Rayleigh Instruments
EST. 1964

Telephone : +44 (0) 1245 428500
Email : sales@rayleigh.com

RI-D380



Quad Load Three Phase **easywire**® Multifunction DIN Rail Energy Meter MID Certified

- Four module DIN rail mounted
- Energy pulse LED
- 4 x separate 3 Phase or 12 x Single Phase inputs 1A (330mV) from **easywire**® CTs (-/5A or -/1A CTs with converter)
- Single phase or three phase network compatible
- Independently programmable CT ratios (Load 1, 2, 3, 4)
- Programmable voltage transformer ratio
- True RMS measurement
- High definition white backlit LCD display
- Simple programming & operation + auto/manual page scrolling
- Modbus communication
- Voltage OUT connector for daisy chaining up to 32 meters from one supply

Product Description

The RI-D380 series are part of the **easywire**® family of meters. The **easywire**® system has been designed to save up to 90% installation time compared to a standard meter and current transformer installation.

This series of meters contain four metering circuits in one case, and accept inputs from four separate three phase, or twelve single phase **easywire**® current transformers while still utilizing the same voltage reference.

These DIN rail mounted multifunction energy meters are suitable for monitoring energy consumption and many other electrical parameters in industrial and commercial applications. This series is particularly suited for use in multi-circuit metering boards in single or three phase applications.

A high efficiency white backlit LCD display provides clear indication of measured values in all light conditions. Push-buttons on the front of the meter allow the user access to the display page required.

The meter is available in two version with RS485 Modbus communication (RJ12 - In and Out).
The unit is housed in a compact four module width housing suitable for DIN rail mounting.

Displayed Parameters

Voltage - L-L, L-N and average

Current - Per phase and average
(LOAD 1, LOAD 2, LOAD 3 and LOAD 4 or 12 x Single Phase)

Power Factor - per phase and average

Frequency

Power - Active, Reactive and Apparent (per phase and total)

Power Max. demand - Active and apparent power.

Energy - Active, reactive and apparent (per load and total)

MID APPROVED FOR BILLING APPLICATIONS
Measuring Instruments Directive

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Display

Display Type	LCD, high definition with white back-light
Digit height	6.35mm (displayed parameter)
Page scrolling	Manual by front key / or auto scroll mode
Displayed parameters and accuracies	Voltage 0.5% of full scale Current 0.5% of full scale Frequency 0.1% of full scale (L-N >20V) Power factor 1% of unity Active power 1% Reactive power 1% Apparent power 1% Active Energy Class 1 (IEC/EN62053-21), Class B (IEC/EN50470) Reactive Energy Class 2 (IEC/EN62053-23)
Energy maximum display	9999999
Resolution	0.01K, 0.1K, 1K, 0.01M, 0.1M (depending on CT ratio & VT ratio)

Programming

Parameters that can be changed using programming menu	Number of Channels : 4 or 12 Network Selection : 3PH4W or Single Phase (L1, L2 or L3) CT Primary current - Load 1, Load 2, Load 3, Load 4, CT (each load independently settable) VT primary voltage VT secondary voltage Communication address Communication speed (Baud) Communication Parity Communication number of stop bits Back-light time-out period Demand period (for integration) Pulse duration Pulse output (kWh) Reset to Factory Default Reset Energy and Maximum Demand Reset Active Energy Reset Reactive Energy Reset Apparent Energy Reset Maximum Current Reset Maximum Active Power Reset Minimum Active Power Reset Maximum Reactive Power Reset Minimum Reactive Power Reset Maximum Apparent Power
Programming access	Password protected (user selectable)
Memory retention	Non volatile memory

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Input

Connection (1ph, 3ph etc., configurable)	Single phase (selectable L1, L2 or L3 CT voltage reference), Three phase four wire Single phase 12 x CTs on same phase
Input voltage range	3 x 85...240V (L - N), 3 x 147...415V (L - L)
Voltage Rated Burden	<8VA
Nominal current input	4 x **easywire**® input - 1A (330mV)
Max current (Imax)	**easywire**® input - 1.2A (396mV) Nominal x 1.2
Current Rated Burden	N/A (**easywire**® input)
Starting current	2mA (0.66mV)
Short time overcurrent	30 x Imax to IEC/EN62053-21 + 23
Impulse voltage withstand	6kV 1.2/50µS 0.5J
AC voltage withstand	4kV 50Hz for 1 min
CT primary current	5A...6000A
VT primary voltage	100...600V
Frequency	50Hz

Auxiliary Supply

Voltage range	Self supplied from measuring input
Operating frequency	See input section
Power consumption	See input section

Outputs

Communication - Modbus Version	
Communication type	RS485
Communication protocol	Modbus
Address	1...255
Number of bits	8bits
Parity	None, odd, even
Baud rate	300, 600, 1200, 2400, 4800, 9600, 19200
Required response time to request	≤100ms
Number of meters connected on the bus	32 (up to 255 with RS485 repeater)
Max distance from Master device	500M

