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**Modbus RTU**

RI-D480-G-C

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**M-Bus**

RI-D480-G-MB

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<b>4x 3Ø</b>			
CT1: 3Ø	CT2: 3Ø	CT3: 3Ø	CT4: 3Ø
<b>4x 1Ø</b> (all measure same phase L1, L2 or L3)			
CT1: 1Ø	CT2: 1Ø	CT3: 1Ø	CT4: 1Ø
<p><b>Network Selection:</b>  <b>L1 = 1P2W P1   L2 = 1P2W P2   L3 = 1P2W P3</b></p>			
<b>12x 1Ø</b> (supplied from Single Phase)			
CT1: 3x 1Ø	CT2: 3x 1Ø	CT3: 3x 1Ø	CT4: 3x 1Ø

Specifications		Accuracy					
Wiring Input	3Ø 4 wire 1Ø 2 wire - P1, P2, P3	Voltage V L-N and V L-L	±0.5% of full scale				
Rated Input Voltage	3x 60...300V AC (L-N), 104...520V AC (L-L)	Current	±0.5% of full scale				
Frequency	45...65Hz	Frequency for L-N > 20V, L-L > 35V	±0.1% of full scale				
CT Primary	1...10,000A configurable	Active, Reactive and Apparent Power	1% of full scale				
CT Secondary	0.01...1(1.2)A (Meter Input: 330mV)	Power Factor	±0.01 of Unity				
VT Primary	100...10kV configurable	Active Energy	Class 1 (IEC/EN 62053-21)				
VT Secondary	100...500V AC (L-L) configurable	Reactive Energy	Class 2 (IEC/EN 62053-23)				
Auxiliary / Voltage Rated Burden	Supplied from V1 only / < 8VA						
		Wh Resolution and Default Pulse Weight					
Display Update Rate	1 sec all parameters	CT Ratio x VT Ratio	<15	<150	<1500	<15000	>15000
Operating / Storage Temperature	-10...55°C / -20...75°C	Wh	0.01k	0.1k	1k	10k	100k
Humidity	0...85% non-condensing	INT	0.001k	0.01k	0.1k	1k	10k
Protection Degree (IEC/EN60529)	IP54 (front of Housing), IP20 (terminals)	<p><b>Example</b>                      If CT Primary = 200A (CT ratio = 200/1 = 200) &amp; VT = 350/350V (VT Ratio = 1)</p>					
Communication	Modbus RTU over RS485 Mbus (EN13757)						

**MECHANICAL INSTALLATION**

**DIN RAIL MOUNT**

**DISMOUNT**

DIN rail mounted, this device must be installed within a suitable IP rated enclosure. Indoor use only.

Installation category: III (300V L-N)

Protection Class: II

Pollution degree: II

Altitude: up to 2000 m

All terminal covers must be fitted after wiring

**PRODUCT SAFETY**

Safety related notification, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of personnel as well as the instrument. If the equipment is not used in a manner specified by the manufacturer it may impair the protection provided by the equipment

- Do not use the equipment if there are mechanical damage
- Do not exceed the stated maximum ratings of the device
- No repairs, maintenance or adjustments are possible
- Read the complete instruction manual prior to installation or operating the unit
- The equipment in its installed state must not come into close proximity to any heating sources, oils, steam, caustic vapours or other unwanted process by-products
- Do not use in hazardous or classified location where explosion or other dangers can be triggered by the device

**INSTALLATION PRECAUTIONS**

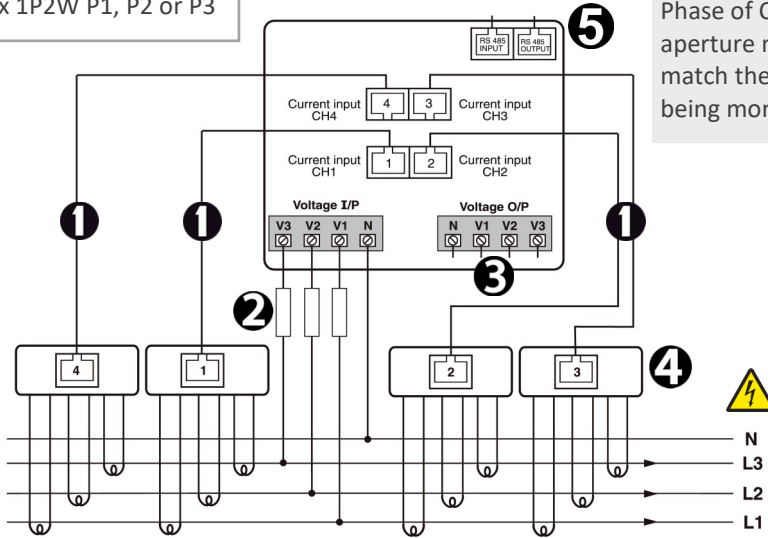
Risk of electric shock!  
Only to be installed by a competent person

