

EM133-XM-HACS

ADVANCED *expertmeter™* FOR COMMERCIAL, INDUSTRIAL, SOLAR AND RESIDENTIAL APPLICATIONS. NMI APPROVED WITH NITP 14 VERIFICATION AND AS62052-11 CERTIFICATION.

SATEC *expertmeter™* EM133-XM-HACS can be used for three (3) x single phase applications per NITP-14. By default the EM133-XM-HACS is a smart multifunction 3 phase meter, DIN Rail mounted, Tariff (TOU) Energy Meter designed for Revenue Billing, Energy Management, NABERS/Green Star and approved by National Measurement Institute (NMI) for use as an electricity billing meter.

The EM133-XM-HACS provides 2 pulse inputs for direct connection to pulse output meters, such as cold water, hot water, gas and steam. Expansion Modules provide 4, 8, or 12 additional pulse inputs.

Main Features

Advanced *expertmeter™*

3 Phase & 3 Single Phase Configuration

- Four (4) Quadrant Import/Export (single phase and 3 phase configuration)
- True RMS, volts, amps, power, power factor, voltage and current unbalance, frequency
- Neutral Current Calculation
- Ampere/Volt demand meter
- 50Hz measurements
- HACS Input Ranges refer data sheet
- HACS wiring up to 200m from EM133-XM-HACS
- Energy Test Mode
- Transformer Correction
- 128 samples per cycle
- *8MB of memory
- 5 Year Warranty

Billing/TOU Energy/Solar Meter

- Meter Energy Accuracy Class 0.5S
- System Accuracy Class 1.0 (Meter + HACS)



- Three-phase total and per phase energy measurements; active, reactive and apparent energy counters
- Time-of-Use, 8 totalization and tariff energy/demand registers x 8 tariffs, 4 seasons x 4 types of days, 8 tariff changes per day
- One-time easy programmable tariff calendar schedule
- Automatic daily energy and maximum demand profile log for total and tariff registers
- Cost calculation (upon application)
- CO2 (upon application)

Water and Gas Measurement

- Direct connection to pulse output water and gas meters
- Setting of multiplication factors and units
- Display of consumption in real values
- Up to 14 Digital Pulse Inputs

Harmonic Analyser

- Voltage and current THD, TDD and K-Factor, up to 40th order harmonic
- Voltage and current harmonic spectrum and angles

Real-time Waveform Capture (via PC with "PAS" free licensed software)

- Real-time "scope mode" waveform monitoring capability
- Simultaneous 6-channel 8-cycle waveform capture at a rate of 64 samples per cycle
- Vector analysis

Programmable Logical Controller

- Embedded programmable controller
- 16 control set points; programmable thresholds and delays
- Relay output control
- 1-cycle response time

Event and Interval Data Recording

- Non-Volatile memory with interval data logging for load surveys and Energy usage
- *Interval Data Logging @ 30 minutes = 1365 days
- *Interval Data Logging @ 15 minutes = 682 days
- *Interval Data Logging @ 5 minutes = 227 days
- *Interval/Data Logging time period user definable 1-60 minutes
- *Interval/Data Logging for up to 16 parameters/channels, user definable
- Event recorder for logging internal diagnostic events and setup changes
- Programmable data logs on a periodic basis; automatic daily energy and maximum demand profile log
- Three (3) Data Interval Logs with up to 16 parameters/channels per data log (Total 48) user definable

Display

- Easy to read 2 x 16 Characters LCD display, adjustable update time
- Signal Strength Display Reading for Modem and WiFi Module
- Auto-scroll option with adjustable page exposition time; auto-return to a default page

Real-time Clock

- With backup battery
- Low Battery Indication

Inputs/Outputs

- Built-in 2 Digital Inputs and 1 form A solid state digital output
- Optional module 4 Digital Inputs and 2 digital outputs (Solid State or Electro Mechanical)
- Optional module 8 Digital Inputs.
- Optional module 12 Digital Inputs and 4 digital outputs (plus Ethernet or RS485)
- Optional module 4 Analogue Outputs

