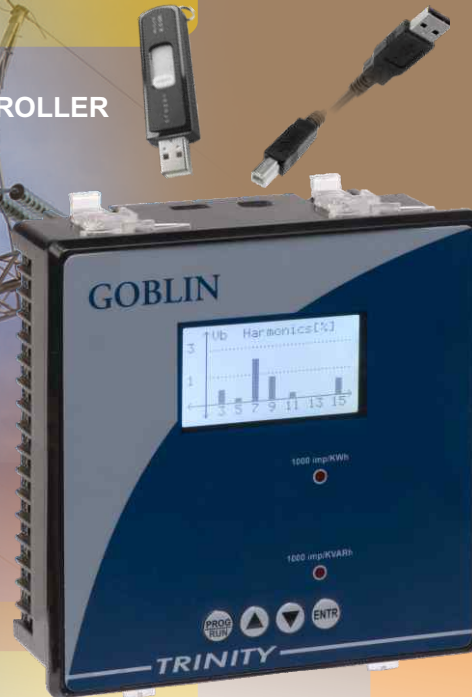


GOBLIN

ELECTRICAL LOAD MANAGER / DEMAND CONTROLLER



Accuracy Class 0.5 (as per IS14697)

Displays more than 20 Parameters

Four Relay contacts, individually field programmable for alarm parameter

RS485 MODBUS-RTU Connectivity

128 X 6 4 Graphical LC Display

USB port for downloading data (Device Mode)

Directly accepts pen-drive to transfer logged data (Host mode)

On board 2 MB of non-volatile memory. Data logging with field programmable log duration

CT / PT ratios field programmable

Odd Harmonic Analysis up to 15th for all voltages and currents, including THD

The digital power meter GOBLIN is a micro-controller based unit which not only measures a host of electrical parameters to display them on a 128 x 64 backlit LCD, but also acts as a comprehensive load managing device due to its four numbers of output relay contacts. These outputs are individually field programmable for both the parameter on which to generate alarm as well as the values on which to activate alarm and deactivate it. In addition to this flexibility in terms of load management, the meter also has RS485 port. RS485 supports MODBUS RTU protocol for connections to EMS/SCADA.

The unit is meant for use in three phase four wire / three wire systems. The installation type, CT ratios and PT ratios are site selectable.

The Load Manager with its four relay contacts can be used as a Demand Controller. The method of Demand calculation i.e. sliding window, fixed window can be selected at site.

GOBLIN is a versatile meter, with all the features needed to implement a robust electrical load management system. It can be configured to suit most control and communication needs.

Technical Specifications

Parameter				
Type	Name	Statistics		
INPUT	Three Phases and Neutral of a 3P4W system / Three Phases of a 3P3W system			
	Voltage	Direct Voltage Input : Up to 500V L-L, Up to 300V L-N PT Ratio : Site Selectable Burden : 0.5VA		
	Current	Secondary Current Input : 5A or 1A (Site Selectable) CT Ratio : Site Selectable Range of Reading : 5 – 5000A Burden : < 1.0VA Overload : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous		
	Power Supply	Auxiliary Supply: 90 - 480 VAC, 50-60 Hz.		
OUTPUT	Relay	Four. Individually Field Programmable. Switching Voltage : Max. 250 VAC Switching Power : Max. 1000W Expected Mechanical Life : >10 x 10 ⁶ switching operations Expected Electrical Life : >4 x 10 ⁸ switching operations @(Load = 200VA, Cosφ = 0.5)		
MEASUREMENT	True RMS Basic Parameters	Voltage (Volts L-N & L-L)	V _{L-N} Accuracy : 0.5% of Reading V _{L-L} Accuracy : 1.0% of Reading	
		Current (Amps I _R , I _Y , I _B)	Accuracy : 0.25% of Reading	
		Line Frequency	45 to 55 Hz, Accuracy: 0.3% of Reading	
	Power	Active Power (P)	Accuracy: 0.5% of Reading (For IPFI>0.5)	
		Reactive Power (Q)	Accuracy: 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)	
		Apparent Power (S)	Accuracy: 0.5% of Reading	
		Power Factor	For Individual phases and System. Accuracy: 0.5% of Reading (IPFI≥0.5) Range of Reading: 0.05 to 1.000 Lag/Lead	
	Energy	Total Active Energy (KWh)	Range of Reading: 0 to 9999999.9 KWh Accuracy: Class 0.5 as per IS14697	
		Total Apparent Energy (KVAh)	Range of Reading: 0 to 9999999.9 KVAh Accuracy: Class 0.5 as per IS14697	
		Total Reactive Energy (KVARh)	Range of Reading: 0 to 9999999.9 KVARh Accuracy: Class 1.0	
	Power Quality	3 rd to 15 th Harmonics(Odd) for all Voltages with THD		
		3 rd to 15 th Harmonics(Odd) for all Currents with THD		
	Demand	Active Power (KW) Demand - Sliding & Fixed, Selectable		
		Apparent Power (KVA) Demand - Sliding & Fixed, Selectable		
MISCELLANEOUS	Dimensions	Bezel	144 X 144 mm	
		Panel Cutout	138 X 138 mm	
		Depth of installation	55 mm	
	Display	128 X 64 Graphical LCD		
	Operating temp	10°C to 50°C		
	Weight	0.65 Kgs (Approx.)		
	Operating Current Range	0.4% to 120% of CT primary		
	Communication	Data Logging Buffer	2 MB, Non-volatile memory, Can hold 19691 records	
		Logging Duration	Site selectable from 1 minute to 60 minutes	
		RS485	Modbus-RTU protocol	
USB 2.0 Pendrive		For downloading logged data		

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TRINITY
Making Energy Matter



*Specifications are subject to change without notice due to continuous improvement.

XPERT-PLUS

ELECTRICAL POWER METER



DIRECT
ETHERNET
CONNECTION!

DIRECT
E-MAIL
REPORTS!

- ◆ Class 0.5s accuracy for Active energy as per the IS14697.
- ◆ Graphical Display 128x64.
- ◆ Compact 96 X 96 DIN Enclosure.
- ◆ Computed Neutral Current.
- ◆ Measurement of all three types of Power Factors – True, Displacement and Distortion.
- ◆ Harmonic measurement: All six waveforms up to 30th order, even and odd, including THD.
- ◆ Histogram and Tabular display of Harmonic content.
- ◆ Wave shape display for all voltage and currents.
- ◆ Two Relays-individually programmable for Alarm/Trip.
- ◆ On board Ethernet Port supporting TCP/IP protocol and e-mail functionality.
- ◆ Event logging of Sags, Swells and Interruptions as per IEC 61000-4-30.
- ◆ Demand Measurement: Fixed or Sliding for KW, KVA, KVAR and Avg.Amps.
- ◆ RUN Hour (For EB and DG) and ON Hour measurement.
- ◆ Energy Pulse Output LED on the front – selectable for Real/Apparent/Reactive Energy.
- ◆ 3P4W, 3P3W and 1P2W connections.
- ◆ User selectable CT and PT Ratios. 5A or 1A operation, field selectable.

