

0.5S ACCURACY CLASS

AS/IEC 62053-22

DIN-RAIL MOUNT

MODULAR I/O

[View SATEC's EM132 Multi-Function Meter on satec-global.com.au](https://www.satec-global.com.au)

EM132

Multi-Function Power Meter & Smart Transducer

SATEC EM132 is a multi-function power meter, ideal for a wide range of applications such as energy management metering, industrial power monitoring and interfacing SCADA in utility substations. Based on SATEC's PM13X family functionality, the EM132 is designed as a DIN-rail mount device equipped with a built-in communication port and an anti-tamper enclosure.

As a smart transducer, the EM132 provides four analogue outputs for selectable power parameters, together with load-shedding and alerting of irregularities, and supports a modular I/O system with up to 16 digital and analogue points. Broad-range frequency measurement from 25Hz to 400Hz and a choice of built-in and optional communication ports make it equally suited to retrofit and new-build metering projects.



EM132

Standard model with a single built-in RS-485 communication port.

EM132-TP

Includes a second built-in RS-485 port (AC/DC power supply model only).

Main Features

Highlights

- Energy meter: Class 0.5S/0.5 accuracy per AS/IEC 62053-22 / ANSI
- Smart transducer: 4 analogue outputs for selectable power parameters, plus load-shedding and alerting of irregularities
- Digital & analogue I/O: modular I/O with up to 16 points
- Broad-range frequency measurement: 25–400 Hz
- Anti-tamper enclosure with DIN-rail mounting

Applications

- Energy management metering
- Industrial power monitoring
- SCADA interfacing in utility substations
- Retrofit and new-build sub-metering, including with SATEC HACS current sensors

Feature Capabilities

Multi-Functional 3-Phase Smart Meter

- True RMS volts, amps, power, power factor, neutral current, angles and unbalance for voltage and current, frequency, symmetrical components and many more
- Ampere/volt demand meter
- 25, 50, 60 and 400Hz measurements
- 128 samples per cycle

Energy Meter

- Accuracy Class 0.5S per AS/IEC 62053-22 / ANSI
- Four-quadrant active and reactive energy polyphase static meter
- Three-phase total and per-phase energy measurements: active, reactive and apparent energy counters
- Automatic logging of daily energy and maximum demand profiles

Real-Time Waveform Capture

VIA PC

Real-time "scope mode" waveform monitoring via PAS software.

Programmable Logical Controller

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

Event and Data Recording

- Non-volatile memory for timestamped event and data recording: over 90 days of half-hourly writing of 4 parameters, recording more than 200 events over the entire period
- Event recorder for logging internal diagnostic events and setup changes
- Two data recorders; programmable data logs on a periodic basis; automatic daily energy log and maximum demand profile

Voltage Inputs

Direct measurement 0–690V AC.

Feature Capabilities (continued)

Current Input Options

- 1A or 5A inputs from CT secondary
- 40mA input designed for SATEC HACS CTs (100–3,000A options)
- 63A or 100A direct connection
- RS: unique input for 5A-rated split-core HACS CTs, ideal for retrofit installation

Digital and Analogue I/O

- Built-in: 2 digital inputs and 1 form-A SSR output
- 4DIO module: 4 digital inputs, 2 relay outputs (SSR or EM relay)
- 12DIO module: 12 digital inputs, 4 relay outputs (with optional Ethernet or RS-485 port)
- 4AO, 8DI and 2AI modules also available – see Specifications for full detail

Communication

PORTS & PROTOCOLS

- On-board: standard 2-wire RS-485; optional second built-in RS-485 port
- Optional interfaces: RS-232/422/485, 10/100BaseT Ethernet, Profibus, 4G cellular modem
- Protocols: Modbus RTU, SATEC ASCII, DNP 3.0, IEC 60870-5-101/104 (optional)

Display

- 2×16 character LCD display; adjustable update time
- Auto-scroll option; auto-return to a default page

Meter Security

3-level password access to meter setups and data.

