

*A guide to using our
multifunction transducers and
meters as programmable
monitoring relays*



Important:

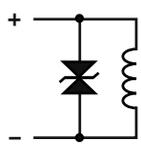
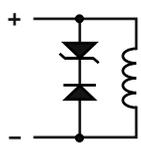
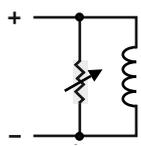
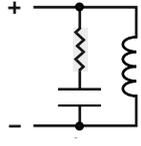
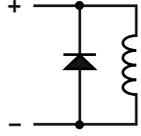
For devices that have solid-state relay outputs, please read the following information -

When a relay is de-energised, the energy stored in its coil can create a spike of several hundred volts.

Any device that uses solid-state relays are susceptible to being damaged by voltage spikes generated by inductive loads. Therefore, relay coils and similar inductive loads **must** be suppressed to limit the voltage spikes to below 80V.

The selection of diodes and other components depends on the coil's operating current.

The table below shows some of the circuits that can be used and their advantages and disadvantages.

- | | |
|---|--|
|  | <p>Zener-Zener protection: (Recommended)
No polarisation required, has very little effect on release time and contact bounce on break, has no effect on relay power and very little reduction of relay life but can have temperature problems.</p> |
|  | <p>Zener-Diode protection:
Can have temperature problems, has very little effect on release time and contact bounce on break, has no effect on relay power, very little reduction of relay life and has to be polarised.</p> |
|  | <p>Varistor protection:
No polarisation required, no temperature problems, has a small effect on release time and contact bounce on break, has no effect on relay power and a small reduction of relay life.</p> |
|  | <p>Resistor-Capacitor protection:
No polarisation required, can have temperature problems, has very large effect on release time and contact bounce on break, has no effect on relay power and very large reduction of relay life.</p> |
|  | <p>Diode protection:
Polarisation required, can have temperature problems, has an excessive effect on release time and contact bounce on break, has no effect on relay power and an excessive reduction of relay life.</p> |

MultiView

The MultiView program displays all parameters being measured.

CT and VT ratios, demand times etc. can all be set using the program and simple data logging can be done.

It can also be used to program the internal relay to function as a set-point relay or an energy type.

MultiView is free and contains help files and operating instructions. It can be downloaded from our website.

Type

Displays system type
i.e. 3 phase 4 wire,
3 phase 3 wire
etc.

Voltage Current

Voltage and Current ratios
can be programmed and the
values are displayed.

Monitor

Display 18 parameters at
a time, showing the
instantaneous value.

The screenshot shows the MultiView V6.3 software interface. The main window is divided into several sections:

- Model Information:** Model (M8xx-LCD), Version (0.4.11.00), Serial No. (1605051052), Date (02/06/16 16:14), System (3ph4W), V Ratio (280:280), Voltage (V) (280.000), Current (kA) (5.000), Power (MW) (4.200).
- Measurements:** V L1-2 (484.9), V L2-3 (484.8), V L3-1 (484.9), V 1 (279.8), V 2 (280.0), V 3 (280.0), I 1 (1006), I 2 (2004), I 3 (3501), kW Sum (1287), kVA Sum (1823), kVAR Sum (1290), PF Avg (0.706), kWhr (IMP) (23001), kVAh (IMP) (16818), Hz (60.01), kW 1 (198.9), kW 2 (396.2).
- Calibration Factors:** V1 (0.848987, 0.850756, I1 0.875702), V2 (0.852880, 0.848859, I2 0.881178), V3 (0.847614, 0.850018, I3 0.879686).
- Relay(s) Setup:** Set-Up [...], Status, Set Endian, Reset, Energy, Demand.
- General Settings:** Node #, Pass Codes (Master, General), Reset All.
- Logging:** Map 3K, Float = Big Endian (Word Swap), Log Start, Samples, Errors (0), Clear, Start, Continue, Pause.
- Modbus TX/RX:** TX >> 01 11 C0 2C, RX << 01 66 00 00 00 12 24 57 2E 3F 59 56 5C 3F 5A FD 42 3F 58 2D FC 3F 60 94 I.
- Lock/Port:** CDM3: baud=38400 parity=E data=8 stop=1, Sampling (ms) 200, Node # 1.
- Demand Time:** 3, Demand Status: Rolling, Parity Errors: 0, CRC Errors: 0, Flash: 1: 0000154, Stack Free: 516, 76, 96, Sample Rate, Memory Dump, PPH Modifiers, CT Delay (±) 3.000.

