EMC3P-P2P1

PRODUCT PROFILE

96mm x 96mm

SPECIFICATIONS

Display	: Liquid crystal display with backlight 4 lines, 4 digits per line to show electrical Parameters 5th line, 8 digits to show energy Bar graph for Current indication as percentage of CT rating
LCD Indications	: ❶ - Integration of energy PRG - Unit is in configuration menu ⇄ - Communication in progress MAX DMD - Maximum & Minimum Demand of Power

Note: ❶ blinks every 5 sec. This indicates energy is being consumed.

Wiring Input	: 3 Ø - 4 wire, 1 Ø - 2 wire - P1
Rated Input Voltage	: 3x230/400V
Installation Category	: III (300V L-N)
Frequency Range	: 47...63Hz (MID approved for 50Hz)
CT Primary	: 1...6,000A (Programmable for any Value)
CT Secondary	: 330mV (x1.2)
PT Primary	: 100V...600V (Programmable for any value)
PT Secondary	: 173...415V AC (L-L) (Programmable for any value)
Display Update Time	: 1 second for all parameters
Display Scrolling	: Automatic / Manual
Temperature	: Operating: -10°C...55°C Storage : -20°C...75°C
Humidity	: 85% non-condensing
Mounting	: Panel mounting
Meter Type	: Indoor
Weight	: 318gms
IP rating	: IP54 Front only (When fitted with rubber gasket)
Pulse Output	: External 5...27VDC max./100mA max. Pulse Duration : Selectable 50...300mS Pulse Resolution: Selectable 0.01...99.99kWh
Communications	: RS485 Modbus RTU

The meter is intended to be installed in Mechanical Environment `M1`,with Shock and Vibrations of low significance, as per 2004/22/EC Directive.
The meter is intended to be installed in Electromagnetic Environment `E2`, as per 2004/22/EC Directive.

ORDER INFORMATION

Product	Outputs	Certification	
EMC3P-P2P1	RS485 (Modbus RTU) & Pulse	CE	MID

SERIAL COMMUNICATION

Interface standard and protocol	RS485 AND MODBUS RTU
Communication address	1...255
Transmission Mode	Half duplex
Data types	Float, Hex and Integer
Transmission distance	500 Metre maximum
Transmission speed	300, 600,1200, 2400, 4800, 9600, 19200 (in bps)
Parity	None, Odd, Even
Stop bits	1 or 2
Response time	100 ms (max and independent of baud rate)

ACCURACY

Voltage V_{L-N}	±0.5% of F.S.	Power factor	±0.01 (Digit)
Voltage V_{L-L}	±0.5% of F.S.	Active energy	EN50470-3: Cl.B
Current	±0.5% of F.S.	Reactive energy	EN62053-23: Cl.2
Frequency For L-N > 20V, For L-L > 35V	±0.1% of F.S.	Apparent energy	Class 1
		MAX/MIN Active Power	1%
Active Power	1%		
Apparent power	1%	MAX/MIN Reactive Power	1%
Reactive Power	1%	MAX Apparent Power	1%

MID APPROVAL INSTALLATION NOTES

For the installation to be valid the following steps must be followed:

1. **The CT ratio must be set before putting the meter into service.**
2. **The RJ45 connection between the meter and the current transformer must be sealed.**

⚠ CONFIGURATION LOCK PARAMETER DESCRIPTION

NOTE:

Once Programming Mode Is entered The parameters below will be locked out after 15 Minutes. No further adjustment is possible without returning to supplier.

Network Selection	**PT secondary**
CT Primary	**Pulse width**
Pulse Duration	**PT Primary**
Factory default	**Energy Reset**

RESOLUTION

PT Ratio x CT Ratio	kWh
<15	0.01K
<150	0.1K

<1500	1K
<15000	0.01M
>15000	0.1M

Example: If CT=100/5A (CT=20) & VT=380:380 (VT=1:1, VT=1), then energy reading resolution=0.1K (20x1=20) and a pulse will be emitted every **100wh**

⚠ SAFETY PRECAUTIONS

Safety related notifications, 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.
⚠ Ensure that the equipment is supplied with correct voltage.
⚠ No repairs, maintenance or adjustments are possible.

⚠ CAUTION

1.Read complete instructions prior to installation or operation of the unit.
2.Risk of electric shock. Only to be installed by competent personnel.
3.The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapours or other unwanted process by-products.

