multitek

MultiRail

Multifunction Power Meter and Programmable Relay

Parameters Measured

* Phase Voltage (V)
* Phase to Neutral (V)
* Phase Current (I)
* Neural Current
* Frequency (Hz)
* Average Power Factor (PF)
* Import Active Power (W)
* Import Active Power per phase L1 L2 L3 (W)
* Export Active Power (W)
* Export Active Power per phase L1 L2 L3 (W)
* Import Reactive Power (Var)
* Export Reactive Power (Var)
* Apparent Power (VA)
* Import Active Energy (W.h)
* Export Active Energy (W.h)
* Import Reactive Energy (VAr.h)
* Export Reactive Energy (Var.h)
* VA Energy (VA.h)
  Amp Hour (A.h)
* System Amp Demand (A Dmd)
* System Import Active Power Demand (W Dmd)
* System Export Active Power Demand (W Dmd)
* System Apparent Power Demand (VA Dmd)
* System Amp Maximum Demand (A Max Dmd)
* System Import Active Power Max Dmd (W Max Dmd)
* System Export Active Power Max Dmd (WMax Dmd)
* System Apparent Power Max Dmd (VA Max Dmd)
* THD Voltage 1% upto 31st
* THD Current 1% upto 31st

Accuracy

Volts & Amps	0.5% of reading ± 2 digits
Frequency	0.1Hz ± 1 digit
Active Power	1% of reading ± 2 digits
Reactive Power	1% of reading ± 2 digits
Apparent Power	1 % of reading ± 2 digits
Power Factor	1% of range
Energy	IEC 1036 class 1

Display

The unique 7 colour option LCD FSTN display is designed to be read in a variety of conditions over wide viewing angles and distances. There are 7 colour options of the back lighting available which are user selectable through the front control buttons. Colours available Blue, Cyan, Green, Magenta, Red, White, Yellow

MultiPower

The M880-DMF (MultiRail-Meter) is a complete 3 phase digital universal metering system in a standard DIN rail mount case, combined with a programmable relay. It can be used on any voltage system with a wide range of inputs. It incorporates a universal AC or DC auxiliary power supply.
The one unit covers the majority of applications without any modification required making the M880-DMF ideal for stocking.

Controls & Programming

The four front control buttons are used for scrolling up or down through the parameters being measured and displayed. These buttons also allow programming of different Current and Voltage transformer ratios, Demand times, Baud rates etc.

Communications

An integrated RS485 port enables the Multi-Rail-meter to communicate with up to 31 other meters or controllers using the popular Modbus RTU protocol. The protocol allows the MultiPower to be used with PC, PLC, RTU, Data loggers and Scada programs

Relay & Pulsed Output

An integrated solid-state relay can be assigned 8 different parameters as a set point relay or be used as a pulsed output for W.h, VAr.h, VA.h A.h

Memory

Current ratios, demand time periods and calibration data is stored in non volatile eeprom. In power down (power loss) conditions this data is retained.

System Types

The M880-DMF can be used on the following measuring systems without any changes apart from wiring configuration.
Single Phase
3 Phase 3 Wire Unbalanced Load
3 Phase 4 Wire Unbalanced Load

Ordering Codes

M850-DMF-RS-PO	RS485 and Relay / Pulsed Output

MultiView

The MultiView program displays all 40 parameters being measured. CT and VT ratios demand times, etc. all can be set via this program. The MultiView enables programming of the relay as well as data logging . MultiView is free and contains help files and operating instructions. It can be downloaded from Multitek website: www.multitek-ltd.com

COMMUNICATION

MuliRail uses RS485 Modbus protocol. This enables remote reading and programming of the MultiRail via a host computer. The RS485 allows up to 32 MultiRails to be connected in parallel, allowing them to be used with PC, PLC, RTU, Data loggers and Scada programs.

