

# DM-50

Digital Multimeter

## features

True RMS Measurement

4-digits Segment Display

Real Time Display (for each phase) :-

Current (I) / Voltage (V) / Frequency (Hz) / True Power Factor (PF)  
Displacement Power Factor (CosΦ) / Active Power (P)  
Reactive Power (Q) / Apparent Power (S)

Default View Mode Selection

Auto / Manual Scroll for L1, L2 & L3

Alarm LED Indication (Activated by A-02s) :-

Adjustable Over / Under Voltage Setting  
Adjustable Over / Under Current Setting  
Adjustable Over / Under Frequency Setting  
Adjustable Low PF / Low Cos Φ Setting  
Adjustable Start / Reset Time Delay

Complies with : IEC 61326-1

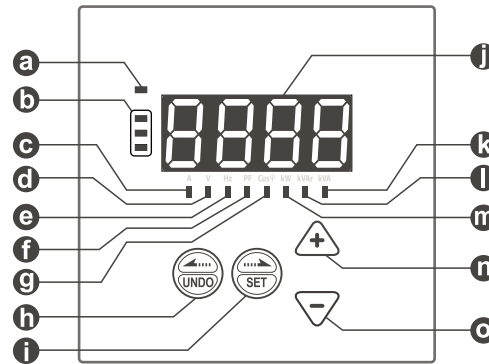
External Plug-in Module for :-

A-01s / A-01sp (RS-485 Modbus RTU) *isolated type*  
A-02s (RS-485 Modbus RTU + Alarm Output) *isolated type*



Delab Scientific Sdn. Bhd.

## Panel Overview



- a - Alarm LED
- b - L1 ~ L3 LED
- c - (A) LED Indication
- d - (V) LED Indication
- e - (Hz) LED Indication
- f - (PF) LED Indication
- g - (Cos Φ) LED Indication
- h - Back Once / Undo Button
- i - Forward Once / Set Button
- j - 4 Digit 7-segment Display
- k - (kVA) LED Indication
- l - (kVAr) LED Indication
- m - (kW) LED Indication
- n - Up Button - Increment
- o - Down Button - Decrement

## Technical Data

### Aux Power Supply

AC range : 65~275 Vac (45~65 Hz)  
DC range : 90~300 Vdc  
Consumption : < 3VA

### Current Measurement

AC Input Range : 0,025~10,0 A  
Accuracy : ± 1,0 %  
CT Range : 5~10,000 / 5A  
Burden : < 0,1 VA at 5A

### Voltage Measurement

AC Input Range : 0~300 VLN  
0~500 VLL  
Accuracy : ± 1,0 %

### Power Measurement

W, VAr, VA, PF, Cos Φ  
Accuracy : ± 2,0 %

### Frequency Measurement

Range : 45 ~ 65 Hz  
Accuracy : ± 0,5 %

### Network Type

3P4W, 3P3W & 1P2W

### Display Type

4-digits 7 Segment Display

### Mechanical

Operating Temp. : -5°C ~ +55°C  
IP Rating : IP54 (front panel)  
Installation : Panel flush mount  
Dimension (mm) : 99,2(h) x 99,2(w) x 45(d)  
Weight : approx. 265 gram

### Communication

A-01s / A-01sp or A-02s Plug in module  
Modbus RTU RS-485 (isolated type) with selectable baud rate, address & parity.

