

## OVERVIEW


**RI-D70-C**  **Modbus**
**RI-D70-MB**  **M-Bus**

**RoHS**

## SPECIFICATIONS


Wiring input	3Ø, 4 wire Direct Connected
Input voltage (Un)	230V (L - N), 400V (L - L)
Operating voltage range	161...279V (L - N), 300...520V (L - L)
Current rating (Imin-Iref)	0.5...10A / Max current (Imax) 100A
Frequency range	50Hz / 60Hz (operating range 45...65Hz)
Short time overcurrent	30 x Imax. for 10mS (IEC/EN62053-21 and -23)
Impulse voltage withstand	6kV 1.2µS
AC voltage withstand	4kV for 1 minute
Auxiliary	Self supplied from measuring input
Power consumption	≤2W / 10VA per phase
Energy maximum display	9999999.9 (default) or 999999.99 programmable
Displayed parameters and accuracy	Active energy: Class 1, Class B (IEC/EN62053-21, IEC/EN50470) Reactive energy: Class 2 (IEC/EN62053-23) Voltage: 0.5% of full scale Current: 0.5% of full scale Active power: 0.5% Reactive power: 0.5% Apparent power: 0.5% Power factor: 0.2% of unity Frequency: 0.2% of full scale
Communication	RS485: Modbus RTU or MBus EN13757-3 <b>Address Register at <a href="http://www.rayleigh.com">www.rayleigh.com</a></b>
Modbus RTU (RI-D70-C only)	Address: 1... 255 Data bits / Parity: 8 bit / None, Odd, Even Baudrate: 1200, 2400, 4800, 9600 Bus loading: 64 meters max Max distance: 1000m
MBus EN13757-3 (RI-D70-MB only)	Address: 1... 255 Baudrate: 2400, 4800, 9600 Bus loading: 64 meters max (dependant on converter and baudrate) Max distance: 1000m (64 meters)
Pulse output	1 x fixed 400 imp/kWh / 5 - 27V DC (external supply) / 27mA max / pulse duration 80mS
Operating temperature	-25°C ... +55°C
Storage temperature	-30°C ... +70°C
Relative humidity	0... 95%, non-condensing
Net weight	400g
Housing material	Self-extinguishing ABS
Insulation voltage rating	300V (L - N)
Installation category	III
Protection degree	IP20 (terminals), IP51 (front of housing)

## ! SAFETY PRECAUTIONS

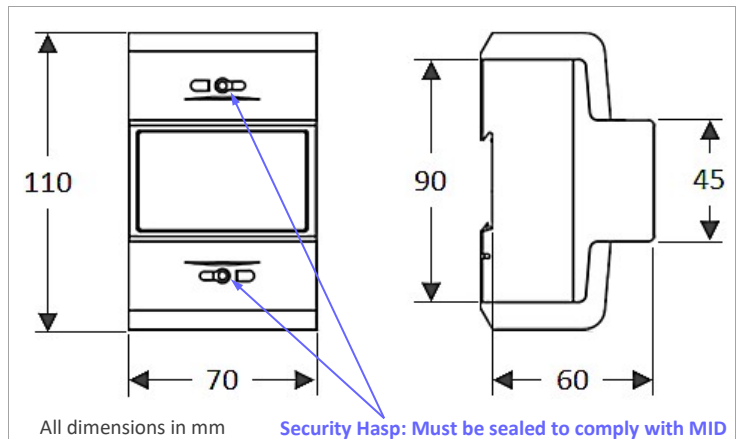
Safety related notification, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of personnel as well as the instrument.