⚠ WIRING GUIDELINES

1.To prevent the risk of electrocution, always isolate the power supply to the equipment prior to undertaking any work. Always confirm absence of supply prior to starting work using appropriate voltage detection equipment.
2. Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct before energizing the equipment.
3. Routing of connecting cables shall be away from any internal EMI source.
4. Cables used for voltage and output connections must have a cross section of 0.5mm^2 to 2.5mm^2. (20 to14AWG ; 75^{0}C (min))
5. Copper cable should be used. (stranded or solid core cable)
6. All wiring to be in accordance with applicable local standards

⚠ CT ROTATION - IMPORTANT NOTE

Please note: Our **THREE PHASE** current transformers as default are configured to monitor Incoming supplies (L1 is on the right-hand side when viewed from the P2 face. If the transformer is to be used for load monitoring (Requiring L1 to be on the Left-hand side when viewed from the P2 face), the operator must perform the **"To change"** procedure described below;

To change:

1. Press and hold "I" for 3 seconds until the display changes, release the key. Press and hold the key again for 3 seconds.
2. Wait 5 seconds for meter to resume online reading. Meter display will show LH when checked using the **"To check"** procedure described below.

To check:

1. Press and hold "I" for 3 seconds until the display changes, release the key.
2. Wait 5 seconds and the meter will resume normal operation.

FRONT PANEL DESCRIPTION

ONLINE PAGE DESCRIPTION

There are 6 dedicated keys labeled as V, I, VAF, PF, P, E. Use these 6 keys to view meter parameters.
If no key is pressed for 60 sec then the meter returns to default page i.e Total import active energy

KEY	ONLINE PAGE DESCRIPTION
Press "V"	**The first screen** : Displays line to neutral Voltage of three phases and average line to neutral voltage. **The second screen** : Displays line to line voltage of three phases and average line to line voltage. **The third screen** : Displays total percentage harmonics of line to neutral voltage of three phases and average line to neutral voltage. **The fourth screen** : Displays total percentage harmonics of line to line voltage of three phases and average line to line voltage. **The fifth screen** : Press for 3 sec, Displays phase sequence indication. (Clockwise, Anticlockwise, Invalid) **Note**s: 1. In 1 Ø 2 wire system only 1st, 3rd and 5th screen will be available.(1st phase parameter will be display). 2. The Energy reading is displayed at the bottom of every on-line page.
Press "I"	**The first screen** : Displays phase current of three phase and neutral current. **The second screen** : Displays phase maximum current demand of three phases and average current. **The third screen** : Displays total percentage harmonic of current of three phases and average phase current. **Notes:** 1. In 1Ø2wire system only 1st phase parameter will be available. 2. The Energy reading is displayed at the bottom of every on-line page.
Press "VAF"	**The first screen :** Displays voltage, current, power factor of first phase and frequency. **The second screen :** Displays voltage, current, power factor of second phase and frequency. **The third screen :** Displays voltage, current, power factor of third phase and frequency. **The fourth screen :** Displays average value of voltage, current and power factor of three phases and frequency. **Notes:** 1. In 1 Ø 2 wire system only 1st screen will be available. 2. The Energy reading is displayed at the bottom of every on-line page.
Press "PF"	**The first screen :** Displays power factor of three phases and average power factor. **Notes:** 1. In 1 Ø 2 wire system only 1st phase power factor will be available. 2. The Energy reading is displayed at the bottom of every on-line page.
Press "P"	**The first screen :** Displays active power of three phases and total active power. **The second screen :** Displays reactive power of three phases and total reactive power. **The third screen :** Displays apparent power of three phases and total apparent power. **The fourth screen :** Displays active, reactive, apparent power and power factor of first phase. **The fifth screen :** Displays active, reactive, apparent power and power factor of second phase. **The sixth screen :** Displays active, reactive, apparent power and power factor of third phase. **The seventh screen :** Displays total active, reactive, apparent power and average power factor of three phases. **The eighth screen :** Displays maximum active power demand, reactive power demand and apparent power demand. **The ninth screen :** Displays minimum active power demand and reactive power demand. **Notes:** 1. In 1Ø2wire system only 1st, 2nd, 3rd, 4th, 8th & 9th screen will be available (1st phase parameters will be display). 2. The Energy reading is displayed at the bottom of every on-line page.

