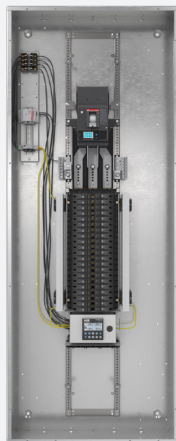


ReliaGear® lighting panelboard

RGLPM branch circuit monitoring



The use of branch circuit monitoring provides a cost-effective integrated solution for ReliaGear® lighting panelboard power monitoring and submetering applications.

Overview

With exceptional performance, the RGLPM BCM system monitors key electrical parameters of the various branch circuits and optional main/subfeed circuits of the panelboard.

This information can be transmitted via the Ethernet port to analyze usage, identify potential cost-saving measures and improve load management. Offering IEC 61557-12 and ANSI C12.20 Class 0.5 revenue-grade metering accuracy, the BCM meter can be used for tenant billing and cost allocation.

The ReliaGear® lighting panelboard comes enclosure mounted with the RGLPM BCM system completely integrated, including current sensors, eliminating the need for any field installation or modifications. This integrated solution can help you meet the measurement and verification points required by the LEED and green building design, ASHRAE 90.1 and IECC energy codes.

A split-core branch circuit monitor is now available as another option to the standard solid-core monitoring feature. The split-core current sensors allow the operator to monitor only the circuits needed. The BCM unit can be factory integrated in the following ReliaGear® panelboards up to 800 amps: RQ, RE or RS.

Benefits

- Analysis of potential cost-saving actions
- Verify energy bills
- Identify wasteful practices and decrease unnecessary usage
- Fairly and accurately allocate energy costs to users
- User-configurable alarm registers assist with load management
- Secure the optimum utility rate structure
- Load balancing for peak/off-peak maximization
- Accurately distinguish between load types where required by regulation

Features

- Solutions up to 800 A
- Reports volts, amps, power and energy for each circuit
- Solid-core multi-sensor strip monitors 42 (2x21) or 84 (4x21) circuits (and optional mains/subfeeds)
- 21-circuit solid-core BCM strip — up to 120 A monitoring
- Configurable as 21 single-phase circuits, 7 three-phase circuits or a mix of single-phase, two-phase and three-phase circuits
- Ability to set the flow direction and numbering of the circuits
- Class 0.5 accuracy for active energy according to IEC 61557-12 and ANSI C12.20 standards
- Optional solid-core or split-core sensors
- RGLPM BCM (plus sensors) monitors up to 66 circuits in a main breaker panel and up to 84 circuits in a main lug panel
- Four configurable alarm thresholds improve load management
- Modbus TCP communication via Ethernet
- BACnet IP and SNMP v1, v2 and V3 communication Ethernet
- Modbus RTU communication via RS485
- RGLPM display module — Multi-point data display and communication gateway
- Rapid Set system software — free of charge — enables the configuration of multiple identical panels with a “duplication” function and provides time-saving configuration templates enabling the initial design to be adapted with ease
- Dedicated cybersecurity features referring to IEC 62443 to help ensure the confidentiality, integrity and availability of data and reduce the risk of cyberattacks

Applications

- Energy monitoring in building automation systems
- Renewable energy
- Energy management
- Commercial submetering
- Industrial monitoring
- Cost allocation California Title 24 Building Code compliant
- Compliant with ASHRAE 90.1 and IECC energy codes

RGLPM BCM technical specification

Inputs	
Input power	1P/3P, 50/60 Hz, 90–277 V AC
Max. solid core multi-sensor strip current	120 A

Accuracy	
Power/energy	Class 0.5 per IEC61557-12 and ANSI C12.20 standards
Voltage	Class 0.2
Voltage frequency	Class 0.02
Frequency range	45 to 65 Hz
Current — Solid-core BCM multi-sensor strip	Class 0.5
Current — Solid-core sensor type TE	Class 0.2
Current — Split-core sensor type iTR	Class 0.2
Current — Split-core sensor type TR	Class 0.5

Communications	
Ethernet RJ45 10/100 Mbps	Ethernet gateway: Modbus TCP, Bacnet IP, SNMP v1, v2, v3 and traps
RS485 2–3 wires	Configurable as input (master) or output (slave)
RGLPM system bus	ABB RJ45 cable
RGLPM sensor connection	ABB RJ12 cable
USB-Micro B	Configuration via Rapid Set software

Mechanical	
Panel module interconnects	Quick RJ45 connection between modules
Split-core and solid-core sensor connection	RJ12 for current sensors

Environmental	
Ambient operating temperature	+14 to +131 °F (-10 to +55 °C)
Storage temperature	-40 to +158 °F (-40 to +70 °C)
Operating humidity	40 °C, 95% RH
Operating altitude	6561 ft (2000 m)

