'Quick-Start' Programming and Calibration Guide

MP-2000 Dual Channel LVDT/RVDT Readout/Controller

This 'Quick-Start' Guide provides the minimal steps and instructions for getting your MP-2000 up and running in the single and dual channel modes. To understand and access the full features and capabilities of the MP-2000, download the Operation Manual from our web site

Step 1. Wire the LVDT/RVDT transducer(s) to the supplied connector plugs for J1/J2. Refer to the Operation Manual (Wiring Instructions) for details.

CAUTION *Do NOT connect the transducers to the MP-2000 at this time!*

Step 2. Determine the full scale output voltage of the LVDT/RVDT, at the preferred operating frequency, for both 1 and 3 VRMS excitation voltages. The full scale output voltage may be obtained from the individual LVDT/RVDT data sheet, or can be calculated as follows:

LVDT/RVDT sensitivity (in V/V/inch or V/V/degree), multiplied by the excitation voltage (OSC 1 or 3 VRMS), multiplied by the displacement of the LVDT in inches, or RVDT in degrees, from the electrical zero (also called Null Position or mid-stroke).

CAUTION *For 3V, ensure VDT input impedance is high enough to avoid damage!*

As an example, the calculation for an HR 1000 LVDT, ±1 inch range (1 inch full scale), with a sensitivity of 0.39V/V/inch at 2.5KHZ, with 3 VRMS excitation would be done as follows:

0.39 x 3 x 1 = 1.17 VRMS full scale output

Note: If using both channels and the transducers are different, you will need to do this for each channel!

Step 3. Using the information from Step 2 above, determine and note the proper gain setting for each channel. Full scale outputs of 0.36 to 0.57 VRMS require HIGH GAIN, while outputs of 0.72 to 1.14 VRMS require LOW GAIN.

Step 4. Connect the power supply to J5 (Power) on the rear panel. The MP-2000 will take approximately 20 seconds to boot up, and will display:

Step 5. After booting for the first time, the top level menu appears:

Note: If the MP-2000 was previously programmed, it will instead go directly into the RUN *mode, and pressing* **[MENU]** *will go to the top level menu.*

Step 6. In the above top level menu, press [▼] to select the PROGRAM SETTINGS and then press **[ENTER]**. The system will ask for the password to go into PROGRAM mode. The password is [▲] [▼] [►] [▼] (successively press these buttons). The following PROGRAM SETTINGS menu will appear:
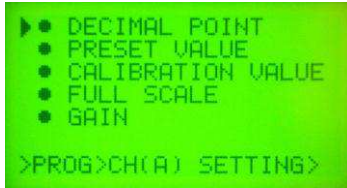

Notes:

- *If the password is entered incorrectly, the system will ask for the password again. After four incorrect attempts, the system will exit and return to the top level menu.*

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- Use [▲] [▼] [►] to navigate the menu and to make changes to values within the submenus.

- Pressing **[ENTER]** will enter the menu of the selected item, except in the lowest menu levels where pressing **[ENTER]** will perform the same task as [▲] [▼] [►] or **[MENU]**, which is returning back to the previous menu.

Step 7. Press **[ENTER]** to program Channel A. The following submenu will appear:

```
►● DECIMAL POINT
   ● PRESET VALUE
   ● CALIBRATION VALUE
   ● FULL SCALE
   ● GAIN

>PROG>CH(A) SETTING>
```

Set the following parameters:
- DECIMAL POINT for position readings.
- CALIBRATION VALUE, the distance you will move the LVDT core, or angle your will rotate the RVDT shaft from the electrical zero during the calibration.
- FULL SCALE, the displacement from zero for which the transducer is rated.
- GAIN setting from Step 3 for Channel A.

When done, press **[MENU]** to return to the PROGRAM SETTINGS menu If you are using two transducers, select CH(B) SETTING, and set the parameters above again for Channel B.

Step 8. Return to the PROGRAM SETTINGS menu, and select OSC CHOICE. The below submenu will appear:

```
►● OSC SOURCE
   ● OSC FREQUENCY
   ● OSC VOLT CH(A)
   ● OSC VOLT CH(B)

>PROG>OSC CHOICE>
```

Step 9. In the OSC SOURCE submenu, select OSC INTERNAL. The required frequency is determined by the specific LVDT/RVDT used. This setting is common to both channels. The required oscillator voltage for each channel was determined in Steps 2 and 3 above. Enter appropriate values.

| **CAUTION** | For 3V, ensure VDT input impedance is high enough to avoid damage! |

Step 10. Return to the PROGRAM SETTINGS menu. Select CALIBRATION SWITCH and then select ENABLE in the submenu.

Step 11. Press **[MENU]** repeatedly until you exit fully out passed the top level menu. The 'RUN' screen will appear displaying both channels:

```
CH(A):        .82

CH(B):       1.62
```
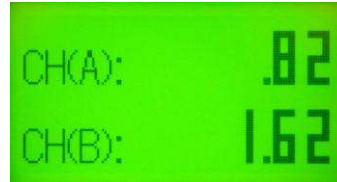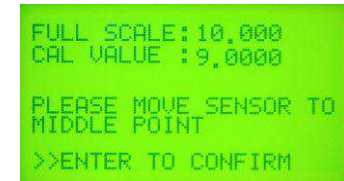
Step 12. When using an LVDT, place the core inside the bore. Connect the transducer(s) to J1 (Channel 1) and J2 (Channel 2) on the rear panel.

Step 13. Press the **A/B [ENTER]** button, and the screen will toggle to display Channel A only. Press [▼] and **[ENTER]** simultaneously, and the MP-2000 will enter the 'Voltmeter' mode as shown below:

```
        ADC INPUT
1V   2.5KHZ LOW GAIN

0.0696  V CH A

ANY BUTTON TO EXIT
```

Step 14. Move the core (LVDT) or rotate the shaft (RVDT) until you obtain the closest reading to 0V. This is the zero or null (MIDDLE POINT) position. Press **[MENU]** to return to the RUN screen.

Step 15. Press the CAL [▼] button and the following screen will appear:

```
FULL SCALE:10.000
CAL VALUE :9.0000

PLEASE MOVE SENSOR TO
MIDDLE POINT

>>ENTER TO CONFIRM
```

As you are already at the null (MIDDLE POINT), press **[ENTER]**, and following screen will appear:

```
FULL SCALE:10.000
CAL VALUE :9.0000

PLEASE MOVE SENSOR TO
END   POINT

>>ENTER TO CONFIRM
```

Step 16. Displace to the exact distance (in the positive direction) that was entered as the Calibration Value in Step 7, then press **[ENTER]**. The following screen will appear:

```
CALIBRATON OK

PRESS ANY KEY TO EXIT
```

Press any key to exit. The calibration process of Channel A is complete. Repeat Steps 12 through 15 to calibrate Channel B if you are using two transducers (use **A/B [ENTER]** button to toggle)

Your MP-2000 is now ready for use!