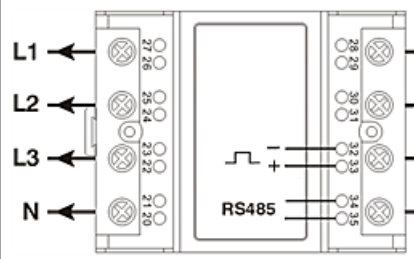


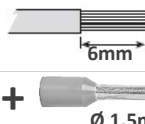


- If the equipment is not used in a manner specified by the manufacturer it may impair the protection provided by the equipment
- Do not use the equipment if there is any mechanical damage
- Do not exceed the stated maximum ratings of the device
- No repairs, maintenance or adjustments are possible
- Read complete instruction prior to installation or operation of 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

 **Risk of electric shock!** To avoid personal and material damage, the installation process must be performed by qualified and trained personnel only.

- 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 connecting cables should be away from any internal EMI sources
- Copper cable should be used
- All wiring to be in accordance with applicable local standards



	RS485	34	35
	Modbus	B	A
	MBus	MBus2	MBus1
	3Ø	Output	
	0.4 Nm Max	0.2 Nm Max	
3Ø: 1 AWG / 42mm <sup>2</sup> max		Output: 14 AWG / 2.5mm <sup>2</sup> max	
			
+  Ø 7mm max		+  Ø 1.5mm	

## FEATURES



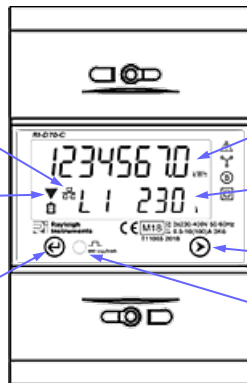
RS485 Communication Indicator



Phase Failure Indicator (Negative or 0V)



Config/Change Button



Accumulated Energy (Auto-scroll only)

V / I / P / PF / Hz / Comms (Auto or Manual scroll)



Scroll/Select Button

Pulse Output Indicator

## CONFIGURATION

1	Enter Config Menu		Hold 3 sec	PS 0000
2	Password 0001		Select	PS 0001
3	Comm Baud Rate See 'Specifications'		Change	bd 9600
4	Comm ID 0... 255			Id 01
5	Number of auto-scroll items 0... 14(0E)		Hold 3 sec advance to next item	Sn 0E

## OPERATION

Auto-scroll	12345670 kWh L1 230 V	Auto-scroll OR
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Total kWh	12345670 kWh
Import kWh	12345670 IMP kWh
Export kWh	12345670 EXP kWh
Total kVAr	12345670 kvar

Phase Voltage	L1 230 V	L2	L3
Phase Current	L1 100.0 A	L2	L3
Active Power	P 12.00 kW		
Power Factor	PF 1.00		
Frequency	F 50 Hz		
Reactive Power	q 12.00 kvar		
Baud Rate	bd 9600		
Comm Address	Id 01		
Serial Number (1st 4 digits)	SH 1802		
Serial Number (2nd 4 digits)	SL 0007		

## EU DECLARATION OF CONFORMITY

RAYLEIGH INSTRUMENTS LIMITED  
Raytel House, Cutlers Road, South Woodham Ferrers, Chelmsford, Essex CM3 5WA. UK

Hereby declares under its sole responsibility the products described below:

Product Family	RI-D70 THREE PHASE ENERGY METER (DIN RAIL MOUNT)
Models	RI-D70-C / RI-D70-MB

complies with the provisions of the following European Directives:

2014/32/EU – Measuring Instruments Directive (MID)  
2011/65/EU – RoHS Directive

based on compliance with the following harmonised standards:

EN 50470-1:2006 - Electricity metering equipment (AC), General requirements, tests and test conditions.  
EN 50470-3:2006 - Electricity metering equipment (AC), Particular requirements  
EN 50581:2012 – Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EC Type Examination	MID Annex B
Certificate Number	EU-TEC-T11065
Issued By	NMi Certain B.V - 0122

Particulars:

- The product is traceable by its serial number applied on the product's casing exterior
- CE marking is applied to the product's casing and packaging
- Conformance of installation is realized only when conducted by a competent installer

Issued: 28 May 2018  
Chelmsford UK

Chi Cheung - Technical Manager  
On behalf of Rayleigh Instruments Limited