**Selectable baud rate (kbps):**  
0,3 , 0,6 , 1,2 , 2,4 , 4,8 , 9,6 , 19,2 , 28,8

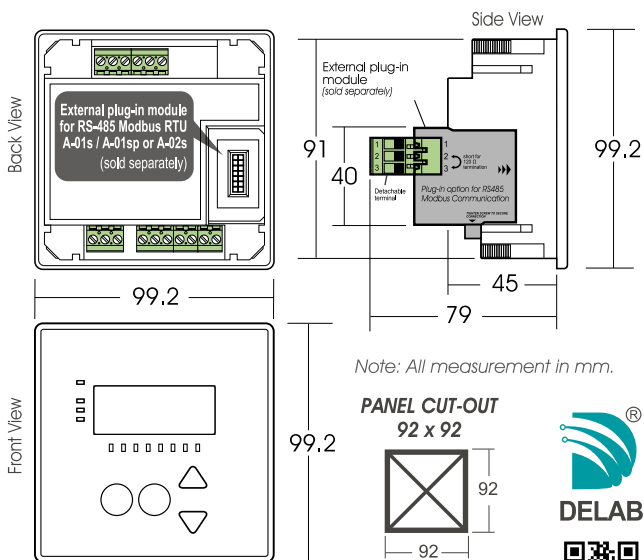
**Selectable address:**  
1 ~ 247

**Selectable Parity:**  
None / odd / even

### External Output (Programmable Alarm)

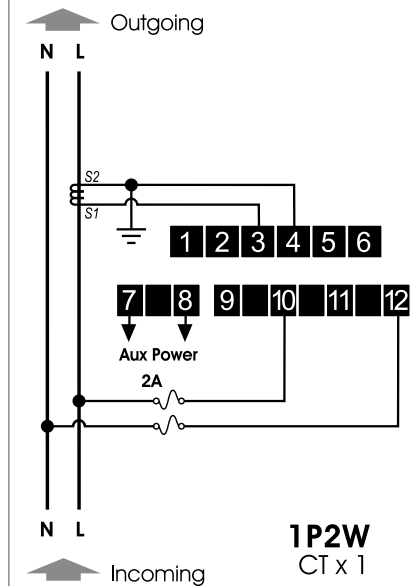
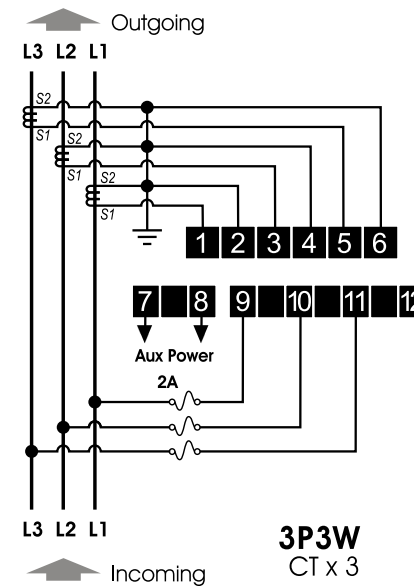
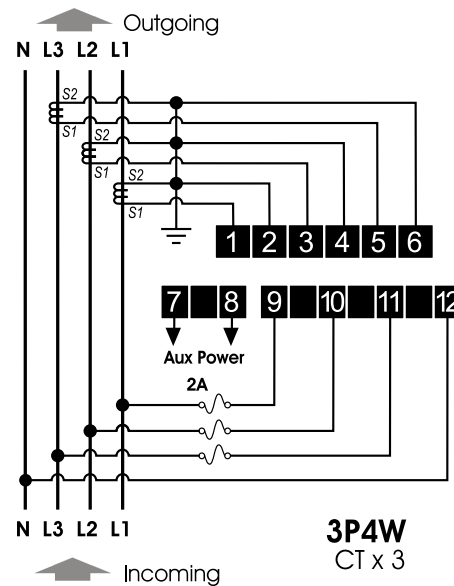
A-02s : Modbus RTU RS-485 (isolated type) with external output  
Plug in module (isolated type) with external output

## Casing Dimension



Note: Specification subject to change without prior notification (please visit [www.delab.com.my](http://www.delab.com.my) for latest specification)

## Wiring





## Access to Set-up Menu

Set CT ratio, Network type, Auto scroll, Default parameter display, Plug-in module & Alarm

### To access Set-up Menu

In any view (not in alarm and operation hour display mode):-

Press 'UNDO & SET' button simultaneously and hold for 5 seconds until **CTr** appears.



Press ▲ or ▼ button to modify parameters.



Press 'SET' button to confirm and proceed to next mode.



