Datasheet

RGB-621-R1 RGB Lighting Control Module

Part No.: RGB-621-R1

Manufacturer: ISYSTEMS AUTOMATION S.R.L.

Hardware Version: V1.0

Architecture: Modular (MCU Board + Field Board)

Controller: RP2350A

Functional Overview

The RGB-621-R1 is a DIN-rail mounted RGBCCT lighting control module for 12-24 V DC LED systems. It provides five low-side MOSFET LED outputs (R, G, B, CW, WW), two 24 V digital inputs, one relay output, RS-485 Modbus RTU communication, and USB-C configuration interface.

Board	Function
MCU Board	RP2350A controller, RS-485 communication, USB-C interface, power conversion
Field Board	MOSFET LED outputs, Relays, DI

The module operates as a Modbus RTU slave over RS-485 and supports configuration and firmware update via USB-C.

Technical Specifications

Specification	Details
Microcontroller	RP2350A dual-core microcontroller
Storage	External QSPI Flash (32 Mbit)
Power Input	24 V DC nominal (18–30 V DC recommended)
Input Protection	1 A time-lag fuse, reverse polarity diode, TVS surge suppression, EMI filtering
Main Logic Supply	Buck regulator 24 V → 5 V (~4.96 V nominal), 3.3 V LDO regulator
LED Outputs	5 × low-side MOSFET outputs (R, G, B, CW, WW)
LED Output Voltage	External 12-24 V DC supply
Maximum Total LED Current	Limited by 5 A input fuse (shared across channels)
Recommended Current per Channel	≤ 1000 mA per channel (recommended)
Relay Outputs*	1 × SPST-NO dry-contact relay
Rated Load (System Limit)	3 A @ 250 VAC (resistive contact rating)
Max Load @ 250 VAC	750 VA (system limit)
Max Load @ 30 VDC	90 W (system limit)
Relay Component Rating (Informative Only)	Relay components are rated up to 12 A @ 250 VAC (resistive); however, this rating does not apply to the complete module
Digital Inputs	2 × isolated 24 V DC discrete inputs (DIx + GND), supporting dry-contact closure protected by per-channel PTC fuse, TVS surge suppression, and EMI filtering.
User Interface	2 buttons, 8xLEDs(Power, 2 user LEDs, RX, TX, 1xRelay, 2xDI)
RS-485	Half-duplex Modbus RTU with surge protection and fail-safe biasing
USB	USB-C, 5 V logic, ESD protected
Typical Power Consumption	0.2–0.5 W

*Relay outputs are **not internally fused**. External overcurrent protection must be provided in accordance with applicable standards and installation requirements. Use appropriately rated fuses or circuit breakers and consider external contactors for loads exceeding 3 A or for inductive and high inrush loads.

Typical module power consumption: 0.2–0.5 W (logic only).

Maximum module power consumption: approximately 1W.

Top Terminal Block (1–9)

Front view – terminals numbered from left to right.

Pos	Marking	Signal	Description
1	+	LED_V+	24 V DC LED supply input

2	–	LED_0V	LED power return
3	V+	+24V	24 V DC module supply input
4	0V	0V	Module power return
5	NO	RELAY_NO	Relay normally open
6	C	RELAY_COM	Relay common
7	I1	DI1	Digital input 1
8	GND	DI1_GND	Digital input return
9	I2	DI2	Digital input 2

Bottom Terminal Block (9–18)

Front view – terminals numbered from left to right.

Pos	Marking	Signal	Description
10	R	LED_R	Red LED channel (low-side output)
11	G	LED_G	Green LED channel (low-side output)
12	B	LED_B	Blue LED channel (low-side output)
13	CW	LED_CW	Cool white LED channel (low-side output)
14	WW	LED_WW	Warm white LED channel (low-side output)
15	COM	LED_COM	LED common positive (+24 V)
16	A	RS485_A	RS-485 A line
17	B	RS485_B	RS-485 B line
18	COM	RS485_COM	RS-485 COM

Installation, Environmental & Mechanical

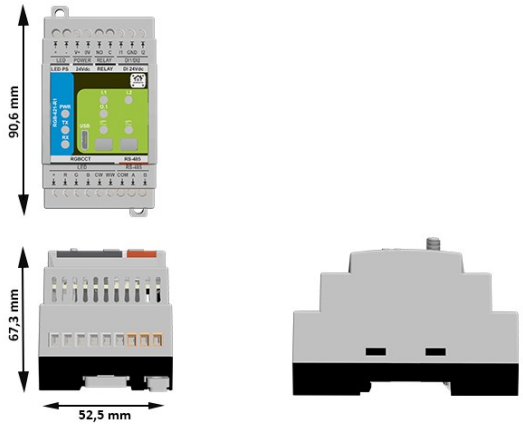
Specification	Details
Terminal Type	Pluggable screw terminal blocks, 5.08 mm pitch
Wire Cross Section	0.2–2.5 mm^2 (AWG 24–12)
Tightening Torque	0.4–0.6 Nm

Specification	Details
Operating Temperature	0 °C to +40 °C
Storage Temperature	−10 °C to +55 °C
Relative Humidity	0–90 % RH, non-condensing
Ingress Protection	IP20 (inside cabinet only)
Maximum Altitude	2000 m
Pollution Degree	2

Specification	Details
Dimensions	52.5 × 90 × 59 mm (L × W × H)
DIN units	3 division units (≈ 53 mm DIN rail mounting width)
Net weight	Xxx g
Gross weight	Xxx+98 g
Pack size	140× 125 × 94 mm (L × W × H)
Mechanical drawing	Front + side views with DIN-clip depth (see below)
Notes	All dimensions shown in millimeters unless stated otherwise
Mounting	35 mm DIN rail (EN 50022)
Enclosure Material	PC/ABS, UL94-V0

Install only inside a control cabinet with ventilation; the cabinet must include a protective front plate covering all module connection terminals and a closing protective door; not for outdoor or exposed installation.

All wiring terminals must be protected against accidental contact by an insulating front plate, wiring duct, or terminal cover. Exposed live terminals are not permitted.



Cable Recommendations & Shield Grounding

This section applies to RS-485. Use shielded, twisted constructions and bond shields correctly to reduce EMI and ground-loop issues.

General Routing Rules

- Route low-level signal cables separately from power wiring.
- If crossing power cables is unavoidable, cross at 90°.
- Keep cable runs as short as practical.
- Avoid parallel runs with high-current conductors.

RS-485 Cable

- Twisted pair recommended (120 Ω characteristic impedance).
- Shielded cable recommended in industrial environments.
- Use one twisted pair for A/B.
- Use second conductor as COM reference if required.

Examples: J-Y(ST)Y 2×2×0.5 mm² or LI2YCY PiMF 2×2×0.50

Shield Grounding

- Bond cable shield(s) to cabinet PE/EMC ground at one end (PLC side recommended).
- Do not connect shields directly to signal terminals (A/B/COM).

Compliance & Certifications

The RGB-621-R1 module is CE marked and designed to comply with applicable European Union directives. The manufacturer maintains technical documentation and a signed EU Declaration of Conformity (DoC).

EMC 2014/30/EU · LVD 2014/35/EU · RoHS 2011/65/EU

Standards: EN 61000-6-1 · EN 61000-6-3 · EN 62368-1 · EN IEC 63000

Safety Notice

The power input and signal terminals are SELV circuits.

Installation by qualified personnel only.

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