

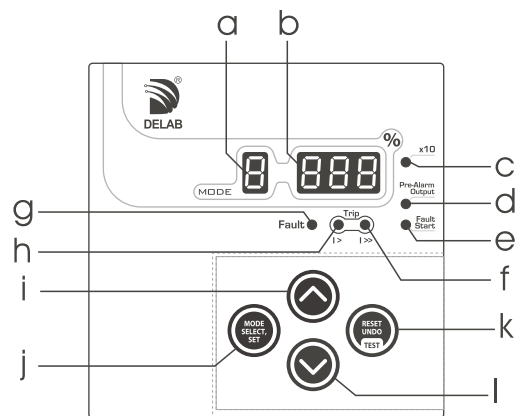
DP-31 (IDMT) Digital Earth Fault Relay

features

- True RMS Measurement with SPARC¹ and DCOI² Algorithm
- Fundamental Signal Detection³
- Real Time Display of Earth Fault in (%)
- 6 Selectable IDMT Graphs + DTL
- Fault / lo-set & hi-set Trip LED Indication
- Fault Start Event Recording & LED Indication + Output⁴
- Pre-Alarm LED Indication + Output⁴
- Trip Event Memory (non-volatile 7 previous records)
- Fault Start Event Memory (non-volatile 4 previous records)
- Selectable Frequency (50 / 60 Hz)
- Programmable Relay Output contact for K2
- Last Trip Elapsed Time (up to 99days)
- Software Lock to Prevent Unauthorized Setting
- Complies with IEC-60255-26/27 ; BS EN 50121-5 Standards
- ANSI Code: 50N, 51N

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. x10
- d. Pre-Alarm output indication
- e. Fault start indication
- f. Hi-set trip indication
- g. Fault indication
- h. Lo-set trip indication
- i. Up button / Increment
- j. Mode select / Set button
- k. Reset / Undo / Test trip button
- l. Down button / Decrement

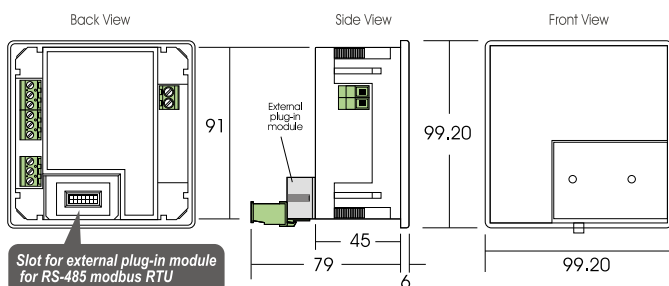
Technical Data

Aux Power	: 65 ~ 275 Vac (45 ~ 65 Hz); 90 ~ 300 Vdc or 18 ~ 72 Vdc
Current Input (In)	: ..5A or ..1A
Fundamental Frequency	: 50 or 60 Hz (software selectable)
Burden	: <0.3 VA @ In
Output Relay Rating	: SPDT 5A, 250V AC/DC
Consumption	: < 3 VA
Accuracy	: Current protection threshold (±5%), Time delayed (+5% or 50ms)
Display	: 7-Segment LED (3 + 1 digit)
Indication (LEDs)	: x10, pre-alarm, 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

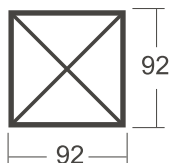
Parameter Setting Range

$I_e >$ (%) : lo-set trip	2% ~ 100% (step of 1%)
IDMT $I_e >$	6 IDMT + DTL
TMS $I_e >$: Time multiplier for IDMT	0.05 ~ 1.00 (step of 0.01)
$t_e >$ (sec) : lo-set trip time delay for DTL	0.03s ~ 20.0s
	0.03s ~ 0.10s (step of 0.01s)
	0.10s ~ 1.00s (step of 0.02s)
	1.0s ~ 20.0s (step of 0.1s)
$I_e >>$ (%) : hi-set trip	OFF or 20% ~ 1000% (step of 10%)
$t_e >>$ (sec) : hi-set trip time delay	Instant or 0.02s ~ 0.50s (step of 0.01s)