KEY	ONLINE PAGE DESCRIPTION
Press "E"	**The first Screen :** Displays import active energy of first phase. **The second screen :** Displays import active energy of second phase. **The third screen :** Displays import active energy of third phase. **The fourth screen :** Displays export active energy of first phase. **The fifth screen :** Displays export active energy of second phase. **The sixth screen :** Displays export active energy of third phase. **The seventh screen :** Displays total import active energy of three phases. **The eighth screen :** Displays total export active energy of three phases. **The ninth screen :** Displays total net active energy of three phases. **The tenth Screen :** Displays import reactive energy of first phase. **The eleventh screen :** Displays import reactive energy of second phase. **The twelveth screen :** Displays import reactive energy of third phase. **The thirteen screen :** Displays export reactive energy of first phase. **The fourteen screen :** Displays export reactive energy of second phase. **The fifteen screen :** Displays export reactive energy of third phase. **The sixteen screen :** Displays total import reactive energy of three phases. **The seventeen screen :** Displays total export reactive energy of three phases. **The eighteen screen :** Displays total net reactive energy of three phases. **The nineteen screen :** Displays apparent energy of first phase. **The twenty screen :** Displays apparent energy of second phase. **The twenty first screen :** Displays apparent energy of third phase. **The twenty second screen :** Displays total net apparent energy of three phases. **The twenty third screen :** Displays run hour. (Increment by 0.01hr after every 36 sec.) **NOTES:** 1. For 1 phase 2 wire only 1st, 4th, 7th, 8th, 9th, 10th, 13th, 16th, 17th,18th, 19th, 22st & 23rd screen will be available. will be display 2. The Energy reading is displayed at the bottom of every on-line page.

DEVICE IDENTIFICATION

Press PF key for 10 sec, displays CRC in first two row, HW & SW version no. in 3rd and 4th raw & serial no in last row.

AUTOMATIC / MANUAL PAGE SCROLLING

Press E (↵) button for 3 seconds to toggle between Automatic and Manual mode.
Note : By default unit operates in automatic mode.
In automatic mode online pages scroll automatically at the rate of 5 seconds per page. All the time, total import active energy will be displays & at any other page of energy if no key is pressed for 1 min.
In automatic mode when any key is pressed, unit temporarily switches to manual mode and the appropriate page is displayed, also if no key is pressed for 5 sec, unit resumes automatic mode.

DECLARATION OF CONFORMITY

We, Eaton Electric GmbH., declare under our sole responsibility as the manufacturer that the EMC3P-P2P1 meter described within this manual corresponds to the production model described in the EC-type examination certificate and to the requirements of the 2014/22/EC Directive EC type examination certificate number TCM 221/18-5535. The identification number of the notified body is 1383.

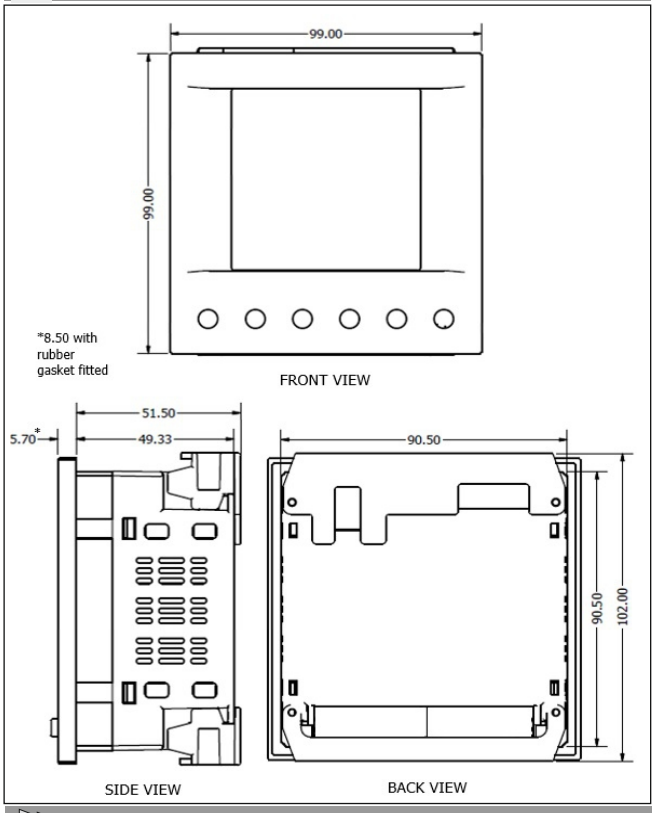
PROGRAMMING MENU

There are 6 dedicated keys with symbols marked as ◀, ▶, ▼, ▲, ←, ↵ use these 6 keys to enter into the configuration menu and to change values.
NOTE : The settings should only be modified by a competent person after having read this users manual fully and having understood the application.
(Please refer to configuration lock note on Page 1 before entering into configuration mode)
Key functions:
Press ▲ + ▼ keys for 3 sec to enter or exit from the configuration menu.
Use ◀ or ▶ keys to move curser left or right by one digit each time.
Use ▲ or ▼ keys for increasing or decreasing parameters value.
Use ← key to go back to previous page.
Use ↵ key to save the setting and move on to next page.

