

ACCURACY CLASS 0.5S
AS 62052-11 CERTIFIED
NITP14 VERIFIED
NMI APPROVED 14/2/72
[View the EM133-XM-HACS product page on satec-global.com.au](https://www.satec-global.com.au)

EM133-XM-HACS

NMI-Approved Smart Multifunction Energy Meter — HACS Remote Current Sensor Input

The EM133-XM-HACS is SATEC's advanced expertmeter™ smart multifunction, DIN rail mounted, tariff (TOU) energy meter for commercial, industrial, solar and residential applications. It can be configured as a three-phase meter or as three (3) single-phase meters per NITP-14, and is approved by the National Measurement Institute (NMI) for use as an electricity billing meter, verified to NITP 14 test procedures and certified to AS 62052-11, and is designed for revenue billing, energy management and NABERS/Green Star reporting.

The EM133-XM-HACS provides 2 built-in digital pulse inputs for direct connection to pulse-output water, hot water, gas and steam meters, with expansion modules available to add 4, 8 or 12 further pulse inputs. It measures three-phase and per-phase active, reactive and apparent energy across four quadrants, with time-of-use registers spanning 8 tariffs, 4 seasons and 4 day types, alongside an embedded programmable logic controller, harmonic analyser and real-time waveform capture.



HACS Remote Sensor

NMI approved with CS1 through CS30S current sensors — see the **HACS datasheet** for the full range

3 Phase / 3 × Single Phase

Configurable as a 3-phase meter or as three (3) single-phase meters per NITP-14

HACS Wiring Distance

Up to 200m between the HACS sensor and the EM133-XM-HACS meter

Main Features

System Accuracy – EM133-XM-HACS + HACS/CTs = Accuracy Class <1.0%

- Four (4) quadrant import/export, 3 phase and 3 single-phase configuration
- True RMS volts, amps, power, power factor, voltage and current unbalance, frequency
- Neutral current calculation
- Ampere/Volt demand meter
- 50Hz measurement
- HACS input ranges — see the **HACS datasheet**
- HACS wiring up to 200m from the EM133-XM-HACS meter
- Energy test mode and transformer correction
- 128 samples per cycle, *8MB of memory
- 3 year warranty

Feature Capabilities

Billing / TOU Energy / Solar Meter

- Three-phase total and per-phase energy measurements; active, reactive and apparent energy counters
- Time-of-Use: 8 totalisation and tariff energy/demand registers × 8 tariffs, 4 seasons × 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
- Meter energy accuracy Class 0.5S; system accuracy Class 1.0 (meter + HACS)

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 period user-definable 1–60 minutes, for up to 16 parameters/channels
- 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 log (48 total), user-definable

Feature Capabilities (continued)

Display

- Easy to read 2 × 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

Meter Security

- 3 levels password security protecting meter setups and accumulated data from unauthorised changes

Upgradeable Firmware

- Easy upgrading of device firmware through serial, Ethernet, WiFi or modem communications

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 RS-485)
- 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 external 4G modem (on application)

Communication Protocols

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

Software Support & Firmware

- **Power Analysis Software (PAS)** – free licensed software for configuration, data acquisition and forensic analysis
- **ExpertPower™** – SATEC's internet-based energy management software
- **eXpertConnect™ App** – mobile connection to the meter for configuration, readings and diagnostics

eXpertConnect™ 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: • 220 to 400V (L-N) • 380 to 690V (L-L) • Range 0–800VAC Via PT (power transformer): • 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	HACS remote current sensor input only – NMI approved with CS1, CS1L, CS1S, CS2, CS2S, CS4, CS4L, CS4S, CS8, CS8S, CS12S and CS30S sensors (refer the HACS datasheet)
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

Specifications (continued)