Communications

- Standard 2-wire RS-485 communication
- Built-in IR communication port (IEC)

Dual Communications (Add-on Module)

- Optional multipurpose RS-232/422/485 port
- Optional 10/100Base T port
- Optional Wi-Fi
- Optional 3G modem
- Optional 3G modem with 2 Analogue Inputs
- Optional 4G modem (on application)

Communication Protocols

- Modbus RTU
- Modbus TCP/IP
- Modbus Assignable Registers
- MV-90 xi Translation Interface Module (TIM) for EM133-XM

Meter Security

- 3 levels Password security for protecting meter setups and accumulated data from unauthorized changes

Upgradeable Firmware

- Easy upgrading device firmware through Serial, Ethernet, WiFi or Modem communications.

Software Support

- Free Licensed Power Analysis Software (PAS) for configuration, data acquisition and forensic analysis.

eXpertPower™ Cloud Based Software as a Service (SAAS)

- KWH (Energy) Billing
- Water Billing
- Gas Billing
- Energy Management and Power Monitoring
- Power Quality Forensic Analysis
- Data pushed to Cloud Service via Ethernet, WiFi or Modem Communications

Specifications

VOLTAGE INPUTS

Voltage Connections	3 phases, 1 Neutral
Voltage Ratings	Direct voltage connection: <ul style="list-style-type: none"> ➔ 220 to 400V (L-N) ➔ 380 to 690V (L-L) ➔ Range 0-800VAC Via PT (Power Transformer): <ul style="list-style-type: none"> ➔ 57.7 to 120V (L-N) ➔ 100 to 207V (L-L) ➔ Range 0-250VAC
Starting Voltage	0.2% U_N
Input Impedance	$\geq 1M\Omega$
Overload withstand	4000 VAC (L-G) for 1 min.
Impulse Voltage	12kV
Terminal Blocks	4 Sealed, pitch 7-10mm 2.5 to 4 mm ²

CURRENT INPUTS

Current Connections	4 galvanic isolated inputs
Current Ratings	Choice of 3 HACS options: <ul style="list-style-type: none"> ➔ NMI Approved with CS1, CS1L, CS1S (refer HACS Data Sheet)
Starting Current	0.2% I_N
Burden per phase	<0.2 VA (./5A)
Overload (continuous)	$2 \times I_N$ ($1.2 \times I_N$ for 100A model)
Over current	$50 \times I_N$ (for 1 second)
Galvanic isolation	4000 VAC (L-G) for 1 min.
Terminal Blocks	6 Sealed, pitch 7-10mm 4 to 16 mm ²

AUXILIARY POWER SUPPLY

Rated Input	Self Powered
Insulation Dielectric withstand	4000 VAC for 1 min.
Terminal Blocks	2 Sealed, pitch 7-10mm 2.5 to 4 mm ²

BUILT IN COMMUNICATION

Communication Type	RS-485
Max. Baud Rate	115.2 kb/s
Isolation	4000 VAC (L-G) for 1 min.
Max. Cable Length	1000 m
Terminal Blocks	3 Sealed, pitch 7-10mm 2.5 to 4 mm ²

INFRA RED COMMUNICATION

Baud rate	Up to 19.200 kb/s
Protocols	MODBUS RTU

ADD-ON MODULES

Max. # of Modules	1
Available Modules	RS485/RS-232; ETHERNET; Digital I/O; Analogue Output; Modem; WiFi

FRONT PANEL

Display type	2x16 Characters Transflective LCD with backlight
Character size	3.2x1.85 mm
Viewing area	46x11 mm
LEDs	Total 6 LEDs: <ul style="list-style-type: none"> ➔ 1 Pulse calibration output ➔ 3 voltage indication ➔ 2 RX/TX activity
Keypad	2 buttons
Nameplate	According to IEC 60688 and IEC 62052-11

MECHANICAL

Enclosure	DIN Rail mount Complies with EN50022
Dimensions [WxHxD]	125 x 90 x 75mm
Enclosure Material	Reinforced Polycarbonate