Type

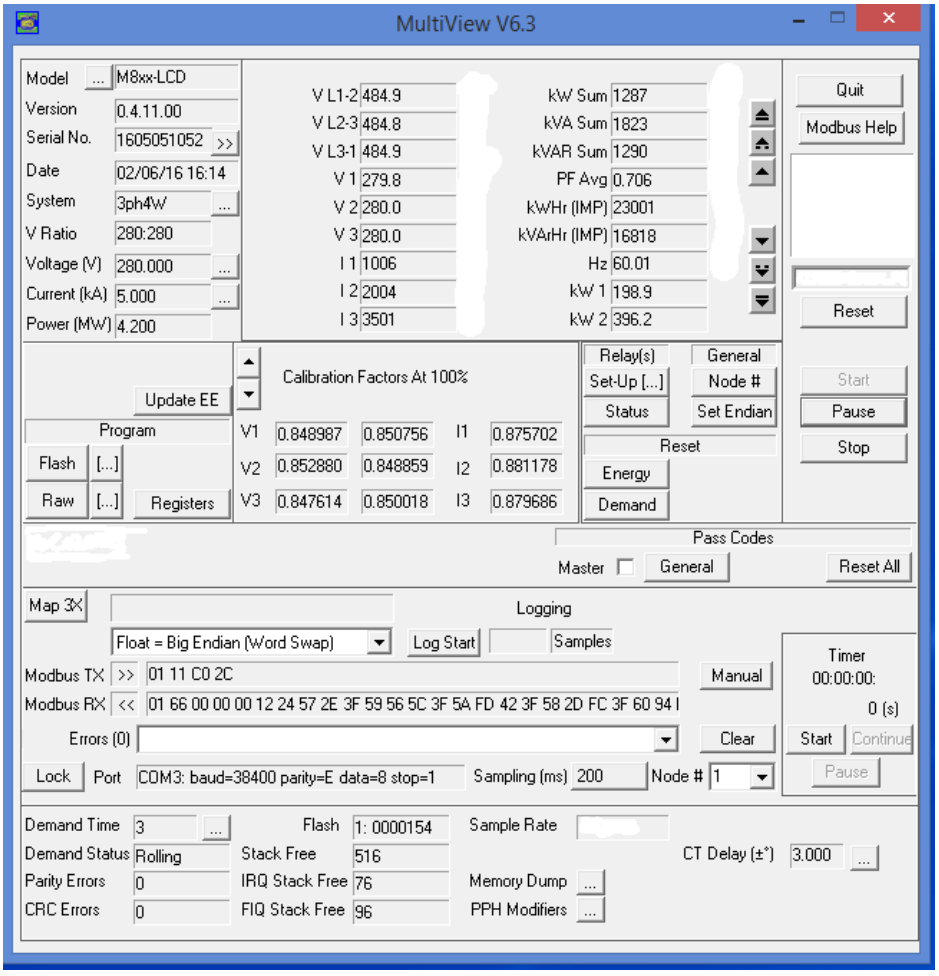
Displays system type i.e. 3 phase 4 wire, 3 phase 3 wire etc.

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

User goes into the log screen and logging of up to 12 parameters can be performed.

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

The MultiRail is a combination of multifunctional meter and programmable relay. The RS485 communication port provides Modbus output of all parameters measured and allows up to 8 parameters to be assigned to the internal relay. Any 8 of the 19 measured parameters can be assigned to the relay. Which ever parameters reach its set point first causes the relay to change state. Also when relay changes state the meter display can be programmed to change colour

RELAY SETUP

The M880DMF relay setup allows 8 different parameters to assigned to the relay. The programming enables set point, time delay, differential etc. to programmed for each parameter being monitored. The relay can also be used for pulsed output for W.h VAr.h VA.h A.h

Parameters

19 different parameters can be assigned to the relays.

Relay Mode

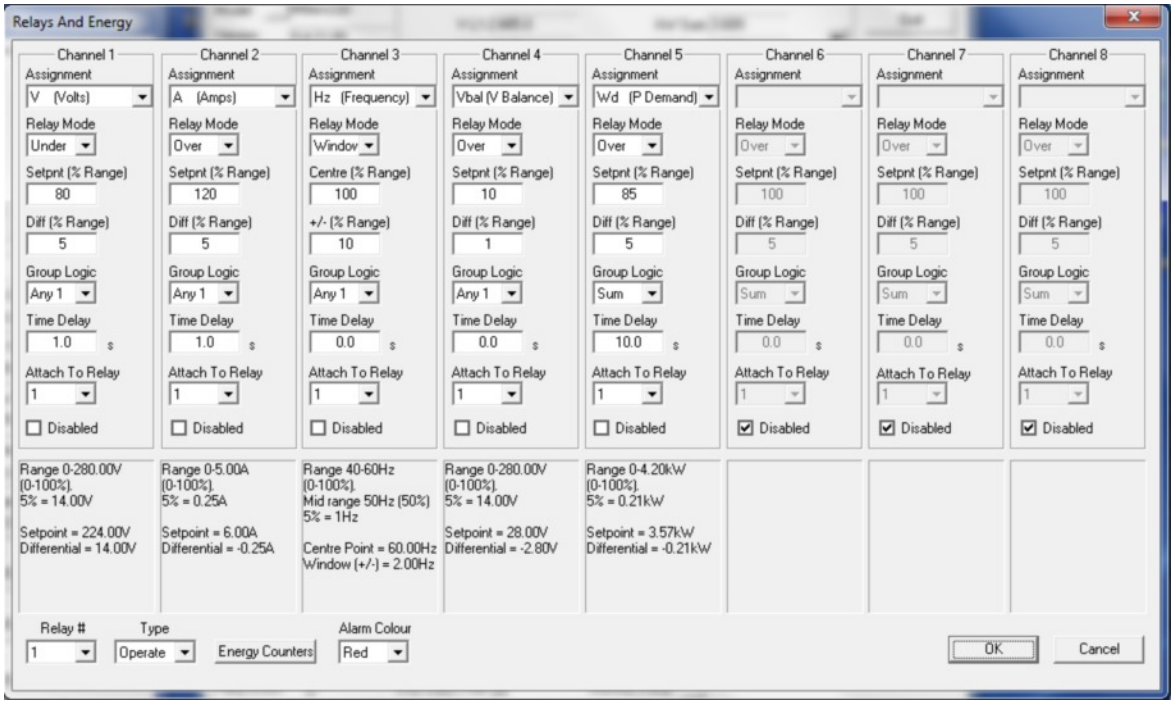
The relay can be assigned so that it operates as an over, under or window type.