Node

Node (address) can be set
between 1 and 247.

Response Time

User can set response time.

Log Start

Enables a user to log the
first twelve measurements
displayed

Relay Setup

Change the function
of the relay

Reset

Energy and Demand
registers can be reset

Pass-Code

Enter pass-code to
enable programming

Relay Status

Display the state and
function of the relay

MultiRail (Example)

The MultiRail (M880) is a combined multifunction meter and programmable relay.

The RS485 (Modbus) port provides communication between the M880 and MultiView.

Any eight of the nineteen measured parameters can be assigned to the relay as a set-point. When a monitored measurement in any channel reaches its set-point an exception is generated and the relay is activated. The relay stays in the active state until all channels have been restored to normal measurements.

Also when an exception is generated the M880's display can be programmed to change colour.

Relay Setup (Example)

The relay in the M880, M550, M553, M560 and the three relays in the M570 allow eight different parameters to be assigned to each.

Programming using MultiView or directly using Modbus enables the set-point, time delay, differential etc. to be programmed for each parameter being monitored. The relay can also be used (exclusively) as a pulsed output for energy. The Status of the channels can be displayed by MultiView and can also be monitored using Modbus.

Parameters

19 different parameters can be assigned to the relays.

Relay Mode

The relay can be assigned so that it operates as an over, under or window type.

Trip (% Range)

The trip-point (set-point) can be adjusted between 1 and 250% of nominal input.

Reset (% Range)

The reset (differential) can be adjusted between 1 and 250% of nominal input.

The image shows two windows from the MultiView software. The 'Relays And Energy' window displays configuration for eight channels. Each channel has settings for Assignment, Relay Mode, Setpoint (% Range), Diff (% Range), Group Logic, Time Delay, and Attach To Relay. Channel 1 is set to V (Volts) with an Under mode, 80% setpoint, 5% diff, and 1.0s delay. Channel 2 is set to A (Amps) with an Over mode, 120% setpoint, 5% diff, and 1.0s delay. Channel 3 is set to Hz (Frequency) with a Window mode, 100% setpoint, +/- 10% diff, and 0.0s delay. Channel 4 is set to Vbal (V Balance) with an Over mode, 10% setpoint, 1% diff, and 0.0s delay. Channel 5 is set to Wd (P Demand) with an Over mode, 85% setpoint, 5% diff, and 10.0s delay. Channels 6, 7, and 8 are set to Over mode with 100% setpoint, 5% diff, and 0.0s delay. The 'Setpoint Status' window shows the current status of the relay for each channel, with color-coded indicators for each parameter.

Group Logic

Allows the relay to trip on 1, 2, 3 phases, the sum or the average of the systems assigned parameter when limits are reached.

Time Delay

The time delay can be set between 0 seconds to 30 minutes in 1 second steps.

Alarm Colour (M880)

The back-light of the M880 can be set to change colour on a relay trip point.

Relay Action

The relay can be programmed to energise on trip or de-energise on trip.

Before set point reached



After set point reach



Using the relay for energy pulsed output

The relay can be set up to be used as an energy relay providing a pulsed output corresponding to any energy counter that the device has.

Pulse width from 0 to 200ms can be selected as well as a relay divisor. In some devices the divisor can be used as a multiplier.

N.B.

When the relay is used as an energy relay all other channels will be disabled and the set-point function will not be operational. (apart from the M570 which has more than one relay)

Relay Channel Status

MultiView can display the status of each channel as well as showing the parameters assigned to the relay.