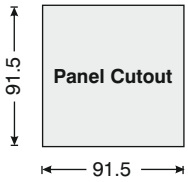
Config. page.	Function	Range or Selection	Factory Setting
	Password	0000 to 9998	1000
1	Change Password	No / Yes	No
1.1	New Password	0000 to 9998	0000
2	Network Selection	3P4W, 1P2W-P1	3P4W
3	CT Secondary	330mV	330mV
4	CT Primary	1A to 6,000A	1
5	PT Secondary	173V to 415V	350
6	PT primary	100V to 600V	350
7	Slave Id	1 to 255	1
8	Baud Rate	300, 600, 1200, 2400, 4800, 9600 and 19200	9600
9	Parity	None, Even, Odd	None
10	Stop Bit	1 or 2	1
11	Back Light	0 to 7200 sec.	0000
12	Demand interval method	Sliding / Fixed	Sliding
13	Demand interval duration	1 to 30	15
14	Demand interval length	1 to 30 min	1
15	Max Page Auto	1 to 21	21
16	Change Page Sequence	No / Yes	No
16.01	Page sequence 1	Page 1 to 21	1
16.02	Page sequence 2	Page 1 to 21	2
16.03	Page sequence 3	Page 1 to 21	3
16.04	Page sequence 4	Page 1 to 21	4
16.05	Page sequence 5	Page 1 to 21	5
16.06	Page sequence 6	Page 1 to 21	6
16.07	Page sequence 7	Page 1 to 21	7
16.08	Page sequence 8	Page 1 to 21	8
16.09	Page sequence 9	Page 1 to 21	9
16.10	Page sequence 10	Page 1 to 21	10
16.11	Page sequence 11	Page 1 to 21	11
16.12	Page sequence 12	Page 1 to 21	12
16.13	Page sequence 13	Page 1 to 21	13
16.14	Page sequence 14	Page 1 to 21	14
16.15	Page sequence 15	Page 1 to 21	15
16.16	Page sequence 16	Page 1 to 21	16
16.17	Page sequence 17	Page 1 to 21	17
16.18	Page sequence 18	Page 1 to 21	18
16.19	Page sequence 19	Page 1 to 21	19
16.20	Page sequence 20	Page 1 to 21	20
16.21	Page sequence 21	Page 1 to 21	21
17	Pulse Resolution	00.01 to 99.99	0.10
18	Pulse duration	50 to 300	200
19	Factory Default	No / Yes	No
20	Reset Energy and Max Demand	No / Yes	No
•20.1	Password	0001 To 9999	0000
20.01	Reset Active Energy	No / Yes	No
20.02	Reset Reactive Energy	No / Yes	No
20.03	Reset Apparent Energy	No / Yes	No
20.04	Reset Max Power	No / Yes	No
20.05	Reset Run Hour	No / Yes	No

• For resetting energy parameters user will be prompted for password. If correct password is entered, the user will be able to reset parameters. This password will be greater than the configuration password by 1.

MECHANICAL INSTALLATION / DIMENSIONS (in mm)

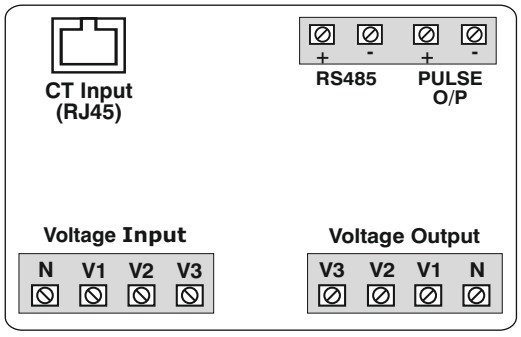


MECHANICAL INSTALLATION



Installation:
1. Prepare the panel cutout with dimensions as shown above. Ensure any burrs are removed.
2.Push the meter into the panel cutout. Secure the meter using the provided ratchet fixings.

TERMINAL CONNECTIONS



INSTALLATION NOTES

CT INPUT - Only Eaton Industries EMC3P-Pxxx-xxx Current transformers may be used with this meter.

VOLTAGE INPUT - This meter is self-supplied from all three phases L-N. The Neutral conductor must be present.

VOLTAGE OUTPUT - This output is used to 'Daisy chain' additional meters so they can be supplied from one supply. Maximum 32 meters total.

