" Natural Water standard. For NaCl ppm/ppt add the letter "N" after the number, i.e. -124N.

G. RE-RANGE YOUR MONITOR/CONTROLLER (Range Module Installation)

1. DESCRIPTION

The 750 Series II Monitor/controllers have been designed for easy field re-rangeability. The Range Module consists of a 16 pin Header that plugs into a 16 pin socket.

For available ranges, see Range Selection Guide I.G. When making large range changes, i.e. 5000 ppm to 50 ppt, a different sensor may also be required as noted in the Range Selection Guide. Order Range Module by adding the prefix "RM" to the range number as in examples below.

Conductivity/TDS Range Modules —
RMXXX i.e. = RM121 is a 0-2000 μ S
Resistivity Range Modules —
RMXX i.e. = RM11 is a 0-20M Ω

NOTE: Some OEM models may not be re-ranged being originally manufactured with a fixed range. If your application requires re-ranging an OEM model, first contact the system manufacture for help. The Myron L[®] Company may re-range or exchange your instrument at a cost.

2. INSTALLATION

Briefly -

The new Range Module simply replaces the Range Module presently installed, see figure II.G.1.

Multiplier label is added to analog models*.

Type label may be required if changing from Microsiemens to Millisiemens or PPM/PPT.

The Full Scale reading is recalibrated.

IMPORTANT NOTES:

1. When changing ranges on Digital Monitor/ controllers with the -45 option (4 1/2 digit backlit display), the following modifications may be required to the range module; RM123 thru 128 and RM16 require pin number 9 be removed or bent toward the side, see Fig. II.G.2. On RM117 thru 122 a jumper wire must be soldered to the RM, see Fig. II.G.3.

*2. Analog Monitor/controllers may require a scale change. See section II.G.3 for the specific instructions.



CAUTION - READ FOLLOWING CAREFULLY

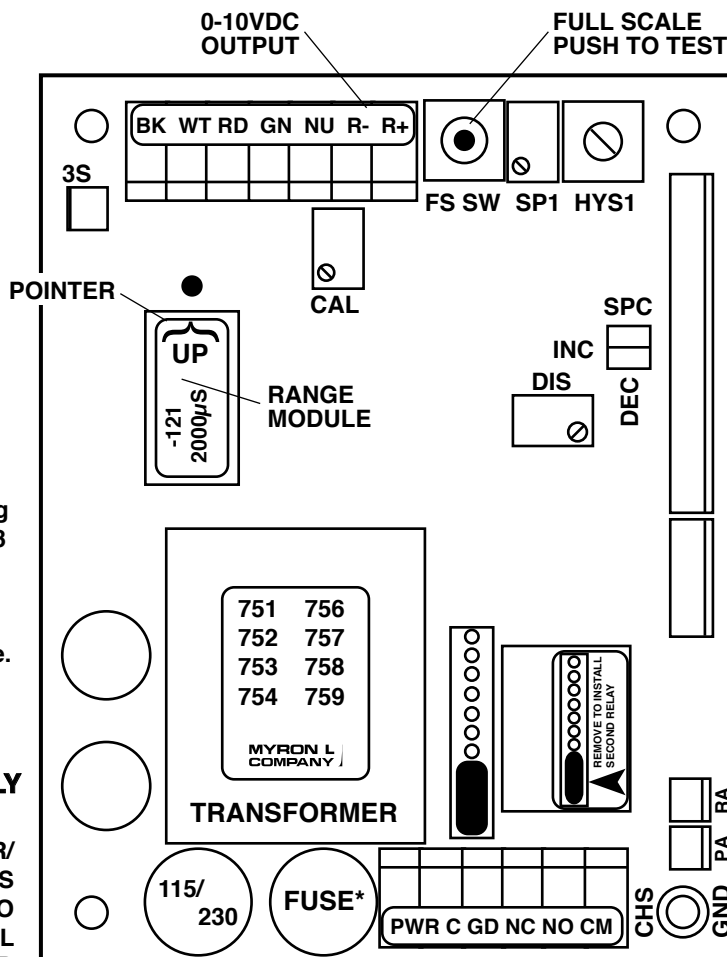
WARNING: BEFORE STARTING, IF MONITOR/CONTROLLER IS INSTALLED, ENSURE THE POWER IS OFF. FAILURE TO DO SO COULD CAUSE DAMAGE TO THE INSTRUMENT, AND COULD BE HARMFUL OR FATAL TO PERSONNEL. ONLY QUALIFIED PERSONNEL SHOULD INSTALL OR SERVICE ELECTRICAL EQUIPMENT.