Trinity introduces the XPERT-PLUS, an easy-to-use, accurate and very versatile electrical power meter with innovative features, which is ideal for remote monitoring of electrical installations, Energy accounting and management, Demand Control, tenant billing and Power quality analysis.

The meter has three LEDs in the front, one to calibrate energies, one to indicate the status of RS485 communication and one to indicate load on DG.

Installation and connection

The CT Primary and Secondary, PT Ratio and installation types are site selectable, thus making it possible to use the meter in all types of installations like 3P4W, 3P3W and 1P2W.

Comprehensive Measurement

In addition to basic metering of the previous models, XPERT-PLUS adds support measurement of three energies for EB & DG, demands, logging of minimum-maximum values, all three types of power factors like True, Displacement and Distortion, Phase angle measurements, unbalance percentages and computed neutral current.

Power Quality Analysis as per IEC 61000-4-30 & IEC 61557-12

For Power Quality Analysis - XPERT-PLUS measures individual harmonics for all voltage and current waveforms, both even and odd, up to the 30th order, with THD as per IEC 61557-12. It also records in its non-volatile memory with date and time stamp, 180 Interruption events and 180 SAG/SWELL events, as per IEC 61000-4-30 standard.

Relay Outputs Options

XPERT-PLUS has a 2 Relay output, rated at 3A. These can be used for Alarm/Trip Events. The use of these relay is totally field configurable. XPERT-PLUS to be used as a maximum demand controller.

Communication

RS485

The XPERT-PLUS supports an isolated RS485 port for connection to EMS/SCADA application. RS485 communication indicated by RX/TX LED.

ETHERNET

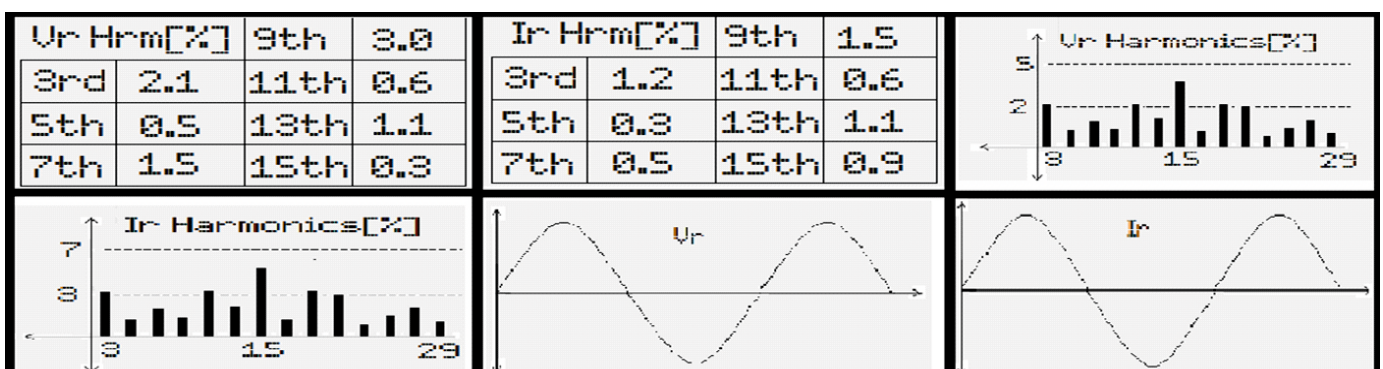
The XPERT-PLUS has a standard Ethernet-TCP/IP connection. The XPERT-PLUS can work as a small Web server. This onboard web server offers quick and easy access to all parameters, without any special software.

XPERT-PLUS also supports e-mail functionality, wherein it sends an electrical summary to programmed e-mail id every fixed interval.

XPERT-PLUS also supports Modbus-RTU protocol over TCP/IP connection.

Other Features

Graphical LC display of 128X64 makes it possible to display Harmonic data in histogram form and waveform of all voltages and currents.



Parameters			
Type	Name	Statistics	
INPUT	Supply	Three Phases and Neutral of a 3P4W system / Three Phases of a 3P3W system / Single Phase and Neutral of a 1P2W System	
	Voltage	Direct Voltage Input : up to 500V L-L, 300V L-N PT Ratio : Site Selectable Burden : 0.5VA	
	Current	Secondary Current Input : 5A or 1A (Site Selectable) CT Primary : Site Selectable Range of Reading : up to 5000A Burden : < 1.0VA Overload : 5ACT → 6ARMS Continuous : 1ACT → 1.2ARMS Continuous	
	Power Supply	Auxiliary Supply : 80 - 270 VAC/DC, 50-60 Hz.	
OUTPUT	Relay	Two. Individually Field Programmable. 3A @ 230 VAC, Resistive Load	
MEASUREMENT	True RMS Basic Parameters	Voltage (Volts L-N & L-L)	Accuracy : 0.5% of Reading.
		Current (Amps IR, IY, IB)	Accuracy : 0.25% of Reading
		Line Frequency	45 to 55 Hz, Accuracy : 0.05% of Reading
	Power	Active Power (P)	Accuracy : 0.5% of Reading (For IPFI > 0.5)
		Reactive Power (Q)	Accuracy : 1.0% of Reading
		Apparent Power (S)	Accuracy : 0.5% of Reading
		Power Factor	For Individual phases and System PF Accuracy : 0.5% of Reading (IPFI ≥ 0.5) Range of Reading : 0.05 to 1.00 Lag/Lead
	Energy	Total Active Energy (KWh)	Range of Reading : 0 to 999999999.9 Accuracy : Class 0.5s as per IS14697
		Total Apparent Energy (KVAh)	Range of Reading : 0 to 999999999.9 Accuracy : 0.5% of Reading
		Total Reactive Energy (KVARh)	Range of Reading : 0 to 999999999.9 Accuracy : 1.0% of Reading
Power Quality	THD and Individual Harmonic For each phase V and A	Class 5.0 as per IEC 61557-12 up to 30th order.	

