

Cumulus

Beyond Energy Measurement

Advanced Smart Energy Meter — Switch Electric

DATASHEET & USER MANUAL

REV. 1.0



Document Overview

This document is divided into two major sections — a **Datasheet** covering product specifications, capabilities, and communication details; and a **User Manual** covering installation, wiring, mounting, and operation. Read all sections before performing any operation on the meter.

Section 1 — Datasheet

- Product Introduction
- Product Properties
- Technical Specifications
- Measurement Capabilities
- Event Detection
- Communication Specifications

Section 2 — User Manual

- Parts List & Package Contents
- Installation Precautions
- Safety Guidelines
- Mounting Instructions
- Wiring: Single Phase
- Wiring: Three Phase
- Display Mapping

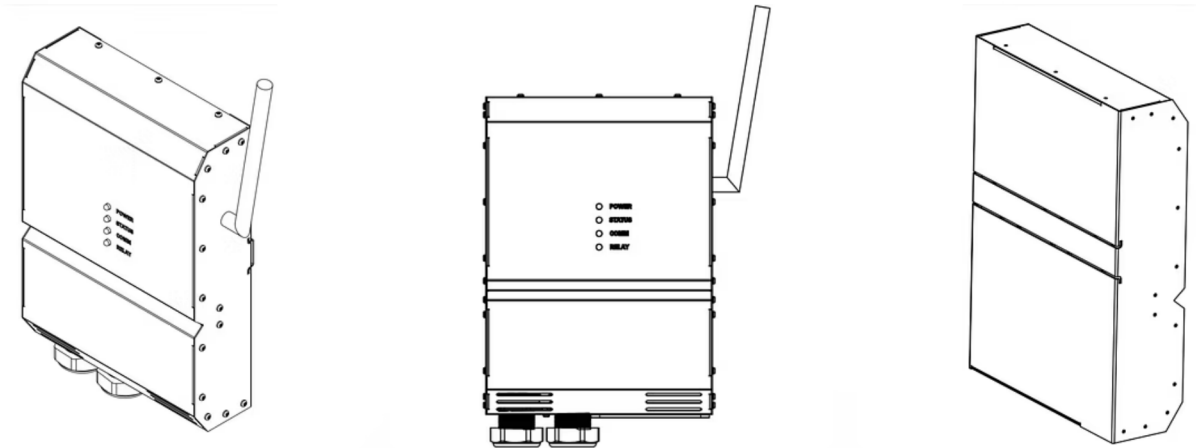


Contents may be periodically updated or revised due to product development. The latest version is available at docs.whynotswitch.com

Product Introduction

Cumulus is an advanced smart energy meter delivering accurate energy measurement, intelligent monitoring, and seamless energy management across modern electrical infrastructures. Designed for residential, commercial, and industrial applications.

Cumulus combines high precision polyphase metering, real time communication, and remote monitoring within a compact, field ready platform.



High Accuracy

$\pm 0.1\%$ active energy · $\pm 0.2\%$ reactive energy
over 6000:1 dynamic range

Polyphase Metering

3-Phase 4-Wire direct connect up to 300A
Single-phase up to 80A

LoRaWAN® Wireless

Long range Sub-GHz · Up to 15 km rural
AES-128 encrypted

IP54 Enclosure

Indoor/Semi-sheltered outdoor rated
-20°C to +80°C operating range

Technical Specifications

Product Properties

Accuracy & Metering

- Active energy: $\pm 0.1\%$
- Reactive energy: $\pm 0.2\%$
- Dynamic range: 6000:1
- 3-Phase 4-Wire direct: up to 300A I_{max}
- Single-phase: up to 80A I_{max}
- Simultaneous independent poly-source metering
- Programmable event detection

Security & Cryptography

- AES 256-bit hardware encryption
- True random number generator (RNG)
- 64-bit UID (IEEE 802-2001 compliant)
- 96-bit unique die identifier
- Hardware public key accelerator (PKA)
- Secure key storage: up to 16 keys/certificates
- Turnkey message encryption with protected keys

Datasheet

Parameter	Value	Unit
Operating Voltage (L-N)	180 – 240	V
Operating Voltage (L-L)	400 – 480	V
Nominal Frequency	45 – 65	Hz
Operating Temperature	-20 to +80	°C
Single-Phase Current (I _{max})	80	A
Polyphase Current (per phase)	300	A
Self-Consumption	≤ 2	W
Accuracy Class	1	—
CT Primary Range	1 – 300	A

Parameter	Value	Unit
CT Secondary	5	A
Display	4 × LED	—
Protection Rating	IP54	—
Mounting	DIN Rail / Wall	—