Physical

NOTE: When opening instrument, remove front cover with care; a ribbon cable connects the front panel and main board. If the front panel has already been removed from the enclosure skip to #4.

- Using a standard slot screwdriver remove the four (4) screws on the front panel.
- Carefully wiggle the front panel to loosen and pull gently toward you. Do not pull more than about 8 inches/20CM or you could damage the wiring harness.

- Turn the front panel around so that the back side is facing you and set aside.
- Locate and remove existing Range Module from MAIN Circuit Board, as shown in figure II.G.1. It is not easy to remove, it was designed to stay in place under adverse conditions.
- With the pointer up, carefully align the new Range Module to the socket on the MAIN Circuit Board as shown in figure II.G.1.
- Press firmly into place.
- For analog models, add multiplier label to front panel. See figures II.G.10 and II.G.11 for suggested locations. In some cases changing the meter scale will be necessary. See Changing Analog Meter Scale, section II.G.3.
- Recalibrate, see CALIBRATION PROCEDURES, section V.C.



Main CB Assembly

Figure II.G.1

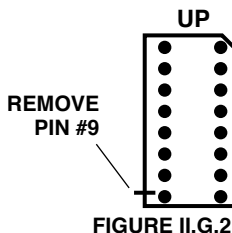


FIGURE II.G.2

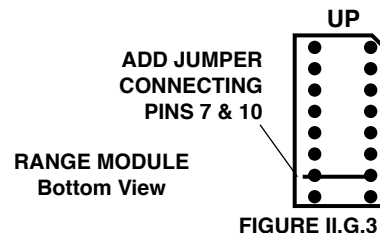


FIGURE II.G.3

DIGITAL 4 1/2 DIGIT LCD
MONITOR/CONTROLLERS ONLY

3. CHANGING ANALOG METER SCALE (DIAL)

After changing ranges on an analog model 750II it may be necessary to change the meter scale (dial). The following steps will guide you through the change. Please read caution carefully.



CAUTION - READ FOLLOWING CAREFULLY

Exercise extreme caution while working on meter. Meter movement, and/or pointer (needle) may be damaged beyond repair. It is recommended only qualified personnel change scales.

DO NOT allow dust to enter the case while it is open. Failure to follow these instructions may cause irreparable damage, and will VOID the warranty.

Briefly -

The meter is removed from front panel (except OEM models).

The cover is removed.

The hex screws retaining the scale are removed, and scale is slid out the top.

New scale is slid in place, and screws reinstalled.

Cover aligned, installed and zero set.

Physical

For OEM models skip to #4.

1. Using a wrench, nut driver or pliers remove the two (2) large nuts retaining the circuit board wiring harness connectors. Red wire is PLUS (+), Brown wire is MINUS (-). See figure II.G.4.
2. Using a standard slot screwdriver remove the four (4) screws, and the backing plate holding the meter to the front panel as shown in figure II.G.4.
3. Remove meter. Do not lose the gasket between the meter and the front panel it must be reinstalled upon reassembly. See figure II.G.5. Align gasket to front panel so as the gasket does not show when meter is assembled to front panel.

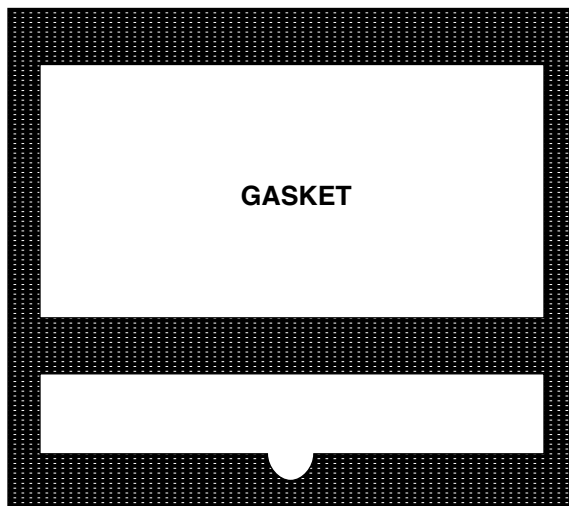


Figure II.G.5

4. Using a wide blade standard slot screwdriver, starting at a bottom corner, CAREFULLY pry the clear plastic cover loose from the movement case. See figure II.G.6.
5. Using a 1/8" (3.2mm) hexdriver, remove the two (2) small screws holding the scale (dial). See figure II.G.7.

6. To remove the scale, lightly press on bottom of scale, the top will lift up. Be extremely careful not to bend the pointer (needle) or to move the Zero Adjust (ZA). See figure II.G.7.