- To prevent the risk of electrocution, always isolate and lock-off the power supply to the equipment prior to undertaking any work
- Always confirm absence of electricity prior to starting work using appropriate voltage detection equipment
- Wiring shall be done strictly according to the terminal layout
- Confirm that all connections are correct before energizing the equipment
- Routing of cables shall be way from any internal EMI source
- Copper cable should be used
- All wiring to be in accordance with applicable local standards

# WIRING

## 4 Channel

4x 3P4W or  
4x 1P2W P1, P2 or P3



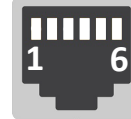
**⚠ 4x 1Ø**

Phase of CT aperture must match the phase being monitored

- 1 RJ45 cable
- 2 Fuse class CC UL / fast acting
- 3 Phase: 600V / Single Phase: 250V

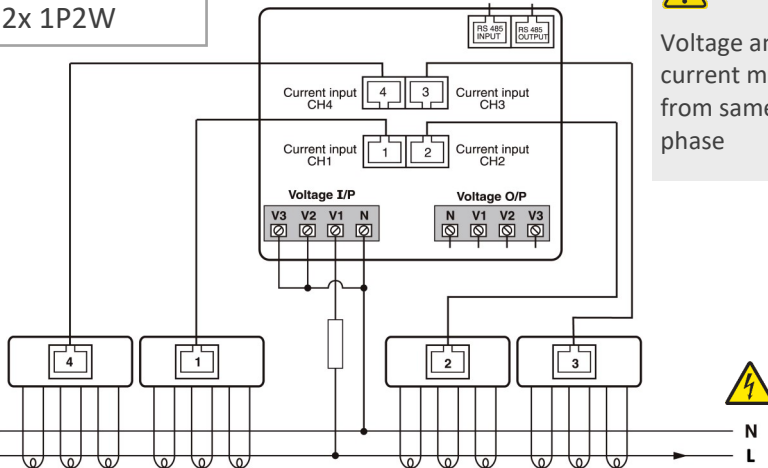
No. Meters	≤ 5	≤ 10	≤ 20	≤ 32
Fuse Rating	0.5A	1A	1.5A	2A

- 3 Supply 31 additional meters (32 total)
- 4 Easywire 3-Phase Current Transformers (x4)  
CT phase rotation is **RH/LH dependant** refer to Configuration Settings  
For **Single-Phase Easywire CT** - Set Phase Network to 1P2W-P1, Voltage Reference V1 must be same phase as CT. Connect V2/V3 to N.
- 5 Comm network: **RJ12** (see Modbus / MBus)



Pin	Modbus	MBus
1	+	1
6	-	2

## 12 Channel 12x 1P2W

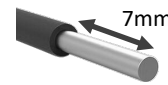


**⚠**

Voltage and current must be from same phase

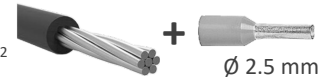
No. of Channel	4 Channel Mode 4x 3Ø or 4x 1Ø			12 Channel Mode 12x 1Ø		
	L1	L2	L3	L1	L2	L3
CT1 =	CH1			CH1	CH2	CH3
CT2 =	CH2			CH4	CH5	CH6
CT3 =	CH3			CH7	CH8	CH9
CT4 =	CH4			CH10	CH11	CH12