Type		Name	Statistics	
	Demand	Parameters	KW, KVA, KVAR and Avg.Amps	
		Window	15 minutes or 30 minutes selectable.	
		Mode	Fixed or Sliding selectable.	
		Calculation	Present, Predicted, Maximum Demand and Last Maximum Demand	
MISCELLANEOUS	Dimensions	Bezel	96 X 96 mm	
		Panel Cutout	92 X 92 mm	
		Depth of installation	55 mm	
		Display	128 x 64 Graphical Display	
		Operating temp	0°C to 55°C	
		Weight	354 gms (Approx).	
		Operating Current Range	0.4% to 120% of CT primary	
	Communication	RS485 PORT	Modbus-RTU protocol : 2 – Wires, 9600, 19200, 38400 baud. Parity – None, Stop bit – 1. Isolation : 2.5KV RMS	
		ETHERNET PORT	Modbus-RTU TCP/IP Protocol, Web server, Email(Without SSL)	
	Display update	Instantaneous	1 S	
		Demand	1 S	
		Harmonics	3 S	
		Keypad	Three Keys for navigation and programming of various parameters.	
		Calibration LED.	Red color. 1000 impulses/unit. Selectable: KWh/KVAh/KVARh.	
		Communication LED	Dual color LED. Data Receive – Green LED. Data Transmit – Red LED.	
	<p>* 0.5s accuracy applicable only in 3P4W mode.</p> <p>Note : Some parameters are available only on Modbus – RTU RS485, Modbus – RTU TCP/IP and Web Server, so please refer to the user manual for more details.</p>			

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TRINITY
Making Energy Matter



XPERT-PRO

ELECTRICAL POWER METER



Compact 96X96X55 mm.

Graphical Display 128X64

Accuracy: Class 1.0 & Class 0.5 (Optionally).

Odd Harmonics up to 15th of individual Voltage and Current Waveform including THD.

RS-485 port for communication with EMS/PLS/SCADA with RX/TX dual color led indication.

Two Relays-individually programmable for Alarm/Trip with led indication.

Histogram & Tabular display of Harmonics content.

Wave shape display for all voltage & currents.

KWh Energy Pulse output on the LED (1000 impulses/KWh)

The electrical power meter, XPERT-PRO is a micro-controller based unit which measures various electrical parameters, and sequentially displays on a 128X64 backlit LCD.

The unit measures the three phase voltages, currents, frequency, power factors, individual Harmonic data as Histogram including Total Harmonic Distortion as well as individual current and voltage waveforms for all three phases.

The unit is fully solid state and will give years of trouble-free service once installed correctly.

Comprehensive Measurement

- All readings are True RMS measurements.
- Measurement of three energies: KWh, KVAh, KVARh
- Odd Harmonics upto 15th of individual Voltage and Current Waveform including THD.
- KVA and KW Demand

Installation and Connections

- Single Model Accepts 3P4W, 3P3W and 1P2W connections
- 1A and 5A CT secondary selectable
- User selectable CT and PT Ratio.

Communication

XPERT-PRO has a communication port, RS485 for connection to SCADA/EMS.

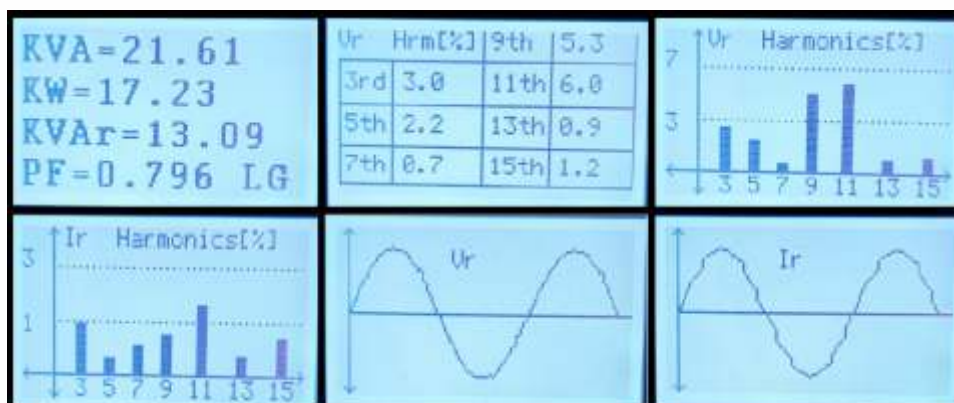
Control

The unit has two relay contacts which are programmable to operate for Alarm/Trip functions with the following parameters including (Sliding) Demand powers (KW and KVA).

Sr No.	Alarm Parameters	Relays Switches on at	Relay Switches off at	Settable Time Delay
1.	Avg. Volts	>Set value	<95% of set value	005 to 180 sec
2.	Avg. Amps.	>Set value	<95% of set value	005 to 180 sec
3.	KVA	>Set value	<95% of set value	005 to 180 sec
4.	KW	>Set value	<95% of set value	005 to 180 sec
5.	KVAR	>Set value	<95% of set value	005 to 180 sec
6.	Demands	>Set value	<95% of set value	2 sec.(fixed)
7.	PF	<Set value	>Set value	005 to 180 sec.

Other features

Graphical LC display of 128X64 monochrome (Black and white) makes it possible to display harmonic data in histogram waveforms of all voltage and currents.



Technical Specifications

		Parameter		
Type	Name	Statistics		
INPUT	Supply	Three Phases and Neutral of a 3P4W system / Three Phases of a 3P3W system & Phase and Neutral of a 1P2W system		
	Voltage	Direct Voltage Input : Up to 500V L-L, Up to 300V L-N PT Ratio : Site Selectable Burden : 0.5VA		
	Current	Secondary Current Input: 5A or 1A (Site Selectable) CT Ratio : Site Selectable Range of Reading : 5 – 5000A Burden : < 1.0VA Overload : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous		
	Power Supply	Auxiliary Supply : 80 - 270 VAC, 50-60 Hz.		
OUTPUT	Relay	Two. Individually Field Programmable. 3A @ 230 VAC, Resistive Load		
MEASUREMENT	True RMS Basic Parameters	Voltage (Volts L-N & L-L)	VL-N - Accuracy : 0.5% of Reading VL-L - Accuracy : 1.0% of Reading	
		Current (Amps IR, IY, IB)	Accuracy : 0.25% of Reading	
		Line Frequency	45 to 65 Hz, Accuracy : 0.3% of Reading	
	Power	Active Power (P)	Accuracy: 1% of Reading (For IPFI>0.5)	
		Reactive Power (Q)	Accuracy: 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)	
		Apparent Power (S)	Accuracy: 1%% of Reading	
		Power Factor	For Individual phases and System Accuracy: 1.0% of Reading (IPFI≥0.5) Range of Reading: 0.05 to 1.00 Lag/Lead	
	Energy	Total Active Energy (KWh)	Range of Reading: 0 to 9999999.9 Accuracy: 1.0S as per IS13779	
		Total Apparent Energy (KVAh)	Range of Reading: 0 to 9999999.9 Accuracy: 1.0% of Reading	
		Total Reactive Energy (KVARh)	Range of Reading: 0 to 9999999.9 Accuracy: 1.5% of Reading	
	Power Quality	Individual waveform for each voltage and current		
		THD for each voltage and current		
	Demand	KVA/ KWA Demand	Site Selectable. Demand Interval 15/30 Min. Also site selectable	
		Max. Demand	Max. Value reached only. No time & date stamp	
MISCELLANEOUS	Dimensions	Bezel	96 X 96 mm	
		Panel Cutout	92 X 92 mm	
		Depth of installation	55 mm	
	Display	128X64 LCD		
	Operating temp	10°C to 50°C		
	Weight	0.35 Kgs (Approx.)		
	Min. Operating Current	0.4% to 120% of CT primary		
	Comm.	RS485	Modbus-RTU protocol	
		Calibration LED.	Red color. 1000 impulses/unit(basic) for KWh	
		Communication LED	Dual color LED. Data Receive - Green LED. Data Transmit - Red LED.	
Relay LED		2 Red Color for Relay ON Indication.		

