Vantor VM-31

Single Phase DIN Rail Smart Meter, WiFi/4G/LoRaWAN

The Vantor VM-31 Single-Phase DIN Rail Smart Energy Meter is a high-precision, multifunctional energy monitoring device designed for residential, commercial, microgrid, and prepaid metering applications.
Built with an advanced integrated DSP measurement chip , the VM-31 delivers accurate energy measurement, prepaid functionality, multi-rate billing statistics, and flexible communication options including RS485, WiFi, 4G LTE, and LoRaWAN .
The meter supports automated data collection, remote control, and network disconnection continuation, helping to reduce manual meter reading errors while improving billing accuracy and energy management efficiency.

Packed and sold in boxes of 10.



Key Features

- High-precision single-phase energy meter with integrated DSP technology
- Direct-connect meter up to 80A (no external CTs required)
- Measures:
  - Single-phase voltage and current
  - Active, reactive, and apparent power
  - Active, reactive, and apparent energy
  - Power factor
  - Frequency
- Four-quadrant energy statistics
- Multi-rate energy billing capability
  - Up to 5 tariff rates per day
  - 14 time zones per year
  - 24 time periods per day
  - Up to 8 time period tables
- 12-month frozen energy consumption data record
- Prepaid functionality with built-in magnetic latching relay
- Remote charging and load control
- Energy data disconnection and continuation function
- Storage of up to 7 days of 15-minute interval energy data
- Automatic data supplementation after network reconnection
- LED pulse output
- 1 channel passive optocoupler pulse output
- Built-in real-time clock with maintenance-free battery
- 35mm DIN rail mounting for quick and easy installation

Communication Options – VM-31 Series

The VM-31 supports multiple communication methods to suit different project requirements:

- RS485 (Standard) – Modbus-RTU protocol
- WiFi Communication Version
- 4G LTE Communication Version (CAT1 module)
- LoRaWAN Communication Version

Important: Only one wireless communication option (WiFi / 4G / LoRaWAN) can be selected per meter.

Supported protocols

- Modbus-RTU
- MQTT (optional for WiFi / 4G versions)

Meters with WiFi or 4G include built-in communication hardware – no external modem required.
Infrared communication is supported for easy WiFi/4G configuration and APN settings.

Prepaid & Remote Control Functions

- Integrated magnetic latching relay for load switching
- Remote power on/off control
- Supports prepaid metering and remote top-up
- Ideal for tenant billing and energy management systems

Technical Specifications

Measurement Capabilities

- Voltage and current
- Active / reactive / apparent power
- Power factor
- Frequency
- Active and reactive energy
- Four-quadrant energy statistics

Input Ratings

- Rated Voltage: AC 110V / 220V
- Rated Current: 0.2 – 80A direct input
- Frequency Range: 45 – 65 Hz

Accuracy

- Voltage: ±0.2%
- Current: ±0.2%
- Active Power: ±0.5%
- Reactive Power: ±2.0%
- Active Energy: Class 1.0 (Level B)
- Reactive Energy: ±2.0%
- Power Factor: ±0.5%
- Frequency: ±0.02 Hz

Communication

- Interfaces: RS485 / WiFi / 4G / LoRaWAN
- Protocols: Modbus-RTU, MQTT
- Baud rate: 1200 – 9600 bps

Electrical Characteristics

- Operating Voltage: AC 110V / 220V
- Overall Power Consumption: <2VA
- Power Frequency Withstand Voltage: AC 2kV/min
- Insulation Resistance: >50MΩ
- Impact Voltage: 5kV (1.2/50μs)

Environmental Specifications

- Operating Temperature: –10°C to +55°C
- Storage Temperature: –20°C to +75°C
- Relative Humidity: 5% – 95% (non-condensing)
- Maximum Altitude: ≤3000 m

Mechanical & Installation

- Standard 35mm DIN rail mounted
- Compact modular design
- Dimensions: 101 × 77 × 76 mm
- Backlit LCD display
- Easy installation and maintenance

Applications

- Prepaid electricity billing
- Residential and commercial energy monitoring

- Microgrid power measurement
- Automatic meter reading
- Remote load control
- Smart building energy management

Key Advantages

- High measurement accuracy
- Direct-connect up to 80A
- Built-in prepaid functionality
- Multiple wireless communication options
- Data continuity after network loss
- Compact DIN-rail design
- Ideal for smart metering and IoT integration

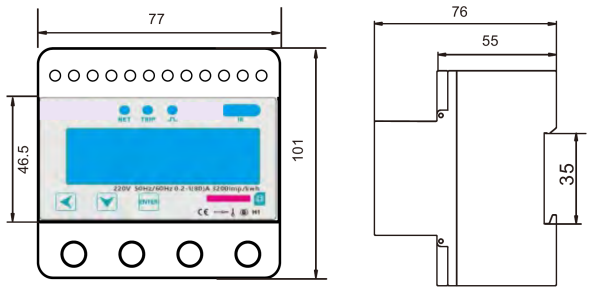
Ordering information

Order code	Description
VM-31-4G	4G
VM-31-WiFi	Wifi
VM-31-LoRa	LoRaWAN

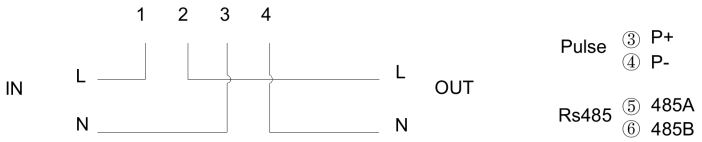
Technical data

Accuracy	Voltage / current	±0.2 %
	Active power	±0.5 %
	Reactive power	±2.0 %
	Active energy	Class 1.0 (Class B)
	Reactive energy	±2.0 %
	Power factor	±0.5 %
	Frequency	±0.02 Hz
	Clock	< 0.5 s/day
Inputs	Rated voltage	AC 110 V / 220 V, 45 - 65 Hz
	Rated current	0.2 - 80 A direct
	Consumption	< 2 VA
Mechanical	Mounting	35 mm DIN rail
	Dimensions (W × H × D)	77 × 101 × 76 mm
	Front window	46.5 mm high; 55 mm rail-to-front depth
Insulation	Power-frequency withstand	AC 2 kV for 1 minute, input / output / supply
	Insulation resistance	> 50 MΩ
	Impulse voltage	5 kV peak, 1.2/50 µs
EMC	Electrostatic discharge	IEC 61000-4-2, Level 4
	Electrical fast transient / burst	IEC 61000-4-4, Level 4
	Surge immunity	IEC 61000-4-5, Level 4
	Power-frequency magnetic field	IEC 61000-4-8, Level 4
Environment	Operating temperature	-10 to +55 °C
	Storage temperature	-20 to +75 °C
	Relative humidity	5 - 95 %, non-condensing
	Altitude	≤ 3000 m

Dimensions and wiring



Dimensions in mm



Typical wiring: line and neutral IN and OUT on the main terminals 1 - 4; pulse output P+ / P- and RS485 A / B on the signal terminals.

Standards and compliance

Standard	Scope
IEC 61000-4-2	Electrostatic discharge immunity - Level 4
IEC 61000-4-4	Electrical fast transient / burst immunity - Level 4
IEC 61000-4-5	Surge immunity - Level 4
IEC 61000-4-8	Power-frequency magnetic field immunity - Level 4
Modbus RTU / DL/T645-2007 / MQTT	Communication protocols

Installation must be carried out by a qualified electrician in line with SANS 10142-1. Isolate the supply before working on the meter, fit the protection shown, and never open-circuit the secondary of a live current transformer.