# User Guide

DELAB®

Auto-reset type DP-10R
Digital Earth Leakage Relay

features

True RMS Measurement with SPARC[1] and DCOI[2] Algorithm
Fundamental Signal Detection[3]
Real Time Display of IΔn in mA / A
Fault / lo-set & hi-set Trip LED Indication
Fault Start Event Recording & LED Indication
Trip Event Memory (non-volatile 7 previous records)
Fault Start Event Memory (non-volatile 4 previous records)
Selectable Frequency (50/60 Hz)
Trip Lock-out contact for K2
Last Trip Elapsed Time (up to 99days)
Self Reclosing / Auto-reset
Re-start Interval Setting
Auto Z.C.T. Detection
Software Lock to Prevent Unauthorized Setting
Complies with ;
IEC-60255-26/27 ; BS EN 50121-5 Standards
External Plug-in Module for :-
A-01s / A-01sp (RS-485 MODBUS RTU) isolated type

Panel Overview
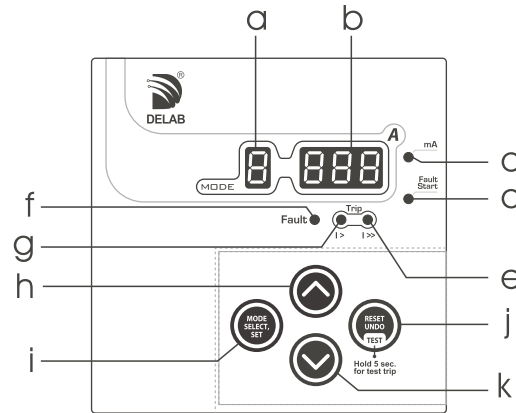
a. Single digit mode LED display
b. 3 digit data LED display
c. (mA) indication
d. Fault start indication
e. Hi-set trip indication
f. Fault indication
g. Lo-set trip indication
h. Up button - increment
i. Mode select / Set button
j. Reset / Undo / Test trip button
k. Down button - decrement

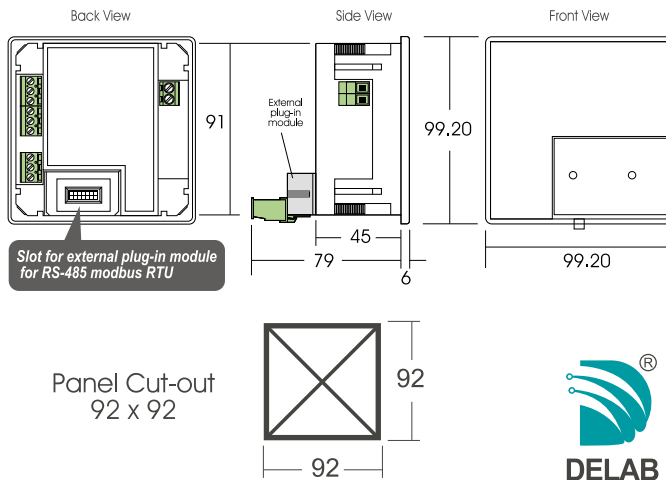## Technical Data

Aux Power	:	65 ~ 275 Vac (45 ~ 65 Hz); 90 ~ 300 Vdc or 18 ~ 72 Vdc
Fundamental Frequency	:	50 or 60 Hz (software selectable)
Current Input (IΔn)	:	ZCT (multiple sizes from ID of 30~200mm)
Measurement Range	:	0.01 ~ 30.0 A
Output Relay Rating	:	SPDT 5A, 250V AC/DC
Consumption	:	< 3 VA
Accuracy	:	Current protection threshold ($\pm5\%$), Time delayed (+5% or 50ms)
Display	:	7-Segment LED (3 + 1digit)
Indication (LEDs)	:	mA, fault start event, lo / hi-set trip, fault
Operating Temp.	:	0°C ~ +55°C
Humidity	:	56 days at 93%RH, 40°C non-condensing
IP Rating	:	IP54 (front panel)
Weight	:	230 g

Parameter Setting Range

1. IΔn > (A) *(lo-set)*   **0.03 ~ 30.0 A**
0.03~1.00 A *(step of 0.01A)*
1.00~3.00 A *(step of 0.05A)*
3.00~10.0 A *(step of 0.10A)*
10.0~30.0 A *(step of 0.50A)*

2. t > (sec) *(lo-set trip time delay)*   **0.03 ~ 20.0 sec**
0.03~ 0.10 s *(step of 0.01s)*
0.10~1.00 s *(step of 0.02s)*
1.0 ~20.0 s *(step of 0.1s)*

