easywire

Pulse SO

Modbus RTU

RI-F300-B-C / RI-F300-G-C

M-Bus

RI-F300-B-MB / RI-F300-G-MB

X 4

X 1

MID UK CA CE

MID Installation must comply with MID certified requirements

MID Config Lock
>> see 'Configuration' for Lockable Settings

Once Configuration Mode is entered, 'MID Config Lock' will activate after 15 minutes or if meter is switched off. No further adjustment is possible for the lockable settings. Unlock only by returning to supplier.

All terminal covers provided must be fitted. All cable connections and terminal covers of the meter and the CT must be secured with sealing hasp.

Specifications	
Wiring Input (MID Approved)	3Ø - 4 wire / 1Ø - 2 wire P1
Rated Input Voltage	3x 100...240V AC (L-N), 173...415V AC (L-L)
Frequency Range	47...63Hz (MID approved @ 50Hz)
CT Primary	1A...6,000A configurable
CT Secondary	0.01...1(1.2)A (Meter input: 330mV)
VT Primary	100...600V configurable
VT Secondary	173...415V AC (L-L) configurable
Auxiliary	Supplied from any phase
Voltage Rated Burden	<6VA
Display Update Rate	1 sec all parameters
Humidity	0...85% non-condensing
Protection Degree (IEC/EN60529)	IP54 Front only (rubber gasket fitted)
Pulse Output	External 5...27V DC / 100mA
Pulse Resolution / Duration	0.01...99.99kWh per imp / 50...300mS
Communication	Modbus RTU over RS485 MBus (EN13757)

Accuracy	
Voltage V L-N and V L-L	±0.5% of full scale
Current	±0.5% of full scale
Frequency for L-N > 20V, L-L > 35V	±0.1% of full scale
Active, Reactive and Apparent Power	1%
Power Factor	±0.01 of Unity
Active Energy	EN50470-3: Cl.B
Reactive Energy	EN62053-23: Cl.2
Apparent Energy	Class 1

Wh Resolution and Default Pulse Weight

CT Ratio x VT Ratio	<15	<150	<1500	<15k	>15k
Wh / VAh / VArh / ⎍	0.01k	0.1k	1k	0.01M	0.1M

Example
If CT Primary = 200A (CT ratio = 200/1 = 200) & VT = 350/350V (VT Ratio = 1)
Wh resolution = 1kWh (200 x 1 = <1500) | Pulse O/P default = 1kWh/pulse

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

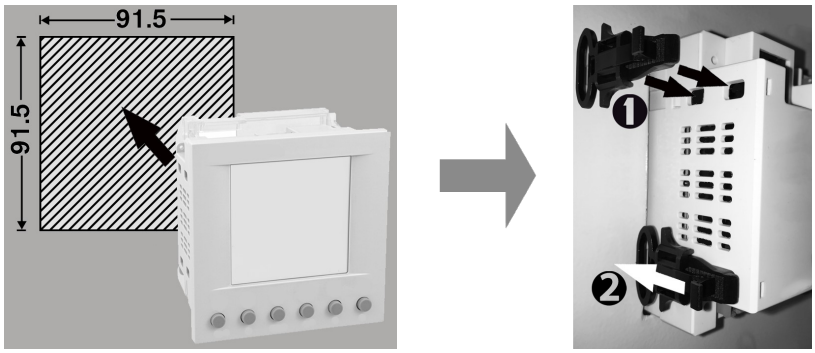
- Do not use the equipment if there are mechanical damage
- Do not exceed the stated maximum ratings of the device
- No repairs, maintenance or adjustments are possible
- Read the complete instruction manual prior to installation or operating the unit
- The equipment in its installed state must not come 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

MECHANICAL INSTALLATION



Panel mounted, installed indoor only.

