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|----------------------|--|------------------------------------|--|------------------------|-----------|
|                      |  | 434 FIELD CALIBRATION<br>PROCEDURE |  | DOCUMENT NO.<br>1-1215 | REV.<br>A |
| Created by: D.J.NEFF |  | 28 JAN 99                          |  | Sheet 1 of 4           |           |

| Rev | Date    | Appd | DCN   |  |  |  |  |  |  |  |  |
|-----|---------|------|-------|--|--|--|--|--|--|--|--|
| A   | 29JAN99 | RPC  | 10387 |  |  |  |  |  |  |  |  |
|     |         |      |       |  |  |  |  |  |  |  |  |
|     |         |      |       |  |  |  |  |  |  |  |  |

**Suggested Equipment:**

1. Precision volt meter with accuracy of  $\pm 0.003\%$  of reading at 2.4V
2. Precision DC Voltage source with accuracy of 0.125% of setting at 100V
3. Current source adjustable from 4.000mA to 24.000mA with resolution of 0.001mA  
Accuracy is irrelevant)
4. 100 Ohm standard resistor with accuracy and stability of  $\pm 0.003\%$  between 18°C and 28°C
5. Ohms Source

**ENABLING CALIBRATION:**

Remove the battery cover and four corner screws. While holding the UUT face down in one hand, carefully separate the top and bottom housing. Place the unit into Calibration mode by placing the jumper (JP201) located in the upper right side of the circuit board into the shorted position (See Figure 1). Verify the UUT is in Calibration mode by turning on the UUT and viewing the top of the LCD for the word SETUP. Place fresh batteries into the UUT before any calibration adjustments are made.

**CALIBRATION:**

**NOTE:** During calibration, pressing the *STORE/RESET* button will cause CAL to illuminate on the LCD. Then pressing either *AUTO CHEK/RAMP/VALVE* or *START/STOP* will cause the display to flash indicating the UUT received the calibration.

**NOTE:** This procedure applies for UUT's with Software Rev 1.02 or Greater. If the UUT has Software Rev 1.01, then the Hi Calibration for SOURCE mA and READ mA should be done at 20mA instead of 24mA.

**SOURCE mA:**

**Lo Calibration:**

1. Connect the Source leads in series with the 100 Ohm resistor. Connect the DVM parallel with the 100 Ohm resistor (See Figure 2).
2. Dial the UUT so the DVM reads 0.000mV  $\pm 0.096$ mV.
3. Press the *STORE/RESET* button and then the *AUTO CHEK/RAMP/VALVE* button.

**Hi Calibration:**

4. Dial the UUT so the DVM reads 2.4000V  $\pm 0.0003$ V.
5. Press the *STORE/RESET* button and then the *START/STOP* button.

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**READ mA:**

Lo Calibration:

1. Disconnect all wires to have an open loop and press the *STORE/RESET* button and then the *AUTO CHEK/RAMP/VALVE* button.

Hi Calibration:

2. Connect a current source in series with a 100 Ohm Resistor and the UUT. Monitor the current by placing a DVM in parallel with the 100 Ohm Resistor, and monitor the voltage burden by placing a DVM in parallel with the UUT inputs (See Figure 3).

3. Set the current source so the DVM in parallel with the 100 Ohm resistor reads 2.4000V  $\pm$ 0.0003V, and adjust R235 so the DVM in parallel with the UUT reads 0.90V  $\pm$ 0.15V.

4. Press the *STORE/RESET* button and then the *START/STOP* button.

**READ V:**

Lo Calibration:

1. Connect the UUT to a voltage source (See Figure 4).

2. Set the voltage source to 0.00V

3. Press the *STORE/RESET* button and then the *AUTO CHEK/RAMP/VALVE* button.

Hi Calibration:

4. Set the voltage source to 100.0V

5. Press the *STORE/RESET* button and then the *START/STOP* button.

When Calibration is completed, turn the UUT Off. Place the UUT into normal operating mode by unshorting JP201 (See Figure 1)