Measuring characteristics

Measurement accuracy	According to IEC 61557-12 PMD DD classification in association with dedicated sensors (TE, TR/iTR) Uses embedded sensors and wiring to avoid overall system uncertainty
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Voltage measurement — RGLPM U module

Voltage range	50–300 V AC (Ph/N) — 87–520 V AC (Ph/Ph) — CAT III
Accuracy of voltage measurement	Class 0.2
Frequency range	45–65 Hz
Accuracy of frequency measurement	Class 0.02
Service type	Single-phase/two-phase/two-phase with neutral/three-phase/ three-phase with neutral
Measurement by voltage transformer	Primary: 400,000 V AC Secondary: 60, 100, 110, 173, 190 V AC
Input consumption	≤ 0.1 VA
Permanent overload	300 V AC Ph/N
Rated impulse voltage	IEC 60947-1 V. IMP: 6.4 kV

Current measurement — RGLPM BCM2125R

Number of integrated current inputs	21
Accuracy of current measurement	Class 0.5
Nominal current I_n	40 to 100 A
Maximum current I_{max}	120 A
Number of RJ12 auxiliary current inputs	3
Associated current sensors	Solid-core RGLPM TE, split-core RGLPM TR/iTR
Accuracy of current measurement (3xRJ12 connections)	Class 0.2 RGLPM BCM-2125R module alone Class 0.5 system accuracy (with RGLPM TE or iTR sensors) Class 1 system accuracy (with RGLPM TR sensors)

Current measurement — RGLPM I-31R, RGLPM I-61R

Number of current inputs	RGLPM I-31R (3); RGLPM I-61R (6); RGLPM I-35R (3)
Associated current sensors	Solid-core RGLPM TE, split-core RGLPM TR/iTR
Accuracy of current measurement	Class 0.2 I-31R/I-61R module alone Class 0.5 system accuracy (with RGLPM TE or iTR sensors) Class 1 system accuracy (with RGLPM TR sensors)

Energy and power measurement

Active power/energy accuracy	For RGLPM I-31R and I-61R: - Class 0.2 accuracy RGLPM I-31R/I-61R module alone - Class 0.5 system accuracy (with TE or iTR sensors) - Class 1 system accuracy (with TR sensors) For RGLPM BCM-2125R: - Class 0.5 accuracy for integrated current sensors (x21) - Class 0.5 system accuracy for external RJ12 inputs (with TR or iTR sensors) - Class 1 system accuracy for external RJ12 inputs (with TR sensors)
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Reactive power accuracy	For RGLPM I-31R and I-61R: - Class 1 accuracy RGLPM I-31R/I-61R module alone - Class 2 system accuracy (with TE or iTR sensors) - Class 1 system accuracy (with TR sensors) For RGLPM BCM-2125R: - Class 1 accuracy for integrated current sensors (x21) - Class 1 system accuracy for external RJ12 inputs (with TR or iTR sensors) - Class 2 system accuracy for external RJ12 inputs (with TR sensors)
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Reactive energy accuracy	For RGLPM I-31R and I-61R: - Class 2 system accuracy (with TE, TR or iTR sensors) For RGLPM BCM-2125R: - Class 1 accuracy for integrated current sensors (x21) - Class 2 system accuracy for external RJ12 inputs (with TE, TR or iTR sensors)
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Power factor measurement

Accuracy	For RGLPM I-31R and I-61R: - Class 0.5 system accuracy (with TE or iTR sensors) - Class 1 system accuracy (with TR sensors) For RGLPM BCM-2125R: - Class 1 accuracy for integrated current sensors (x21) - Class 0.5 system accuracy for external RJ12 inputs (with TE or iTR sensors) - Class 1 system accuracy for external RJ12 inputs (with TR sensors)
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Electrical characteristics

Input voltage	480 V AC/277 V AC; 240/120 V AC; 208/120 V AC
Link with RGLPM U voltage module	The RGLPM U voltage module is linked to the RGLPM D-50 by a proprietary RGLPM bus with RJ45 connectors.

Communication characteristics

RGLPM RJ45 bus

Function	Connection between RGLPM D-50, U, I and BCM modules
Cable type	ABB RGLPM cable with RJ45 connectors

RS485

Connection type	2–3 half-duplex wires
Protocol	Modbus RTU
Baudrate	9600 to 115200 baud
Function	Communication of measurement data from the complete RGLPM system to external EPMS/BMS software
Location	Single point on RGLPM D-50 display
Connection	Removable screw terminal block, 3 positions, stranded or solid 0.14–1.5 mm ² cable. Use copper conductors only.

Ethernet

Connection type	RJ45 10/100 Mbps
Protocol	Modbus TCP/IP, BACnet IP, SNMP v1,v2.v3. HTTP(S), FTP(S), SMTP(S), MQTT
Function	Communication of measurement data from the complete RGLPM system to external EPMS/BMS software.