Measurement & Communication

Measurement Capabilities

Parameter	Supported
Voltage (1Ø / Split Phase / 3Ø)	✓
Current	✓
Active Power	✓
Reactive Power	✓
Apparent Power	✓
Active Energy	✓
Reactive Energy	✓
Frequency	✓
Power Factor	✓
Phase Angle	✓
Neutral Current	✓
Reverse Energy (Net Metering)	✓

Event Detection

Event	Detected
Phase Loss	✓
Phase Reversal	✓
Reverse Power Flow	✓
Voltage Sag	✓
Voltage Swell	✓
Overcurrent	✓
Neutral Current Alarm	✓
THD+N Over-Threshold	✓
Frequency Deviation	✓

Communication Specifications

LoRaWAN® Wireless

Integrated Sub-GHz radio ·
2–5 km urban · 10–15 km
rural · Auto network
join/rejoin · Real-time
telemetry transmission

Security

AES-128 end-to-end
encryption · Unique Device
EUI · Network &
Application Session Keys ·
Hardware-assisted crypto ·
Secure authentication

Network Performance

Low-power continuous
operation · High scalability
for distributed
deployments · Automatic
retry · Binary/JSON
payload via gateway



Communication range varies by terrain, obstacles, and regional RF regulations. Ensure antenna is installed before powering the device.

Parts List & Installation Precautions

Package Contents

Inspect the packaging before installation. Confirm all items are present and undamaged. Contact Switch Electric support if any component is missing or damaged.



Cumulus Meter Unit

Main meter unit with integrated SSR, CT sensor, and LoRaWAN antenna port



LoRaWAN Antenna

Sub-GHz antenna for wireless communication — must be installed before powering on



Mounting Hardware

DIN rail clips, terminal screws, and enclosure fasteners included



Documentation

Quick start guide, warranty card, and compliance certificates

Installation Site Requirements

✓ Acceptable Conditions

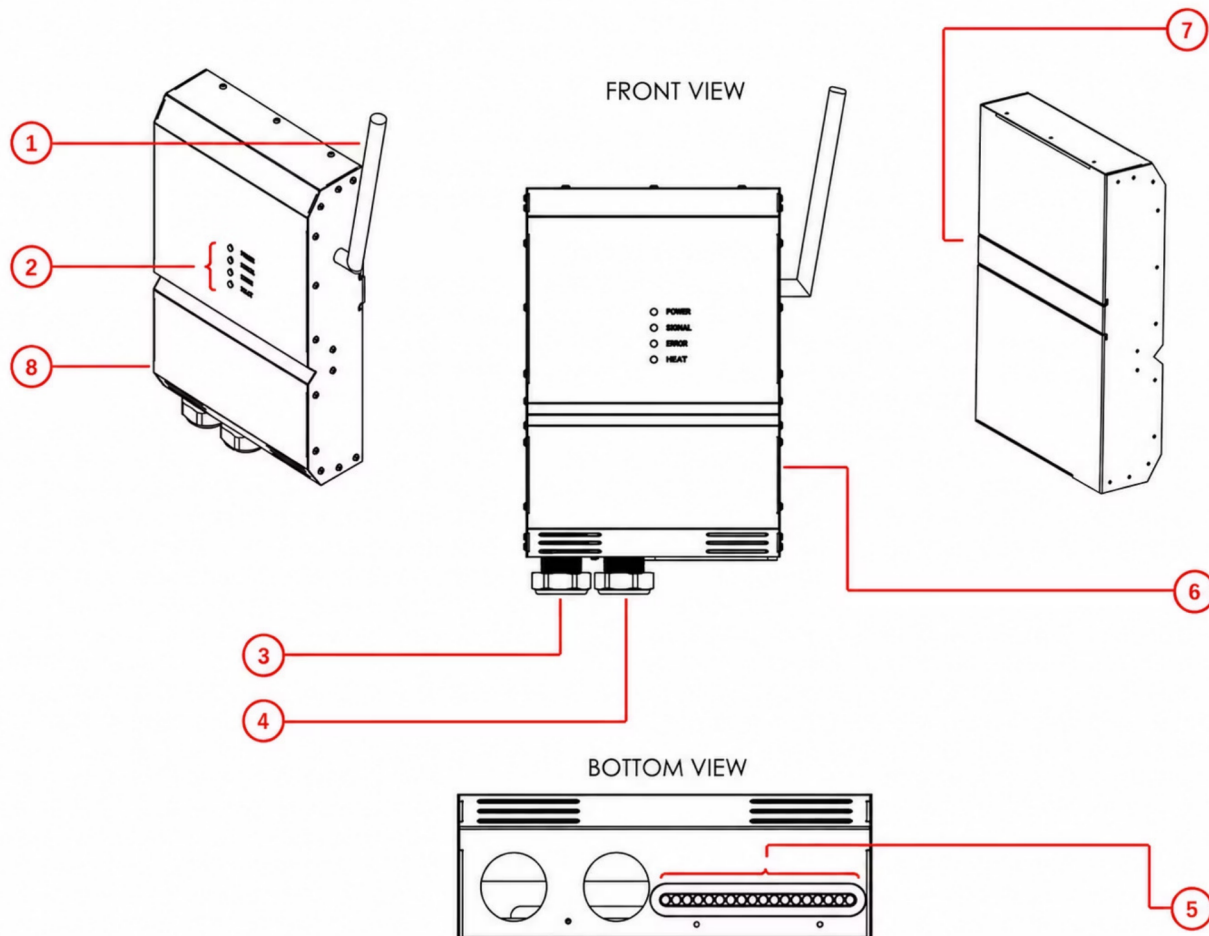
- Indoors or outdoors (IP54 rated)
- DIN rail or wall mount surface
- Adequate ventilation around enclosure
- Protected from prolonged water exposure
- Ambient temperature: -20°C to +80°C