The exception status for each channel can be seen on the previous page. It shows that when an exception is active the corresponding box for the channel is a solid colour.

The status screen below shows that the relay is now an energy type.

Select Parameter

Select

W.h import/export,
VAr.h import/export
VA.h or A.h

Units

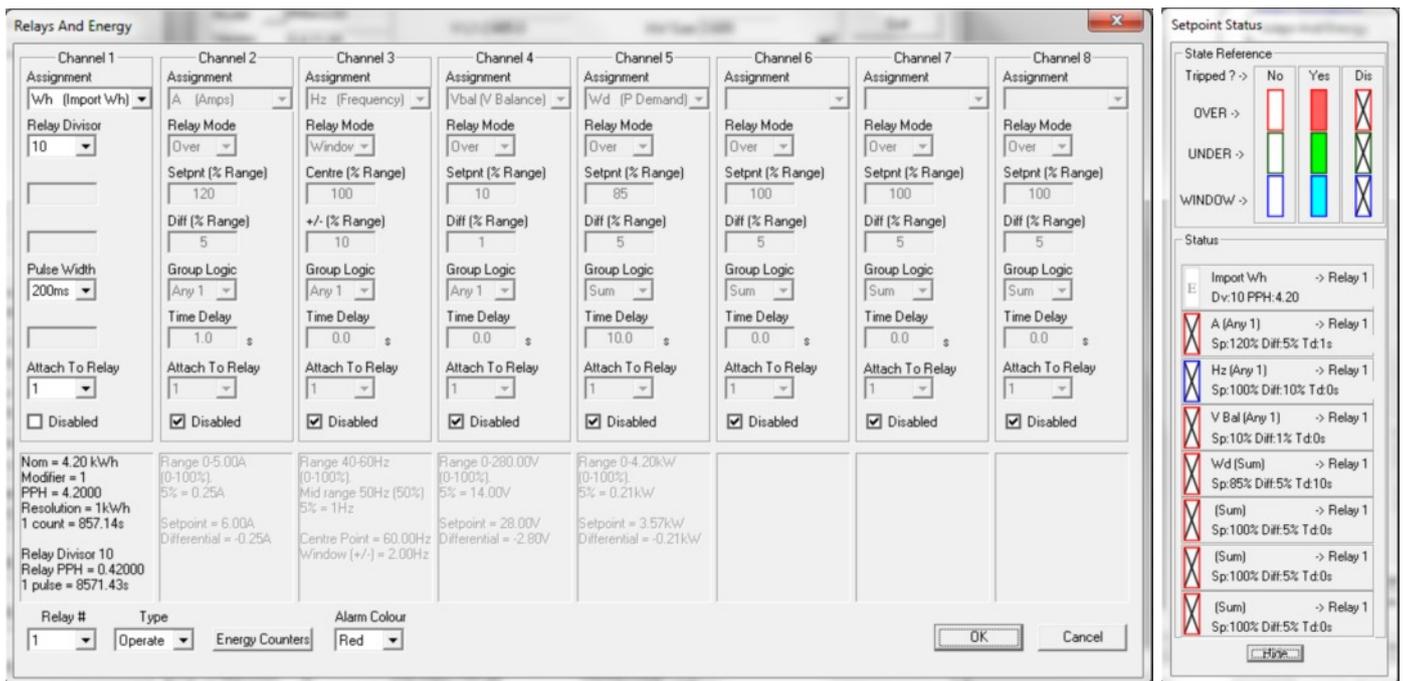
The pulsed output will depend on the C.T. and V.T. ratios of the system and the energy divisors

State Reference

Key to relay channel status

Under/Over/Window

Over condition red band
Under condition green band
Window condition blue band



Relay Mode

Assigns the relay to an energy type.

Pulse width sets the width of relay pulse

Energy Counters

Set the energy counter divider or multiplier of any energy register

Dis

If a parameter is not assigned, the box will contain an 'X' (disabled)

Exception status

Displays the measurement being monitored, time delay, differential, status and the relay the channel is attached to