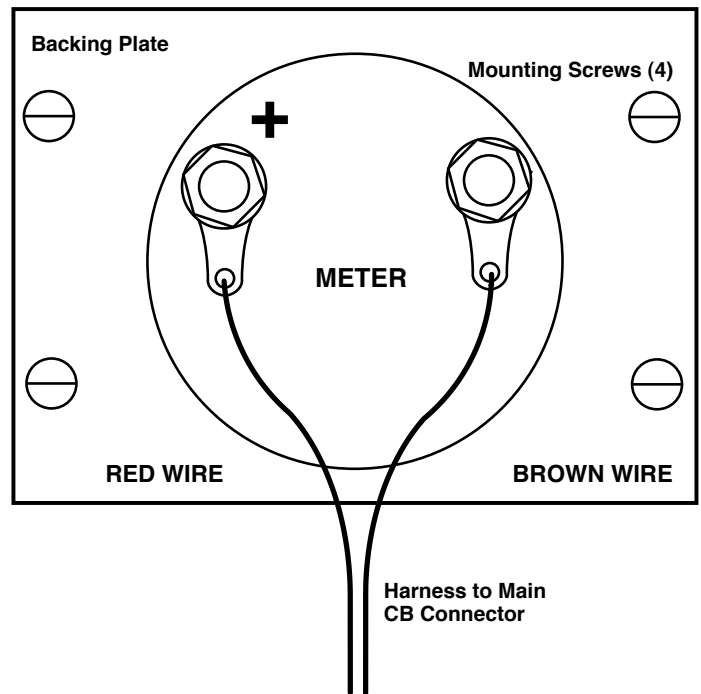


Figure II.G.4

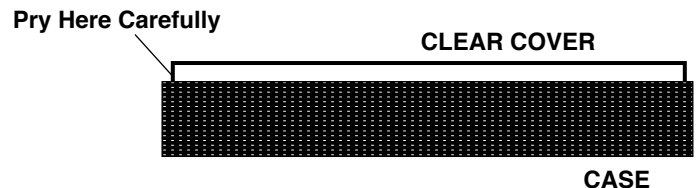


Figure II.G.6

7. Grasp top and slide scale slowly out from top. Be extremely careful not to bend the pointer (needle) or to move the Zero Adjust (ZA). See figure II.G.7.
8. Reverse the above procedure using the new scale.

NOTE: While replacing the clear plastic cover, ensure the ZA screw pin on the cover aligns with the inverted "Y" shaped slot on the meter movement. See figure II.G.7. IF, the inverted "Y" shaped slot is inadvertently moved - BEFORE installing cover:

- a. Re-center the inverted "Y" to the meter case as shown in figure II.G.7.
 - b. Center the Zero Adjust (ZA) PIN on the clear plastic cover as shown in figure II.G.8.
9. Using a standard slot screwdriver, ensure the ZA is operating - pointer swings left and right when turning the ZA with a standard slot screwdriver. See figure II.G.9.
 10. Set Meter ZERO as shown in figure II.G.9.
 11. Reinstall meter to front panel, reversing steps 1-3 (except OEM models).