MODBUS REGISTER ADDRESSES LIST

Readable / writable parameters : [Data Structure : Integer]

Address	Hex Address	Parameter	Range		Length (Register)
40000	0x00	Password	Min value : 0	Max value : 9998	1
40007	0x07	Slave id	Value : 1	Meaning : 255	1
40008	0x08	Baud rate	Value : 0x0000	Meaning : 300	1
			Value : 0x0001	Meaning : 600	
			Value : 0x0002	Meaning : 1200	
			Value : 0x0003	Meaning : 2400	
			Value : 0x0004	Meaning : 4800	
			Value : 0x0005	Meaning : 9600	
			Value : 0x0006	Meaning : 19200	
40009	0x09	Parity	Value : 0x0000	Meaning : None	1
			Value : 0x0001	Meaning : Odd	
			Value : 0x0002	Meaning : Even	
40010	0x0A	Stop bit	Value : 0x0000	Meaning : 1	1
			Value : 0x0001	Meaning : 2	1
40011	0x0B	Backlight OFF	Min value : 0	Max Value : 7200	1
40016	0x10	Auto Mode Pages	Min Value : 1	Max Value : 21	
40017	0x11	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40018	0x12	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40019	0x13	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40020	0x14	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40021	0x15	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40022	0x16	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40023	0x17	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40024	0x18	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40025	0x19	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40026	0x1A	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40027	0x1B	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40028	0x1C	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40029	0x1D	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40030	0x1E	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40031	0x1F	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40032	0x20	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40033	0x21	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40054	0x36	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40055	0x37	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40059	0x3B	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40060	0x3C	Page Address Sequence	Page No : 1-21	Meaning : 1-First Page ; 21-Last Page	1
40034	0x22	Demand Interval Method	Value : 0x0000	Meaning : Sliding	1
			Value : 0x0001	Meaning : Fixed	
40035	0x23	Demand Interval Duration	MIN Value : 1	MAX Value : 30	1
40036	0x24	Demand Interval Length	MIN Value : 1	MAX Value : 30	1
40043	0x2B	Reset Max	Value : 1	Meaning : Reset all Max power & Max Current	1
40045	0x2D	Reset Run Hour	Value : 1	Meaning : Reset Run hour	1

MODBUS REGISTER ADDRESSES LIST

Readable Parameters : [Length (Register) : 2 ; Data Structure : Float]

Formula to find address of individual Harmonic

Constant Parameter	Meaning	Constant Parameter	Meaning
0	Voltage V1N	5	Voltage V31
1	Voltage V2N	6	Current I1
2	Voltage V3N	7	Current I2
3	Voltage V12	8	Current I3
4	Voltage V23	—	—

{143 + [(Harmonic no-2) x 2] + 60 x Constant Parameter}

For Example, To find the 14th Harmonic address of Voltage V31 following formula can be used :

Formula with the parameter :
{143 + [(Harmonic no-2) x 2] + 60 x C P}
Eg. {143 + [(14-2) x 2] + 60 x 5} = 467

So, Check the 14th Harmonic of Voltage V31 at 467 address.

MODBUS REGISTER ADDRESSES LIST

Readable Parameters : [Length (Register) : 2 ; Data Structure : Float]

Address	Hex Address	Parameter
30000	0x00	Voltage V1N
30002	0x02	Voltage V2N
30004	0x04	Voltage V3N
30006	0x06	Average Voltage LN
30008	0x08	Voltage V12
30010	0x0A	Voltage V23
30012	0x0C	Voltage V31
30014	0x0E	Average Voltage LL
30016	0x10	Current I1
30018	0x12	Current I2
30020	0x14	Current I3
30022	0x16	Average Current
30024	0x18	kW1
30026	0x1A	kW2
30028	0x1C	kW3
30030	0x1E	kVA1
30032	0x20	kVA2
30034	0x22	kVA3
30036	0x24	kVAr1
30038	0x26	kVAr2
30040	0x28	kVAr3
30042	0x2A	Total KW
30044	0x2C	Total KVA
30046	0x2E	Total KVAr
30048	0x30	PF1
30050	0x32	PF2
30052	0x34	PF3
30054	0x36	Average PF