Insulation

Installation category	III
Pollution degree	2
Insulation voltage rating	300V (L - N)

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Environmental Conditions

Reference temperature	23°C ±2°C
Specified temperature operating range	–10°C...+55°C
Storage temperature	–20°C...+75°C
Relative humidity	0...85%, non condensing
Mechanical environment	M1
Electrical environment	E2

Mechanical

Housing	
Housing	4 module DIN 43880
Mounting	Snap-on 35mm rail
Tamper sealing	Meter housing (by means of a tamper evident seal)
Housing material	Self-extinguishing polycarbonate (UL94 V-0)
Protection degree (IEC/EN60529)	IP20 (terminals), IP51 (front of housing)
Weight	<240g
Termination	
Current input terminal type	4 x RJ45 connection
Max. wire size	N/A
Voltage input terminal type	Pluggable terminal block - screw clamp type
Max. wire size	0.5...2.5mm^2
Voltage output terminal type	Pluggable terminal block - screw clamp type
Max. wire size	0.5...2.5mm^2
Communication output terminal type	2 x RJ12 connection (In & Out)
Max. wire size	N/A

Conformity

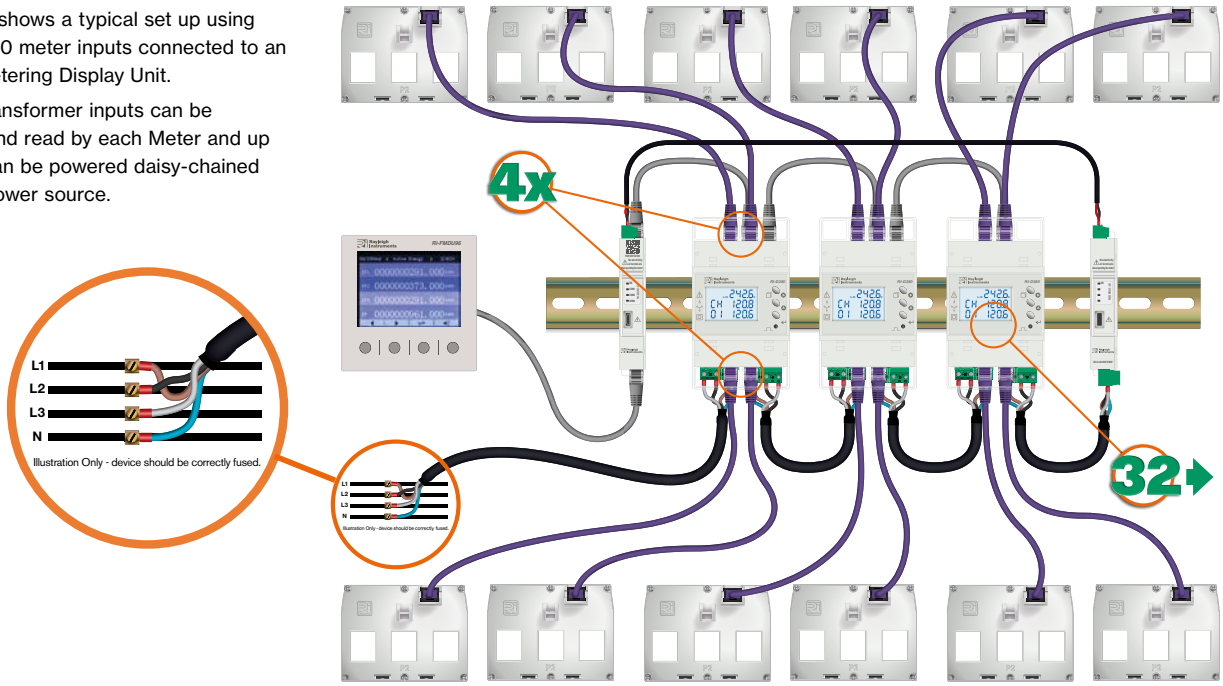
Electromagnetic compatibility	IEC/EN61326-1, IEC/EN55011 Class A, IEC/EN61000-4-2, -3, -4, -5, -6, -8, -11 IEC/EN50470-1/3
Accuracy and functionality	IEC/EN62053-21, IEC/EN62053-23
Safety	IEC/EN61010, EN62052-31

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Schematic

The illustration shows a typical set up using multiple RI-D380 meter inputs connected to an RI-FMDU96 Metering Display Unit.