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TRINITY
Making Energy Matter



MULTIFUNCTION METER

TINY PRO 6



The most versatile and intelligent Multifunction meter for measuring all the basic electrical parameters along with energy and power.

TINY PRO 6 digital power meter is low cost, easy-to-use, individual & multifunctional that enables to measure all the basic parameters required in an electrical installation and monitors electricity over and above basic metering. The entire range is very rugged & cost-effective. All these products are field proven and more than 100,000 units are active in service.



FEATURES

- Multiparameter monitoring.
- All parameters with default accuracy class 1.0
- LED indication for Imp/Exp KWH , DG , RX/Tx
- Compact 96 x 96 x 55 mm DIN enclosure
- Micro-controller based
- True RMS
- Dual Source Measurement (Optional)

PARAMETERS

- Parameters : V, A, Hz, KW/KVA or KWH/KVAH, Run hour, PF

TECHNICAL DATA

PARAMETERS	STATISTICS	
Volts R-N	Direct Voltage Input : Up to 300V L-N Burden : 0.5VA Secondary Voltage Input : 63.5V*	
Volts Y-N		
Volts B-N		
Volts RY	Direct Voltage Input : Up to 500V L-L Burden : 0.5VA Secondary Voltage Input : 110V*	
Volts YB		
Volts BR		
Current R	Secondary Current Input : 5A or 1A CT Primary : Site Selectable Range of Reading : 0 – 5000A Burden : < 1.0VA Overload(Through CT) : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous (Whole Current) : 120% of I _{max} continuous.	
Current Y		
Current B		
Frequency	45 to 55 Hz, Accuracy : 0.3% of Reading	
KWh	Range of Reading : 0 to 9999999.9 KWh Accuracy : 1.0S as per IS13779.	
KVAh	Range of Reading : 0 to 9999999.9 KWh Accuracy : 1.0% of Reading	
System PF	Accuracy : 1% of Reading (IPFI>0.5) Range of Reading : 0.05 to 1.00 Lag/Lead	
System KVA	Accuracy : 1.0% of Reading	
System KW	Accuracy : 1.0% of Reading (Between 0.5 Lag to 0.8 Lead)	
Display	0.4" Red Seven Segment.	
RS485	For Integration with EMS/SCADA	
Bezel	96x96mm	DINenclosure
Depth	55 mm	

TRINITY

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* Specifications are subject to change without notice due to continuous improvement.

POWERPRO

ELECTRICAL POWER METER



Multiparameter Monitoring

Measures all important Electrical Parameters

All parameters with default accuracy class 1.0S

Compact 96 X 96 DIN enclosure

Optional RS-485 port for connection to SCADA/EMS

Optional Alarm/Trip Outputs (Two) programmable for any parameter including Demand

16 X 1 backlit LC display and 128 X 64 backlit graphical LC display (Optional)

Dual source measurement (EB & DG) option available

The POWERPRO from **Trinity** is an easy-to-use, cost effective electrical power meter that offers all the basic measurement capabilities required to monitor an electrical installation. In addition to measuring the instantaneous parameters, it also measures accurately all three energies, and also demand, thus helping to measure and control energy costs.

Over the basic metering, it optionally provides two relay outputs, RS485 port supporting MODBUS RTU protocol, dual source metering and THD measurements.

The relays are site programmable for parameter of action, and the value on which to operate.

The CT primary and secondary, PT ratio and installation type are site selectable, thus making it possible to use the meter in all types of three phase installations.

Technical Specifications

		Parameter	
Type	Name	Statistics	
INPUT	Supply	Three Phases and Neutral of a 3P4W system / Three Phases of a 3P3W system	
	Voltage	Direct Voltage Input : Up to 500V L-L, Up to 300V L-N PT Ratio : Site Selectable Burden : 0.5VA	
	Current	Secondary Current Input: 5A or 1A (Site Selectable) CT Ratio : Site Selectable Range of Reading : 5 – 5000A Burden : < 1.0VA Overload : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous	
	Power Supply	Auxiliary Supply: 90 - 480 VAC, 50-60 Hz.	
OUTPUT	Relay	Two. Individually Field Programmable. Switching Voltage : Max. 250 VAC Switching Power : Max. 1000W Expected Mechanical Life: >10 x 10 ⁶ switching operations. Expected Electrical Life : >4 x 10 ⁶ switching operations. @(Load = 200VA, Cosφ = 0.5)	
MEASUREMENT	True RMS Basic Parameters	Voltage (Volts L-N & L-L)	VL-N - Accuracy : 0.5% of Reading VL-L - Accuracy : 1.0% of Reading
		Current (Amps IR, IY, IB)	Accuracy : 0.25% of Reading
		Line Frequency	45 to 55 Hz, Accuracy: 0.3% of Reading
	Power	Active Power (P)	Accuracy: 1% of Reading (For IPFI>0.5)
		Reactive Power (Q)	Accuracy: 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)
		Apparent Power (S)	Accuracy: 1%% of Reading
		Power Factor	For Individual phases and System Accuracy: 1.0% of Reading (IPFI≥0.5) Range of Reading: 0.05 to 1.00 Lag/Lead
	Energy	Total Active Energy (KWh)	Range of Reading: 0 to 9999999.9 Accuracy: 1.0S as per IS13779
		Total Apparent Energy (KVAh)	Range of Reading: 0 to 9999999.9 Accuracy: 1.0% of Reading
		Total Apparent Energy (KVARh)	Range of Reading: 0 to 9999999.9 Accuracy: 1.5% of Reading
	Power Quality	THD for each Voltage (Optional)	
		THD for each Current (Optional)	
	Demand	KVA/ KWA Demand	Site Selectable. Demand Interval 15/30 Min. Also site selectable
		Max. Demand	Max. Value reached only. No time & date stamp
MISCELLANEOUS	Dimensions	Bezel	96 X 96 mm
		Panel Cutout	92 X 92 mm
		Depth of installation	55 mm
	Display	16 X 1 Backlit LCD or 128 X 64 graphical backlit LCD (Optional)	
	Operating temp	10°C to 50°C	
	Weight	0.35 Kgs (Approx.)	
	Min. Operating Current	0.4% to 120% of CT primary	
	Comm.	RS485	Modbus-RTU protocol