Address	Hex Address	Parameter
30056	0x38	Frequency
30058	0x3A	Total net kWh
30060	0x3C	Total net kVAh
30062	0x3E	Total net kVArh
30064	0x40	kW Max Active Power
30066	0x42	kW Min Active Power
30068	0x44	kVAr Max Reactive Power
30070	0x46	kVAr Min Reactive Power
30072	0x48	kVA Max Apparent Power
30074	0x4A	MAX I1 Demand
30076	0x4C	MAX I2 Demand
30078	0x4E	MAX I3 Demand
30080	0x50	MAX Avg Demand
30082	0x52	Run hour
30084	0x54	kWh1 (Imp)
30086	0x56	kWh2 (Imp)
30088	0x58	kWh3 (Imp)
30090	0x5A	kWh1 (Exp)
30092	0x5C	kWh2 (Exp)
30094	0x5E	kWh3 (Exp)
30096	0x60	Total kWh (Imp)
30098	0x62	Total kWh (Exp)
30100	0x64	kVArh1 (Imp)
30102	0x66	kVArh2 (Imp)
30104	0x68	kVArh3 (Imp)
30106	0x6A	kVArh1 (Exp)
30108	0x6C	kVArh2 (Exp)
30110	0x6E	kVArh3 (Exp)

Address	Hex Address	Parameter
30112	0x70	Total kVArh (Imp)
30114	0x72	Total kVArh (Exp)
30116	0x74	kVAh1
30118	0x76	kVAh2
30120	0x78	kVAh3
30122	0x7A	Neutral Current
30124	0x7C	THD of 1st Phase Voltage
30126	0x7E	THD of 2nd Phase Voltage
30128	0x80	THD of 3rd Phase Voltage
30130	0x82	THD of Voltage V12
30132	0x84	THD of Voltage V23
30134	0x88	THD of Voltage V31
30136	0x8A	THD of Current I1
30138	0x8C	THD of Current I2
30140	0x8E	THD of Current I3
30684	0x2AC	Serial no. (Data Structure : Hex)
30700	0x2BC	Phase Sequence Indication (Data structure: Integer) 0 - Clockwise 1 - Anticlockwise 2 - Invalid
30702	0x2BE	Existing KW MAX Active Power
30704	0x2C0	Existing KW MIN Active Power
30706	0x2C2	Existing KVAr MAX Reactive Power
30708	0x2C4	Existing KVAr MIN Reactive Power
30710	0x2C6	Existing KVA MAX Apparent Power
30712	0x2C8	Existing MAX I1 Demand
30714	0x2CA	Existing MAX I2 Demand
30716	0x2CC	Existing MAX I3 Demand
30718	0x2CE	Existing MAX Avg. I Demand

NOTE : LSB will be displayed on lower address and MSB will be displayed on higher address.

Readable parameters : [Data Structure : Hex]

Address	Hex Address	Parameter	Length
31000	0x3E8	Voltage V1N	2
31002	0x3EA	VoltageV2N	2
31004	0x3EC	Voltage V3N	2
31006	0x3EE	Average Voltage LN	2
31008	0x3F0	Voltage V12	2
31010	0x3F2	Voltage V23	2
31012	0x3F4	Voltage V31	2
31014	0x3F6	Average VoltageLL	2
31016	0x3F8	Current I1	2
31018	0x3FA	Current I2	2
31020	0x3FC	Current I3	2
31022	0x3FE	Average current	2
31024	0x400	Kw1	2
31026	0x402	Kw2	2
31028	0x404	Kw3	2
31030	0x406	Kva1	2
31032	0x408	Kva2	2
31034	0x40A	Kva3	2
31036	0x40C	Kvar1	2
31038	0x40E	Kvar2	2
31040	0x410	Kvar3	2