**Single Core**  
0.5 > 4mm<sup>2</sup>  
Ø 2.5mm Max



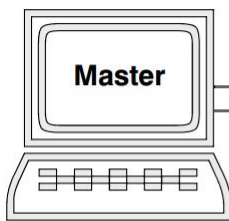
**0.5 Nm Max**

**Stranded**  
0.5 > 2.5mm<sup>2</sup>



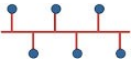

## Modbus / MBus

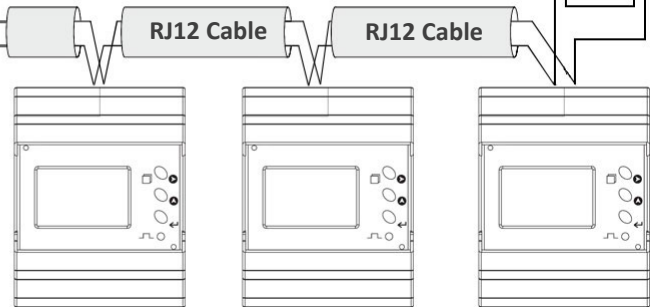
Typical Modbus configuration shown  
For MBus interface follow Wiring Topology below



500m Max, ≤ 32 meters

Recommended termination resistor 120 Ω

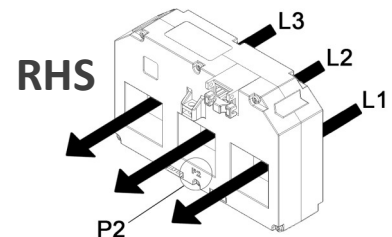
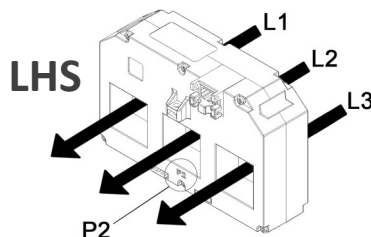
Wiring Topology	A   B	 Daisy Chain		 Star Network	
		✓	✗	✓	✓
Modbus	+   -	✓	✗	✗	✗
MBus	1   2	✓	✗	✓	✓



**⚠**

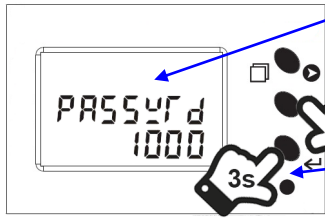
**easywire**

**Current Phase Connection illustration**  
- Refer to Configuration Settings 9 to 12



# CONFIGURATION

## Step A: Enter Configuration Menu



**2** Password = 1000  
(Refer to Step B)

**1** Hold 3 Secs to  
Enter Config  
(same to Exit)

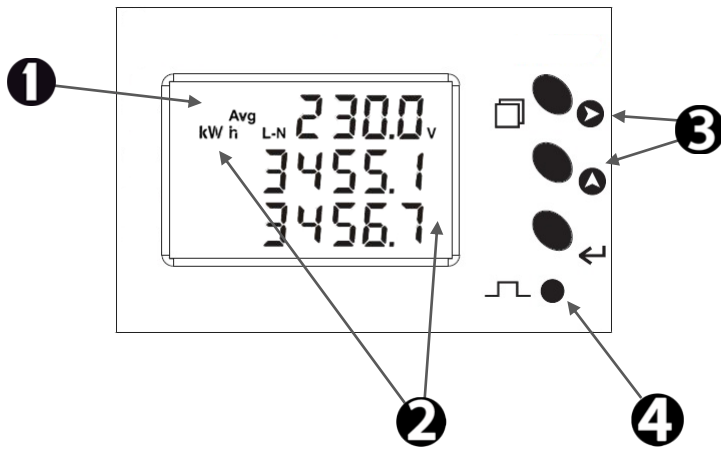
## Step B: Configure each setting, as required, referring to Settings Table below, using the buttons as follow:

<b>1</b>		Press once to make digit or option flash, press again to move flashing cursor
<b>2</b>		Press to change digit or option, press  to move cursor position as required
<b>3</b>		Press to save and move to next setting option, Exit menu once all settings are configured (see Step A)

