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

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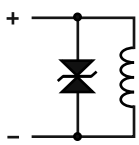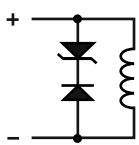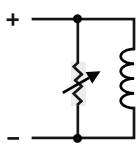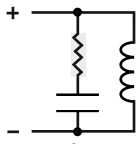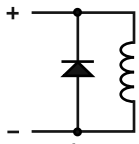
For devices that have solid-state relay outputs, please read the following information -

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.

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.

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.

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.

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.

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.

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.

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

MultiView V6.3

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

V L1-2	484.9	kW Sum	1287
V L2-3	484.8	kVA Sum	1823
V L3-1	484.9	kVAR Sum	1290
V 1	279.8	PF Avg	0.706
V 2	280.0	kWHr (IMP)	23001
V 3	280.0	kVArHr (IMP)	16818
I 1	1006	Hz	60.01
I 2	2004	kW 1	198.9
I 3	3501	kW 2	396.2

Quit
Modbus Help
Reset

Calibration Factors At 100%

V1	0.848987	0.850756	I1	0.875702
V2	0.852880	0.848859	I2	0.881178
V3	0.847614	0.850018	I3	0.879686

Update EE

Program
Flash [...]
Raw [...] Registers

Relay(s) | General
Set-Up [...] | Node #
Status | Set Endian
Reset
Energy
Demand

Start
Pause
Stop

Pass Codes
Master ☐ General | Reset All

Map 3X

Logging

Float = Big Endian (Word Swap) | Log Start | Samples

Modbus TX >> 01 11 C0 2C
Modbus 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

Errors (0) | Clear

Lock | Port | COM3: baud=38400 parity=E data=8 stop=1 | Sampling (ms) 200 | Node # 1

Manual
Timer
00:00:00:
0 (s)
Start | Continue
Pause

Demand Time	3 ...
Demand Status	Rolling
Parity Errors	0
CRC Errors	0
Flash	1: 0000154
Stack Free	516
IRQ Stack Free	76
FIQ Stack Free	96
Sample Rate	
Memory Dump	...
PPH Modifiers	...
CT Delay (±°)	3.000 ...

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.

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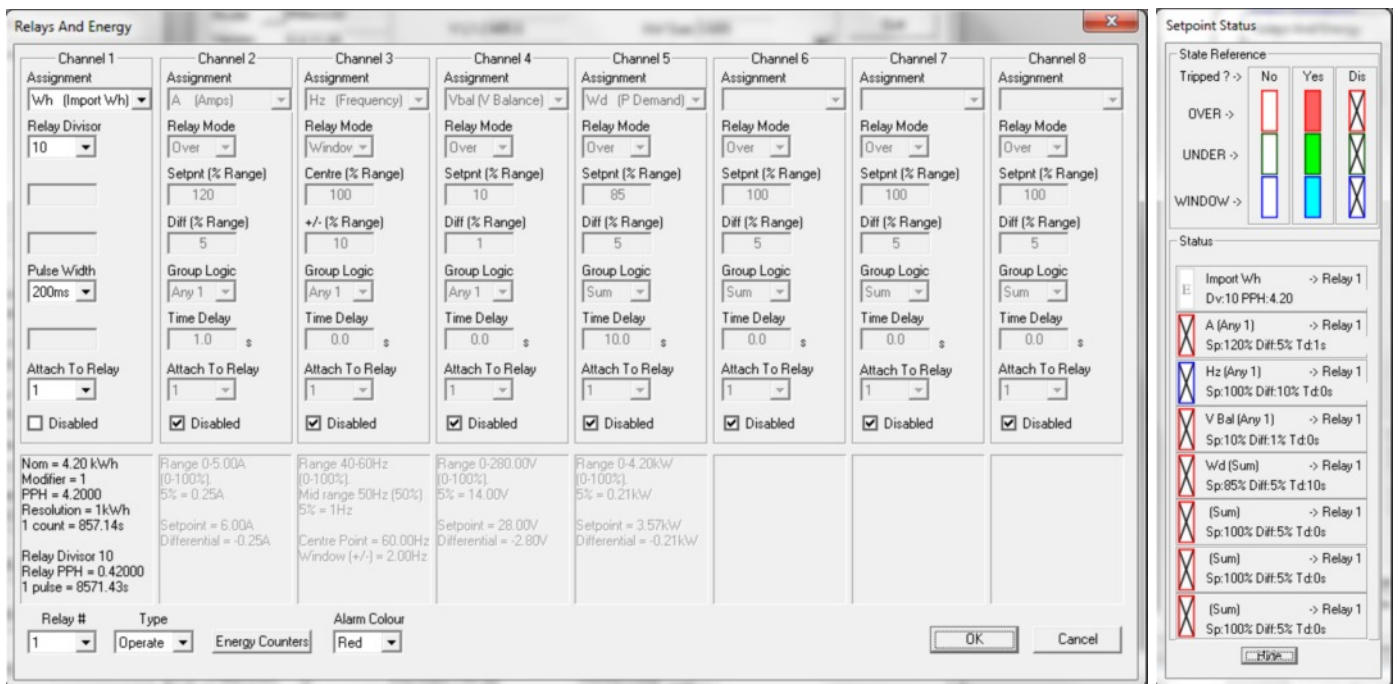W.h import/export,
VAr.h import/export
VA.h or A.h