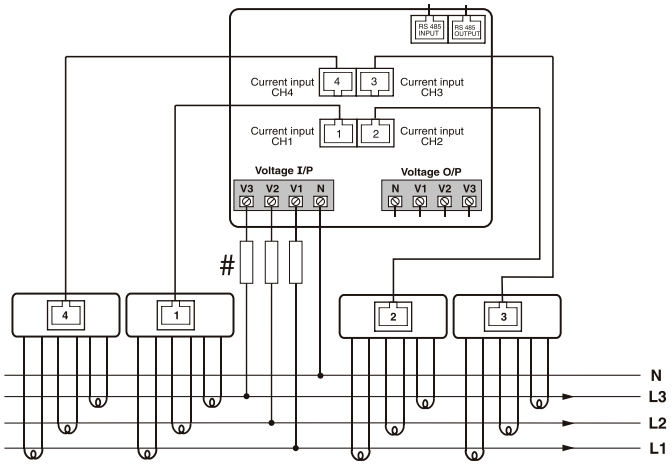
Four current transformer inputs can be connected to and read by each Meter and up to 32 Meters can be powered daisy-chained from a single power source.



Wiring Diagrams

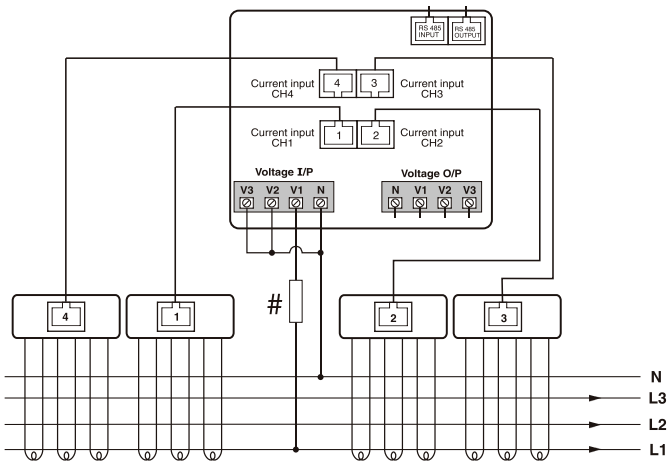
Note: # All fuse types :	0.5A lass CC UL type 0.5A fast acting 600V	Max. 3A (Actual rating is dependent on the number of meters connected to the voltage supply and must be determined during system design).

3 Phase 4 Wire - 4 x CTs

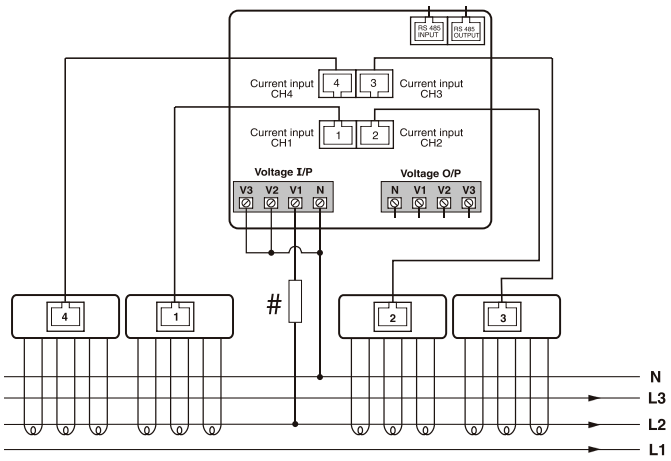


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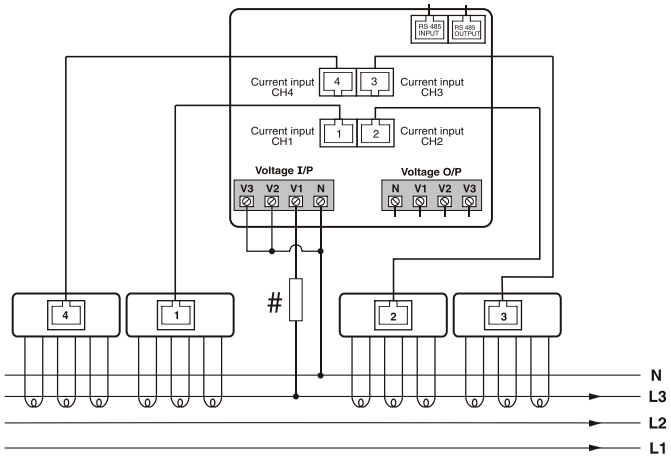
Up to 12 Single Phase L1 - 4 x CTs **



Up to 12 Single Phase L2 - 4 x CTs **



Up to 12 Single Phase L3 - 4 x CTs **



**** Note : Irrespective of which phase is being monitored, the voltage connection must be connected to V1 on the meter.**

Notes for MID conformity

Once installed the RJ45 connector of both the meter and current transformer must be sealed with a tamper proof seal to prevent the meter and current transformer being separated.

To fulfil the requirements of MID the RI-D380 meter should be used with current transformer type RI-CT240-EW, RI-CT242-EW, RI-CT248-EW, RI-CT249-EW or RI-CT250-EW.

Model Selection Table

Communications	Model
MID Certified Quad Load Input with RS485 Modbus Output	RI-D380-G-C

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