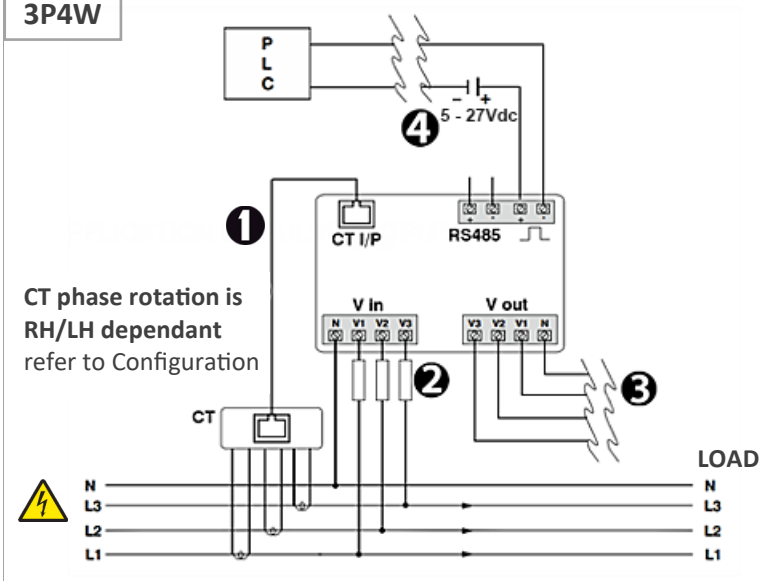
The meter is intended to be installed in Mechanical Environment 'M1', with Shock and Vibrations of low significance, as per 2014/32/EC Directive.

The meter is intended to be installed in Electromagnetic Environment 'E2', as per 2014/32/EC Directive.

Installation Category III (300V L-N)
Protection Class: II Pollution degree: II

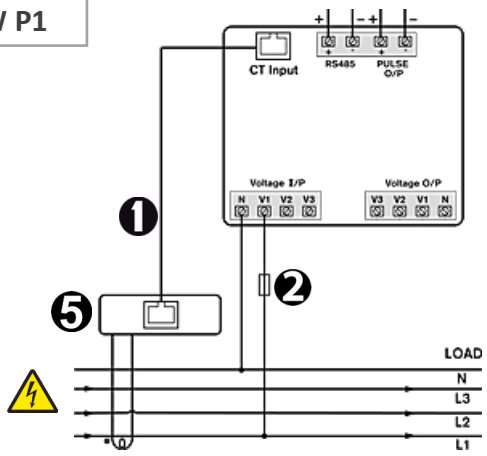
WIRING

3P4W



CT phase rotation is RH/LH dependant
refer to Configuration

1P2W P1



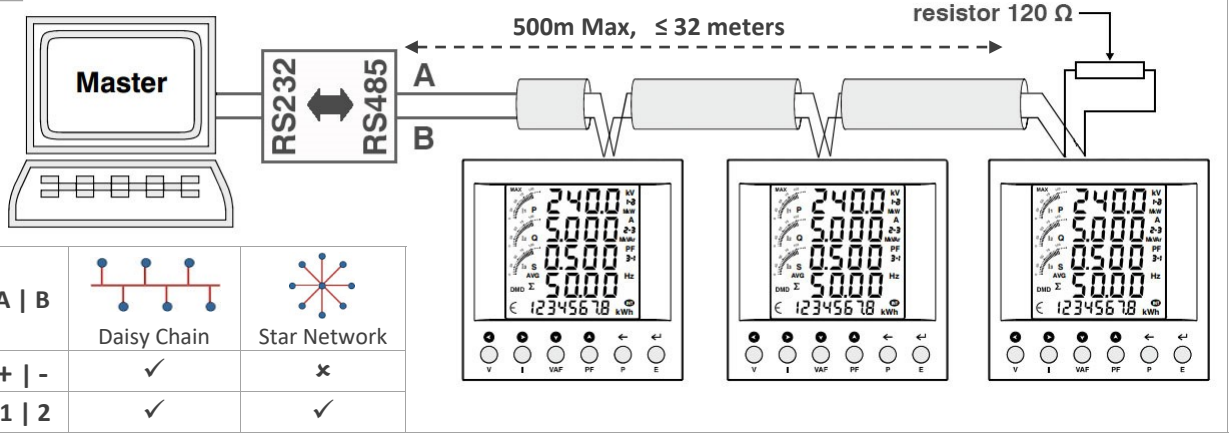
Monitoring L2 or L3 LOAD - use L1 coil of Easywire CT (**RH/LH dependant - refer to Configuration**) and ensure the respective Phase Voltage (V2 or V3) is connected to V1 of the meter

1 RJ45 cable
2 Fuse class CC UL / fast acting
3-Phase 600V/Single Phase 250V
3 Supply 31 additional meters (32 total)
4 For 'Volt-free' PLC or digital input, voltage must be provided by the addition of a DC PSU
5 Single Phase Easywire CT - Set to 1P2W-P1, ensure Voltage Reference to V1 is the same Phase as being measured by CT

