Murata Power Solutions

DMS APPLICATION NOTE 15

Troubleshooting Guide

Though panel meters are not very complex components, the real-world situations in which they are used are not always that straightforward. Though we have attempted to clearly describe a number of the more popular DPM applications, it is inevitable that your particular application will have its own little idiosyncracies and challenges.

The following troubleshooting guide — while obviously not guaranteed to solve every problem — should prove useful, particularly to first-time users of Murata Power Solutions' DMS Series DPM's. Where applicable, we have referenced Murata Power Solutions Application Notes that may provide additional clarifications, alternatives or other helpful insights. The most likely "possible causes" of a particular problem are listed first with the least likely ones listed later.

Some simple "self-tests" are also included to assist in determining whether or not a meter has suffered irreparable damage (i. e., "blown"). The self-tests are particularly useful if dc voltage calibrators, digital multimeters (DMM's), or similar troubleshooting instruments are not readily available. Testing is usually more effectively performed with the meter disconnected from the circuit in question.

If problems persist, please don't hesitate to call Murata Power Solutions' experienced application engineers at 508-339-3000.

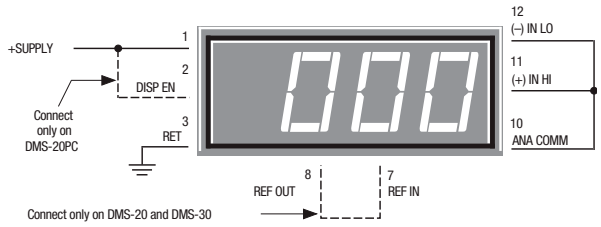

Figure 1. Self-Test Circuit (Zero Test)

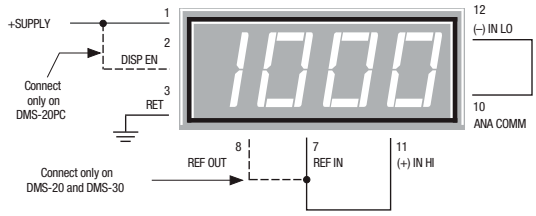

Figure 2. Self-Test Circuit (Reference Test)

Dead (off) display

1. Power may be connected incorrectly (reverse polarity?). Verify connections at meter with a DMM.
2. On DMS-20PC models, pin 2 (DISPLAY ENABLE) may be open.
3. Meter may be blown or defective (see self-tests). See individual product data sheets.

Display permanently overranged

1. Pin 7 (REFERENCE IN) may be open (DMS-20/30 only).
2. 9V models may be incorrectly used in single-ended mode.
3. Input voltage range may be exceeded.
4. Common mode voltage may exceed power supply voltage.
5. Meter may be blown or defective (see self-tests). See application notes 2 and 3.

Display intermittently overranges

1. Pins 11 and/or 12 (INPUTS) may be open (no connections).
2. Input signal may be "floating". For 5V models, tie pin 12 (–INPUT LO) to pin 3 (5V RETURN). For 9V models, tie pin 12 to pin 10 (ANALOG COMMON).
3. Input may not be a steady dc voltage.
4. Pin 7 (REFERENCE IN) may be open (DMS-20/30 only). See individual product data sheets & ap notes 2, 3 and 11.

All readings low

1. Pin 10 (ANALOG COMMON) may be grounded (DMS-20's only).
2. Pin 9 (+1.23V REFERENCE OUT) may be incorrectly tied to pins 7 and 8 (REFERENCE IN/OUT) (DMS-30's only).
3. Pin 8 may be incorrectly tied to pin 7 (DMS-40's).
4. Gain potentiometer on back of meter may be misadjusted.
5. Wrong input range (too high) possibly being used.
6. Wrong input range may have been selected (DMS-40LCD only). See application notes 3 and 4.

Display will not read "000"

1. Input may not be at 0.0V (has some zero offset).
2. There may be ground loops in input signal wiring. See application notes 2, 3 and 12.

Erratic (unsteady) readings

1. There may be ground loops in the input/power system wiring.
2. Pin 10 (ANALOG COMMON) may be incorrectly tied to pin 3 (5V RETURN) (DMS-40PC).
3. Power source may be poorly regulated.
4. Input signal may have excessive ac components.
5. There may be strong magnetic or electrostatic fields near the meter. See application note 2.

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