## Set-up Menu

- |   |  |
|---|--|
| 1) Set CT ratio   | 5 ~ 10,000 / 5   |
| 2) Set Network Type   | 3P (3P4W / 3P3W) or 1P (1P2W)  |
| 3) Set Auto Scroll  | Auto / Off   |
| 4) Set Default Parameter  | Ampere / Voltage / Frequency / Power Factor / Cos Φ / Active Power / Reactive Power / Apparent Power                     |
| 5) Plug-In Module   | None ; A-01s / A-01sp ; A-02s<br>Add : 1~247<br>Baud rate : 3,6,12,24,48,96,192,288<br>Parity : none / odd / even        |
| 6) Set Alarm Parameter<br>(available only when A-02s is selected) | Over / Under Current<br>Over / Under Voltage<br>Over / Under Frequency<br>Low PF / Low Cos Φ<br>Start / Reset Time Delay |
| 7) End Setting  | Save & Exit Set-up Menu  |

**1****CTr**

## Set CT ratio

Factory Setting

**1**

Modify by pressing the ▲ or ▼ button.

e.g. CT primary is 1,000 turns,  $CTr = \frac{1,000}{5} = 200$

Press ▲ or ▼ button to modify CT ratio to 200.  
Press 'SET' button to confirm and proceed to next mode.

Note: Selectable CT ratio range is from 1 ~ 2,000, which means the CT primary is from 5 ~ 10,000.

**2****TYPE**

## Network Selection

Factory Setting

**3PH****3PH** 3P4W or 3P3W**1PH** 1P2W

Note: Please refer wiring diagram for 3P4W, 3P3W & 1P2W connection

**3****rotp**

## Auto Scroll Selection

Factory Setting

**Auto****Auto** Auto scroll phase view**OFF** Disable auto scroll

When auto scroll is activated, L1, L2, & L3 will scroll automatically in the selected view mode every 10 seconds.

**4****VIEW**

## Default Parameter Display Selection

Factory Setting

**AMP****AMP** Ampere (A)**Cos** Cosine Φ (Cos Φ)**Volt** Voltage (V)**Watt** Active Power (kW)**Hz** Frequency (Hz)**kVAR** Reactive Power (kVAR)**PF** Power Factor (PF)**kVA** Apparent Power (kVA)

The selected parameter will be the default display view after power on, it will auto return to default display view after 4 minutes if in other display view.

**5****-PC-**

## Plug-in Module Selection

Factory Setting

**non****A02** A-02s**A01** A-01s / A-01sp**non** None**Addr** Modbus Address -> Selectable from 1~247

Factory Setting

**1**

**bAud** Baud Rate Setting -> Selectable as:  
3=300, 6=600, 12=1200, 24=2400, 48=4800, 96=9600, 192=19200 or 288=28800 bps

Factory Setting

**96****Prty** Parity Setting -> Selectable as:**non** None**Odd** Odd**Even** Even

Factory Setting

**non****6**

## Alarm Parameter Setting

Setting can only be done when A-02s in **-PC-** mode is selected.

Factory Setting

<b>OL</b>	100.P Over-current	: <b>10P</b> to <b>110P</b>	range: OFF or 10~110 % (step of 1%)
<b>UL</b>	10.P Under-current	: <b>5P</b> to <b>100P</b>	range: OFF or 5~100 % (step of 1%)
<b>OV</b>	250.V Over-voltage	: <b>200V</b> to <b>270V</b>	range: OFF or 200~270 V (step of 1V)
<b>UV</b>	200.V Under-voltage	: <b>70V</b> to <b>220V</b>	range: OFF or 70~220 V (step of 1V)
<b>OF</b>	65.H Over frequency	: <b>45H</b> to <b>65H</b>	range: OFF or 45~65 Hz (step of 1 Hz)
<b>UF</b>	45.H Under frequency	: <b>45H</b> to <b>65H</b>	range: OFF or 45~65 Hz (step of 1 Hz)
<b>PF</b>	OFF Low-PF	: <b>0.85</b> to <b>0.85</b>	range: OFF or 0.85 cap~0.85 ind (step of 0.01)
<b>Cos</b>	OFF Low-CosΦ	: <b>0.85</b> to <b>0.85</b>	range: OFF or 0.85 cap~0.85 ind (step of 0.01)

**t-on** 4 Start Time Delay of alarm output : range: 1~200 seconds (step of 1 sec.)

**t-off** 2 Reset Time Delay of alarm output : range: 1~200 seconds (step of 1 sec.)

Factory Setting

**7****End**

## End Setting

Press 'SET' button to save setting and exit or 'UNDO' button to previous set-up menu.



## Mode Viewing



Press '....' button to forward next view mode.  
Press and hold '....' button for 2 seconds to view default parameter display.



Press '....' button to previous view mode.  
Press and hold '....' button for 2 seconds to view alarm display.



Press '▲ or ▼' button to swap each phase.