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

Relays And Energy

	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
Assignment	Wh (Import Wh)	A (Amps)	Hz (Frequency)	Vbal (V Balance)	Wd (P Demand)			
Relay Mode / Relay Divisor	10	Over	Window	Over	Over	Over	Over	Over
Setpnt (% Range) / Centre		120	100	10	85	100	100	100
Diff (% Range) / +/-		5	10	1	5	5	5	5
Pulse Width	200ms							
Group Logic		Any 1	Any 1	Any 1	Sum	Sum	Sum	Sum
Time Delay		1.0	0.0	0.0	10.0	0.0	0.0	0.0
Attach To Relay	1	1	1	1	1	1	1	1
Disabled	☐	☑	☑	☑	☑	☑	☑	☑

Norm = 4.20 kWh
Modifier = 1
PPH = 4.2000
Resolution = 1kWh
1 count = 857.14s

Relay Divisor 10
Relay PPH = 0.42000
1 pulse = 8571.43s

Range 0-5.00A [0-100%]. 5% = 0.25A
Setpoint = 6.00A
Differential = -0.25A

Range 40-60Hz [0-100%]. Mid range 50Hz (50%) 5% = 1Hz
Centre Point = 60.00Hz
Window (+/-) = 2.00Hz

Range 0-280.00V [0-100%]. 5% = 14.00V
Setpoint = 28.00V
Differential = -2.80V

Range 0-4.20kW [0-100%]. 5% = 0.21kW
Setpoint = 3.57kW
Differential = -0.21kW

Relay # 1   Type Operate   Energy Counters   Alarm Colour Red

OK   Cancel

Setpoint Status

State Reference

Tripped ? ->	No	Yes	Dis
OVER ->			X
UNDER ->			X
WINDOW ->			X

Status

	Import Wh -> Relay 1 Dv:10 PPH:4.20
X	A (Any 1) -> Relay 1 Sp:120% Diff:5% Td:1s
X	Hz (Any 1) -> Relay 1 Sp:100% Diff:10% Td:0s
X	V Bal (Any 1) -> Relay 1 Sp:10% Diff:1% Td:0s
X	Wd (Sum) -> Relay 1 Sp:85% Diff:5% Td:10s
X	(Sum) -> Relay 1 Sp:100% Diff:5% Td:0s
X	(Sum) -> Relay 1 Sp:100% Diff:5% Td:0s
X	(Sum) -> Relay 1 Sp:100% Diff:5% Td:0s

Hide

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