OrionM2M

THREE-PHASE AC ENERGY METERING MODULE

NEM-6L24

Modbus-RTU · accuracy class 1 % · external CTs up to 100 A



01 FEATURES

- Per-phase metering: U, I, P / Q / S, PF, frequency, energy
- Accuracy class 1 % across all measured values
- Modbus-RTU over RS-485 and UART TTL, galvanically isolated
- External CTs up to 100 A — solid-core or clamp-on
- Ultra-low self-consumption — 0.3 W typ., powered from mains
- Non-volatile energy counters up to 399 999 999.9 kWh

APPLICATIONS

- Energy submetering of HVAC and ventilation units
- BMS / SCADA integration
- Measurement & verification of energy savings
- Retrofit of existing switchboards

02 GENERAL

Wiring	**3-ph, 3 / 4**	wire
Voltage range	**50 … 566**	V
Nominal voltage	**220 / 380**	V
Current range	**0 … 100**	A · CT
Frequency	**45 … 65**	Hz
Accuracy	**1**	%
Self-consumption	**0.3 / 2**	W typ/max
Operating temp.	**–20 … +60**	°C
Dimensions	**116×76×27.8**	mm
Mounting	**DIN-rail**	35 mm
Weight (PCB 51 g)	**107**	g

03 OUTPUTS & ISOLATION

CF pulse width	**10**	ms, open-drain
RS-485 / UART	**galvanically**	isolated
Current inputs	**3 × external CT**	solid/split
Voltage inputs	**L1 · L2 · L3 · N**	

04 MEASUREMENT

Power P / Q / S, /ph	**0 … 38**	kW/kvar/kVA
Power factor	**0 … 1**	0.01
Active energy	**≤ 399 999 999.9**	kWh
Reactive / apparent	**kvarh / kVAh**	
Phase angles	**0 … 360**	° · 0.01
CF pulse constant	**1000**	imp/kWh

05 COMMUNICATION

Protocol	**Modbus-RTU**	
Interfaces	**RS-485 / UART**	TTL
Baud rate (def. 9600)	**2400 … 115200**	bps
Device address (def. 1)	**1 … 247**	

06 METERING & ADDRESSING

Reference current	**Ib 10 / Imax 100**	A
Rated frequency	**50 / 60**	Hz sel.
Addressing	**DIP / software**	

07 ORDER INFO

SKU	DESCRIPTION
NEM-6L24-[CT] CT kit included (3 pcs)	**Three-Phase AC Energy Metering Module** **CT KIT — SELECT** · 100C — 100 A solid core · 100S — 100 A split core (clamp-on) **INTERFACES — BUILT-IN** · RS-485 Modbus-RTU · UART TTL (3.3 / 5 V)

Request a quote & full spec: bms@orion-m2m.com · www.orion-m2m.com

NEM-6L24

INTEGRATION REFERENCE

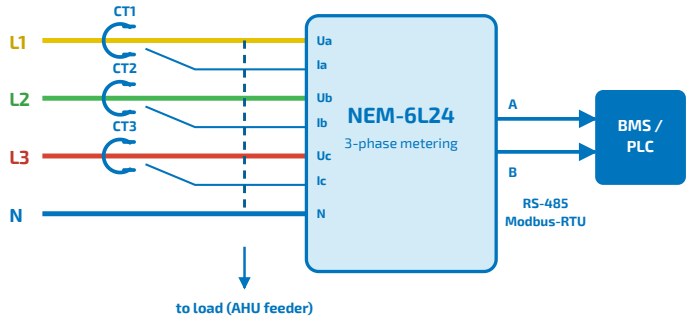
08 MODBUS-RTU PROTOCOL

Read measurements	**FC 0x04**	
Read / write config	**FC 0x03 / 0x06**	
Calibration (factory)	**FC 0x41**	pwd 0x3721
Energy counter reset	**FC 0x42**	
Frame	**8N1 + CRC-16**	
Address range	**1 … 247**	0 = bcast

09 CONFIGURATION REGISTERS

0x0000 device address	**1 … 247**	
0x0001 baud rate code	**0 … 6**	2400–115200
0x0002 wiring mode	**4-wire / 3-wire**	def. 4

10 TYPICAL CONNECTION



· Observe CT phase order and S1/S2 polarity

· Set wiring mode (3- / 4-wire) before measurement; power-cycle the module after changing

Three-phase four-wire connection (default)

11 TERMINALS

Voltage	**L1 · L2 · L3 · N**	
Current (CT)	**CT1 · CT2 · CT3**	S1/S2
Comms	**A / B · TX / RX · CF**	
Interface supply	**VCC · GND**	3.3–5.5 V

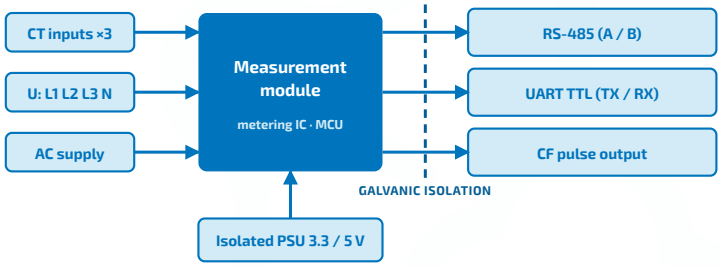
12 MEASUREMENT REGISTERS — FC 0x04

Address		Format	
0x0000–0002	Voltage, phase A / B / C	0.1 V	· u16
0x0003–0005	Current, phase A / B / C	0.01 A	· u16
0x0006–0008	Frequency, phase A / B / C	0.01 Hz	
0x0009–000A	Voltage angle B / C (vs A)	0.01°	
0x000B–000D	Current angle A / B / C	0.01°	
0x000E–0013	Active power A / B / C	0.1 W	· s32
0x0014–0019	Reactive power A / B / C	0.1 var	· s32
0x001A–001F	Apparent power A / B / C	0.1 VA	· s32
0x0020–0021	Combined active power	0.1 W	· s32
0x0022–0023	Combined reactive power	0.1 var	· s32
0x0024–0025	Combined apparent power	0.1 VA	· s32
0x0026	PF phase A (Hi) / B (Lo)	0.01	
0x0027	PF phase C (Hi) / total (Lo)	0.01	
0x0028–0029	Active energy, phase A	0.1 kWh	· u32
0x002A–002B	Active energy, phase B	0.1 kWh	· u32
0x002C–002D	Active energy, phase C	0.1 kWh	· u32
0x002E–0033	Reactive energy A / B / C	0.1 kvarh	· u32
0x0034–0039	Apparent energy A / B / C	0.1 kVAh	· u32
0x003A–003B	Combined active energy	0.1 kWh	· u32
0x003C–003D	Combined reactive energy	0.1 kvarh	· u32
0x003E–003F	Combined apparent energy	0.1 kVAh	· u32

U voltage · I current · f / φ angles · P / Q / S power · PF · E energy

32-bit values (power / energy): low 16-bit word first, then high.

13 FUNCTIONAL DIAGRAM



14 TYPICAL APPLICATION