❑ Avoid These Conditions

- Direct sunlight exposure
- Areas with flammable materials
- Direct cool air flow
- Humidity above 95%
- Rain, snow, or standing water

Wiring & Display Mapping

Product Overview — Port Identification



Item	Label	Description
1	Antenna	LoRaWAN antenna port — install before power-on
2	LED Displays	Power · Status · Relay · COMM indicators
3	Single Phase IN	Live (L) and Neutral (N) input — 25mm gland
4	Single Phase OUT	Neutral (N) and Live (L) output — 25mm gland

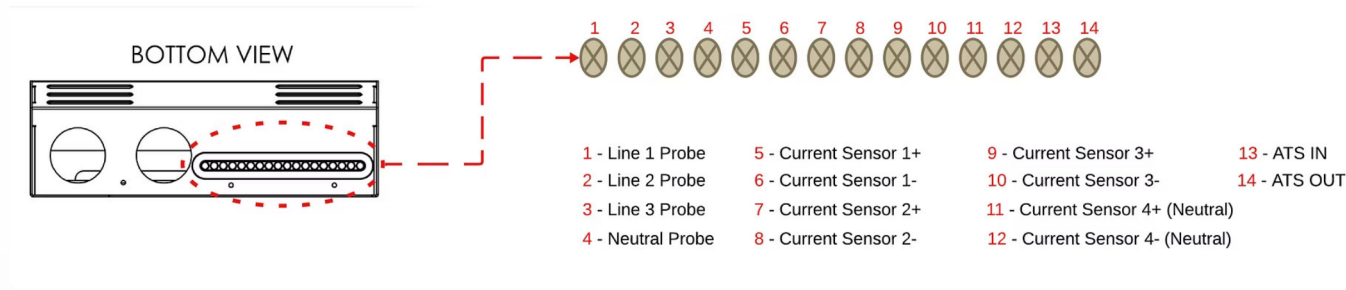
Item	Label	Description
5	Polyphase Ports	3Ø voltage probes and CT sensor connections
6	Terminal Compartment	Internal wiring and signal control pins
7	DIN Rail Mount	Standard 35mm DIN rail mounting groove
8	Air Vent	Ventilation slot — maintain clearance