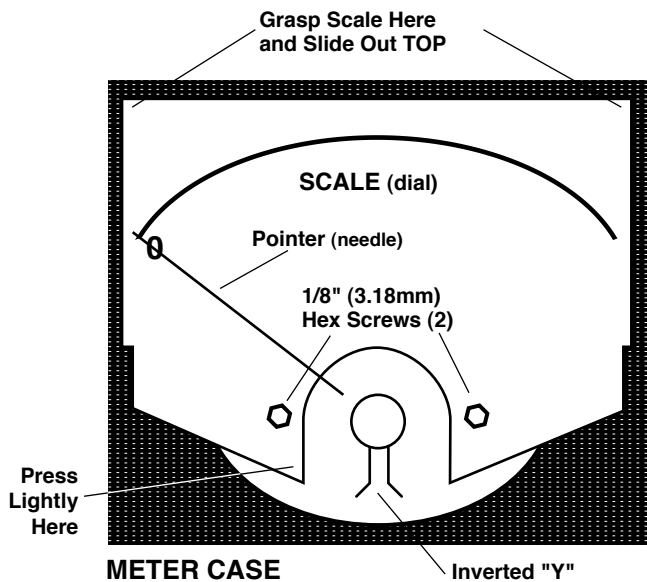


Figure II.G.7

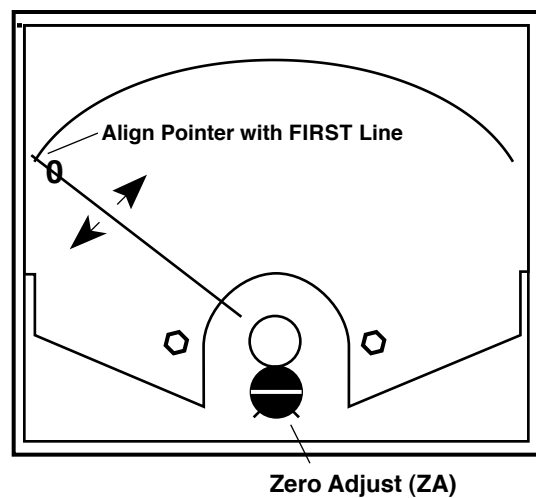


Figure II.G.9

4. LABEL CHANGE

Since you have re-ranged your Monitor/controller it may be necessary to relabel it. If you made any one of the following changes it will be necessary to "add or change" the designator label on the Front Panel. Pick the correct label and apply to the Front Panel as shown in figure II.G.10. If there is an overlay label already in place remove it and clean the surface with isopropyl alcohol (rubbing alcohol) before installing the new label. A clean surface will allow the new label to adhere to the surface better.

1. Did you change from μ S to mS, PPM or PPT?
2. Did you change from mS to μ S, PPM or PPT?
3. Did you change from PPM to PPT, μ S or mS?
4. Did you change from PPT to PPM, μ S or mS?
5. Do you need to install a Multiplier label as in figure II.G.11.

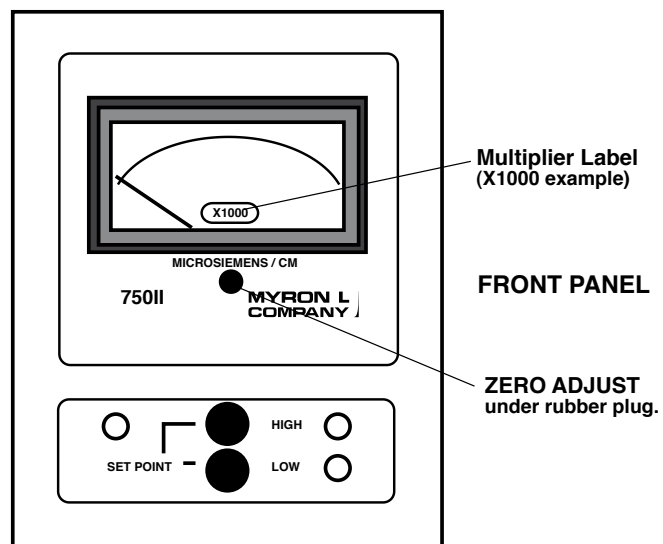


Figure II.G.10

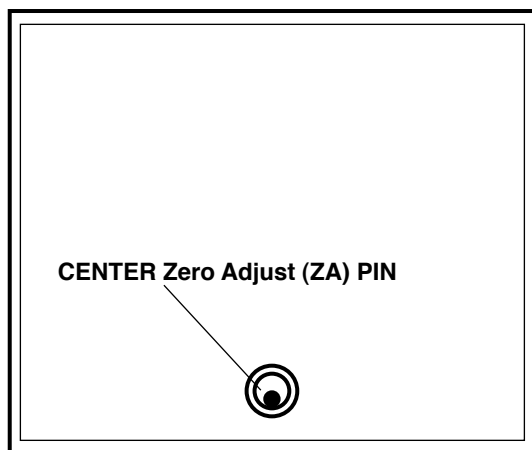


Figure II.G.8

REASSEMBLY

1. Carefully reinstall the front panel, bottom first, ensure no wires have been pinched.
2. Reinstall the four (4) screws and tighten.
3. To operate, turn power **ON**.

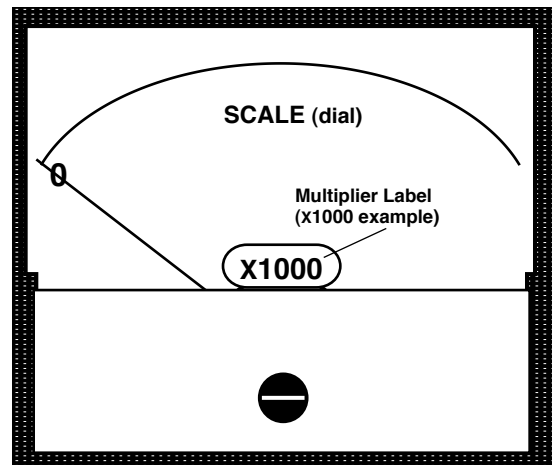


Figure II.G.11