

Icon Electronics



D3
53mm
DIN rail mount



P44
48mmx48mm
panel mount



P49
48mmx96mm
panel mount

SINGLE PHASE VOLTAGE MONITOR

incl 4-20mA or 0-10V re-transmit

D3-VM1 0/1/2-T

P44-VM1 0/1/2-T

P49-VM1 0/1/2-T

EXAMPLE: D3-VM10-T = 0 RELAY

Operating instructions and Guarantee Certificate

www.iconelectronics.co.za

ReTransmit devices (-T)

The 4 -20mA re-transmitted signal is optically isolated from the input signal. By default the re-transmission parameters are set so that the output follows the full scale input.

Description:

This device may be used for OVER and / or UNDER voltage protection.

The display may be scaled to any value from 5 to 3500 and the decimal pointer set to any position, allowing it to be configured for use with external step-down transformers (see notes).

Each relay is controlled via separate upper, lower and hysteresis set-points. The relays may therefore be configured for both over and / or under, or one for over and the other for under voltage protection.

The start-up and reaction delays are also programmable.

The menu may be reduced to stop accidental changes to more advanced settings. The settings may also be locked. When this is done, the settings may be viewed, but not changed. See description of the different functions for further details.

Press the "▲" or "+" button to cycle between the voltage and frequency of the applied signal.

The value displayed is re-transmitted based on the re-transmit offset and span parameters. The output may be set to correspond to the entire input range or any part thereof. eg. An input signal of 0-300V AC may be re-transmitted as received (4mA=0V, 20mA=300V), or for example: 50 - 70 V (4mA=50 V, 20mA=70V. set re-tx offset=50, span=20).

0 RELAY

The measured voltage is displayed.

If a step down voltage transformer is used, the display may be programmed to indicate the voltage at the input to the transformer instead of the input to this device.

1 RELAY

The relay remains energised while the voltage remains below the upper and above the lower set points. The device indicates OVER and UNDER voltage conditions by displaying "r1.Hi" & "r1.Lo". If the start-up or reaction delay is keeping the relay energised during a fault condition, "-r1-" is displayed as a warning. These messages can be disabled. See description of the different functions for further details.

2 RELAY

The relays remain energised while the voltage remains below the upper and above the lower set points. OVER and UNDER voltage conditions are displayed as follows: "r1.Hi", "r2.Hi", "r1.Lo", "r2.Lo". If the start-up or reaction delay is keeping a relay energised during a fault condition, "-r1-" or "-r2-" is displayed as a warning. These messages can be disabled. A latch facility is also included.

Adjustable Parameters:

Please note: *Depending on the model of the device purchased, some of the parameters listed below may not be available*

- **Scale ("SCAL")** (default: 300V)
This value will be displayed when the input is at its maximum (300V RMS).
- **Decimal Pointer ("dEC")** (default: no decimal)
Set the position of the decimal pointer (xxxx, xxx.x, xx.xx, x.xxx)
- **Upper limit for relay 1 ("Hi 1")** (default: Disabled)
If the input voltage exceeds this value, relay 1 is de-energised and "r1.Hi" is displayed. To disable this feature, set it to maximum. "diSA" is displayed. The maximum value of this setting depends on the scale setting.
- **Lower limit for relay 1 ("Lo 1")** (default: Disabled)
If the input voltage drops below this value, relay 1 is de-energised. "r1.Lo" is displayed. To disable this feature, set it to minimum (-1). "diSA" is displayed.
- **Hysteresis for relay 1 ("HyS.1")**
If the input voltage has exceeded the "Hi 1" setting, or dropped below the "Lo 1" setting, the voltage must drop, or rise above the applicable limit by this amount before relay 1 re-energises. This setting is limited to the difference between the "Hi 1" and "Lo 1" settings.
- **Upper limit for relay 2 ("Hi 2")** (default: Disabled)
- **Lower limit for relay 2 ("Lo 2")** (default: Disabled)
- **Hysteresis for relay 2 ("HyS.2")**
- **Start-up delay ("St d")** (default: 1 Second)
The relays are energised upon start-up. The device does NOT monitor the voltage until the start-up delay has lapsed. This feature is used to allow for over/under-voltage conditions following a power-up. If a fault occurs during this time, the display indicates "-r1-" and or "-r2-".
- **Reaction delay ("rE d")** (Default: 0 seconds)
This function is similar to the start-up delay. The device will tolerate over or under voltage conditions for this period of time once monitoring has commenced.
- **Status Indication ("indi")** (Default: on)
This setting enables / disables the "Hi 1", "Lo 1", "Hi 2", "Lo 2", "-r1-" and "-r2-" messages during fault conditions.
- **Calibration ("CAL")** (Default: 100%)
This function may be used re-calibrate the device. The reading may be adjusted from 90% to 110%. Use this setting to correct possible step-down transformer errors (to increase overall system accuracy).