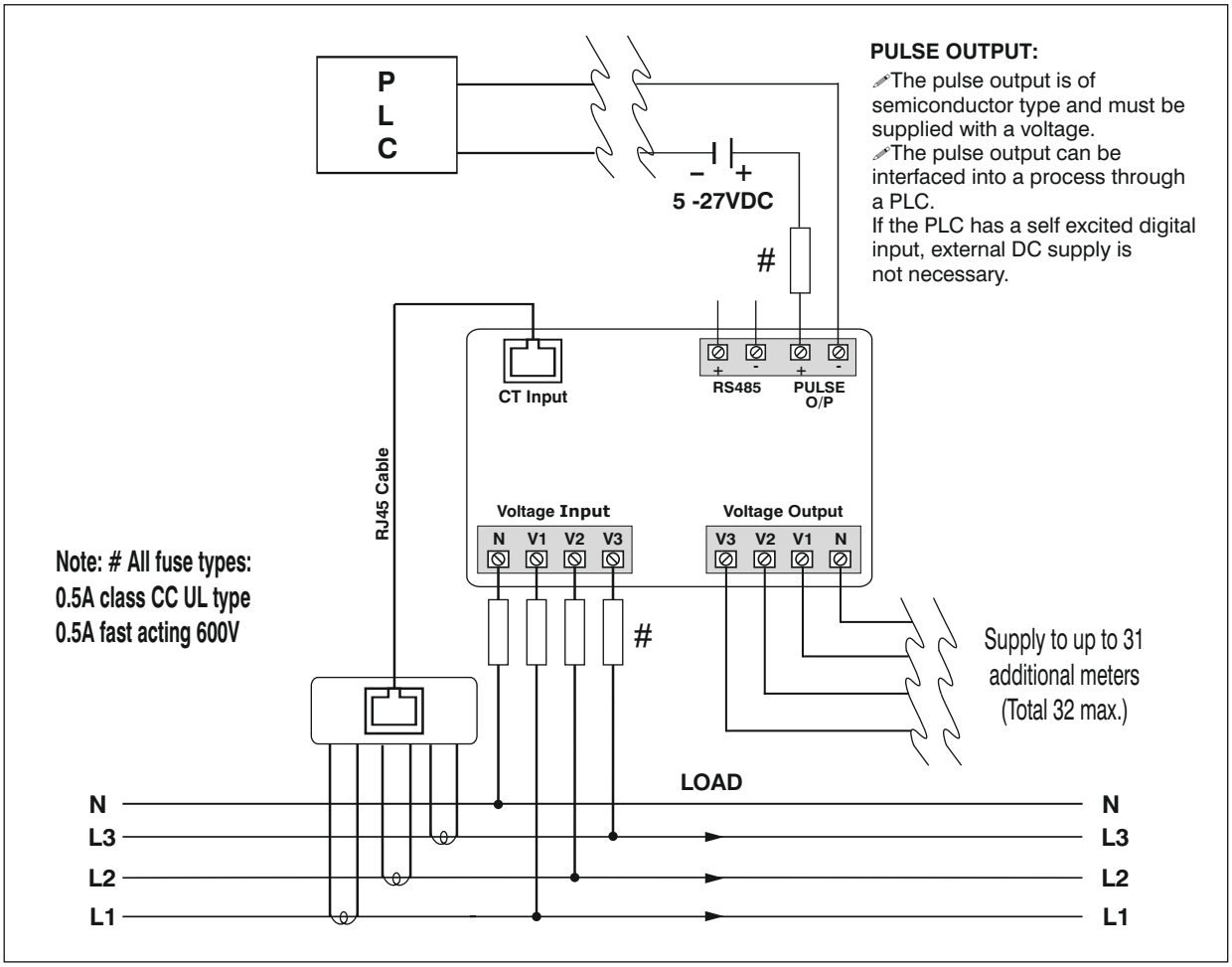
Address	Hex Address	Parameter	Length
31042	0x412	Total Kw	2
31044	0x414	Total Kva	2
31046	0x416	Total Kvar	2
31048	0x418	Neutral Current	2
31050	0x41A	PF1	1
31051	0x41B	PF2	1
31052	0x41C	PF3	1
31053	0x41D	Avg PF	1
31054	0x41E	Total net Kwh	3
31057	0x421	Total net Kvah	3
31060	0x424	Total net Kvarh	3
31063	0x427	Frequency	1
31064	0x428	Kw max Active Power	2
31066	0x42A	Kw Min Active Power	2
31068	0x42C	Kvar Max Reactive Power	2
31070	0x42E	Kvar Min Reactive Power	2
31072	0x430	Kva Max Apparent Power	2
31074	0x432	Max I1 Demand	2
31076	0x434	Max I2 Demand	2
31078	0x436	Max I3 Demand	2
31080	0x438	Max Avg Demand	2

Address	Hex Address	Parameter	Length
31082	0x43A	Run Hour	2
31084	0x43C	Kwh1(imp)	3
31087	0x43F	Kwh2(imp)	3
31090	0x442	Kwh3(imp)	3
31093	0x445	Kwh1(Exp)	3
31096	0x448	Kwh2(Exp)	3
31099	0x44B	Kwh3(Exp)	3
31102	0x44E	Total Kwh (Imp)	3
31105	0x451	Total Kwh (Exp)	3
31108	0x454	Kvarh1(Imp)	3
31111	0x457	Kvarh2(Imp)	3
31114	0x45A	Kvarh3(Imp)	3
31117	0x45D	Kvarh1(Exp)	3
31120	0x460	Kvarh2(Exp)	3
31123	0x463	Kvarh3(Exp)	3
31126	0x466	Total Kvarh(Imp)	3
31129	0x469	Total Kvarh(Exp)	3
31132	0x46C	Kvah1	3
31135	0x46F	Kvah2	3
31138	0x472	Kvah3	3
—	—	—	—