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

Modbus / MBus

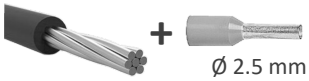
Typical Modbus configuration shown
For MBus interface follow Wiring Topology below



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

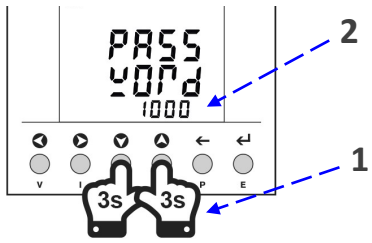
Single Core
0.5 > 4mm²
Ø 2.5mm Max

Stranded
0.5 > 2.5mm²



CONFIGURATION

Step A: Enter Configuration Menu



2 Password = 1000 (Refer to Step 2)

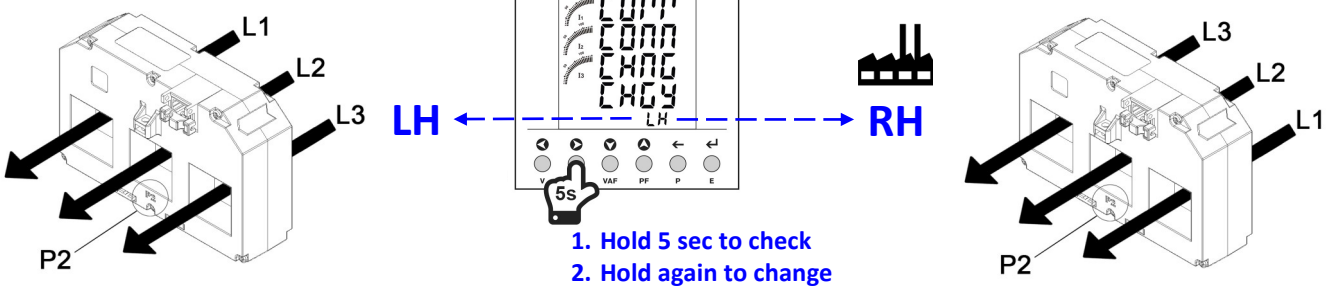
1 Hold 3 Secs to Enter Config (same to Exit)

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

1	◀ ▶	Press either button once to make digit or option flash, press again to move flashing cursor
2	▼ ▲	Press to change digit or option, press ◀ or ▶ to move cursor position as required
3	↵	Press to save and move to next setting option, Exit menu once all settings are configured (see Step 1)

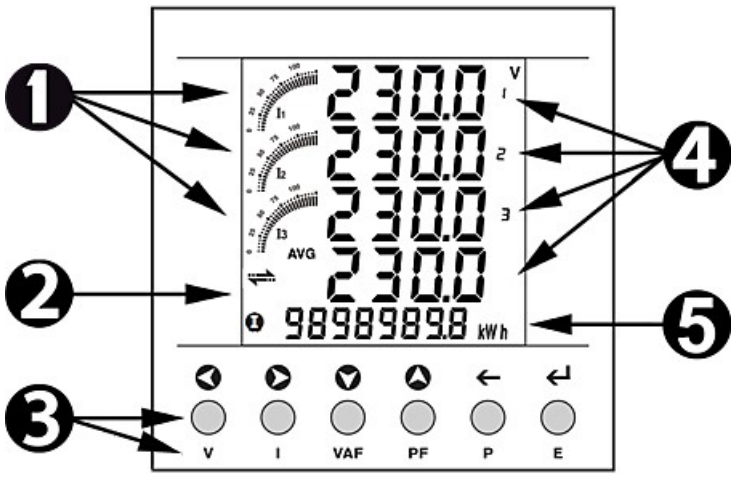
F300-x-C	F300-x-MB	Setting 🔒 = MID CONFIG LOCK (refer to page.1)	Default	Adjustment Range	Network & CT Must configure	VT Adjust if Using VT	Comms Modbus / MBus	Pulse O/P Adjust if used	System Settings Optional
1	1	Change Password	1000	NO / YES (0000 - 9998)					✓
2	2	Phase Network Selection	3P4W	3P4W / 1P2W-P1	🔒				
3	3	CT Secondary	1	330 mV non-adjustable					
4	4	CT Primary (see CT Label)	1	1 > 6000A	🔒				
5	5	PT Secondary	350	173 > 415V		🔒			
6	6	PT Primary	350	100 > 600V		🔒			
7	7	Slave ID *Modbus:* *MBus (Primary ID):*	1 1	1 > 255 1 > 250			✓		
8	8	Baud rate *Modbus:* *MBus:*	9600 2400	300 > 19200 bps 1200 > 9600			✓		
9	9	Parity *Modbus:* *MBus:*	None Even	None / Odd / Even Even			✓		
10	10	Stop Bit *Modbus:* *MBus:*	1 1	1 / 2 1			✓		
11	11	Back Light	0000	0 > 7200 Sec					✓
12	12	Demand interval method	Sliding	Sliding / Fixed					✓
13	13	Demand interval duration	15	1 > 30					✓
14	14	Demand interval length	1	1 > 30 min					✓
15	15	Max Auto Display Pages	21	1 > 21					✓
16	16	Change Page Sequence	1- 21	No / YES (1 > 21)					✓
17	17	Pulse Weight	0.1	00.01 > 99.99 kWh/imp				🔒	
18	18	Pulse Duration	200	50 > 300 mS				✓	
X	19	MBus Secondary ID	Serial #	0000 0000 > 9999 9999			✓		
19	20	Factory Default	No	No / Yes	Does not reset energy & demand values				🔒
20	21	Reset Energy & Demand	No	No / Yes (Password +1)	Once entered, reset each value individually				🔒