Software Support & Firmware

- Includes comprehensive Power Analysis Software (PAS) for configuration and data acquisition
- Compatible with SATEC's **ExpertPower™** web-based energy management platform (subscription)
- Connect via the **eXpertConnect™ App** for on-the-go readings and diagnostics
- Any third-party software supporting the open protocol
- Easy firmware upgrading via serial or Ethernet ports

Specifications

VOLTAGE INPUTS

Installation category	Category III
Over-voltage withstand	1,000V AC continuous, 2,000V AC for 1 second
Input impedance	1 MΩ
Wire size	Up to 12 AWG (up to 2.5mm ²)

MODEL WITH AUX. POWER SUPPLY

Nominal voltage	400/690V AC (L-N/L-L)
Measurement range	15–480/828V AC (L-N/L-L)
Frequency range	25–400 Hz
Burden for 400V	< 0.4 VA
Burden for 120V	< 0.04 VA

MODEL SELF-ENERGISED FROM VOLTAGE INPUTS*

Nominal voltage (HACS, 1A/5A/RS5 models)	120/207V AC to 230/400V AC (L-N/L-L); 120/207V AC to 277/480V AC (L-N/L-L)
Frequency range	50/60 Hz
Burden for 277V	< 1.5 VA
Burden for 120V	< 2 VA

* Not available with the EM132-TP model.

CURRENT INPUTS

Current connections	3 galvanically isolated inputs
Current ratings	../5A CT; ../1A CT; direct up to 63A ^{**} ; remote CT (40mA)
Starting current	0.2% I _n
Burden per phase	<0.2 VA (../5A); <0.05 VA (../1A)
Overload (continuous)	2×I _n (1.2×I _n for 100A model)
Over current	50×I _n for 1 second
Galvanic isolation	4,000V AC (L-G) for 1 min.
Terminal blocks	6 sealed, pitch 7–10mm, 4 to 16 mm ²

AUXILIARY POWER SUPPLY

Rated input	57.7–277V AC; 48–290V DC
Tolerance	@V AC = ±15%; @V DC = ±10%
Insulation dielectric withstand	4,000V AC for 1 min.
Burden	5VA
Terminal blocks	2 sealed, pitch 7–10mm, 2.5 to 4mm ²

OPTIONAL POWER SUPPLY

Rated input	12–24V DC
Tolerance	±20%

^{**} Connecting up to 100A is possible under certain conditions (up to 55°C ambient temperature).

Specifications (continued)

OPTIONAL MODULAR I/O – ELECTROMECHANICAL RELAY

Dry contact	1 contact (SPST Form A)
Rating	5A/250V AC; 5A/30V DC
Galvanic isolation	Contacts–coil: 3,000V AC 1 min; open contacts: 750V AC
Operate time	10 ms max
Release time	5 ms max
Update time	1 cycle
Wire size	14 AWG (up to 1.5 mm ²)

OPTIONAL MODULAR I/O – SOLID STATE RELAY

Dry contact	1 contact (SPST Form A)
Rating	0.15A/250V AC/DC
Galvanic isolation	3,750V AC 1 min
Operate time	1 ms max
Release time	0.25 ms max
Update time	1 cycle
Connector / wire size	Removable, 4 pins; 14 AWG (up to 1.5 mm ²)

OPTIONAL MODULAR I/O – DIGITAL INPUTS

Dry / wet contacts	Internally wetted @ 24V DC, or wet contact @ 250V DC (12DI/4DO only)
Sensitivity	Open >100kΩ; closed <100Ω
Galvanic isolation	3,750V AC 1 min
Internal power supply	24V DC, 4DI/2DO or 12DI/4DO
External power supply	250V DC (12DI/4DO only)
Scan time	1 ms
Connector / wire size	Removable, 5 pins; 14 AWG (up to 1.5 mm ²)