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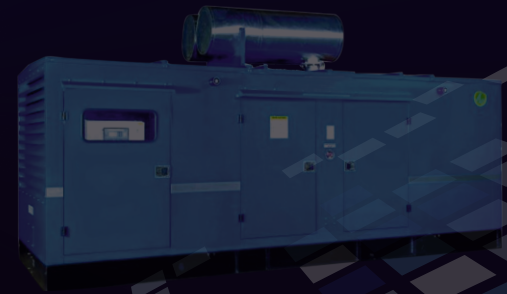
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web : www.trinityenergy.co.in

TRINITY
Making Energy Matter



SLM PRO ELECTRICAL POWER METER



- ◆ Class 0.5s accuracy for Active energy as per the IS14697.
- ◆ 4 digits X 3 rows bright 7-Segment display.
- ◆ Compact 96 X 96 DIN Enclosure.
- ◆ Computed Neutral Current.
- ◆ Shows all three types of Power Factors – True , Displacement and Distortion.
- ◆ Harmonic measurement: All six waveforms up to 30th order, even and odd, including THD.
- ◆ Event logging of Sags, Swells and Interruptions as per IEC 61000-4-30.
- ◆ Demand Measurement: Fixed or Sliding for KW, KVA, KVAR and Avg.Amps.
- ◆ RUN Hour and ON Hour measurement.
- ◆ Energy Pulse Output LED on the front – selectable for Real/Apparent/Reactive Energy.
- ◆ 3P4W, 3P3W and 1P2W connections.
- ◆ Import – Export counters for all three energies and all Power Demands.
- ◆ User selectable CT and PT Ratios. 5A or 1A operation, field selectable.

Trinity introduces the SLM PRO, an easy-to-use, accurate and very versatile electrical power meter with innovative features, which is ideal for remote monitoring of electrical installations, Energy accounting and management, tenant billing and Power quality analysis.

The meter has three LEDs in the front, one to calibrate energies, one to indicate the status of RS485 communication and one to indicate conversion from kilo to mega. The display consists of three rows of four-digit seven segment red LEDs of 0.56 inches. Twenty four LEDs in two columns on either side of the display indicate the various parameters being shown.

It supports MODBUS-RTU protocol over RS485 port.

Installation and connection

The CT Primary and Secondary, PT Ratio and installation types are site selectable, thus making it possible to use the meter in all types of installations like 3P4W, 3P3W and 1P2W.

Comprehensive Measurement

In addition to basic metering of the previous models, SLM PRO adds support for Import-Export measurement on three energies and demands, logging of minimum-maximum values, all three types of power factors like True, Displacement and Distortion, Phase angle measurements, unbalance percentages and computed neutral current.

Power Quality Analysis as per IEC 61000-4-30 & IEC 61557-12

For Power Quality Analysis - SLM PRO measures individual harmonics for all voltage and current waveforms, both even and odd, up to the 30th order, with THD as per IEC 61557-12. It also records in its non-volatile memory with date and time stamp, twenty Interruption events and thirty SAG/SWELL events, as per IEC 61000-4-30 standard

Parameters		
Type	Name	Statistics
INPUT	Supply	Three Phases and Neutral of a 3P4W system / Three Phases of a 3P3W system / Single Phase and Neutral of a 1P2W System
	Voltage	Direct Voltage Input : up to 500V L-L, 300V L-N PT Ratio : Site Selectable Burden : 0.5VA
	Current	Secondary Current Input : 5A or 1A (Site Selectable) CT Primary : Site Selectable Range of Reading : up to 5000A Burden : < 1.0VA Overload : 5A CT → 6A RMS Continuous : 1A CT → 1.2A RMS Continuous
	Power Supply	Auxiliary Supply : 60 - 480 VAC/DC, 50-60 Hz.

Type	Name	Statistics	
MEASUREMENT	True RMS Basic Parameters	Voltage (Volts L-N & L-L) Accuracy : 0.5% of Reading.	
		Current (Amps IR, IY, IB) Accuracy : 0.25% of Reading	
		Line Frequency 45 to 55 Hz, Accuracy : 0.05% of Reading	
	Power	Active Power (P) Accuracy : 0.5% of Reading(For IPFI>0.5)	
		Reactive Power (Q) Accuracy : 1.0% of Reading	
		Apparent Power (S) Accuracy : 0.5% of Reading	
		Power Factor For Individual phases and System PF Accuracy : 0.5% of Reading (IPFI≥0.5) Range of Reading : 0.05 to 1.00 Lag/Lead	
	Energy	Total Active Energy (KWh) Range of Reading : 0 to 999999999.9 Accuracy : Class 0.5s as per IS14697	
		Total Apparent Energy (KVAh) Range of Reading : 0 to 999999999.9 Accuracy : 0.5% of Reading	
		Total Reactive Energy (KVARh) Range of Reading : 0 to 999999999.9 Accuracy : 1.0% of Reading	
	Power Quality	THD and Individual Harmonic For each phase V and A Class 5.0 as per IEC 61557-12 up to 30th order.	
	Demand	Parameters	KW, KVA, KVAR and Avg.Amps.
		Window	15 minutes or 30 minutes selectable.
Mode		Fixed or Sliding selectable.	
Calculation		Present, Predicted, Maximum Demand and Last Maximum Demand (Import & Export – For Power Parameter Only)	

Type	Name	Statistics	
MISCELLANEOUS	Dimensions	Bezel	96 X 96 mm
		Panel Cutout	92 X 92 mm
		Depth of installation	55 mm
		Display	4x3, 7 Segment, bright Red.
		Operating temp	0°C to 55°C
		Weight	310 gms (Approx).
		Operating Current Range	0.4% to 120% of CT primary
	Communication	RS485 PORT	Modbus-RTU protocol : 2 – Wires, 9600, 19200, 38400 baud. Parity – None, Stop bit – 1. Isolation : 2.5KV RMS
	Display update	Instantaneous	1 S
		Demand	1 S
		Harmonics	3 S
		Keypad	Three Keys for navigation and programming of various parameters.
		Calibration LED.	Red color. 1000 impulses/unit. Import/Export of KWh/KVAh/KVARh.
		Communication LED	Dual color LED. Data Receive – Green LED. Data Transmit – Red LED.
	<p>* 0.5s accuracy applicable only in 3P4W mode.</p> <p><u>Note : Some parameters are available only on RS485 , so please refer to the user manual for more details.</u></p>		

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EMPOWER PLUS DIGITAL MULTIFUNCTION METER



Class 1.0s accuracy as per IS13779

Microcontroller Based

Seven Segment LED Based Display

Measures all important Electrical Parameters

Compact 96 X 96 DIN enclosure

RS485 port for connection to SCADA/EMS

The EM9400 from Trinity is an easy-to-use, cost effective electrical power meter that offers all the basic measurement capabilities required to monitor an electrical installation. In addition to measuring the instantaneous parameters, it also measures all three energies, thus helping to measure energy costs.

