Instruction Manual for Multi-function Panel Meter
Elite Model – DCM9040

Main Features of the Meter

- The measured values are shown on two-line 7-segment multi-function displays:
  On the top display, toggled by the V/W button between
  - Voltage (V), Power (W) and Working Hours (TIME)
  On the bottom line display, toggled by the A/AH button between
  - Current (A), Ampere-hours (AH) and Working Hours (TIME)
- With switched output, it can be triggered manually or automatically.
- With built-in Buzzer Alarm
- Free to set 6 type protection modes, switched output will be triggered automatically when protection take effect.
  - Over Voltage (OVP), Over Current (OCP), Over Power (OPP)
  - Over AH (OAH), Time Over (OFT), Under Voltage (LOP)
- The "OUT" LED on the right shows the status of switched output, Other LEDs (V, W, A, AH, H) show what the display to the left is measuring.
- There is a flexible calibration process for voltage, current.
- The meter does not require external power when measuring between 5V and 40V.
- The meter consumes very little power for its own operation.
- The package includes the meter, connector block and current-measuring shunt.

Specification

- Power supply required: DC 5 to 40V (external or internal)
- Measuring range:
  (1) Using an external power supply - Voltage 0 to 90.0V / Amp 0 to 100A
  (2) Using an internal power supply - Voltage 5 to 40.0V / Amp 0 to 100A
  Accuracy: Volts ± 0.1% + 2byte, Amps ± 0.5% + 3byte
- Resolution 0.01V, 0.01A, 0.01W, 0.01Ah
- Protect Type OCP, OAH, OVP, OPP, OFT, LOP
  - OVP/LOP 0.1V~99.99V, OCP 0.01~ Upper limit, OPP 0.01W~9999W
  - OAH 0.01Ah~9999Ah, OFT 0.01Hours~99.99Hours
- Dimensions: 79mm x 43mm x 30mm
- Panel cutout: 76.5mm x 39.2mm
- Sampling rate: 5 reading per second
- Displays: Two line 4 digits Red LED
- Operating Temperature: 0 to 50°C
- Operating Humidity: 35 to 85% Relative Humidity
- Weight: 200g including the shunt

Installation

1. Cut rectangular hole in the panel precisely 76.5mm x 39.2mm to mount the meter.
2. Plug the multi-pair cable between the meter and the connector block. .
3. Mount the meter into the cutout, with the connector block accessible for wiring.
4. Connect the shunt in series with the heavy cable on negative terminal of battery.
5. Select the configuration (internal or external power) from Figures 1, 2, & 3.
6. Cable between the shunt and connector block according to selected configuration.
7. Connect DC positive (+) power to meter according to the selected configuration.
8. Test the meter for normal operation and calibrate it as follows.

Normal Operation

- By default, when the meter is first powered up, the display on the top line shows voltage (V) and the display on the bottom line shows current (A).
- To switch the top display successively between voltage (V) and power (W), press the V/W button repeatedly.
- To switch the bottom display successively between current (A), capacity (AH) and working hours (H), press the A/AH button repeatedly.
- To put the meter into protection mode, press OUT button momentarily, the LED (OUT) to the right of the panel meter will light up, it start to calculate the working hours and AH.
- To reset Ah and working hours, long press A/AH button till buzzer sound.
- The display shows "-AL- Oxxx" when protection take effect, the LED (AL) will light up, the buzzer will alarm, press OUT button to stop the alarm.

Debug Mode

The debug mode enables calibration, saving of settings, resetting to default values, protection value, and other preset values.

Switch the meter to debug mode by pressing and holding down the SET button until the display changes. The first item of the debug menu will be voltage [0-U], the voltage LED (labelled V) on the right hand side of the display will light. To change to the next item in the debug menu (current), press the SET button momentarily.

[0-U] Calibration of Voltage reading
[1-C] Calibration of Current reading
[2-FL] Multiple of current, default value [10].
[3-ON] Switched-output on/off status when meter powered on
[4-ES] Save setting
[5-r] Reset to Factory Default Values
[6-OV] Over-voltage values
[7-OC] Over-current values
[8-OP] Over-power values
[9-AH] Over ampere-hour values
[10-H] Time-out values
[11-T] Reserved for future
[12-L] Under-voltage values
[13-F] Multiple of voltage, default value [10].