Casing



Panel Cut-out
92 x 92

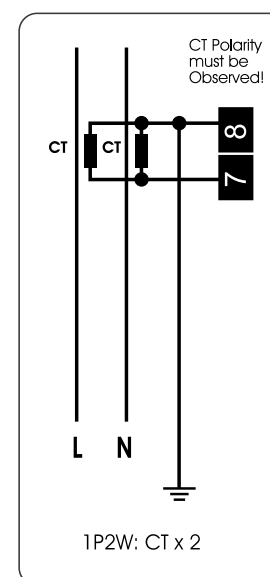
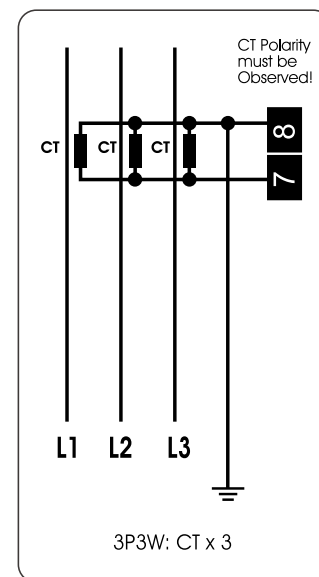
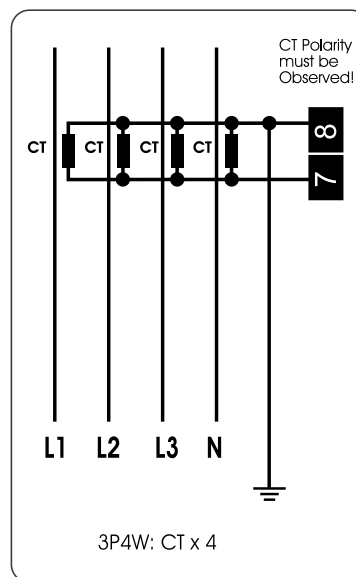
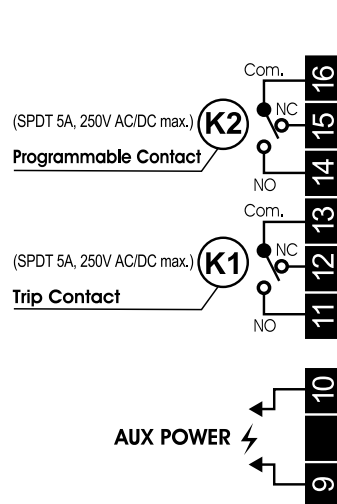


Note: All measurement in mm.

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



Wiring





Modes



PARAMETER SETTING

1 $I_e > (\%)$	lo-set trip
2 IDMT $I_e >$	6 IDMT + DTL
3 $T M_s I_e >$ or $t_e >$ (sec)	Time Multiplier or lo-set trip time delay
4 $I_e >> (\%)$	hi-set trip
5 $t_e >>$ (sec)	hi-set trip time delay



VIEWING INFO

6 , 01 to 06	Trip memory	7 trip event memories (non-volatile)
d	Last trip elapsed time	Last trip elapsed time
01 to 04	Fault start memory	4 fault start event memories (non-volatile)
F U E r	Version	Firmware version
F o P h	Operation hours	Device operated in hours (x 1000 hr)



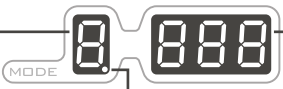
SPECIAL SETTING MODE

l	Software lock	Keypad lock : OFF or ON
01	Trip relay K1 response type	Latching (Lc) or Non-latching (nLc)
02	Output relay K2 function	Programmable relay output
03	Trip relay K2 response type	Latching (Lc) or Non-latching (nLc)
04	Network frequency	Selectable as : 50 Hz or 60 Hz
0	Standby mode	Running LED bar : ON or OFF
00	Selection of plug-in module	A-01s / A-01sp (RS485 modbus isolated type) or none
0d	Modbus address	Selectable from 1 ~ 247
0r	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

Single digit mode display



Three digit mode display

Mode decimal
Indicates standby mode / seconds count

STEP 1

Press [SELECT] button while in default mode (when mode display is blank)
To scroll thru modes, just press & release the Select button

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

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.



Info Viewing

6 01 ~ 06

Tripped values for last 7 events

Press [SELECT] button until mode **6** or hold [SELECT] button for 1 second in any mode **01~06**.
Display will show the tripped value for the most recent tripped event.

Single flash : Indicate a lo-set trip

Double flash : Indicate a high-set trip

Manual tripped event will display a flashing **ErrP**.
--- Indicate no tripping has occurred.

