

E4000

SMART ENERGY METER



The E4000 is microcontroller based electrical Revenue Smart Energy Meter that measures various parameters and displays on a customized LC display. The unit is a reliable and cost-effective solution for residential smart metering with high quality communication technologies. As part of a comprehensive end-to-end smart meter offering, the E4000 meter enables multi-dwelling applications, remote management, feeder control (load disconnection) and reduced operating costs. It is designed to optimize investment and operational expenses over the long term. The communication technologies have also been optimized to guarantee operational efficiency.

Load Management with high profiling is available with E4000. On-demand load management and configuration is available by integrated relay to control specific loads (feeders). Energy consumption distribution with time of use in a day (TOD) profiles are also possible. User defined Trip parameters to Trip/Reclose Relay as per sequence and programmed value to avoid damage in fault condition are also available.

The unit is field programmable as well as remotely programmable where remote programming is more convenient for feeder controls like TOD up to eight zones along with tripping parameters for each feeder and so on. The unit has five relays of which four relays can be used for feeder control and one relay can be used for GPRS power supply. Remotely control using GPRS facility avails for the comprehensive measurement & control of entire Electrical System as much as possible.

The E4000 provides utilities with advanced anti-fraud and security features to ensure efficient revenue protection. Information on tamper events, consumption and data logging can be easily retrieved by using GPRS to take immediate action. Logged Data of 2 MB can be retrieved using Bluetooth (Bluetooth enabled Laptop or HHD) for data analysis.

The unit is basically used for the purpose of Power distribution where intra-regional and inter-regional powers are distributed depending upon day-to-day power availability and load conditions. Subsequently, surplus power can be transferred to the power deficit.

Comprehensive Measurement

- All readings are true RMS measurements
- Instantaneous data like phase wise voltage and current, Active Power (KW), Reactive Power (KVAR), Apparent Power (KVA), PF, Hz, THD and Max KVA Demand
- Instantaneous data of phase wise voltage and current, active, reactive and apparent power, up to 29th Harmonics for all three phase voltage and current, Latest Tamper Event, with time and date from remote Meters in tabular form at base station using GPRS connectivity on E-Mon
- Last 120 days KWh Consumption, Feeder Relay ON Time (in minutes)
- Last 12 month KWh consumption, Max KVA Demand , phase wise min/max Voltage & current and phase wise Avg. power factor.
- Latest 250 Tamper Events and latest 100 Power up/down time-date stamp
- Viewing of online waveforms of all V & I phase [128 sample/cycle] are available remotely (via E-Mon software)
- Real Time Clock (RTC) for both date and time.

Installation and Connections

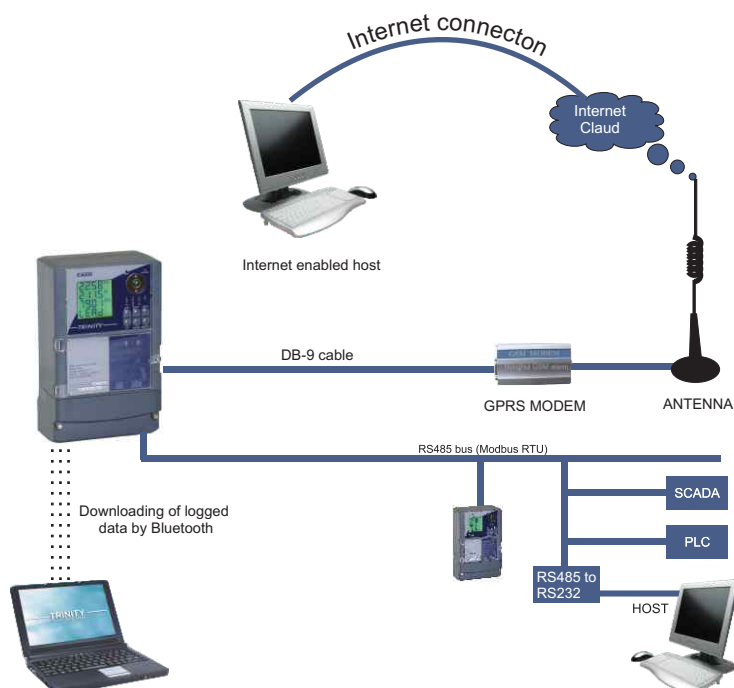
- Single Model with 3P4W
- CT-Primary selectable
- Fixed CT- Secondary with 5A

Control

- Programmable TOD with four relays for feeder control
- Feeder status (TOD detail, TOD on/off, Trip on/off), Periodic data (Daily, Monthly), feeder relay on time of the day in minutes
- Trip & Reclose relays forcefully including TOD programmed

Communication

- Intigrate GPRS Connectivity using Relay Controlled power supply for GPRS Modem
- MODBUS-RTU protocol on RS485 for connection to EMS/SCADA
- On Board 2 MB of memory for data downloading by using Bluetooth.