Over the basic metering, it provides RS485 port supporting MODBUS RTU protocol, THD measurements, Phase angle, Unbalance % for Voltage and Current, On Hour & Run Hour, Power Interruption recording. These parameters are available over RS485 only.

The CT Primary, Secondary and PT ratios are site selectable.

Technical Specifications

Parameters			
Type	Name	Statistics	
INPUT	Supply	Three Phases and Neutral of a 3P4W system	
	Voltage	Direct Voltage Input : 25 to 500V L-L, 25 to 300V L-N PT Ratio : Site Selectable Burden : 0.5VA	
	Current	Secondary Current Input : 5A or 1A (Site Selectable) CT Ratio : Site Selectable Range of Reading : 5 - 5000A Burden : < 1.0VA Overload : 5A CT → 6A RMS Continuous 1A CT → 1.2A RMS Continuous	
	* Power Supply	Auxiliary Supply (AC) : 40 - 480 VAC/DC, 50-60 Hz. Auxiliary Supply(DC) : 8 - 32 VDC	
MEASUREMENT	True RMS Basic Parameters	Voltage (Volts L-N & L-L) VL-N - Accuracy : 0.5% of Reading VL-L - Accuracy : 1.0% of Reading	
		Current (Amps IR, IY, IB) Accuracy : 0.25% of Reading	
		Line Frequency 45 to 65 Hz, Accuracy : 0.3% of Reading	
	Power	Active Power (P) Accuracy (For IPFI>0.5) : 1% of Reading	
		Reactive Power (Q) Accuracy : 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)	
		Apparent Power (S) Accuracy : 1% of Reading	
		Power Factor For Individual phases and System Accuracy : 1.0% of Reading (IPFI≥0.5) Range of Reading : 0.05 to 1.00 Lag/Lead	
	Energy	Total Active Energy (KWh) Range of Reading : 0 to 9999999.9 Accuracy : Class 1.0s as per IS13779	
		Total Apparent Energy (KVAh) Range of Reading : 0 to 9999999.9 Accuracy : 1.0% of Reading	
		Total Apparent Energy (KVARh) Range of Reading : 0 to 9999999.9 Accuracy : 1.5% of Reading	
	Power Quality	THD for each phase current THD for each phase voltage	
	MISCELLANEOUS	Dimensions	Bezel : 96 X 96 mm
			Panel Cutout : 92 X 92 mm
Depth of installation : 55 mm			
Display : 4x3 7-Segment			
Operating temp : 10°C to 50°C			
Weight : 0.29 Kgs (Approx.)			
Min. Operating Current : 0.4% to 120% of CT primary			
Comm.	RS485	Modbus-RTU protocol	

* Note: To be specified at the time of ordering

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MULTIFUNCTION METER

NF29



The unit is low cost, easy-to-use, individual and multifunctional that enables to measure all the basic parameters required in an electrical installation and monitors electricity over and above basic metering. The entire range is very rugged and cost-effective. All these products are field proven and more than 100,000 units are active in service.



FEATURES

- Multiparameter Monitoring
- Micro-controller based
- Measurement of all important Electrical Parameters
- All parameters with default accuracy class 1.0S
- Displays with customized LCD
- Individual voltages and currents for all three phases (R-Y-B)
- Individual three powers-KW, KVA and KVAR
- Individual PF and system PF with lead (-) and lag side
- Compact 96 X 96 X 55 mm DIN enclosure
- Frequency (Hz), three energies (KWh, KVAh, KVARh)
- THD, Voltage & Current available (optional)

DISPLAY PARAMETERS

V, A, KWH, KVAH, KVARH, PF, Hz, System & Phase wise KW; KVA; KVAR.

TECHNICAL DATA

DE	PARAMETERS	STATICS
Volts R-N	Direct Voltage Input : 20 to 300V L-N Burden : 0.5VA	
Volts Y-N		
Volts B-N		
Volts RY	Direct Voltage Input : Up to 500V L-L Burden : 0.5VA	
Volts YB		
Volts BR		
I R	Secondary Current Input : 5A or 1A (To be specified at the time of Ordering) CT Primary : Site Selectable Range of Reading : 5 – 5000A Burden : < 1.0VA Overload(Through CT) : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous (Whole Current) : 120% of I _{max} continuous.	
I Y		
I B		
Frequency	45 to 55 Hz, Accuracy: 0.3% of Reading	
KWh	Range of Reading: 0 to 9999999.9 KWh Accuracy : 1.0% as per IS13779.	
KVARh	Range of Reading: 0 to 9999999.9 KVARh Accuracy : 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)	
KVAh	Range of Reading: 0 to 9999999.9 KVAh Accuracy : 1.0% of Reading	
System PF	Accuracy : 1% of Reading (IPFI>0.5) Range of Reading : 0.05 to 1.00 Lag/Lead	
System KVA	Accuracy : 1.0% of Reading	
System KW	Accuracy : 1.0% of Reading	
System KVAR	Accuracy: 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)	
Display	Customized LCD	
Bezel	96x96mm	DIN enclosure
Depth	55 mm	

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DIGITAL MULTIFUNCTION METER

MODEL: VAF

Basic Features:

- Multiparameter Monitoring
- Measurement of all important Electrical Parameters
- All parameters with default accuracy class 1.0S
- Compact 96 X 96 X 55 mm DIN enclosure



