

MULTIFUNCTION METER



SPECIFICATION:

DISPLAY

3 Row of 4 Digits
7 Segment LED Display
Digit Integrated with parameter Units

WIRING INPUT

3 Ø - 4 wire,
1 Ø - 2 wire

AUXILIARY SUPPLY

90V-300VAC/DC

ACCURACY

Active Energy	Class 0.2S as per IEC 62053-22
Apparent Energy	Class 1
Reactive Energy	Class 2 as per IEC 62053- 23
Active Power	±0.2% of nominal value
Reactive Power	±1.0% of nominal value
Apparent Power	±0.2% of nominal value
Voltage	±0.2% of nominal value
Current	±0.2% of nominal value
Frequency	±0.2% of nominal value
THD (Voltage / Current)	±3.0%
Power Factor/Phase Angle	±3.0°

RATED INPUT VOLTAGE

11 to 300VAC (L-N); 19 to 519 VAC (L-L)
Installation Category III (600V)

FREQUENCY RANGE

50-60Hz

RATED INPUT CURRENT

Nominal 5A AC (Min-20mA, Max-6A)

BURDEN

0.5VA @ 5A per phase

CT PRIMARY

1A/ 5A to 99,000A (Programmable for any value)

Note: 1A to 99,000A if CT secondary is 1 else 5A to 99,000A

CT SECONDARY

1A to 6A (programmable)

PT PRIMARY

100V to 500Kv (Programmable for any value)

PTSECONDARY

100 to 500V (Programmable for any value)

FEATURES:

- True RMS measurements
- Simultaneous sampling of voltage and current.
- STAR and 1PHASE Programmable wiring connections.
- Universal Auxiliary supply 90 - 300V AC/DC.
- Auto Scaling of Decimal point and Auto scrolling.
- Programmable CT & PT Ratio.
- User programmable password protection.
- Energy Import and Export available.
- Individual Phase energy through communication.
- Demand measurement for watts, VA & Var.
- Individual phase angle measurement.
- THD+N measurement.

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PROGRAMMING MODE:

Programming Keys:-



Programming Procedure:-

Press SET to enter setup mode.

Press ▲ to move to the next digit.

Enter Password blinking of digit indicates Edit is possible.

Press ▼ to decrement value from 9 to 1.

Press ▲ to move to the next digit till 4th digit.

Press SET to enter Programming mode.

Press ▼ key to view and press ▲ key to edit.

Press ▼ to decrement values or select from available options.

Press ▲ to move to the next digit.

Press SET to save and move to next Setting.

MAIN SETTING: - (5000)

Programming Parameter	Default	Option/Range
ELEMENT Defines the power system configuration	STAR ELEN	STAR or SINGLE PHASE
PT Primary	4 150 PPr 1	100V-999kV to set 11kV Set first four digits (1100) as explained above. Press key to Up / Down place decimal point at appropriate location. LED K will indicate Kilo
PT Secondary	4 150 PSEC	50V - 550V
CT Primary	5000 CPPr 1	0.5A - 99KA
CT Secondary	1000 CSEC	0.5A - 6A
Baud rate	9600 bAUD	2400 / 9600 4800 / 19.20k/38.40k
Parity	NONE Prty	no(none)
Device Id	1000 dU Id	1.000 247.0
Password	5000 PASS	1000 - 9999

Demand Period	1000 dPrd	1 - 30 (Only for 6400)
No of Poles	4000 PoLS	2 - 28 poles
Starting Current	3000 ASUP	0.02% to 10.00% of FS
Starting Voltage	1000 VSUP	10V - 40V

CLEAR MEASUREMENTS: - (2111)

Programming Parameter	Default	Option/Range
Clear Integrator	NO CLER	Option: (YES)for clearing / (NO) for not clearing

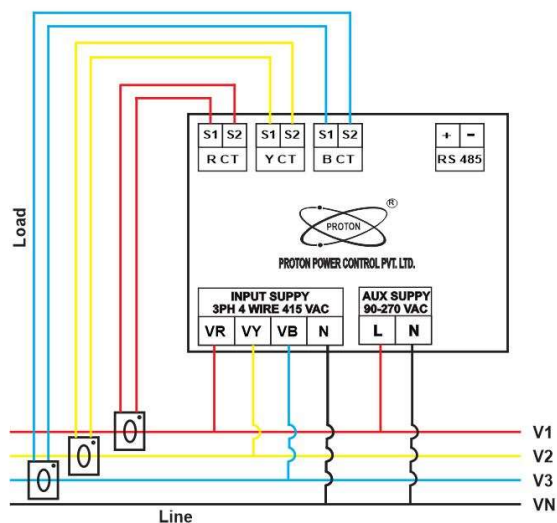
TROUBLE SHOOTING:

- Meter display does not turn ON.
 - Check that there is power supply applied on AUX supply terminals.
 - Check fuse connection (Use fuse connection of specified ratings).
- Data displayed / reading incorrect.
 - Check that CT/PT ratios are properly set.
 - Check if proper configuration mode Star \1Phase is correctly set.
- PT readings are incorrect / Active Power reading is negative.
 - CT connections may be reversed, check and correct CT connection.
 - Check Voltage and current phases are connected in proper sequence.
- RS485 communication does not work.
 - Check baud rate & parity maintained in the connected computers is same as meter.
 - Memory mapping in software is correct.
 - Check device ID of meter unique & properly maintained.
 - Check converter is working properly.

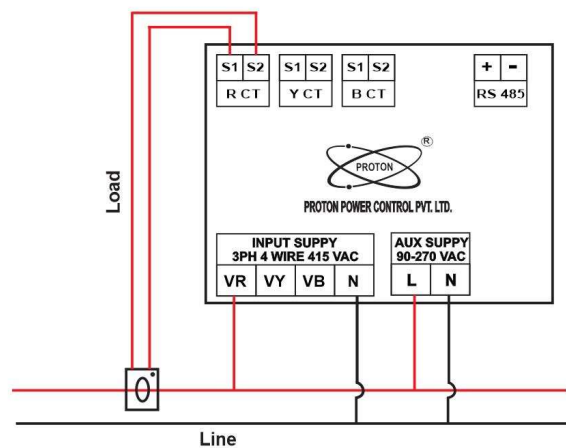
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WIRING DIAGRAM:

1) Star Connection (3E) 3 Phase 4 Wire system



2) Single phase Connection



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MECHANICAL SPECIFICATION:

Dimension Bezel: 96 x 96 mm (Depth 72 mm)
 Panel Cutout: 90⁺¹ x 90⁺¹ mm

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COMMUNICATION INTERFACES

RS485 connection

RS-485 communications allows multiple devices to be connected on the same bus. Up to 32 devices can be connected on a single RS-485 bus, which consists of a shielded twisted pair cable. The overall length of the RS-485 cable connecting all devices cannot exceed 1000m. If the length is more than 1000m, RS 485 repeater is required.

Termination resistors

Termination resistors are often used to reduce reflections on the network. This problem occurs most with long wires and high baud rates. Due to variations in wire and equipment, whether or not to use these terminators is usually determined by system testing. The general rule is to add them only if needed. The resistors are typically 120 ohms, and installed across the Transmit and Receive wire pairs. Normally, one resistor is installed at each end of each pair of wires.

Shielding and wiring considerations

The signal ground conductor is often overlooked when ordering cable. An extra twisted pair must be specified to have enough conductors to run a signal ground. A two-wire system then requires two twisted pairs. It is often hard to quantify if shielded cable is required in an application or not. Since the added cost of shielded cable is usually minimal it is worth installing the first time.

Cable requirements

The type of wire to use will vary with required length. Wire with twisted pairs and an overall shield is used most often. The shield is tied to earth ground or chassis, and typically at one end only (generally at the Mod-bus Master side). The shield is not to be used as a signal common or ground.

RS485 interface settings

1. Baud rate: 9600 (default), programmable to 2400, 4800, 9600 and 19200bps
2. Parity: NONE (default).
3. Device ID: 1 (default), 1 to 247
4. Read Multiple Registers: (Function Code 0x03)
5. Word Length: 8
6. Stop Bits: 1

Mod-bus Registers

Mod-bus protocol uses a master-slave technique, in which only one instrument (the master) can initiate transactions. The other instruments (the slaves) respond by supplying the requested data to the master, or by taking the action requested in the query. All the Mod-bus registers are communicated through MODBUS RTU protocol. No scaling or multiplication factor is required for the data communicated. All the registers can be communicated in blocks or individual.

