

# SLM102

0.2 CLASS MULTIFUNCTION POWER AND ENERGY METER



## Features:

- Exceeds class 0.2 revenue accuracy in Power & Energy Metering.
- On board Ethernet port supporting TCT/IP protocol. Acts as a small web-server. Also supports MODBUS TCP/IP.
- RS485 port with MODBUS-RTU protocol.
- Demand Measurement: Fixed or sliding, KW or KVA.
- Harmonics measurement: All six waveforms upto 29th including THD.
- Bright Red LED display. Three rows of 8-digits each ensure unbroken display of even large energy register values.
- Four relay outputs for Alarm & Trip. Limits are field programmable.
- Event definition and logging.
- Datalogging of all parameters for load pattern analysis. 2 Mbytes memory on-board.
- USB 2.0 port to download logged data.
- USB 2.0 port based programming of field selectable parameters.

## Applications

- Sub-station Metering
- Industrial Large Feeder Metering
- Load profile analysis.
- Sub-Metering
- Power generation
- Power Quality analysis.

## Comprehensive and Accurate Measurement:

- 3 $\Phi$  Voltage (L-N)
- 3 $\Phi$  Voltage (L-L)
- 3 $\Phi$  Current
- KW (3 $\Phi$  and Total)
- KVAR (3 $\Phi$  and Total)
- KVA (3 $\Phi$  and Total)
- PF (3 $\Phi$  and Total)
- Bidirectional KWh
- KVAh
- KVARh
- Frequency
- % THD
- Demand & MD

## Advance Measurement Features:

SLM102 also measures the minimum & maximum values and also allows definition of events, so that the user can define the parameter of interest, event definition value and related time delays.

- Voltage min/max. - 3 $\Phi$  L-N
- Voltage min/max. - 3 $\Phi$  L-L (applicable only for 3P3W)
- Current min/max. - 3 $\Phi$ .
- Hz min/max.
- Active Power min/max. - 3 $\Phi$  &  $\Sigma$  system
- Apparent Power min/max. - 3 $\Phi$  &  $\Sigma$  system

## Harmonic Measurements

SLM102 measures the odd harmonics for 3 $\Phi$  voltages and 3 $\Phi$  currents upto 29th, including THDs for each waveform.

## Relay Outputs Options

The SLM102 has four relay outputs, rated at 3A. These can be used for alarm/trip events. The use of these relays is totally field configurable, for the parameter on which to operate, the value on which to trip, the delay offer which to trip and the value at which to open. This enables the SLM102 to be used as a maximum demand controller.

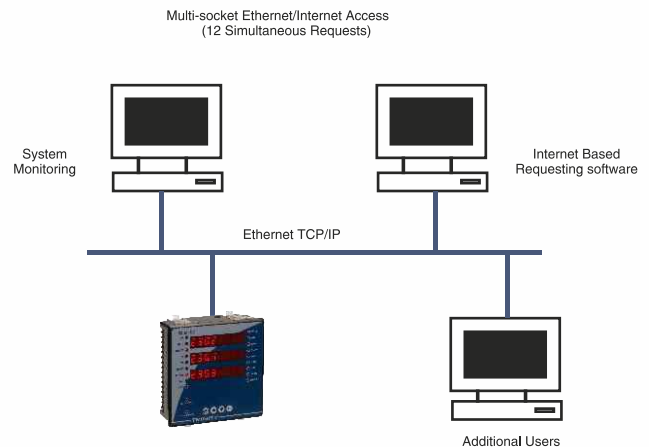
## Data Logging

The SLM102 has 2Mb on-board non-volatile memory. The unit has a user programmable log capacity, that is the log duration is site selectable. A complete electrical system snap-shot is saved, to be later downloaded using the USB 2.0 port, into a PC based utility supplied free by Trinity.

## Communications

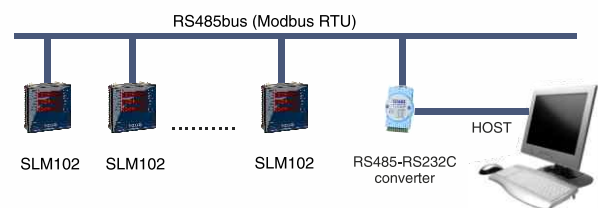
### Ethernet

The SLM102 has a standard Ethernet-TCP/IP connection. Multiple socket Ethernet connectivity enables the unit to respond to as many as 12 different requests. The SLM102 can act as a small web-server. This on-board web-server, offers quick and easy access to basic measurement, without special software. Built-in web pages display a range of power, energy and basic power quality information through any web enabled device. It also supports MODBUS-TCP/IP protocol.