OPTIONAL MODULAR I/O – ANALOGUE OUTPUTS

Ranges (upon order)	±1mA / 0–1mA (max. 5kΩ, 100% overload); 0–20mA / 4–20mA (max. 510Ω)
Isolation	2,500V AC 1 min
Power supply	Internal
Accuracy	0.5% FS
Update time	1 cycle
Connector / wire size	Removable, 5 pins; 14 AWG (up to 1.5 mm ²)

Specifications (continued)

BUILT-IN COMMUNICATION – SERIAL (RS-485)

Max. baud rate	115.2 kb/s
Optical isolation	3,000V AC (L-G) for 1 min.
Max. cable length	1,000 m
Protocols	Modbus RTU/ASCII; DNP 3.0; IEC 60870-5-101 (option)
Terminal blocks	3 sealed, pitch 7-10mm, 2.5 to 4 mm ²

COM2 (OPTIONAL MODULE) – ETHERNET PORT

Availability	Independent module or add-on to 12DIOR module; plug-in DIN-rail mount 73×90×32mm, or plug-in no-mount
Interface	Transformer-isolated 10/100BaseT Ethernet
Supported protocols	Modbus/TCP (port 502), IEC 60870-5-104, DNP3/TCP (port 20000)
Simultaneous connections	4 (2 Modbus/TCP + 2 DNP3/TCP)
Connector type	RJ45 modular
Isolation	1,500V DC @ 1 min

CELLULAR PORT

Supported protocols	Modbus/TCP (port 502), DNP3/TCP (port 20000)
Connector type	SMA

PROFIBUS DP (IEC 61158)

Interface	RS-485 optically isolated Profibus
Connector type	Removable, 5 pins
Baud rate	9,600 bit/s – 12 Mbit/s (auto-detect)
Data	32 bytes input, 32 bytes output; PROFIBUS DP

RS-232/422-485 PORT

Interface	RS-232 or RS-422/485, optically isolated
Isolation	3,000V AC 1 min
Baud rate	Up to 115.2 kbps
Supported protocols	Modbus RTU, DNP3, SATEC ASCII, IEC 60870-5-101
Connector type	Removable 5-pin (RS-422/485); DB9 (RS-232)

FRONT PANEL

Display type	2×16 character transfective LCD with backlight
Character size	3.2×1.85 mm
Viewing area	46×11 mm
LEDs	6 total: 1 pulse calibration output, 3 voltage indication, 2 RX/TX activity
Nameplate	According to IEC 60688 & IEC 62052-11

CONSTRUCTION

Enclosure	DIN-rail mount, complies with EN50022
Dimensions [W×H×D]	125 × 90 × 75mm
Enclosure material	Reinforced polycarbonate
Enclosure protection	IP20

ENVIRONMENTAL CONDITIONS

Operational	–25°C to 60°C (–13°F to 140°F)
Storage	–30°C to 85°C (–22°F to 185°F)

Standards Compliance

EMC Immunity (IEC 60688 & IEC 62052-11)

- **IEC 61000-4-2:** Electrostatic discharge, 15/8kV 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, 2kV for auxiliary circuits
- **IEC 61000-4-5:** Surge, 4kV on current and voltage circuits, 1kV for auxiliary circuits
- **IEC 61000-4-6:** Conducted radio-frequency, 10V @ 0.15MHz–80MHz
- **IEC 61000-4-8:** Power frequency magnetic field

EMC Emission (Radiated / Conducted)

- EN 55022:2010 Class A (CISPR 22)
- FCC Part 15 Class A (mandatory)

Safety

- UL / IEC 61010-1
- UL 916

Insulation

- **IEC 62052-11:** Insulation impulse 6kV/500Ω @ 1.2/50 μs
- **AS/IEC 62053-22:** AC voltage tests related to ground, 4kV AC @ 1 min, for power and signal ports (above 40V)
- 2.5kV AC r.m.s. @ 1 min, for other ports (below 40V)

Accuracy According To

- AS/IEC 62053-22, Class 0.5S – active energy
- IEC 62053-21, Class 0.5 – reactive energy
- IEC 60688, Class 0.5S – active energy
- IEC 60688, Class 1 – reactive energy
- ANSI C12.20, Class 0.5

Ordering Information

MODEL — CURRENT — CAL. FREQ. — RES. — POWER — SEAL — PROTOCOL

Order-code bar condensed for width — mechanical and electronic seal are two separate code positions; see the segment tables below for the full breakdown.