TEMPERATURE

Operational	-25°C to 60°C
Storage	-30°C to 85°C

Standards Compliance Specifications

EMC per IEC 60688, AS 62052-11 and

IEC 62052-11

Immunity:

- IEC61000-4-2: Electrostatic discharge, 15/– air/contact
- IEC61000-4-3: Electromagnetic RF Fields, 10V/m @ 80MHz – 1000MHz
- IEC61000-4-4: Fast Transients burst, 4KV on current and voltage circuits and 2 KV for auxiliary circuits
- IEC61000-4-5: Surge 4KV on current and voltage circuits and 1 KV for auxiliary circuits
- IEC61000-4-6: Conducted Radio-frequency, 10V @ 0.15MHz – 80MHz
- IEC61000-4-8: Power Frequency Magnetic Field

Emission (radiated/conducted):

- EN55022: 2010 Class B (CISPR 22)
- FCC p.15 Class A mandatory

Safety

- UL/IEC 61010-1
- AS 62052-11
- IEC 62052-11

Insulation

- Impulse Tested to SP-Method 1618, Impulse Voltage 12KV @ 1.2/50 μ s
- IEC 62053-22: AC voltage tests related to ground, 4 kV AC @ 1min, for power and signal ports (above 40V)
- 2.5KVAC r.m.s. @ 1min, for other ports (below 40V)

Atmospheric Environment

- Operational ambient temperature range: -25°C to +60 °C
- Long-term damp heat withstand according to IEC 68-2-3 <95% (non-condensing), +40 °C
- Transport and storage temperature range: – 30°C to +85 °C
- IEC 60068-2-6: Vibration
- Frequency range: 10Hz to 150Hz
- Transition frequency: 60Hz
- Constant movement amplitude 0.075mm, f<60Hz
- Constant acceleration 9.8 m/s² (1g), f > 60Hz
- Additional Transport vibration and shocks:
- Longitudinal acceleration: 2.0 g
- Vertical acceleration: 1.2 g
- Transversal acceleration: 1.2 g
- Enclosure protection: IP51 (front cover)
- Enclosure protection: IP51 (body) with the addition of grommets supplied separately plus silicon.

Accuracy according to:

- AS/IEC 62053-22, class 0.5S – active energy
- AS/IEC 62053-21, class 0.5 – reactive energy
- IEC 60688, class 0.5S – active energy
- IEC 60688, class 1 – reactive energy

National Measurement Institute (NMI) (Australia)

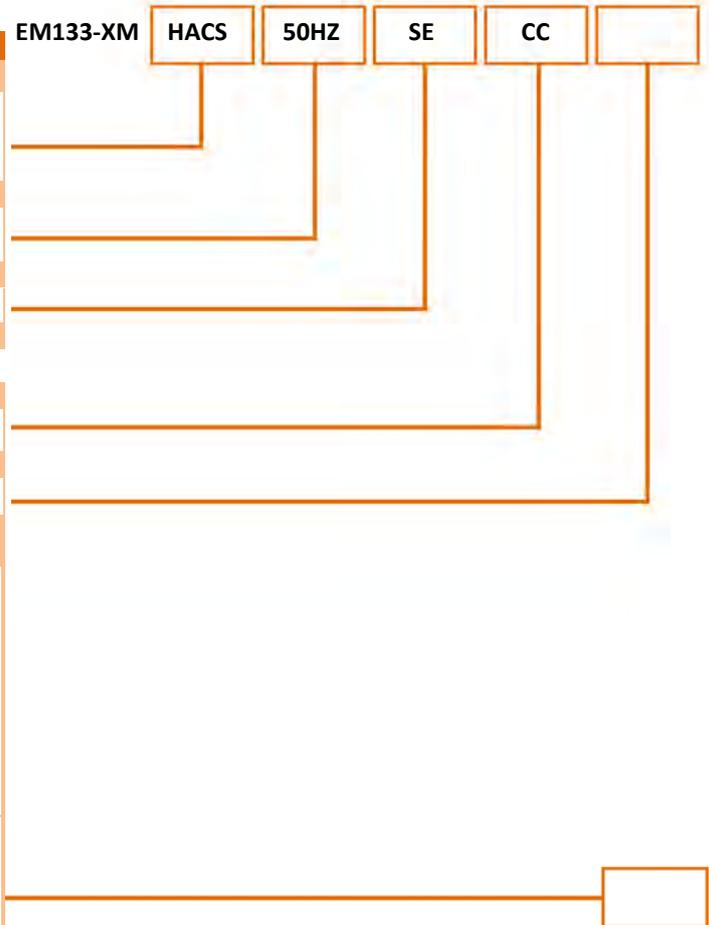
- NMI M6 Compliant
- NMI Approved 14/2/72
- Verification per NITP14 Test Procedures
- ISO17025 Certified Manufacturing Facilities

