Instruction Manual for Multi-function Panel Meter

Model – Elite DCM-12030C

(English version)

Main Features of the Meter

- Both forward (Positive) and reverse (Negative) current flows can be measured.
- The "CHARGING" LED on the right lights when the battery is charging.
- Other LEDs (V, TIME, W, A, AH, %) show what the display to the left is measuring.
- The measured values are shown on two-line seven-segment multi-function displays:
  On the top line is a four-digit display, toggled by the V/W button between
  - Voltage (V), Power (W) and Working Hours (H)
  On the bottom line is a three-digit display, toggled by the A/AH button between
  - Current (A), Ampere-hours (AH) and Remaining Capacity Percentage (%).
- There is a flexible calibration process for voltage, current and Amp-hours/ % capacity
- The meter does not require external power when measuring between 10V and 90V.
- The meter consumes very little power for its own operation.

Specification

- Power supply required: DC 10 to 90V (external or internal)
- Measuring range:
  (1) Using an external power supply - Voltage 0 to 120.0V / Amp 0 to 30.0A
  (2) Using an internal power supply - Voltage 10 to 90.0V / Amp 0 to 30.0A (Figures 1)
- Accuracy: Volts ± 1% + 2byte, Amps ± 2% + 5byte
- Resolution 0.01V, 0.01A, 0.01W, 0.01Ah
- Dimensions: 79mm x 43mm x 30mm
- Panel cutout: 76.5mm x 39.2mm
- Sampling rate: 5 reading per second
- Displays: 4 and 3 digits Red LED
- Operating Temperature: 0 to 50°C
- Operating Humidity: 35 to 85% Relative Humidity
- Weight: 70g

Installation

1. Cut rectangular hole in the panel precisely 76.5mm x 39.2mm to mount the meter.
2. Mount the meter into the cut out.
3. Connect the meter in series with the load or charger.
4. Select the configuration (external or internal power) from Figures 1, 2, & 3.
5. 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 power (W), working hours (H), and voltage (V), press the V/W button repeatedly.
- To switch the bottom display successively between charge/discharge (AH), capacity percentage (%) and current (A), press the A/AH button repeatedly.
- To turn all LEDs off press the SET button momentarily.
- To turn the display back on press the SET button momentarily again.

Debug Mode

The debug mode enables calibration, saving of settings and resetting to default 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 displayed (voltage). 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. The current LED (A) in the right hand side of the display will be lit. Each successive momentary press of the

SET button steps the display through the remaining menu items (battery capacity (AH), save settings (ES) and reset-to-default (dEF)) until the first menu item (voltage) is displayed again.

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

Calibration of Zero and High Voltage Readings

1. Disconnect the INPUT + and - on the connector block, just short INPUT + and −.
2. Power the Elite panel meter by external source.
3. Using the SET button on the Elite panel meter, select the first item of the debug menu.
4. The LED (V) to the right of the panel meter will light up.
5. The top 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 short press A/AH button 2-3 times till the LED display [0.00], finish the calibration of zero reading.
7. Connect the INPUT + and − to known power 33.00V.
8. If the reading is the same as on the calibrated voltmeter, then go to step 11.
9. If the reading differs from the calibrated voltmeter then adjust the panel meter.
10. Press the V/W button to increase the reading, or press the A/AH button to reduce the reading.
11. Save the settings by pressing the:
    - SET button to step the debug menu through to save-settings (ES),
    - V/W button to change the display to -y- (Yes), and SET button to confirm the selection.

※ Long press V/W or A/AH button to increase or decrease the value faster.

Calibration of High and Zero Current Readings:

1. Disconnect the INPUT + and - on the connector block.
2. Power the Elite panel meter by external source. By default, when the meter is first powered up, the display on the bottom line shows current (A).
3. Long press A/AH button till the LED on the bottom line display [00.0], finish the calibration of zero reading.
4. Connect INPUT + and – to battery, OUTPUT + and – to load, cause a current to flow at a value close to the maximum that you expect to measure with the Elite meter, for example 25.0A
5. Read the battery current continuously with a separate calibrated ammeter.
6. Using the SET button, step to the second item of the debug menu.
7. The LED (A) to the right of the panel meter will light up.
8. The three-digit bottom line of the display will show the current reading in Amps.
9. If the reading is the same as on the separate calibrated ammeter, then go to step 12.
10. If the reading differs from the separate calibrated ammeter then adjust the Elite panel meter.
11. Press the V/W button to increase the reading, or press the A/AH button to reduce the reading.
12. Save the settings by pressing the:
    - SET button to step the debug menu through to save-settings (ES),
    - V/W button to change the display from –n- (No) to -y- (Yes), and SET button to confirm the selection.