Sr. No.	Parameters & Options	VAF	STATISTICS
1	Volts R-N	Y	Direct Voltage Input : Up to 300V L-N Burden : 0.5VA Secondary Voltage Input : 63.5V*
2	Volts Y-N	Y	
3	Volts B-N	Y	
4	Volts RY	Y	Direct Voltage Input : Up to 500V L-L Burden : 0.5VA Secondary Voltage Input : 110V*
5	Volts YB	Y	
6	Volts BR	Y	
7	Current R	Y	Secondary Current Input : 5A or 1A (To be specified at the time of Ordering) CT Primary : Site Selectable Range of Reading : 5-5000A Burden : <1.0VA Overload (Through CT) : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous
8	Current Y	Y	
9	Current B	Y	
10	Frequency	Y	45 to 55 Hz, Accuracy : 0.3% of Reading
11	KWh	-	Range of Reading : 0 to 9999999.9 KWh Accuracy : 1.0S as per IS 13779
12	KVARh	-	Range of Reading : 0 to 9999999.9 KVARh Accuracy : 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)
13	KVAh	-	Range of Reading : 0 to 9999999.9 KVAh Accuracy : 1.0% of Reading
14	System PF	-	Accuracy : 1% of Reading (IPFI ≥ 0.5) Range of Reading : 0.05 to 1.00 Lag/ Lead
15	System KVA	-	Accuracy : 1.0% of Reading
16	System KW	-	Accuracy : 1.0% of Reading (Between 0.5 Lag to 0.8 Lead)
17	System KVAR	-	Accuracy : 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)
18	DISPLAY	0.56" Red Seven Seg.	
19	RS485 (Option)	-	For Integration with EMS/ SCADA

DIGITAL PANEL METERS

- SINGLE PHASE DIGITAL VOLTMETER-ME2V1
- SINGLE PHASE DIGITAL AMMETER-ME2A1
- THREE PHASE DIGITAL VOLTMETER-ME2V3
- THREE PHASE DIGITAL AMMETER-ME2A3
- SINGLE PHASE DIGITAL FREQUENCY METER-ME2F1
- SINGLE PHASE DIGITAL POWER FACTOR METER-ME2Φ1
- DIGITAL KW METER-KW300
- DIGITAL 3-PHASE PF METER-PF300



Technical Specifications

Sr. No.	Parameters & Options	ME2V1	ME2A1	ME2V3	ME2A3	ME2F1	ME2Ø1	KW300	PF300	STATISTICS
1	Volts	Y	-	-	-	-	-	-	-	Direct Voltage Input : 25 to 500V L-L Burden : 0.5VA Secondary Voltage Input : 110V*
2	Volts RY	-	-	Y	-	-	-	-	-	
3	Volts YB	-	-	Y	-	-	-	-	-	
4	Volts BR	-	-	Y	-	-	-	-	-	
5	Current	-	Y	-	-	-	-	-	-	Secondary Current Input : 5A or 1A (To be specified at the time of Ordering) CT Primary : Site Selectable Range of Reading : 0-5000A Burden : <1.0VA Overload (Through CT) : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous
6	Current R	-	-	-	Y	-	-	-	-	
7	Current Y	-	-	-	Y	-	-	-	-	
8	Current B	-	-	-	Y	-	-	-	-	
9	Frequency	-	-	-	-	Y	-	-	-	45 to 55 Hz, Accuracy : 0.3% of Reading
10	Phase/System PF	-	-	-	-	-	Y	-	Y	Accuracy : 1% of Reading (IPF≥0.5) Range of Reading : 0.05 to 1.00 Lag/ Lead
11	System KW	-	-	-	-	-	-	Y	-	Accuracy : 1.0% of Reading (Between 0.5 Lag to 0.8 Lead)
12	DISPLAY	0.56" Red Seven Seg.	0.56" Red Seven Seg.	0.56" Red Seven Seg.	0.56" Red Seven Seg.	0.56" Red Seven Seg.	0.56" Red Seven Seg.	16 X 1 LCD	16 X 1 LCD	
13	Bezel	96 X 96 mm								
14	Depth	55 mm								
DIN enclosure										

* To be specified at the time of ordering along with PT Primary

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DIGITAL ENERGY METERS

INFINITY



Infinity, from Trinity are micro-controller based digital energy meters for use in three phase electrical systems for sub-metering applications. The design of these meters is based on proven micro-controller technology; with front end ASICs resulting in compact and accurate energy metering. The accuracy of the meters is maintained even under severely distorted waveform conditions which occur due to harmonics in the system.

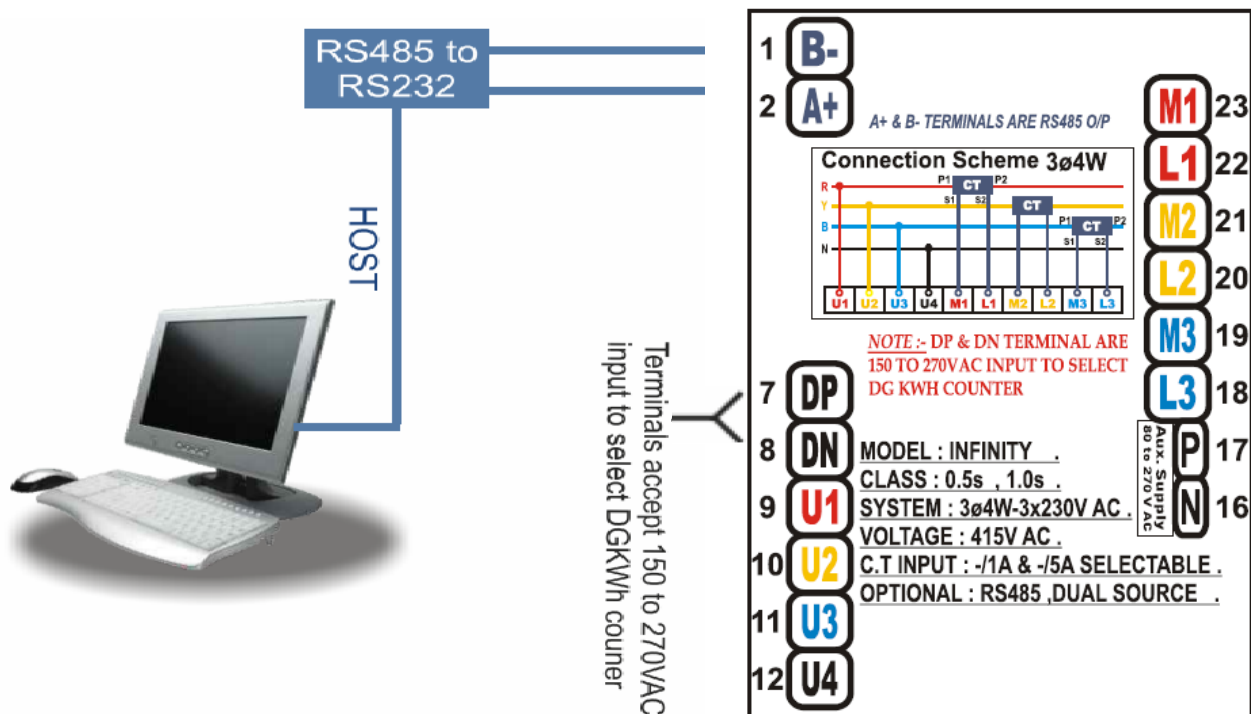
Infinity is the advanced model with bright 16 x 1 LC display having additional features like RS485 port, dual source measurement and whole current measurement up to 60A.