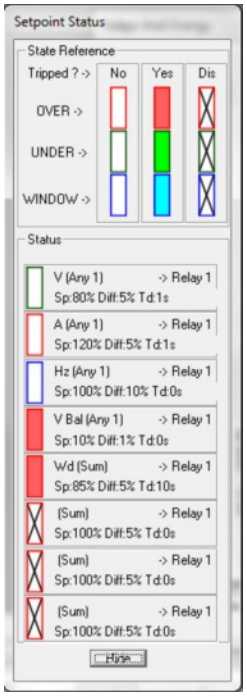
Trip (% Range)

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

The alarm colour allows the display back-light to be set to change colour on 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 RELAY AS A PULSED OUTPUT

The relay can be used as an energy relay providing a pulse output corresponding to either Watt hour Import or Export, VAr hour Import or Export, VA hour or Ampere hour. Pulse width can be selected as well as the relay divisor which allows relay to pulse every 1000, 100, 10, 1, 0.1, 0.01, 0.001 counts.

RELAYS STATE

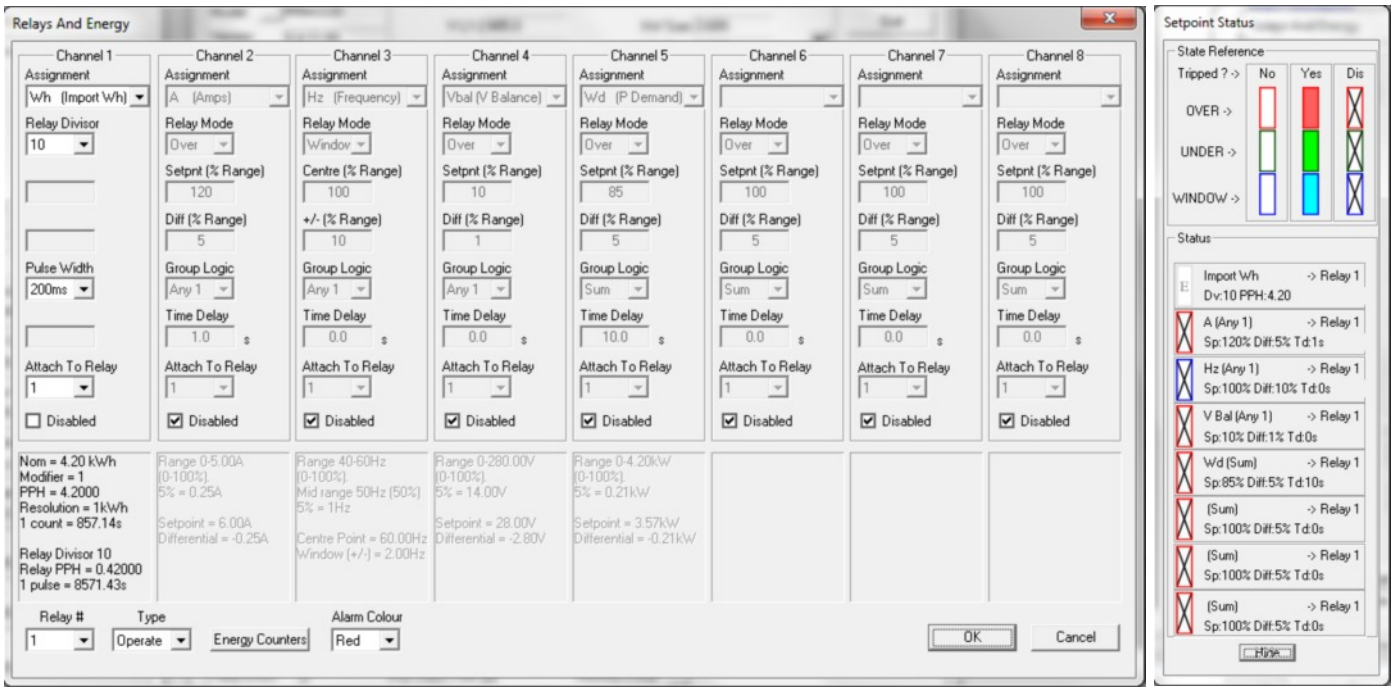
The free set up software MultiView allows monitoring of the state of each relay as well as indicating the parameters assigned. See below the exceptions screen.