Setting the Rated Battery Capacity

Such resets are necessary for the initial installation of either the meter or a battery, so that the Elite meter correctly display the actual remaining capacity of the battery.

1. Determine the rated capacity of the battery, expressed in Amp-hours, eg 100 Ah.

2. Using the SET button on the panel meter, step to the third item of the debug menu.
3. The LED labelled AH, to the right of the panel meter, will light up.
4. The bottom line of the numerical display will show the battery capacity (Ah).
5. If the reading is the same as the rated battery capacity, then quit debug mode.
6. If the reading differs from the rated battery capacity then adjust the meter.
7. Press the V/W button to increase the reading to the rated value, or press the A/AH button to reduce the reading to the rated value.
8. Save the settings by pressing the:
    - SET button to step the debug menu through to save-settings (ES),
    - V/W button to change the display from –n- (No) to -y- (Yes), and SET button to confirm the selection.

Save settings

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

Reset to Factory Default Values

If restore factory setting, recalibrate voltage reading and current reading are required.

1. This resets values for debug menu items V, A and AH to factory default values.
2. Using the SET button, step to the fifth item of the debug menu.
3. The LED display will show "dEF" on the top line and "-n-" on the bottom line.

4. Press the V/W button to select "-y-" (Yes), or press the A/AH button to select "-n-" (No).
5. Save the settings by pressing the SET button to confirm the -y- or –n- selection.

Setting the Value for Remaining Amp-hour and Remaining Capacity %

Such resets are necessary for the initial installation of either the meter or a battery, so that the display correctly registers the actual remaining capacity of the battery, as opposed to the rated capacity of the battery.
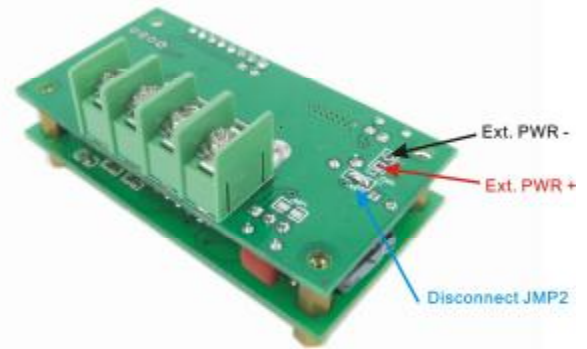
1. Charge the battery fully.
2. Ensure that the panel meter is in normal operational mode, not in debug mode.
3. Momentarily press the A/AH button repeatedly until the AH LED is lit.
4. Press and hold the A/AH button until the AH LED blinks.
5. Press and hold the A/AH button until reading is reduced to the correct value, or press and hold the V/W button until the reading is increased to the correct value.
6. Momentarily press the SET button to save the value.

※ Above steps should be done periodically (monthly) to correct for any accumulated errors caused by charger pulsing etc.
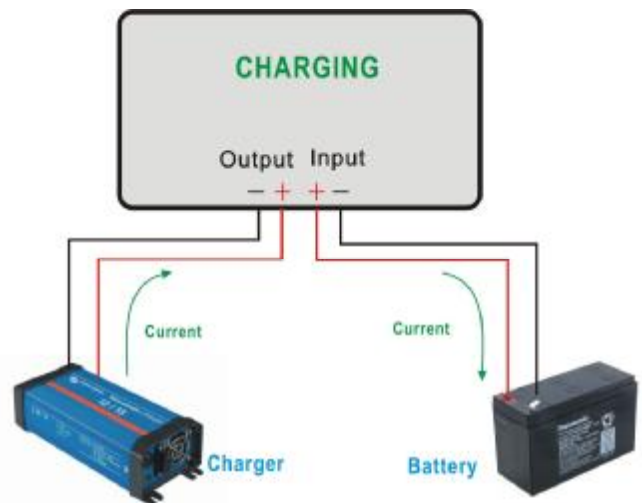
Saving the Presently Displayed Amp-hour and % Capacity Readings

- Ensure that the panel meter is in normal operational mode, not debug mode.
- Momentarily press the A/AH button repeatedly until the AH LED is lit.
- Then momentarily press the SET button to save the value.
- The display will be extinguished by the previous step but can be restored by a momentary press of the SET button.

Figures 1

Figures 2

Figures 3