FEATURES

- Class 1.0s accuracy as per IS13779
- Class 0.5 accuracy also available
- Micro-controller based
- Backlit 16x1 LC Display with dual source
- Whole current models for 32A and 50A available
- RS 485 communication port with MODBUS-RTU protocol
- Available with single phase and three phase with RS485 + dual source

TECHNICAL DATA

Parameter			
TYPE	NAME	STATISTICS	
INPUT	Supply	Three Phases and Neutral of a 3P4W system/	
	Voltage	Direct Voltage Input : Up to 300 V L-N or 500 V L-L Burden : 0.5 VA	
	Current	Secondary Current Input : 5A or 1A CT Primary : Site Selectable Burden : < 1.0VA Overload (Through CT) : 5A CT = 6A RMS continuous 1A CT = 1.2A RMS continuous (Whole Current) 120% of I _{max} continuous	
	Auxiliary Power Supply	Operating Voltage for SMPS : 80 VAC — 480 VAC, 50-60 Hz	
COMM.	RS485 Port	Supporting MODBUS-RTU protocol	
MEASUREMENT	Total Active Energy (KWh)	Range of Reading: 0 to 9999999.9 KWh Accuracy : 1.0 S as per IS13779	
MISCELLANEOUS	Dimen.	Bezel	96 x 96 mm
		Panel Cutout	92 X 92 mm
		Depth of installation	55 mm
	Operating temp	0° C to 60 °C	
	Weight	0.3 Kgs	
	Min. Operating Current	0.4A	
	Dual Source Sensing	By presence or absence of across two terminals can be looped	



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DIGITAL ENERGY METERS

| ENTITY



Entity, from Trinity are micro-controller based digital energy meters for use in three phase electrical systems for sub-metering applications. The design of these meters is based on proven micro-controller technology; with front end ASICs resulting in compact and accurate energy metering. The accuracy of the meters is maintained even under severely distorted waveform conditions which occur due to harmonics in the system.

Entity is the basic model, with a 16 x 1 LC Display.

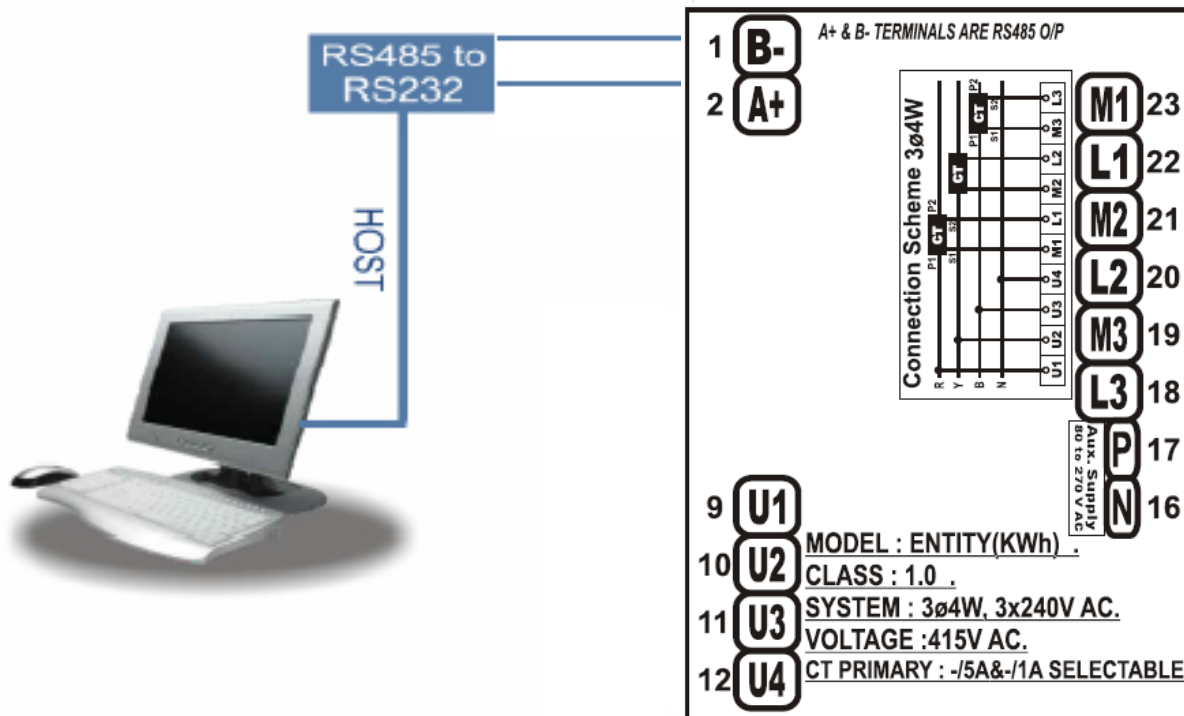
Entity is the advanced model with bright 16 x 1 LC display having additional optional features like RS485 port, dual source measurement and whole current measurement up to 60A.

FEATURES

- Class 1.0s accuracy as per IS13779
- Class 0.5 accuracy also available
- Micro-controller based
- Backlit 16x1 LC Display with dual source
- Backlit 16x1 LC Display in Entity

TECHNICAL DATA

Parameter			
TYPE	NAME	STATISTICS	
INPUT	Supply	Three Phases and Neutral of a 3P4W system/ Three Phases of 3P3W system	
	Voltage	Direct Voltage Input : Up to 300 V L-N or 500 V L-L Burden : 0.5 VA	
	Current	Secondary Current Input : 5A or 1A (Site Selectable) CT Primary : Site Selectable Burden : < 1.0VA Overload (Through CT) : 5A CT = 6A RMS continuous 1A CT = 1.2A RMS continuous (Whole Current) 120% of I _{max} continuous	
	Auxiliary Power Supply	Operating Voltage for SMPS : 80 VAC — 480 VAC, 50-60 Hz	
COMM.	RS485 Port	Supporting MODBUS-RTU protocol	
MEASUREMENT	Total Active Energy (KWh)	Range of Reading: 0 to 9999999.9 KWh Accuracy : 1.0 S as per IS13779	
MISCELLANEOUS	Dimen.	Bezel	96 x 96 mm
		Panel Cutout	92 X 92 mm
		Depth of installation	55 mm
	Operating temp	0° C to 60° C	
	Weight	0.3 Kgs (Infinity), 0.264 Kgs (Entity)	
	Min. Operating Current	0.4% of CT primary	
	Dual Source Sensing	By presence or absence of across two terminals can be looped	



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