### RS485

The SLM102 support an isolated RS485 port, for half duplex multidrop communication using MODBUS-RTU protocol.



This makes it easy to integrate SLM102 to any EMS/SCADA application.

# Technical Specifications

## Parameter List

		Parameters		Mode	
Type	Name	Statistics	Symbols	3P4W	3P3W
True Rms Basic Parameters	Voltage (Volts L-N)	Direct Voltage Input : 0 to 300 VAC PT Ratio : Programmable upto 66 KV Range of Reading : 0 to 66 KV Accuracy : 0.2% of reading (50<V<300)	Vr	✓	-
			Vy	✓	-
			Vb	✓	-
	Voltage (Volts L-L)	Direct Voltage Input : 0 to 450 VAC PT Ratio : Programmable upto 66 KV Range of Reading : 0 to 66 KV Accuracy : 0.5% of reading (85<V<545)	Vry	✓	✓
			Vbr	✓	-
			Vyb	✓	✓
	Current (Ir, Iy, Ib)	Secondary Current input : 1A or 5A CT Ratio : Freely programmable from 5A to 5000A Range of Reading : 0 to 5000A Accuracy : 0.2% of reading (0.02 Ib<l<1.2 Ib)	Ir	✓	✓
			Iy	✓	-
			Ib	✓	✓
	Line (Frequency)	45 to 55 HZ Accuracy : 0.5% of Reading	Hz	✓	✓
Power	Active Power(P)	Accuracy : See Table-1 (0.5 < cosΦ < 0.8)	(P) R-Phase	✓	✓
			(P) Y-Phase	✓	-
			(P) B-Phase	✓	✓
	Reactive Power(Q)	Accuracy : See Table-1 (0.5 < sinΦ < 0.8)	(Q) R-Phase	✓	✓
			(Q) Y-Phase	✓	-
			(Q) B-Phase	✓	✓
	Apparent Power(S)	Accuracy : 0.3% of Reading (0.01 Ib ≤ I < Imax)	(S) R-Phase	✓	-
			(S) Y-Phase	✓	-
			(S) B-Phase	✓	-
	System Active Power(P)	Accuracy : See Table-1 (0.5 < cosΦ < 0.8)	Σ - P	✓	✓
	System Reactive Power(Q)	Accuracy : See Table-1 (0.5 < sinΦ < 0.8)	Σ - P	✓	✓
	System Apparent Power(S)	Accuracy : 0.3% of Reading (0.01 Ib ≤ I < Imax)	Σ - P	✓	✓
	Power Factor	0.5% for 0.5 < IPFI < 0.8, (0.05 Ib < I < 1.2 Ib)	PF R-Phase	✓	-
			PF Y-Phase	✓	-
			PF B-Phase	✓	-
			System PF	✓	✓

**Table 1-Percentage Error Limits for Power**

Value fo Current	PF	Percentage Error Limits
0.01 Ib ≤ I < 0.05 Ib	1.0	±0.4
0.05 Ib ≤ I ≤ Imax	1.0	±0.2
0.02 Ib ≤ I < 0.1 Ib	0.5 Lagging	±0.5
	0.8 Leading	±0.5
0.01 Ib ≤ I ≤ Imax	0.5 Lagging	±0.3
	0.8 Lagging	±0.3

## Energy, Demand and Power Quality

Parameters		Mode	
Type	Statistics	3P4W	3P3W
Total Active Energy(KWh)	Range of reading : 0 to 9999999.9 MWh Accuracy : 0.2S as per IS 14697:1999	✓	✓
Total Reactive Energy(KVARh)	Range of reading : 0 to 9999999.9 MVARh Accuracy : 0.2S as per IS 14697:1999	✓	✓
Total Apparent Energy(KVAh)	Range of reading : 0 to 9999999.9 MVAh	✓	✓
Active Power Demand(KWDMND)	Sliding and Fixed selectable	✓	✓
Apparent Power Demand(KVADMND)	Sliding and Fixed selectable	✓	✓
Harmonics for Voltages (3rd to 29th)		✓	✓
Harmonics for Current (3rd to 29th)		✓	✓
THD for each voltage		✓	✓
THD for each current		✓	✓

### Power Supply:

Self Power. Unit has in-built 3-phase supply with an operating range of 50 VAC - 480 VAC, 50-60 Hz.

### Miscellaneous

Display	8X3 (Digits X Lines) 7 Segment LED display Eighteen LEDs for parameter indication Two LEDs for Active and Reactive Energy (1000 impulse / KWh or KVARh).		
Dimensions	Bezel	:	144 mm X 144 mm.
	Depth of Installation	:	55 mm
	Panel cutout	:	138 mm X 138 mm
Operating Temperature		:	0°C to 60°C.

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