



# ENERGY AUDITING AND ACCOUNTING METER AS PER CEA GUIDE LINES—PM130EH+ CEA

Innovative Electronics For You

APPLICATION NOTE –5

## M.B. Control & Systems Pvt. Ltd.

PM130EH+ EAA

- Panel mounted Multi-Function Meter
- Fully compliant as per CEA guide lines for Energy Audit and Accounting Meter
- Serial RS485 for MODBUS, DNP3 and IEC– 60870-5-101
- Optional second port for communication—RS485, RS232 or ETH
- Accuracy class 0.2S and 0.5S



## ENERGY AUDITING AND ACCOUNTING METER—CEA GUIDE LINES

As per CEA guidelines published on 17th March 2006 and its amendment dated 4th June 2010, Energy Auditing and Accounting meters are to be installed at following locations to facilitate accounting of energy :generated, transmitted, distributed and consumed.

### i) Generating Stations:

- At a point on the generator stator terminals and before tap-off to the unit auxiliary transformers.
- On each incoming feeder of 3.3KV and above.
- Low voltage side of each incoming transformer feeder of low voltage (415V) bus.
- On all high tension motor feeders.
- On feeders to various auxiliaries.

### ii) Transmission Systems:

- On all incoming and outgoing feeders (if interface meters do not exist)

### iii) Distribution Systems:

- On all incoming feeders (11KV and above).
- On all outgoing feeders (11KV and above)
- On sub-station transformers including distribution transformer.

These special meters allow monitoring of energy losses.



*Satec MFM PM130EH+ with optional Ethernet communication module*

## PM130EH+ EAA

Panel mounted, four quadrant Satec Smart MFM PM130EH+ EAA provides all required electrical parameters as per CEA guidelines with accuracy class 0.2S or 0.5S. The meter comes with one isolated RS485 communication port as standard. This port can be configured for MODBUS RTU, DNP3 or IEC-60870-5-101 communication protocols.

The smart meter also provides option of second communication port . The second communication port can be RS485, RS232 or ETH. The second communication port can be configured for required baud rate and protocol—( MODBUS RTU over RS485 or RS232, MODBUS TCP over ETH , DNP3 over RS485 or ETH, IEC-60870-5-104 over ETH).

PAS software is supplied with each meter. The software enables configuration and operational testing of all meter parameters.

# PARAMETERS AS PER CEA GUIDELINES FOR ENERGY AUDING AND ACCOUNTING METERS

Details of parameters in PMI30EH+ EAA as per CEA guidelines are provided below.

| Sr. No. | Parameter as per CEA guidelines        | MODBUS Register Address in PMI30EH+ CEA     |
|---------|--|---|
| 1       | Apparent Power (KVA)                   | Total KVA—14340                             |
| 2       | Phase wise KW at peak KVA              | KW L1– 29958 KW L2—29960 KW L3– 29962       |
| 3       | Phase wise KVAR (reactive) at peak KVA | KVAR L1– 29964 KVAR L2—29966 KVAR L3– 29968 |
| 4       | Phase wise Voltage at peak KVA         | V1– 29952 V2– 29954 V3–29956                |
| 5       | Power Down Time                        | Power off duration—44210                    |
| 6       | Average Power Factor                   | Total PF—14342                              |
| 7       | Line Currents                          | L1-13958 L2-13960 L3– 13962                 |
| 8       | Phase Voltages                         | V1-13952 V2-13954 V3– 13956                 |
| 9       | Date and Time                          | Date and Time—4352 to 4358                  |
| 10      | Tamper Events Counter                  | Tamper/ Event Counter—44218                 |

Table-1: Parameters required as per CEA Guidelines for Energy and Audit meters.

All the above required parameters can be read via communication ports of PMI30EH+ EAA. Satec power meter PMI30EH+ CEA provides all other electrical parameters also as per details provided in the meter communication manual.

Following tamper events are recorded and counted :

- i) Phase reversal
- ii) Low voltage
- iii) Low Current
- iv) High Voltage Unbalance
- v) High Current Unbalance

Following parameters are also provided in the meter— Billing Profile log of energy registers each month, Number of MD Resets, Maximum Demands, TOU Maximum Demands , four quadrant reactive energies etc.

For logging of Power Down time and proper TOU energies, it is recommended that TOU module be used along with the meter PMI30EH+ CEA. This module also enables time synchronization of the meter RTC via minute pulse.

Meter is password protected. Meter panel can also be sealed if required.

PAS software (supplied with each meter) can be used for downloading parameters logged in the meter.

## ADD ON MODULES AVAILABLE WITH SATEC MFM PMI30EH+ (OPTIONAL)

4DI+2DO • 12DI+4DO • Four Analog Outputs • TOU • RS232/RS485 Communication Port • Ethernet Communication Port • Profibus Communication Port • GPRS Modem

## COMMUNICATION PROTOCOLS AVAILABLE WITH SATEC MFM PMI30EH+ (OPTIONAL)

MODBUS RTU over serial • MODBUS RTU over TCP • Profibus DP • DNP3.0 • IEC-60870-101 • IEC-60870-104



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