MODELS		RESOLUTION	
EM132: Multi-function transducer	EM132	Low resolution 1A, 1V	—
EM132-TP: EM132 with two integral RS-485 ports (AC/DC power supply only)	EM132-TP	High resolution 0.01A, 0.1V	H
CURRENT INPUTS		POWER SUPPLY	
5 Ampere	5	40–300V AC/DC	ACDC
1 Ampere	1	Self-energised: powered from measured voltages (120–277V L-N), 50/60Hz models only. Not suitable for EM132-TP	SE
Direct current measurement up to 63A*	63	12V/24V DC power supply. Not suitable for EM132-TP	21DC
Direct current measurement up to 100A* (up to 55°C ambient)	100		
5A split-core remote High Accuracy Current Sensor (HACS)*	RS5	MECHANICAL SEAL	
High Accuracy Current Sensors (HACS)**	HACS	Standard seal	—
High Accuracy Current Sensors (HACS), with wires	HACS-SPDR	Special seal	S
CALIBRATION AT FREQUENCY		ELECTRONIC SEAL	
25 Hz (supports 1A and 5A models only)	25HZ	Energy register is accessible	—
50 Hz	50HZ	Energy register is protected	P
60 Hz	60HZ	COMMUNICATION PROTOCOL	
400 Hz (supports 1A and 5A models only)	400HZ	Modbus and DNP 3.0	—
		Modbus and IEC 60870-5-101/104***	870
		TESTING AND CERTIFICATE	
		Full functional test, calibration at various work loads & detailed test report	—
		All of the above, plus ISO 17025 & ILAC certified calibration certificate	CC

* For 50/60Hz only. ** For 50/60Hz only, requires ordering of 3 HACS. *** –104 requires ETH; not compatible with AR version, does not work over cellular network.

Ordering Information (continued)

Expansion Module – maximum 1 module per instrument, can be ordered separately.

ANALOGUE OUTPUTS		DIGITAL INPUTS	
4 analogue outputs: $\pm 1\text{mA}$	A01	4 DI (dry contact) / 2 relay outputs, 250V/5A AC	DIOR
4 analogue outputs: 0–20mA	A02		
4 analogue outputs: 0–1mA	A03	4 DI (dry contact) / 2 SSR outputs, 250V/0.1A AC	DIOS
4 analogue outputs: 4–20mA	A04		
4 analogue outputs: 0–5mA	A07	8 DI (dry contact)	8DI
4 analogue outputs: $\pm 5\text{mA}$	A08		
COMMUNICATION		12 DIOR MODULE	
Ethernet (TCP/IP) for DIN rail	ETHD	12 digital inputs / 4 relay outputs, 250V/5A AC	12DIOR
Profibus	PRO	Digital input rating – dry contact (DRC), 48V, 125V or 250V	DRC/48V/125V/250V
RS232 (for DIN rail enclosure)	RS232D	Communication port: none	-
RS232/422/485	RS232	Communication port: RS-485	485
CAT-M / LTE modem – x: G=Europe, V=Verizon (US), A=AT&T (US), T=Telstra (AUS); y: T=Top Antenna, F=Front Antenna*	LTEEx-y	Communication port: Ethernet	ETH

* Does not support 870 protocol. Supplied with bendable antenna.

Place An Order



To place an order or request a quotation for the EM132, contact the SATEC Australia sales team, or scan the QR code.

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Document Revision History

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