Press the V/W button to increase the reading, or Press the A/AH button to reduce the reading. Long press V/W or A/AH button to increase/decrease the value faster.

To quite the debug mode without saving any changes, press and hold down the OUT button until the display reverts to normal operation.

Calibration of Zero and High Voltage Readings:

1. Disconnect the Vin and GND on the connector block, just short Vin and GND.
2. Power the Elite panel meter by external source.
3. Using the OUT button, select first item of the debug menu [0-U].
4. The LED (V) to the right of the panel meter will light up.
5. The bottom line of the LED display will show the voltage reading.
6. Press the V/W button to increase the reading, or Press the A/AH button to reduce the reading till the LED display [0.01], then press A/AH button momentarily 2-3 times till the LED display [0.00], finish the calibration of zero reading.
7. Connect Vin and GND to the known power 25.00V.
8. If the reading is 25.00V, then go to step 11
9. If the reading differs from the separate calibrated voltmeter 25.00V, then adjust the Elite panel meter.
10. Repeat steps 1 to 9 several times, until high and zero voltage both read correctly.
11. Save the settings by pressing the:
    - OUT button to step the debug menu through to save-settings [4-ES]
    - V/W or A/AH button to change the display from –n- (No) to -y- (Yes), OUT button to confirm the selection.

Calibration of Zero and High Current Readings:

1. Connect ISNA and AGND to the shunt.
2. Using the OUT button, step to the second item of the debug menu [1-C].
3. The LED (A) to the right of the panel meter will light up.
4. The bottom line of the LED display will show the current reading.
5. Press the V/W button to increase the reading, or Press the A/AH button to reduce the reading till the LED display [0.01], then press A/AH button momentarily 3-5 times till the LED display [0.00], finish the calibration of zero reading.
6. Connect a load to the battery to cause a current to flow at a value close to the maximum that you expect to measure with the Elite panel meter, for example 80A.
7. Read the battery current continuously with a separate calibrated ammeter.
8. If the reading is the same as on the separate calibrated ammeter, then go to step 11.
9. If the reading differs from the separate calibrated ammeter then adjust the Elite panel meter.
10. Repeat steps 1 to 9 several times, until high and zero currents both read correctly.
11. Save the settings by pressing the:
    - OUT button to step the debug menu through to save-settings [4-ES]
    - V/W or A/AH button to change the display from –n- (No) to -y- (Yes), OUT button to confirm the selection.