3. IΔn ≫ (A) *(hi-set)*   **OFF or 0.10 ~ 30.0 A**
0.10~10.0 A *(step of 0.1A)*
10.0~30.0 A *(step of 0.5A)*

t ≫ *(sec)* hi-set trip time delay
Fixed @ 30ms

4. Trip-lockout >
1~10 times *(step of 1 time)*

5. Auto-reset timer *(sec)*
3s ~ 200s *(step of 1sec)*

6. Re-start Interval *(minutes / hour)*
OFF or 5/10/15/30/45 mins
1~ 8 hrs/10/12,24 hrs

Casing

Back View   Side View   Front View

External plug-in module

91

99.20

45
79   6   99.20

Slot for external plug-in module for RS-485 modbus RTU
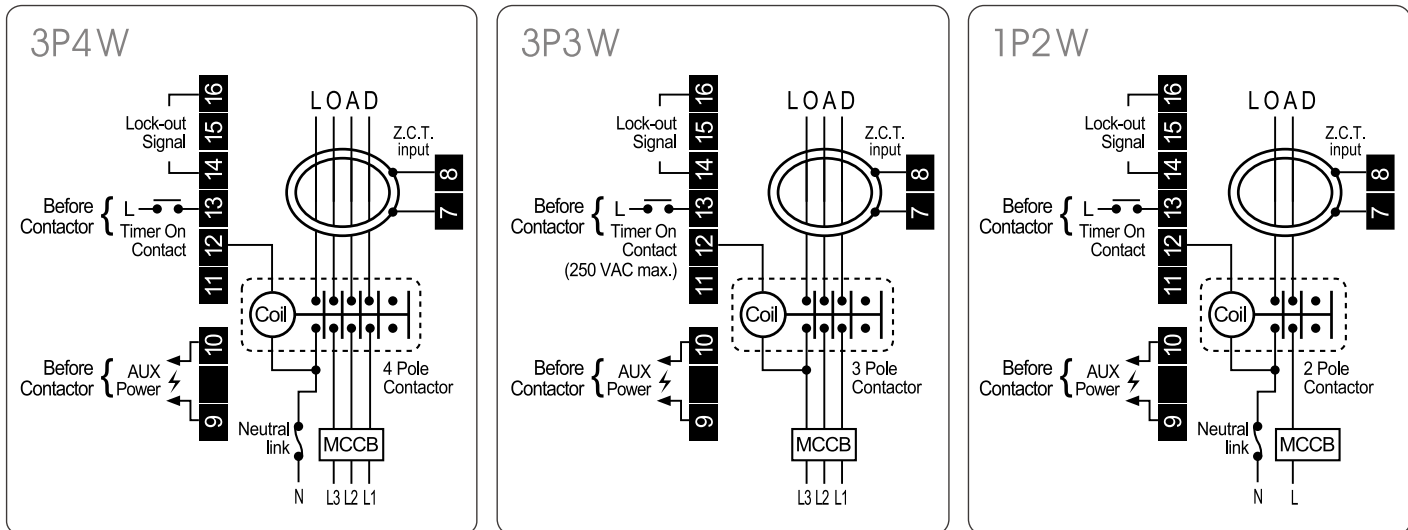
Panel Cut-out
92 x 92

92
92

DELAB®

Note: All measurement in mm.

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

Wiring

3P4W

Lock-out Signal
Before Contactor { L Timer On Contact
Before Contactor { AUX Power
Neutral link
LOAD
Z.C.T. input
4 Pole Contactor
MCCB
N L3 L2 L1

3P3W

Lock-out Signal
Before Contactor { L Timer On Contact (250 VAC max.)
Before Contactor { AUX Power
LOAD
Z.C.T. input
3 Pole Contactor
MCCB
L3 L2 L1

1P2W

Lock-out Signal
Before Contactor { L Timer On Contact
Before Contactor { AUX Power
Neutral link
LOAD
Z.C.T. input
2 Pole Contactor
MCCB
N L

☰ Modes

⚙ SETTING

1 I∆n › (A) : Lo-set leakage current		**4** Trip Lock-out : max. 10 times	
2 t › (sec) : Trip time delay		**5** Auto-reset Timer : Reclosing Time	
3 I∆n » (A) : Hi-set leakage current		**6** Re-start Interval : Reset Trip Count Interval	

ℹ INFO VIEWING

| **A** Trip Count : **Int** / **tot**	Interval Trip Count / Total Trip Count
b , **c1** to **c6** Trip Memory	7 Trip Event Memories (non-volatile)
d Last Trip Elapsed Time	Last Trip Elapsed Time
E1 to **E4** Fault Start Memory	4 Fault Start Event Memories (non-volatile)
F UEr Version	Firmware Version
F oPh Operation Hour	Device Operated in Hours (x 1000 hr.)