**CHECK ACCURACY**

**Source mA:**

Set the UUT to mA SOURCE. See Figure 2 for connections. Set the UUT to the currents in the table below and verify the accuracy of Source mA mode (Meter reads within spec).

| Current  | DVM                   |
|----------|-----------------------|
| 4.000mA  | 0.4000V $\pm$ 0.0003V |
| 12.000mA | 1.2000V $\pm$ 0.0004V |
| 20.000mA | 2.0000V $\pm$ 0.0005V |

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**2-Wire Sim:**

Connect the source leads in series with the voltage source set to 24V and the 100 Ohm resistor. Connect the DVM parallel with the 100 Ohm resistor (See Figure 5). Control the current with the UUT and verify the accuracy (Meter reads within spec).

| UUT Setting | DVM                   |
|-------------|-----------------------|
| 4.000mA     | 0.4000V $\pm$ 0.0003V |
| 12.000mA    | 1.2000V $\pm$ 0.0004V |
| 20.000mA    | 2.0000V $\pm$ 0.0005V |

**PWR XMTR:**

See Figure 6 for connections. Set the Ohms Source to the readings of the DVM in the table below and verify the accuracy. (UUT reads same as the meter)

| Ohms Setting | DVM Reading | UUT Display            |
|--------------|-------------|------------------------|
| →            | 0.4000V     | 4.000mA $\pm$ 0.003mA  |
| →            | 1.2000V     | 12.000mA $\pm$ 0.004mA |
| →            | 2.0000V     | 20.000mA $\pm$ 0.005mA |

**Read mA:**

Connect a current source in series with a 100 Ohm Resistor and the UUT. Monitor the current by placing a DVM in parallel with the 100 Ohm Resistor (See Figure 3). Set the current source to the currents in the table below and verify the accuracy. (UUT reading within spec)

| Current Source Setting | DVM Reading | UUT Display            |
|------------------------|-------------|------------------------|
| 4.000mA                | 0.4000V     | 4.000mA $\pm$ 0.003mA  |
| 12.000mA               | 1.2000V     | 12.000mA $\pm$ 0.004mA |
| 20.000mA               | 2.0000V     | 20.000mA $\pm$ 0.005mA |

**Read V:** Connect the UUT to a voltage source (See Figure 4). Adjust the voltage source to the voltages in the table below and verify the accuracy. (UUT reading within spec)

| Voltage Setting | UUT Display        |
|-----------------|--------------------|
| 1.00V           | 1.00V $\pm$ 0.50V  |
| 10.00V          | 10.00V $\pm$ 0.50V |
| 50.00V          | 50.00V $\pm$ 0.50V |
| 100.0V          | 100.0V $\pm$ 0.5V  |

Disconnect UUT and turn the UUT off.

Reset the unit by holding the *STORE/RESET* button while turning the power on. Continue to hold the *STORE/RESET* button until the display starts to flash.

**This completes the procedure.**

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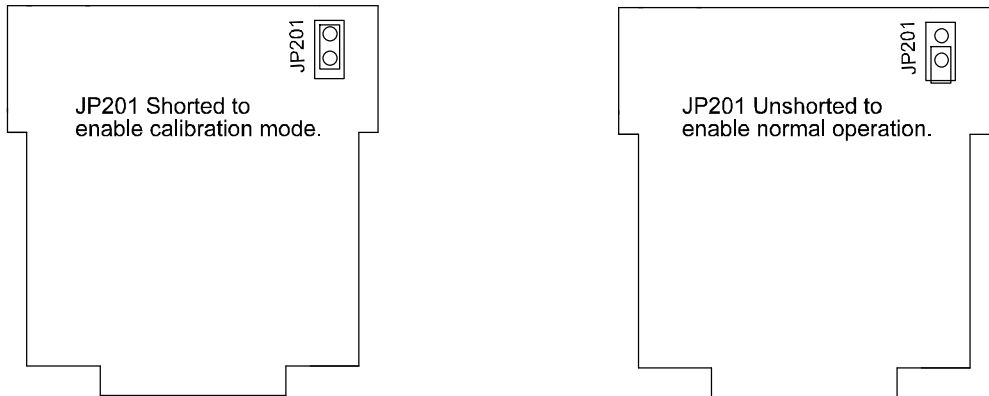