AER/AEMO/AEMC

- NEM12/13 Data (via eXpertPower Cloud/SAAS or Server version)
- NEM 5 Minute Settlement (5MS) Interval Data
- AS 62052-11

Order String

OPTIONS	
Current Inputs	
HACS (Refer HACS Data sheet) NMI approved CS1, CS1L, CS1S, CS2, CS2S, CS4, CS4L, CS4S, CS8, CS8S, CS12S, CS30S.	
Calibration at Frequency	
50HZ	50HZ
Power Supply	
Self Energised/Powered	SE
RS485/Modbus Communications	
RS485/Modbus	Standard
NMI Approved	
NITP 14 Verification	CC
Expansion Module	
(Max. 1 module per instrument, can be ordered separately)	
4 Analogue Output: ±1mA	
4 Analogue Output: 0-20mA	AO1
4 Analogue Output: 0-1mA	AO2
4 Analogue Output: 4-20mA	AO3
4 Analogue Output: 0-3mA	AO4
4 Analogue Output: ±3mA	AO5
4 Analogue Output: 0-5mA	AO6
4 Analogue Output: ±5mA	AO7
	AO8
Communication: Ethernet (TCP/IP)	ETH-DIN
Communication: RS232/422/485	RS232D
Communication: Modem - 3G*	T3G-x
Communication: Modem 3G with 2 Analogue Inputs*	T3G-x-2AI
Communication: Modem - 4G* Communication	T4T-x
Communication: WiFi	WiFi
4 Digital Inputs (Dry Contact) / 2 Relay Output 250V / 5A AC	DIOR
4 Digital Inputs (Dry Contact)/ 2 SSR Output 250V / 0.1A AC	DIOS
8 Digital Inputs (Dry Contact) / 2 SSR Output 250V / 0.1A AC	8DI
12 Digital Inputs (Dry Contact)/4 Relay Outputs 250V/5A AC	12DIOR-DRC
12 Digital Inputs (48VDC) / 4 Relay Outputs 250V/5A AC	12DIOR-48V
12 Digital Inputs (125VDC) /4 Relay Outputs 250V/5A AC	12DIOR-125V
12 Digital Inputs (250VDC) / 4 Relay Outputs 250V/5A AC	12DIOR-250V
12 Digital Inputs (Dry Contact)/4 Relay Outputs 250V/5A AC, with RS485	12DIOR-DRC-485
12 Digital Inputs (48VDC) /4 Relay Outputs 250V/5A AC, with RS485	12DIOR-48V-485
12 Digital Inputs (125VDC) /4 Relay Outputs 250V/5A AC, with RS485	12DIOR-125V-485
12 Digital Inputs (250VDC) /4 Relay Outputs 250V/5A AC, with RS485	12DIOR-250V-485
12 Digital Inputs (Dry Contact)/4 Relay Outputs 250V/5A AC, with Ethernet	12DIOR-DRC-ETH
12 Digital Inputs (48VDC)/4 Relay Outputs 250V/5A AC, with Ethernet	12DIOR-48V-ETH
12 Digital Inputs (125VDC)/4 Relay Outputs 250V/5A AC, with Ethernet	12DIOR-125V-ETH
12 Digital Inputs (250VDC)/4 Relay Outputs 250V/5A AC, with Ethernet	12DIOR-250V-ETH



*Modem Antennas: x = T - Top or F - Front (other options refer price list)