⚙ SPECIAL SETTING MODE

L Software Lock	Keypad Lock : OFF or ON
Fr Network Frequency	Selectable as : 50 or 60 Hz
- Standby Mode	Running LED bar : ON or OFF
Ct Z.C.T. Detection	Auto detection or no detection
PC Selection of plug-in module	A-01s/ A-01sp (RS485 modbus plug-in module) or none
Ad Modbus address	Selectable from 1 ~ 247
br Baud rate setting	Selectable from 3,6,12,24,48,96,192,288
End End Program Setting	Save Changes and Exit Setting Mode

⚙ Parameters Setting : Mode 1~6

Single digit mode display

MODE — Mode decimal — Indicates standby mode / seconds count
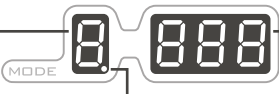
Three digit mode display

STEP 1
Press [SELECT] button while in default mode (when mode display is blank)

To scroll thru modes, just press & release the Select button

MODE SELECT, SET

STEP 2
Press [UP] or [DOWN] button to desired value

For fast increment or decrement, press and hold the Up or Down button

RESET UNDO TEST

RESET/UNDO
Press button to undo changes or exit mode

STEP 3
Press [SET] button to store new value & proceed to next mode

TEST TRIP
Press and hold 5 seconds to test trip device
5 flashes (mode decimal) = 5 seconds

All modes exit automatically if left untouched for more than 20 secs.

ℹ Info Viewing

A Int *Interval trip counter*

This mode display the number of tripping that has occurred within the time interval from the 1st tripping. Time interval can be adjusted in mode **6**. The counter will automatically reset to zero once the time interval has been achieved. The counter will also reset automatically when mode **4** is modified.

A tot *Total trip counter (max. no = 255)*

This mode display the number of tripping that has occurred. The value cannot be reset by any timer. To reset the recorded value, proceed to mode **b** and hold the [RESET] button for 3 seconds.

b , c1 ~ c6 *Tripped values for last 7 events*

Press [SELECT] button until mode **b**.
Display will flash the tripped value for the most recent tripped event.

Single flash : Indicate a lo-set trip	To reset trip event memory,
Double flash : Indicate a high-set trip	hold [RESET] button for 3 sec. in mode **b**.

Manual tripped event will display a flashing **trP**.
If display shows **---**. (No tripping has occured)
Press [SELECT] button again to scroll thru mode **c1** to **c6**. (Auto skip to mode **d** if memory is empty)
To skip directly to mode **d**, hold [SELECT] button for 1 sec.
To exit, press [UNDO] button.

d *View last trip elapsed time*

Press [SELECT] button until mode **d**.
Display will show **---** (device has no tripping since last power up).

e.g. | hour min Display up to | **00h 23n** 99 hour 99 min | → | day hour Display up to | **00d 23h** 99 day 99 hour | → | over 99 day | **oUr 99d** |

To exit, press [UNDO] button.

E1 ~ E4 *Fault start event memory*

Press [SELECT] button until mode **E1**. If display show **---** (no fault event has occured).
Press [SELECT] button again to scroll thru mode **E2** to **E4**. (Auto skip to mode **F** if memory is empty)
To reset memory, hold [RESET] button for 3 seconds in mode **E1**.
To exit, press [UNDO] button.

F UEr *Firmware version*

This mode is not adjustable. For user to view firmware version.
Press [SELECT] button until mode **F UEr** is being displayed.
The display will show the firmware version of the device.
To exit, press [UNDO] button.

F oPh *Total operation hour*

This mode shows the total time of the device that has been in operation.
Press [SELECT] button until mode **F oPh** is being displayed.
Display will show a value (x1000 hr).
To exit, press [UNDO] button.

🔒 Trip Lock-out Conditions

Loc is being displayed when there is trip lock-out.
i) Number of interval trip count = Trip lock-out setting
ii) Persistent fault

⚙ Special Setting Modes

When NO mode is selected (mode display is blank),
i) Press [SELECT] & [UNDO] button simultaneously and hold for 5 seconds until mode **L** appears.
ii) Press ⌃ or ⌄ button to modify
iii) Press [SET] button to confirm and proceed to next mode

L *Software keypad lock*

OFF or **On**

Fr *Electrical network system frequency*

50 : 50 Hz   **60** : 60 Hz

- *Standby option*

OFF : De-activate   **On** : Activate
After about 3 minutes of idle and no leakage is detected, running LED bar will be displayed instead of the real time leakage current if activated. It automatically exits on leakage detection or Z.C.T. is not connected or when any button is pressed. When device trips, standby mode is temporary de-activated until device is reset.
When Z.C.T. is open circuited, standby mode is temporary de-activated until Z.C.T. is connected.
To toggle this setting, user can also press [SELECT] button when powering up the device.

Ct *Z.C.T. detection*

OFF : No detection   **Aut** : Auto detection

2Ct is being displayed and flashing instead of the real time leakage current when auto Z.C.T. detection is activated, it means that the Z.C.T. is not connected properly. User may need to check the wiring connection with the device.

PC *Selection of plug-in module*

A01 : A-01s / A-01sp   **non** : None

Ad Modbus address

Selectable from 1 ~ 247

br Baud rate setting

Set the baud rate in a modbus communication between host computer and device.
Selectable as : (3 = 300, 6 = 600, 12 = 1200, 24 = 2400, 48 = 4800, 96 = 9600, 192 = 19200 or 288 = 28800) bps. Data parity is fixed to none.

End End setting

Press [SELECT] button to exit and save the setting or [UNDO] button to go back.

Digital Earth Leakage Relay **DP-10R** (Auto-reset type)