Re-transmit output Offset "rt.OS" (default value: programmed display offset value)

When the display indicates this value, 4mA will be transmitted. (see notes)

- **Re-transmit output SPan "rt.SP"** (default value: programmed display span value)
When the display indicates this value PLUS the offset value ("rt.SP"+"rt.OS"), 20mA is transmitted.
- **Reset ("rEst)**
By selecting this option, all values are reset to default.

Latch facility:

If the latch pins are shorted, the relay will not re-energise after fault conditions (until the short is removed or the device is reset), even if the input current is within the pre-set limits.

DUAL DISPLAY Programming Examples:

1. Set the device to convert a 0 to 100V AC signal to re transmit 4-20mA.

If all of the following settings are NOT available, exit the menu and activate the advanced menu.

Press "↻" repeatedly until "rt.OS" is displayed.

Use the "▲" & "▼" buttons to change the value to "0".

Press "↻". "rt.SP" is displayed.

Change the value to "100".

2. Set the device to convert a 50 to 100V AC signal to re transmit 4-20mA.

Press "⏏" repeatedly until "rt.OS" is displayed.

Use the "▲" & "▼" buttons to change the value to "50".

Press "⏏". "rt.SP" is displayed.

Change the value to "50" (50+50=100V @ 20mA).

3. Set the device to de-energise relay 1 if the display indicates a value greater than 200V, and smaller than 100V.

(window comparator)

Press "⏏" to display "Hi 1".

Use "▲" & "▼" to change the value to "200".

Press "⏏". "Lo 1" is displayed.

Change the value to "100".

Press and hold "⏏" for 3 seconds to exit the menu.

4. Configure the device to display 0-33.0 kV.

Press "⏏" repeatedly until the display indicates "SCAL".

Use the "▲" & "▼" buttons to change the value to "900".

Press "⏏" to display "dECi".

Use the "▲" & "▼" buttons to change the position of the decimal pointer to the second last position from the right of the display.

Press and hold "⏏" for 3 seconds to exit the menu.

SINGLE DISPLAY Programming Examples:

Configure the device to de-energise relay 1 when the voltage reaches 260V.

Press "MENU" repeatedly until the display indicates "Hi 1".

Press "SELECT".

Use the "+" and "-" buttons to change the value to "260".

Press "ENTER" to return to the menu. "Lo 1" is displayed.

Press "BACK".

Note:

- The latch pins MUST BE ISOLATED FROM THE INPUT.
- We recommend that all relay connections be disconnected while making adjustments and the unit be reset by disconnecting the power after settings have been changed.
- Certain settings are reset to default when the device is re-configured. Before commissioning, re-check all settings to ensure they are correct. (use full menu)
- Even though the device seems to operate correctly, the relays will not energise if the supply is below the minimum operating voltage.
- The maximum input voltage is 300V RMS. When this voltage is applied to the device, the full scale value is displayed.
- If the input voltage is below the minimum operating voltage, the relay may not energise.
- When using external step down transformers adjust the scale according to the ratio of the transformer.
Eg. If a 380V : 220V transformer is used, the ratio is $380/220 = 1.72$. Thus the scale must be increased by this amount: $300V * 1.72 = 520V$.
If the scale is set to 520V, the display will indicate the voltage applied to the external step-down transformer.
- When using a 11kV : 110V transformer, set the scale to 300 and the decimal pointer to 30.0
- To display voltages to 1 decimal place, set the scale to 3000 and the decimal pointer to 300.0