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 : 40 to 500V L-L, Up to 300V L-N PT Ratio : 110 to 66000 Burden : 0.5VA	
	Current	Base Current (Ib) : 5A(Fixed CT-Secondary) Imax : 6A, continuous operation CT Ratio : Site Selectable Range of Reading : 5 – 5000A Burden : < 1.0VA	
	Power Supply	Self Powered : 80 - 480 VAC, 50-60 Hz.	
OUTPUT	Relay	Four. Individually Field Programmable. 3A@250 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 55 Hz, Accuracy: 0.3% of Reading
	Power (Import and Export)	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 to 1.00 Lag/Lead
	Import Energy	Total Active Energy (KWh)	Range of Reading: 0 to 9999999.9 Accuracy: Class 0.5 as per IS14697
		Total Apparent Energy (KVAh)	Range of Reading: 0 to 9999999.9 Accuracy: Class 0.5 as per IS14697
		Total Reactive Energy (KVARh)	Range of Reading: 0 to 9999999.9 Accuracy: Class 1.0
	Export Energy	Total Active Energy (KWh)	Range of Reading: 0 to 9999999.9 Accuracy: Class 0.5 as per IS14697
		Total Apparent Energy (KVAh)	Range of Reading: 0 to 9999999.9 Accuracy: Class 0.5 as per IS14697
		Total Reactive Energy (KVARh)	Range of Reading: 0 to 9999999.9 Accuracy: Class 1.0
	Power Quality	Individual waveform for each voltage and current	
		THD for each voltage and current	

Mechanical

Material-Base : Polycarbonate
 Material-Top : Polycarbonate-Transparent
 Dimension (mm) : 290x176x98
 Construction : Screws & Seals, Unidirectional & polycarbonate with printed logo and meter serial number.

Standard Applicable: IS14697-1999,

Operation

- Energy Measurements in all four Quadrants total 8 different energy registers like Import/Export and LAG/LEAD.
- Four Feeder Control relays with Programmable TOD, 8 TOD definition per feeder.
- Battery backup: Meter will work for at least 3 days in absence of power for data downloading by pressing key.

Temper Detection

Voltage circuit : Voltage unbalance, Phase seq. error
Current circuit : CT Reverse
Neutral circuit : neutral missing

Interface

Display : Custom LCD - 62mm x 66mm size; 7-segment-12mm (High Resolution Display)
Outputs : 4 nos. relay outputs for feeder and 1 relay for GPRS Modem, with potential free contacts rated at 3 Amps, 250V AC
Inputs : 1 no. digital input rated at 24VDC
Communication : RS232 Port/ RS 485 and Optical port/Blue tooth
AMR : AMR compatibility (GSM/GPRS),
Remote configuration : Supports downloading of system parameters and Logged data

Miscellaneous

- Energy measurement in all four quadrants. Total 8 different energy registers like Import/Export and lag/lead.
- RS232 port for external modem for GPRS connectivity with EMON at base station.
- Bluetooth data downloading is reduced to 2M Bits for load survey and other required data for easy data downloading through Bluetooth enabled laptop or Bluetooth Hand Held Device.
- Load survey data with 48 logs per day and for the last 30 days. Log includes all the parameters like rising demand, all quadrant energies and Power.
- Battery Backup: Meter will work for at least three days in absence of power. Readings can be taken even without power, at the press of a key. Inbuilt battery charger to charge battery in presence of power.
- Logs 100 power down, 100 power up and 250 tamper events like CT reversal, phase sequence error, neutral missing/ neutral imbalance with all three phases, voltage imbalance, magnetic switch. Tamper event will also have a electrical system snap shot.
- Fixed window based KVA and KW Max Demand for the running month for both Import and Export.
- Record of last 12 months MD for Import/Export, phase wise average PF of the month for both Import and Export. Minimum - maximum values for 3 phase voltages and currents and all energies.
- Record of last 120 days all energies and on time of feeder control relays in minutes.

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