FRONT PANEL		MECHANICAL	
Display type	2×16 characters transfective LCD with backlight	Enclosure	DIN rail mount, complies with EN50022
Character size	3.2×1.85 mm	Dimensions [W×H×D]	125 × 90 × 75mm
Viewing area	46×11 mm	Enclosure material	Reinforced polycarbonate
LEDs	Total 6 LEDs: • 1 pulse calibration output • 3 voltage indication • 2 RX/TX activity	TEMPERATURE	
Keypad	2 buttons	Operational	–25°C to 60°C
Nameplate	According to IEC 60688 and AS/IEC 62052-11	Storage	–30°C to 85°C

Standards Compliance

EMC Immunity (per IEC 60688, AS 62052-11 & IEC 62052-11)

- IEC 61000-4-2: electrostatic discharge, 15/- air/contact
- IEC 61000-4-3: electromagnetic RF fields, 10V/m @ 80MHz-1000MHz
- IEC 61000-4-4: fast transients burst, 4KV on current and voltage circuits and 2KV for auxiliary circuits
- IEC 61000-4-5: surge 4KV on current and voltage circuits and 1KV for auxiliary circuits
- IEC 61000-4-6: conducted radio-frequency, 10V @ 0.15MHz-80MHz
- IEC 61000-4-8: 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
- AS/IEC 62053-22: AC voltage tests related to ground, 4kV AC @ 1 min, for power and signal ports (above 40V)
- 2.5KVAC r.m.s. @ 1 min, 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, $f < 60$ Hz
- Constant acceleration 9.8 m/s² (1g), $f > 60$ Hz
- Additional transport vibration and shocks – longitudinal acceleration 2.0g, vertical acceleration 1.2g, transversal acceleration 1.2g
- Enclosure protection: IP51 (front cover); IP51 (body), with grommets supplied separately plus silicon

Standards Compliance (continued)

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

AER / AEMO / AEMC

- NEM12/13 data, available via **ExpertPower™** Cloud/SaaS or Server version
- NEM 5 Minute Settlement (5MS) interval data

National Measurement Institute (NMI) (Australia)

- NMI M6 compliant
- NMI approved 14/2/72
- Verification per NITP14 test procedures
- ISO17025 certified manufacturing facilities

Ordering Information

EM133-XM-HACS - **50HZ** - **SE** - **CC**

CURRENT INPUTS

HACS (refer HACS datasheet) – NMI approved **HACS**
 CS1, CS1L, CS1S, CS2, CS2S, CS4, CS4L, CS4S,
 CS8, CS8S, CS12S, CS30S

CALIBRATION AT FREQUENCY

50Hz (standard) **50HZ**

POWER SUPPLY

Self energised / powered **SE**

RS485/MODBUS COMMUNICATIONS

RS485/Modbus (standard) **–**

NMI APPROVED

NITP 14 verification **CC**

Expansion module (max. 1 per instrument) is ordered separately – see the following page.

Ordering Information (continued)

EXPANSION MODULE — MAX. 1 PER INSTRUMENT, ORDERED SEPARATELY

Analogue Outputs

4 analogue output: $\pm 1\text{mA}$	A01
4 analogue output: 0–20mA	A02
4 analogue output: 0–1mA	A03
4 analogue output: 4–20mA	A04
4 analogue output: 0–3mA	A05
4 analogue output: $\pm 3\text{mA}$	A06
4 analogue output: 0–5mA	A07
4 analogue output: $\pm 5\text{mA}$	A08

Communication

Ethernet (TCP/IP)	ETH-DIN
RS232/422/485	RS232D
Modem – 4G (optional external on application)*	T4T-x

*Modem antennas: x = T – top, or F – front (other options refer to price list)

Digital I/O & Relay Outputs

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
As above, with RS485 – dry contact / 48V / 125V / 250V	...-485
As above, with Ethernet – dry contact / 48V / 125V / 250V	...-ETH



PLACE AN ORDER

To place an order or request a quotation for the EM133-XM-HACS, contact the SATEC Australia sales team, or scan the QR code.

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Document Revision History

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