Select Parameter
Select from 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 conditions

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' (disconnected).

Exception status
This shows the parameter, the relay that it is assigned to and the state that relay is in. Colour band indicates over, under or window.

General Specification

INPUT

Rated Un	*28V to 330V L.N. 48V to 570V L.L. (280V L.N. nominal)*
Overload	*800V continuous*
Burden	*0.5VA*
Cut Off Point	*2% Un nominal*
Rated In	*0.5A to 6A (5A nominal) via C.T.*
Overload	*10In for 1 sec*
Burden	*0.5VA per phase*
Cut Off Point	*2% In nominal*

Auxiliary Voltage

100 to 440V AC 100 to 420V DC
45 to 65Hz, burden < 10VA

Insulation

Installation category	*III (480 VAC ph/ph)*
Degree of pollution	*2*
Rated impulse withstand voltage	*IEC 60947-1-V imp: 4kV*
Meters Front	*Class II*
Electrical security	*IEC 61010-1*
Inputs + Aux to case:	*4 kV rms 50 Hz for 1 min*
Inputs + Aux to RS485 port:	*3kV rms 50 Hz for 1 min*
Inputs + Aux to relay output:	*1k5V rms 50 Hz for 1 min*
Low voltage dc Aux to Inputs:	*1k5V rms 50 Hz for 1 min*

Electromagnetic compatibility

Immunity to :

electrostatic discharges:	*IEC 61000-4-2-Level III*
radiated radio-Hz fields:	*IEC 61000-4-3-Level III*
electrical fast transient/brusts:	*IEC 61000-4-4-Level III*
impulse waves:	*IEC 61000-4-5-Level III*
conducted disturbances:	*IEC 61000-4-6-Level III*

voltage dips & short interruptions: IEC 61000-4-11

Emissions to:

Conducted and radiated	*CISPR11-Class A*

Approvals

UL P e n d i n g

Display

Custom	*LCD*
Backlight	*Customer selectable option of seven different colours*
Update time	*1 second*

Response Time

RS 485 Modbus *Less than 10mS*

Relay

Solidstate, low voltage relay
100V pk, 120mA

Options

1. 1 Amp input

Environmental

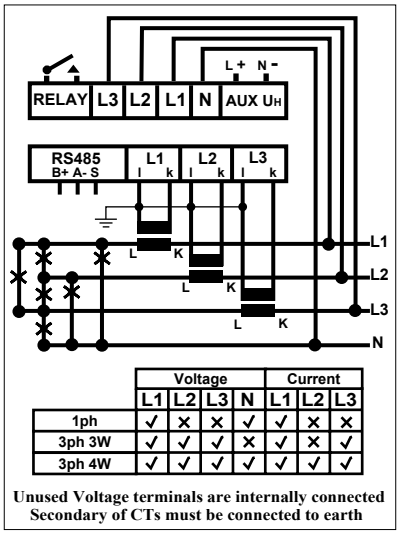
Working Temperature	*-20 to +70 deg C*
Storage Temperature	*-30 to +80 deg C*
Relative Humidity	*0-95% non condensing*
Shock	*30G in 2 planes*

Enclosure

DIN -rail	*DIN 43880*
Dimensions	*71x90x64mm*
Material	*Cycoloy UL94VO*
Terminals	*2.5mm²*
IP rating front	*IP52 / Nema*
IP rating case	*IP30 / Nema*
Weight	*0.22kg / 0.5lb*

Case Dimensions

Connection Diagram



	Voltage				Current		
	L1	L2	L3	N	L1	L2	L3
1ph	✓	×	×	✓	✓	×	×
3ph 3W	✓	✓	✓	×	✓	×	✓
3ph 4W	✓	✓	✓	✓	✓	✓	✓

Unused Voltage terminals are internally connected
Secondary of CTs must be connected to earth