D480-G-C	D480-G-MB	Setting	Default 	Adjustment Range 	Network & CT Must configure	VT Adjust if Using VT	Comms Modbus / MBus	System Settings	
									Optional
1	1	Change Password	1000	NO / YES (0000 - 9998)					✓
2	2	Channel Selection	4 CH	4 CH (4x 3P4W / 1P2W) 12 CH (12x 1P2W)	✓				
3	3	Phase Network Selection	3P4W	3P4W, 1P2W-P1/P2/P3	✓				
4	4	CT Secondary	1	Non-adjustable	✓				
5	5	CT Primary 1 (see CT Label)	1	1 > 10000A	✓				
6	6	CT Primary 2 (see CT Label)	1	1 > 10000A	✓				
7	7	CT Primary 3 (see CT Label)	1	1 > 10000A	✓				
8	8	CT Primary 4 (see CT Label)	1	1 > 10000A	✓				
9	9	Current Connection 1 - see	RHS	RHS / LHS	✓				
10	10	Current Connection 2 - see	RHS	RHS / LHS	✓				
11	11	Current Connection 3 - see	RHS	RHS / LHS	✓				
12	12	Current Connection 4 - see	RHS	RHS / LHS	✓				
13	13	PT Secondary	350	100 > 500V		✓			
14	14	PT Primary	350	100 > 600V		✓			
15	15	Slave ID <i>Modbus:</i> <i>MBus (Primary ID):</i>	1 1	1 > 255 1 > 250			✓		
16	16	Baud rate <i>Modbus:</i> <i>MBus:</i>	9600 2400	300 > 38400 bps 1200 > 9600			✓		
17	17	Parity <i>Modbus:</i> <i>MBus:</i>	None Even	None / Odd / Even Even			✓		
18	18	Stop Bit <i>Modbus:</i> <i>MBus:</i>	1 1	1 / 2 1			✓		
19	19	Back Light Off (0000 = Never)	0000	0 > 7200 Sec					✓
20	20	Demand Interval Method	Sliding	Siding / Fixed					
21	21	Demand Interval Duration	15	1 > 30					
22	22	Demand Interval Length	1	1 > 30 min					
X	23	MBus Secondary ID	Serial #	0000 0000 > 9999 9999			✓		
23	24	Factory Default	No	No / Yes	Does not reset energy & demand values				✓
24	25	Reset Energy & Demand	No	No / Yes (Password +1)	Once entered, reset each value individually				✓



# OPERATION



## 1 Display Symbols:

- Avg** Average of 3-phase
- tOt** Total of 3-phase
- MD** Max Demand
- L-N** Line to Neutral
- RS485 communication in progress

## 2 Measurement Units (refer to Functions Table below)

V, kWh, kVAh, kVA, A, Hz, kW, kVA, kVA

## 3 Navigation Buttons:

- Change **PARAMETER** (refer to Functions Table below)
- HOLD 10 sec: change page scroll (AUTO<>MANUAL)
- Change **CHANNEL** (refer to Functions Table below)
- HOLD 10 sec: Serial #

## 4 Integration of Energy Indicator (blinks at rate of INT)

	Change Parameter	Change Channel	
		4 Channel (4x 3Ø or 4x 1Ø)	12 Channel (12x 1Ø)
x1	Avg Voltage (V L-N) Active Energy (kWh)	CH1 > CH2 > CH3 > CH4 > Total	CH1 > CH2 > .....CH12 > Total
x2	Phase Voltage (V L-N)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12
x3	Phase Voltage (V L-L)	CH1 > CH2 > CH3 > CH4	X
	Phase Current (A)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12
	Phase Power Factor Frequency (Hz)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12
	Avg Voltage (V L-N) Reactive Energy (kVAh)	CH1 > CH2 > CH3 > CH4 > Total	CH1 > CH2 > .....CH12 > Total
	Avg Voltage (V L-N) Apparent Energy (kVAh)	CH1 > CH2 > CH3 > CH4 > Total	CH1 > CH2 > .....CH12 > Total
	Phase Active Power (kW)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12
	Phase Reactive Power (kVAh)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12
	Phase Apparent Power (kVA)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12
	MD of Active Power (kW)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12
	MD of Apparent Power (kVAh)	CH1 > CH2 > CH3 > CH4	CH1/2/3 > CH4/5/6 > CH7/8/9 > CH10/11/12