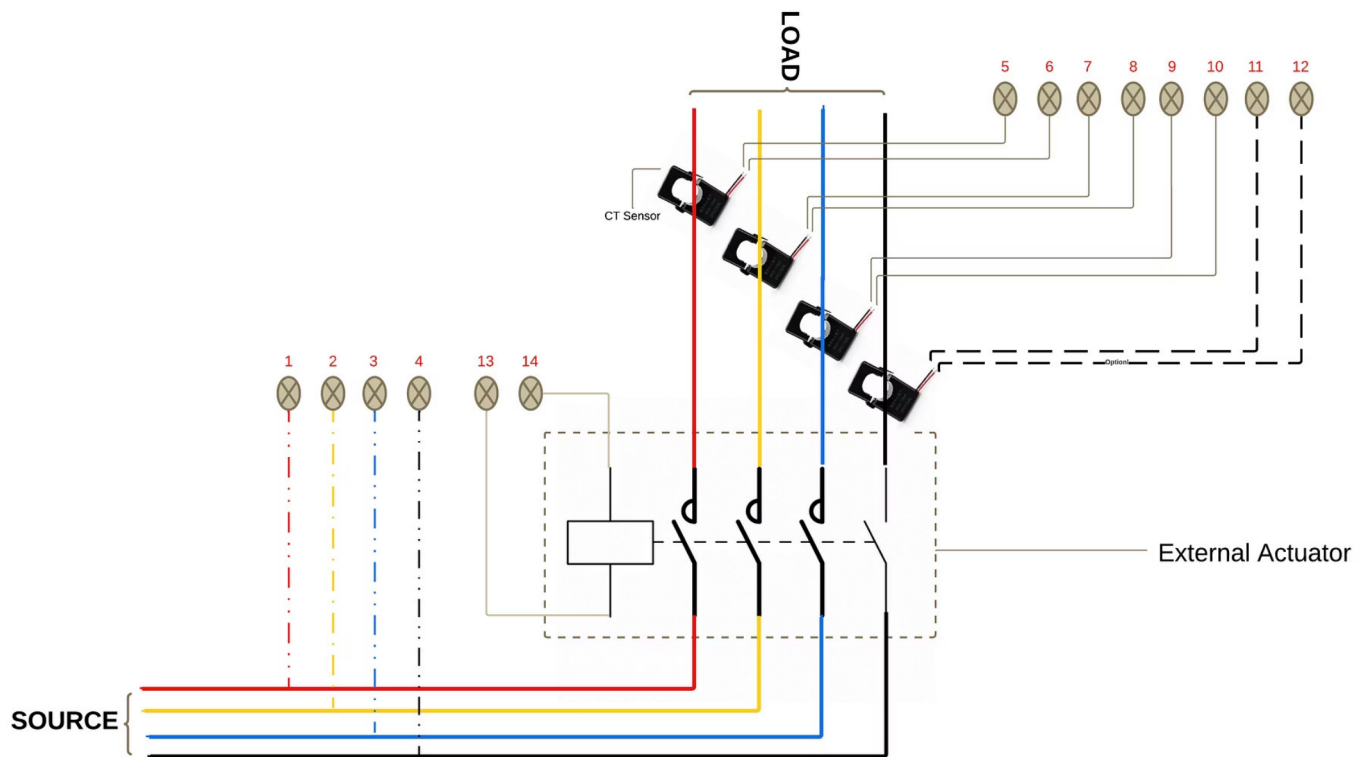
Single Phase Wiring

- Use Ports 3 (IN) and 4 (OUT)
- 25mm cable glands — max two 16mm conductors per gland
- Live IN → Neutral IN · Neutral OUT → Live OUT
- Inbuilt SSR rated at 80A (input to output)
- Inbuilt CT sensor — no external CT required

Three Phase Wiring

- Port 5 activated for voltage probes and external CT sensors
- External CT: primary 1–300A, secondary 5A output only
- Signal control pins activated for external Contactor/ATS
- Internally connected to SSR control signal
- Supports 3-Phase 4-Wire direct connect up to 300A





Safety Guidelines & Mounting



Electrical Safety

- Qualified personnel only
- De-energize all circuits first
- Verify zero voltage before touching conductors
- Comply with local electrical codes
- Do not exceed rated voltage/current
- Install antenna before powering on



Mechanical Safety

- Mount on structurally sound surfaces
- Secure enclosure before energizing
- Avoid mechanical impacts
- Do not modify the enclosure
- Maintain antenna clearance



Environmental Safety

- Protect from prolonged water exposure
- Maintain ventilation around enclosure
- Operating range: -20°C to +80°C
- Avoid high-humidity (>95%) locations



RF Safety

- Antenna must be installed before power-on
- Maintain recommended antenna clearance
- Follow local RF transmission regulations
- Keep antenna away from metal objects

Mounting Instructions

Remove the metal terminal cover by unscrewing the fasteners before wiring. The meter features a standard DIN rail mounting groove (Item 7) compatible with 35mm DIN rails. For wall mounting, use the provided bracket hardware and ensure the enclosure is level and securely fastened.

Display Mapping

LED Label	Color	Frequency	Meaning
Power	Green	Constant	Device powered
Status	Blue	Constant	Gateway connection successful
	Red	Constant	Gateway connection unsuccessful
	Orange	Flashes at 15 seconds	Attempting to connect to Gateway
COMM	Blue	Flashes 3 times at data dump interval	Data transfer
	Green	Constant	Load Connected
	Red	Constant	Load Disconnected
Relay	Red	Constant	Load Disconnected



Refer to the latest firmware guide at docs.whynotswitch.com for LED status code definitions and troubleshooting.