Press [SELECT] button again to scroll thru mode **01** to **06**. (Auto skip to mode **0** if memory is empty)

Skip directly to mode d :

Hold [SELECT] button for 1 second.

Clear trip event memory :

Hold [RESET] button for 3 seconds in mode **6**.

Press [UNDO] button to exit.

d View last trip elapsed time

Press [SELECT] button until mode **d**.
Display will show the elapsed time of last trip since last power up.

--- Indicate no tripping since last power up.



Press [UNDO] button to exit.

00 ~ 04

Fault start event memory

Press [SELECT] button until mode **01**.

If display shows --- (No fault event has occurred)
Press [SELECT] button again to scroll thru mode **00** to **04**. (Auto skip to next mode if no fault start event has occurred)

Clear fault start event memory :

Hold [RESET] button for 3 seconds in mode **01**.

Press [UNDO] button to exit.

F U E r Firmware version

Press [SELECT] button until mode **F U E r**.
Display will show the firmware of the device.

Press [UNDO] button to exit.

F o P h Total operation hour

Press [SELECT] button until mode **F o P h**.
Display will show a value of (x1000 hr).

Press [UNDO] button to exit.



IDMT graph

Time graph based on
Time Multiplier 1.0

Characteristics

030
Normal Inverse 3.0 /10

013
Normal Inverse 1.3 /10

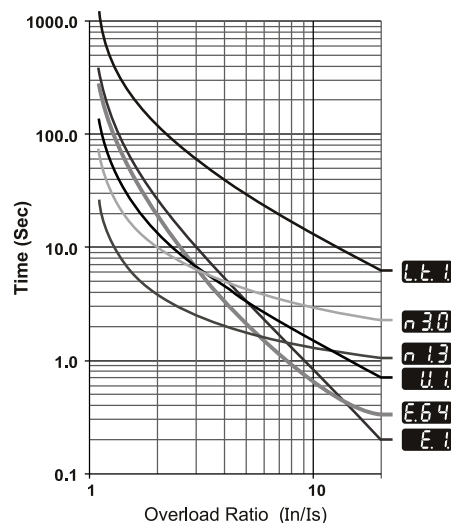
011
Very Inverse

011
Extremely Inverse

064
Extremely Inverse (0.64 sec)

011
Long Time Inverse

011
Definite Time



Special Setting Modes

When NO mode is selected (mode display is blank),

- Press [SELECT] & [RESET] button simultaneously and hold for 5 seconds until mode **0** appears.
- Press [Up] or [Down] button to modify
- Press [SET] button to confirm and proceed to next mode

0 Software keypad lock

OFF or ON

02 Trip relay K2 response type

Lc : Latching trip nLc : Non-Latching trip

04 Trip relay K1 response type

Lc : Latching trip nLc : Non-Latching trip

04 Electrical network system frequency

Electrical network frequency setting:
50 : 50 Hz 60 : 60 Hz

02 Output relay K2 function

ErrP : Tripping output (Lc / nLc)

0 Standby option

OFF : De-activate ON : Activate

Fault Start Output Function

LFS : Lo-set fault start signal output (Lc/nLc)

HFS : Hi-set fault start signal output (Lc/nLc)

AFS : Any fault start signal output (Lc/nLc)

Fault start event LED (e) indicates any detected fault events.

To clear event indication, press [RESET] button or scroll to mode **01** while no fault is present.

K2 output will be activated when there is any fault start event if programmed is being set as 'AFS'.

To latch fault events output, select **02** to Lc in trip relay K2 response type.

Device Failure Output Function

DUF : Device failure output (nLc only)

K2 automatically turns ON when device is functioning normally.

Circuit Breaker Failure Output Function

CBF : Circuit breaker failure output (nLc only)

Activates K2 output if fault still exists after 100 ms of trip event.

Pre-Alarm Output Function

A50 : > 50% of $I_e >$ (Lc / nLc)

A90 : > 90% of $I_e >$ (Lc / nLc)

If K2 is programmed to pre-alarm A50 / A90, Pre-alarm output LED (d) will indicate the status of K2. Set **03** to Lc in trip relay K2 response type if need to latch pre-alarm events.

Press [RESET] button to clear output.

00 Selection of plug-in module

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

0d Modbus address

Selectable from 1~247

0r 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.