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COMMUNICATION REGISTER MAP

SL.N	PARAMETER	DATATYPE	ADDRESS
1	Watts Total	float	40001
2	Watts R phase	float	40003
3	Watts Y phase	float	40005
4	Watts B phase	float	40007
5	Var Total	float	40009
6	Var R phase	float	40011
7	Var Y phase	float	40013
8	Var B phase	float	40015
9	PF Ave. (Instantaneous)	float	40017
10	PF R phase	float	40019
11	PF Y phase	float	40021
12	PF B phase	float	40023
13	VA total	float	40025
14	VAR phase	float	40027
15	VAY phase	float	40029
16	VAB phase	float	40031
17	VLL average	float	40033
18	Vry phase	float	40035
19	Vyb phase	float	40037
20	Vbr phase	float	40039
21	VLN average	float	40041
22	VR phase	float	40043
23	VY phase	float	40045
24	VB phase	float	40047
25	Avg Current	float	40049
26	Current R phase	float	40051
27	Current Y phase	float	40053
28	Current B phase	float	40055
29	Frequency	float	40057
30	Wh received	float	40059

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31	Vah received	float	40061
32	VARh Ind. Received	float	40063
33	VARh Cap. received	float	40065
34	Wh Delivered	float	40067
35	VAh Delivered	float	40069
36	VARh Ind. Delivered	float	40071
37	VARh Cap. Delivered	float	40073
38	Voltage R Harmonics	float	40075
39	Voltage Y Harmonics	float	40077
40	Voltage B Harmonics	float	40079
41	Current R Harmonics	float	40081
42	Current Y Harmonics	float	40083
43	Current B Harmonics	float	40085
44	kW demand	float	40087
45	kVA demand	float	40089
46	kVAR demand	float	40091
47	kW Maximum demand	float	40093
48	kVA maximum demand	float	40095
49	kVAR maximum demand	float	40097
50	RPM	float	40099
51	Load Hours Received	Long Inverse	40101
52	Load Hours Delivered	Long Inverse	40103
53	Reserved	float	40105
54	On_hours	Long Inverse	40107
55	kWh received–R Phase	float	40109
56	kWh received–Y Phase	float	40111
57	kWh received–B Phase	float	40113
58	kVAh received–R Phase	float	40115
59	kVAh received–Y phase	float	40117
60	kVAh received–B phase	float	40119
61	kVArh inductive received–R	float	40121
62	kVArh inductive received –Y	float	40123
63	kVArh inductive received–B	float	40125
62	kVArh capacitive received–R	float	40127

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65	kVAh capacitive received–Y	float	40129
66	kVAh capacitive received–B	float	40131
67	kWh Delivered–R Phase	float	40133
68	kWh Delivered–Y Phase	float	40135
69	kWh Delivered–B Phase	float	40137
70	kVAh Delivered–R phases	float	40139
71	kVAh Delivered–Y phases	float	40141
72	kVAh Delivered–B phases	float	40143
73	kVAh inductive Delivered–R	float	40145
74	kVAh inductive Delivered–Y	float	40147
75	kVAh inductive Delivered–B	float	40149
76	kVAh capacitive Delivered–R	float	40151
77	kVAh capacitive Delivered–Y	float	40153
78	kVAh capacitive Delivered–B	float	40155
79	Loadhours received–R phases	Long Inverse	40157
80	Loadhours received–Y phases	Long Inverse	40159
81	Loadhours received–B phases	Long Inverse	40161
82	Loadhours Delivered–R phases	Long Inverse	40163
83	Loadhours Delivered–Y phases	Long Inverse	40165
84	Loadhours Delivered–B phases	Long Inverse	40167
85	Voltage VR_Unbalance	float	40169
86	Voltage VY_Unbalance	float	40171
87	Voltage VB_Unbalance	float	40173
88	Current AR_Unbalance	float	40175
89	Current AY_Unbalance	float	40177
90	Current AB_Unbalance	float	40179
91	Voltage R phase angle	float	40181
92	Voltage Y phase angle	float	40183
93	Voltage B phase angle	float	40185
94	Current R phase angle	float	40187
95	Current Y phase angle	float	40189
96	Current B phase angle	float	40191
97	CO2	float	40193