FIGURE 1

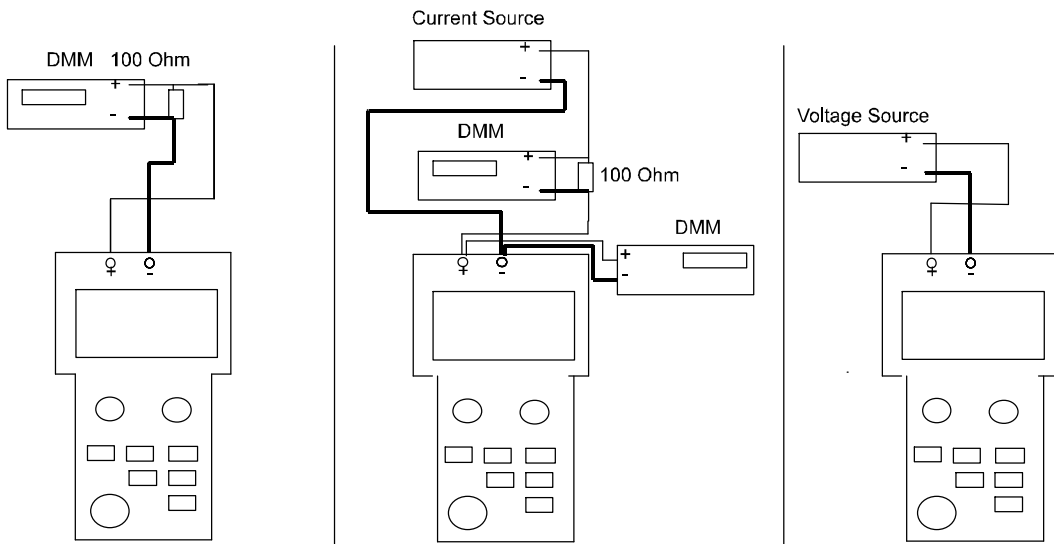


FIGURE 2 (Source mA)

FIGURE 3 (Read mA)

FIGURE 4 (Read V)

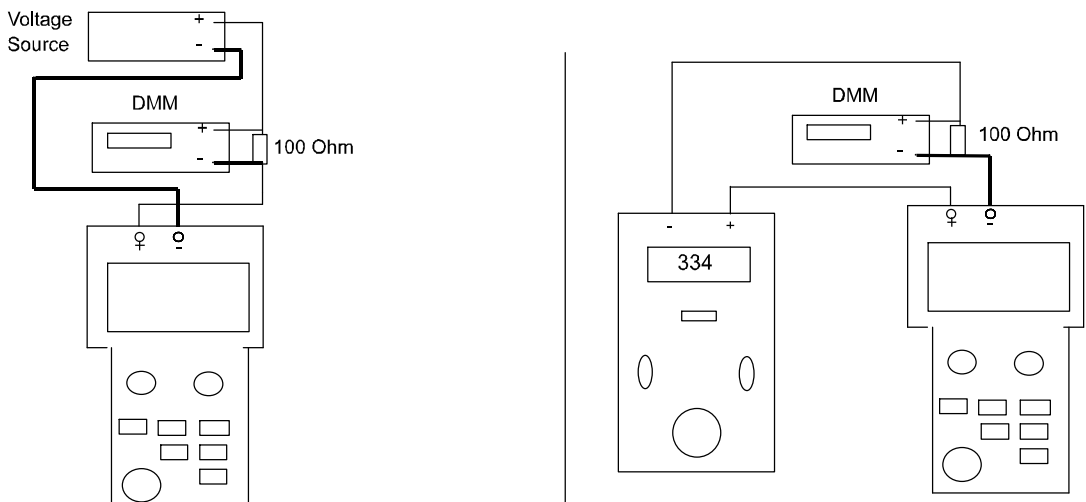


FIGURE 5 (2-Wire)

FIGURE 6 (Pwr Xmtr)