easywire CT Phase Rotation - RH or LH, check/change in normal operating mode



1. Hold 5 sec to check
2. Hold again to change

OPERATION



1 Current level bar graph (% of CT current rating)
2 Functions & displayed measurement indicators:

- RS485 communication in progress
- Integration of energy (blinks every 5 sec)
- ∑ Sum of 3-phase
- **AVG** Average of 3-phase
- **DMD** Max/Min Demand
- **TH** Total Harmonic Distortion (THD)
- **IP** Imported Energy (positive value)
- **EP** Exported Energy (negative value)
- **Total** Sum of 3-phase Energy (IP or EP)
- **Net** Sum of IP + EP Energy

3 Function buttons and function symbols
4 Phase & total or average instantaneous measurements (V, A, PF, Hz, kW, kVAr, kVA) >> **V/I/VAF/PF/P buttons**
5 Energy readings (kWh/kVArh/kVAh) >> **E button**

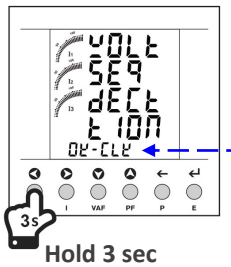
No. of Presses	V	I	VAF	PF	P
x1	Voltage (L-N)	Current	L1: V/A/PF/Hz	Power Factor	Active Power - kW
x2	**Voltage (L-L)**	Current Max DMD	**L2: V/A/PF/Hz**	**Hold 10 sec** displays Serial #	Reactive Power - kVAr
x3	% THD (L-N)	% THD	**L3: V/A/PF/Hz**		Apparent Power - kVA
x4	**% THD (L-L)**		**Avg: V/A/PF/Hz**		L1: kW/kVAr/kVA/PF
x5					**L2: kW/kVAr/kVA/PF**
x6					**L3: kW/kVAr/kVA/PF**
x7					**∑: kW/kVAr/kVA/PF**
x8					Max DMD: kW/kVAr/kVA
x9					Min DMD: kW/kVAr

Parameters in BOLD not displayed for 1P2W configuration

E											
x1 > 9	Active Energy - kWh ⇨	L1 IP	**L2 IP**	**L3 IP**	L1 EP	**L2 EP**	**L3 EP**	∑ IP	∑ EP	Net (IP + EP)
x10 > 18	Reactive Energy - kVArh ⇨	L1 IP	**L2 IP**	**L3 IP**	L1 EP	**L2 EP**	**L3 EP**	∑ IP	∑ EP	Net (IP + EP)
x19 > 22	Apparent Energy - kVAh ⇨	L1	**L2**	**L3**	∑					
x23	Run Hour (0.01 hr = 36 sec)									

Hold 10 sec - change Page Scroll Auto <-> Manual

Voltage Phase Rotation



Hold 3 sec

OK-CLK: L1 → L2 → L3 ✓

ANTI-CK: Incorrect Order
INVAL Id: Missing Phase ✗