Specifications:

Accuracy:	1% of full scale (sinusoidal inputs. see notes) Typically 0.5% at 25 °C.
Scale:	5 to 3500 (in steps of 5)
Full scale input voltage:	300V RMS
Supply voltage:	±15% of rated voltage
Led indication:	Relay status
Response time:	<1.1 sec
Start-up delay	1 to 100 sec (0.5 sec intervals)
Reaction delay	0 to 100 sec (0.5 sec intervals)

re-transmit Notes:

- The output 4-20mA is dependant on the value being displayed, and is set up in a similar manner to the display. The offset parameter determines when 4mA is output, and the span is the amount required for the output to increase by an additional 12mA ie. 20mA is output when the value displayed = re-transmit OFFSET+SPAN
- To set the re-transmission signal to follow the input signal (the output 4-20mA follows the 4-20mA received), set the re-tx offset and span settings to the same value as the display offset and span settings.
- To set the re-transmission signal to invert the input signal (the output = 4mA when the input = 20mA), set the re-tx offset = (display offset+span) and re-tx span = (display span x -1).
- Whenever the input signal is above or below the "CAL.O" or "CAL.S" values by more than 3%. The display indicates "Er.Hi" or "ER.Lo".
- Certain settings are reset to default when the device is re-configured. Re-check all settings to ensure they are correct before commissioning. (use the advanced menu)

Menu operation (single display):

All adjustments are made via the three front mounted buttons.

Press the "MENU" button repeatedly until the desired setting is reached, press "SELECT" to display the current value of the selected parameter, or sub menu (if applicable).

The "+" and "-" buttons are used to change the value.

"ENTER" will return the device to the menu.

The "BACK" button will exit the menu.

Menu operation (dual display):

Press the menu "U" button repeatedly until the desired setting is reached.

The "▲" and "▼" buttons are used to change the value.

"U" will display the next menu item.

To exit the menu hold "U" button for 3 seconds.

Menu options:

Exit the menu before making the following adjustments.

Lock / unlock parameters:**(default: unlocked)**

Press "BACK" ("▼"), then "ENTER" ("U") and hold the 2 buttons until the desired option is displayed.

The display cycles between "Loc" (no changes allowed) & "u.Loc" (parameters may be adjusted)

Full / reduced menu (default: Full)

Press "SELECT" ("▲"), then "ENTER" ("U") and hold the 2 buttons until the desired option is displayed.

The display cycles between "rEdu" (limited menu) & "Full" (all parameters are accessible)

Access Code: (default: no code)

Once the above options have been set as required, Press "BACK" and "SELECT" ("▼" and "▲") simultaneously until "CODE" is displayed.

Now use the "+" & "-" ("▲" and "▼") to enter a code.

Once a code is entered, access to the options above is not permitted.

To clear the code, re-enter the same code again.

If the code is forgotten. Press and hold "+" & "-" ("▲" and "▼") until "CODE" is displayed while re-applying power to the device.

Please Note (for 1 and 2 relay devices ONLY):

- As a power saving feature, the display dims if settings are not being made.
- Even though the device seems to operate correctly, the relay(s) will not energise if the input voltage is below the operating voltage.

12 Month guarantee:

Our product is guaranteed for a 12 (twelve) month period from date of purchase. This guarantee is valid for defects arising from failure during specified conditions. This guarantee does not cover damage due to abuse, tampering or improper installation. Our company does not accept liability for any consequential damage or loss arising from product malfunction. Should this product prove to be defective, kindly return for inspection or repair.

Relay specifications:

Contact rating: 10A 250 VAC 2500VA

Mechanical life: 30 million operations

Electrical life: 250 000 operations (at maximum load)