USB

Protocol	Modbus RTU over USB
Function	Firmware upgrade and configuration of RGLPM modules
Location	On RGLPM D-50 display
Connection	USB-Micro B connector located on front panel

Environmental characteristics

Ambient storage temperature	-10 to +70 °C (+55 °C for RGLPM BCM-2125R) (IEC 60068-2-1/IEC 60068-2-2)
Storage temperature	-25 (-40 for RGLPM BCM-2125R) to +70 °C (IEC 60068-2-1/IEC 60068-2-2)
Operating humidity	25°C, 97% RH and 55 °C, 93% RH (IEC 60068-2-30)
Operating altitude	< 2000 m
Location	NEMA 1, NEMA 3R
Vibration	0.35 mm, 25 Hz, 20 min./axe (IEC 61557-12)
Impact resistance	Front panel: 1J casing: 1J (IEC 61010-1 Ed 3.0)

Monitoring functions for RGLPM solid-strip BCM and split-core sensors

Monitoring at branch circuits	BCM-2125R	I-35R	I-31R/ I-61R
General measurements			
± kWh	X	X	X
±kvarh	X	X	X
kVAh	X	X	X
Load curves/demand profiles	X	X	X
Multi-measurement			
I1, I2, I3, In	X	X	X
$\Sigma P, \Sigma Q, \Sigma S, \Sigma PF$	X	X	X
P, Q, S, PF per phase	X	X	
Current unbalance (Inba, Idir, linv, Ihom, Inb)	X	X	
Phase angle	X	X	X
Voltage measurement — phase to phase	X	X	X
Ph/N unbalance, Ph/Ph unbalance	X	X	
Multi-load current measurement	X	X	X
Operation across 4 quadrants	X	X	
predictive power	X	X	
Power quality			
THDi1, THDi2, THDi3, THDiN, THDisys and harmonics up to 63rd for voltage and current	X	X	
K-factor	X	X	
Crest factor I1, I2, I3	X	X	
Overcurrent	X	X	
Alarms			
Measurement thresholds	X	X	
System alarms	X	X	
Protection alarms			X (with ITR sensors)
Protection counters			X (with ITR sensors)
Boolean combination of alarms	X	X	
Trends			
Average values	X	X	
Advanced features			
Virtual monitor technology			X (with ITR sensors)
Auto correct technology	X		X (with ITR sensors)

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RGLPM system modules (factory wired and interconnected via RGLPM RJ45 bus)

Modules	Details
RGLPMD50 display module	Display unit that acts as a viewing node and gateway, centralizing measurements from RGLPM devices and making them available over Ethernet
RGLPMBCM21 solid-core multi-sensor strip	Robust plastic cover safeguards 21 sensors and electronic components to reduce risk of breakage (max. 120 A)
Solid-core sensor type TE	
RGLPMCTE25 solid core (1pk)	RGLPM 0.8–192 A solid core (1) Class 0.5 TE25
RGLPMCTE35 solid core (1pk)	RGLPM 1.26–300 A solid core (1) Class 0.5 TE35
RGLPMCTE45 solid core (1pk)	RGLPM 3.2–756 A solid core (1) Class 0.5 TE45
Split-core sensor type TR/iTR	
RGLPMCT0K split core (6pk)	RGLPM TR10 0.5–75 A split core sensor (6) with I-61R module
RGLPMCT1K split core (6pk)	RGLPM TR14 0.64–160 A split core sensor (6) with I-61R module
RGLPMCT2K split core (6pk)	RGLPM TR21 1.26–200 A split core sensor (6) with I-61R module
RGLPMCT3K split core (3pk)	RGLPM TR32 4–600 A split core sensor (3) with I-31R module
RGLPMCTR10 split core (1pk)	RGLPM TR10 0.5–75 A split core (1) Class 1 TR10
RGLPMCTR14 split core (1pk)	RGLPM TR14 0.64–120 A split core (1) Class 1 TR14
RGLPMCTR21 split core (1pk)	RGLPM TR21 1.26–200 A split core (1) Class 1 TR21
RGLPMCTR32 split core (1pk)	RGLPM TR32 4–600 A split core (1) Class 1 TR32
RGLPMI61	Current input module — 6 RJ12 port current in/1 RJ45 out
RGLPMI31	Current input module — 3 RJ12 port current in/1 RJ45 out
RGLPMI35	Power quality current input module — 3 RJ12 port current in/1 RJ45 out
RGLPMU30	Voltage-sensing module
RGLPM power supply plate	Fuse-protected 24 V power source (with as required control power transformer), and DIN-rail provision for voltage-sensing module
RJ45 industrial bus cables	Connection cables for RGLPM bus between system modules
RJ12 industrial sensor cables	Connection cables for unit mount sensor to 3 port of 6 port current module

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Mechanical characteristics

Casing type	DIN-rail mounting module and base
Mechanical strength	IK06

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