Note - Voltage and current will display in mV and mA. Power will display in W(Active), VAr (Reactive) & VA(Apparent). Energy will display in Wh(Active) VArh(Reactive) & VAh(Apparent)

Energy rollover counter addresses : Energy rollover counter will increment when energy is roll over from 99999999 to 0. [Data Structure : Integer]

31200	4B0	IMP Kwh1 RC*	1	31208	4B8	Total Net Kwh RC*	1	31216	4C0	EXP Kvarh1 RC*	1
31201	4B1	IMP Kwh2 RC*	1	31209	4B9	Kvah1 RC*	1	31217	4C1	EXP Kvarh2 RC*	1
31202	4B2	IMP Kwh3 RC*	1	31210	4BA	Kvah2 RC*	1	31218	4C2	EXP Kvarh3 RC*	1
31203	4B3	EXP Kwh1 RC*	1	31211	4BB	Kvah3 RC*	1	31219	4C3	Total IMP Kvarh RC*	1
31204	4B4	EXP Kwh2 RC*	1	31212	4BC	Total Net Kvah RC*	1	31220	4C4	Total EXP Kvarh RC*	1
31205	4B5	EXP Kwh3 RC*	1	31213	4BD	IMP Kvarh1 RC*	1	31221	4C5	Total Net Kvarh RC*	1
31206	4B6	Toatl IMP Kwh RC*	1	31214	4BE	IMP Kvarh2 RC*	1	NOTE : RC* : Rollover counter			
31207	4B7	Total EXP Kwh RC*	1	31215	4BF	IMP Kvarh3 RC*	1	—	—	—	—

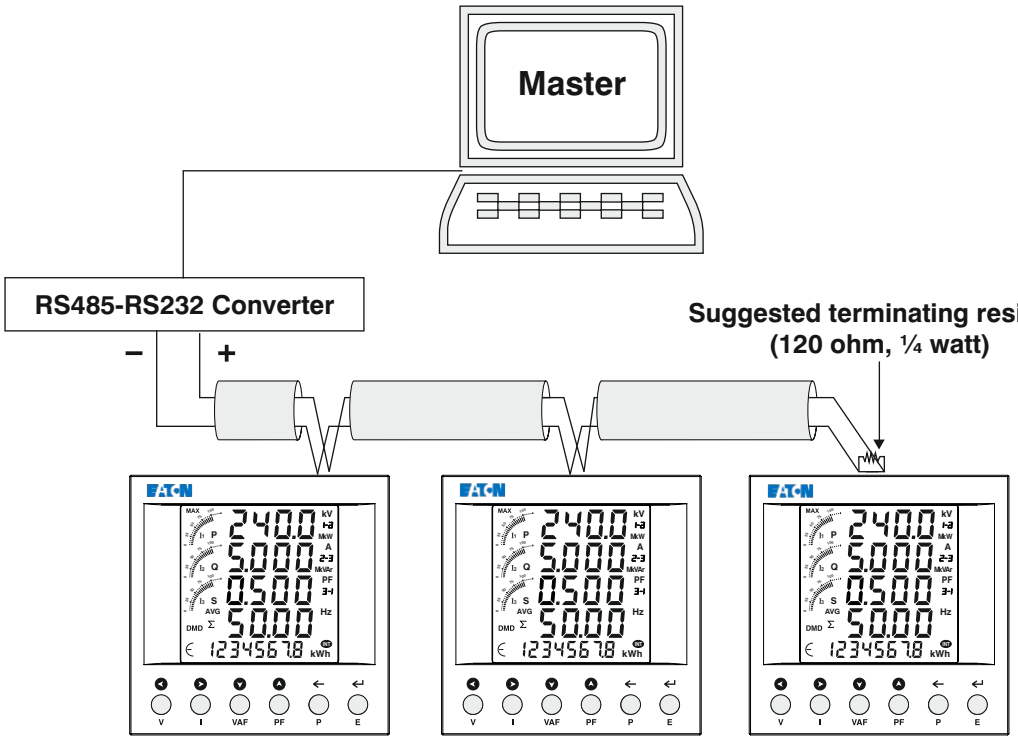


PULSE OUTPUT:

- The pulse output is of semiconductor type and must be supplied with a voltage.
- The pulse output can be interfaced into a process through a PLC.

If the PLC has a self excited digital input, external DC supply is not necessary.

CONNECTION DIAGRAM FOR RS485



(Specifications are subject to change, since development is a continuous process.)

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