

SEM

Smart Energy Manager



Device Description

SEM is a compact and highly capable monitoring and control device for commercial, industrial and utility based energy management applications. It supports most of the common industrial communication protocols (Modbus, IEC104, IEC62056 etc.) as well as those being used for IoT applications (REST, MQTT, CoAP etc.). Owing to its embedded click-on communication board, you can choose any type of media over GSM, Wi-fi, Ethernet, Zigbee or Lora. SEM's power measurement feature provides monitoring of two three-phase circuits simultaneously with a sampling rate of 3.2kHz. Besides, it has an SD Card option up to 32GB to restore data even if there is a loss of communication. Its embedded and expandable digital inputs and outputs make it very easy to have more information from other communicable devices opening the door to a world of connectivity and control.

Device Specifications

Supply Voltage Range	85 - 264 V _{AC}
Nominal Supply Voltage	230V _{AC}
CPU	ARM Cortex-M4 32 Bit 96 Mhz
Flash	1 MB
RAM	320 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	2.3W @ 230 V _{AC}
Real Time Clock	Available
Configuration	Web Server Interface / MCU-CX Configurator

Wi-Fi Specifications

Wi-Fi Protocols	802.11 b/g/n
Frequency Range	2.4 GHz ~ 2.5 GHz (2400M ~ 2483.5M)
Wi-Fi Antenna	External Antenna On board SMA Connector
RF Certification	SRRC, FCC, CE (RED), IC, NCC, KCC, TELEC (MIC)
Wi-Fi Certification	Wi-Fi Alliance
Wi-Fi Mode	Station / SoftAP / SoftAP + Station
Security	WPA / WPA2
Network Protocols	IPv4, TCP / UDP / HTTP / FTP

GSM Specifications

Embedded GSM	Yes (Optional)
Operating Frequencies	Standard (Quad Band GSM module 850/900/1800/1900 MHz)
Number of Connections	6
GSM Antenna	On Board SMA Connector
Ping Blocking	Yes
Stop Bit and Parity Bit Adjustment	Yes
Identification With Phone Number	Yes
Dispatch of warnings and alarms from software as text message to administrators possible	Yes
3G / 4G Connection	Optional

Communication Specifications

Communication Protocols	Modbus-RTU (Slave), IEC60870-5-104, IEC62056-21
Serial Interfaces	RS-485, Micro USB C Type 2.0
Serial Communication Speed	1200bps – 115200bps
USB Data Transfer Speed	480 Mbit/s

Power Measurement Specifications

Voltage Measurement Range	0 - 275 V _{AC,RMS} (L - N), 0 - 500 V _{AC,RMS} (L - L)
Current Measurement Range	1 - 4000 A _{AC,RMS} (Split Type)
Frequency	50 / 60 Hz ±5%
Voltage Channels	3P + N (3 Phase Voltage and Neutral)
Current Channels	2 x 3P (Either 3 Phases or 6 Single Phases)
Sampling Frequency	128 Sample / Cycle
Voltage Accuracy	±0,5%
Current Accuracy	±0,5%
Active Energy Accuracy	IEC 62053-22 Class 0.5S
Accuracy Class	IEC 61000-4-30 Class S
Basic Measurements	V, I, f, P, Q, S / kWh, kVArh, kVAh (Four Quadrant) / PF, cos φ / THD-I, TDD-I, THD-U, THD-V / K-Factor / Ih(1-13) - Vh(1-13)
Detailed Measurements	Outage / Maximum Voltage, Current and Power Demand
Programmable Alarms	Under Voltage / Over Voltage / Low Current / High Current

Environment Conditions

Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidity	25% - 95% RH
Protection Class	IP20

Mechanical Specifications

Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	190gr