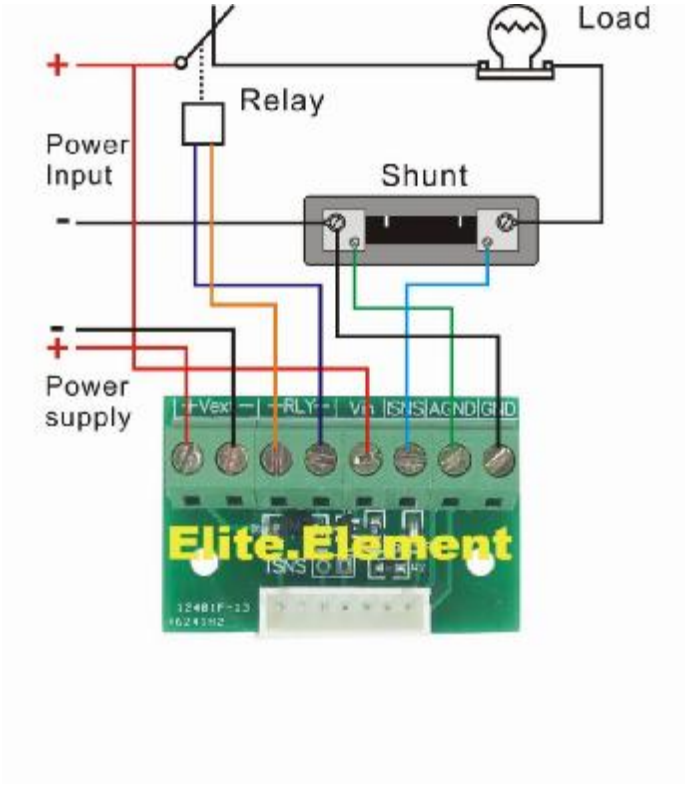
Save settings

1. This enables settings made in the debug menu items to be saved.
2. Using the OUT button, step to the fourth item of the debug menu.
3. The LED display will show [4-ES] on the top line and "-n-" on the bottom line.
4. Press the V/W or A/AH button to select "-y-" (Yes), or "-n-" (No).
5. Save the settings by pressing the OUT button to confirm the -y- or –n- selection.

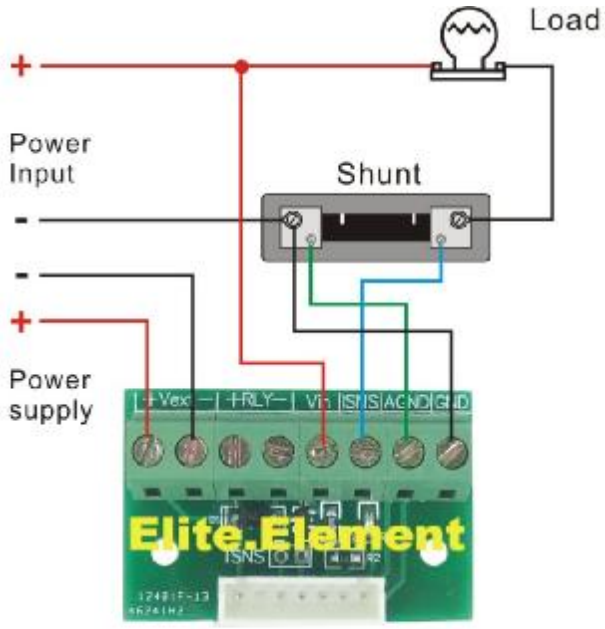
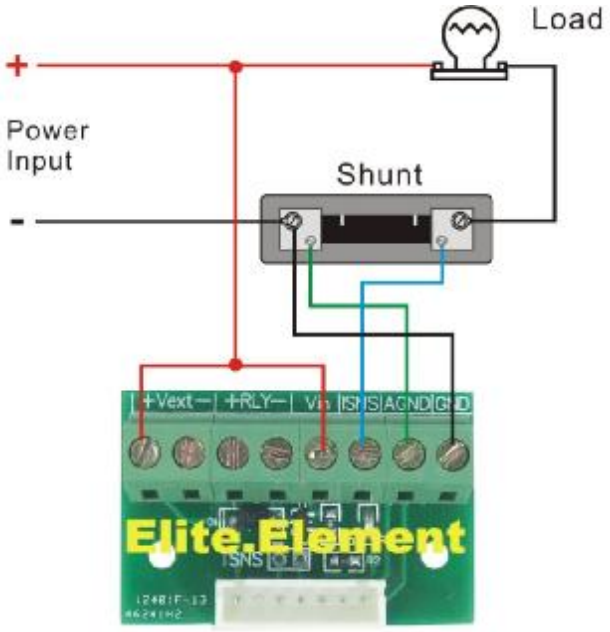
Switched Output Control

1. Switched output available only when
2. Maximum Output Current 500mA.
3. If the meter powered by 12Vdc, 12V relay is required. If the meter powered by 24Vdc, then 24V relay is required.
4. By default, meter triggers the external relay when it powered on, so the NC of relay will be cut off, press OUT button to stop trigger, it will triggers the relay again when protection take effect.
5. If require opposite status of trigger, enter the debug mode, step to [14-L], change value "0" to "1".
6. The display shows "-AL- Oxxx" when protection takes effect, the LED (AL) will light up, and the buzzer will alarm, press OUT button to stop the alarm.

(1)Full function system



(2)Three-wire system



(3)Two-wire system