

Model CUB®5V - Miniature Electronic 5-Digit DC Voltmeter

Installation Guide

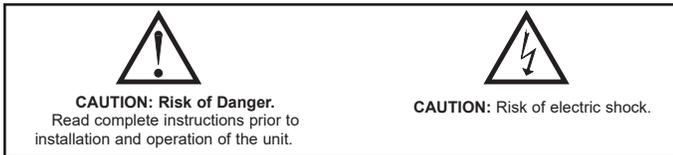


See the Red Lion website at www.redlion.net for full user manual.

SAFETY SUMMARY

All safety related regulations, local codes as well as instructions that appear in this document or on equipment must be observed to ensure personal safety and to prevent damage to either the device or equipment connected to it.

Do not use these products to replace proper safety interlocking. No software-based device (or any other solid-state device) should ever be designed to be responsible for the maintenance of personnel safety or consequential equipment not equipped with safeguards. Red Lion disclaims any responsibility for damages, either direct or consequential, that result from the use of this equipment in a manner not consistent with these specifications.



ORDERING INFORMATION

DESCRIPTION	PART NUMBER
DC Volt Meter with reflective display	CUB5VR00
DC Volt Meter with backlight display	CUB5VB00

SPECIFICATIONS

1. **POWER:** Input voltage range is +9 to +28 VDC with short circuit and input polarity protection.

MODEL NO.	DISPLAY COLOR	INPUT CURRENT @ 9 VDC WITHOUT CUB5RLY0	INPUT CURRENT @ 9 VDC WITH CUB5RLY0
CUB5VR00	---	10 mA	40 mA
CUB5VB00	Red (max intensity)	85 mA	115 mA
CUB5VB00	Green (max intensity)	95 mA	125 mA

2. **DISPLAY:** 5 digit LCD 0.48" (12.2 mm) high digits
CUB5VR00: Reflective LCD with full viewing angle
CUB5VB00: Transmissive LCD with selectable red or green LED backlight, viewing angle optimized. Display color change capability with output state when using an output module.

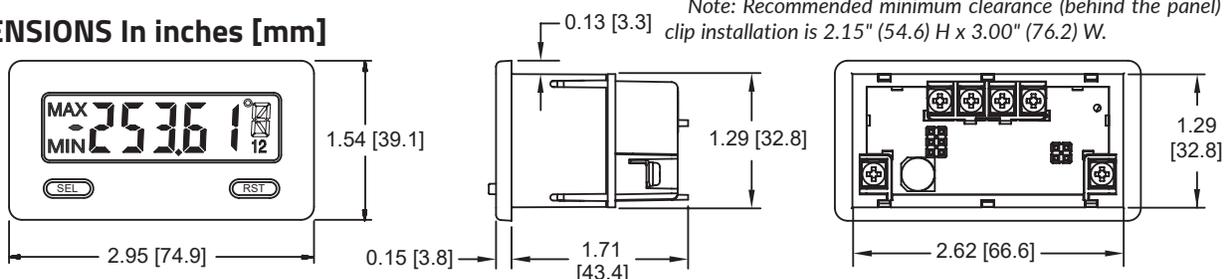
3. **INPUT RANGES:** Jumper Selectable
D.C. Voltages: 200 mV, 2 V, 20 V, 200 V

4. **RESPONSE TIME:**
Display: 500 msec min.
Output: 800 msec max (with input filter setting of 0)

5. **USER INPUT (USR):** Programmable input. Connect terminal to common (USR COMM) to activate function. Internal 10KΩ pull-up resistor to +9 to 28 VDC.
Threshold Levels: $V_{IL} = 0.7 V$ max; $V_{IH} = 2.4 V$ min; $V_{MAX} = 28 VDC$
Response Time: 5 msec typ.; 50 msec debounce (activation and release)

6. **ENVIRONMENTAL CONDITIONS:**
Operating Temperature Range for CUB5VR00: -35 to 75°C
Operating Temperature Range for CUB5VB00 depends on

DIMENSIONS In inches [mm]



Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.15" (54.6) H x 3.00" (76.2) W.

display color and intensity level as per below:

	INTENSITY LEVEL	TEMPERATURE
Red Display	1 & 2	-35 to 75°C
	3	-35 to 70°C
	4	-35 to 60°C
	5	-35 to 50°C
Green Display	1 & 2	-35 to 75°C
	3	-35 to 65°C
	4	-35 to 50°C
	5	-35 to 35°C

Storage Temperature: -35 to 85°C

Operating and Storage Humidity: 0 to 85% max. relative humidity (non-condensing)

Vibration to IEC 68-2-6: Operational 5-500 Hz, 5 g

Shock to IEC 68-2-27: Operational 30 g

Altitude: Up to 2000 meters

7. CERTIFICATIONS AND COMPLIANCES:

CE Approved

EN 61326-1 Immunity to Industrial Locations

Emission CISPR 11 Class A

EN 61010-1: General Requirements

EN 61010-2-030: Particular Requirements for Testing and Measuring Circuits

RoHS Compliant

UL Recognized: File #E179259

UL Listed: File #E137808

Type 4X Indoor/Outdoor Enclosure rating (Face only)

IP65 Enclosure rating (Face only)

IP20 Enclosure rating (Rear of unit)

8. CONNECTIONS: Wire clamping screw terminals

Wire Strip Length: 0.3" (7.5 mm)

Wire Gage: 30-14 AWG copper wire

Torque: 3.5 inch-lbs (0.395 N-m) max.

9. CONSTRUCTION: This unit is rated for Type 4X/IP65

requirements for indoor/outdoor use. Installation Category I,

Pollution Degree 2. High impact plastic case with clear

viewing window. Panel gasket and mounting clip included.

10. WEIGHT: 3.2 oz (100 g)

While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approx. 28 to 36 in-oz [0.202 to 0.26 N-m]). Do not over-tighten the screws.

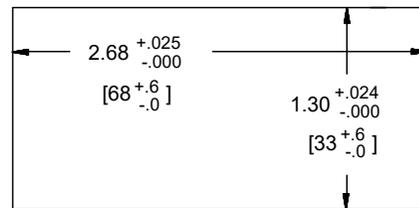
Installation Environment

The unit should be installed in a location that does not exceed the operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The bezel should only be cleaned with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.

Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.

PANEL CUT-OUT



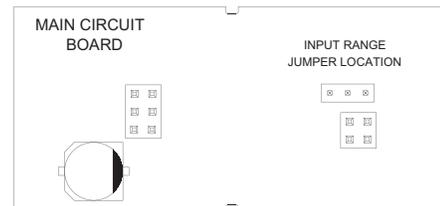
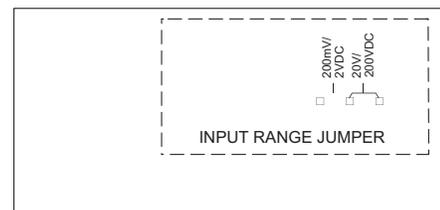
SETTING THE JUMPERS

Input Range Jumper

This jumper is used to select the proper input range. The input range selected in programming must match the jumper setting. Select a range that is high enough to accommodate the maximum input to avoid overloads. To access the jumper, remove the rear cover of the meter.



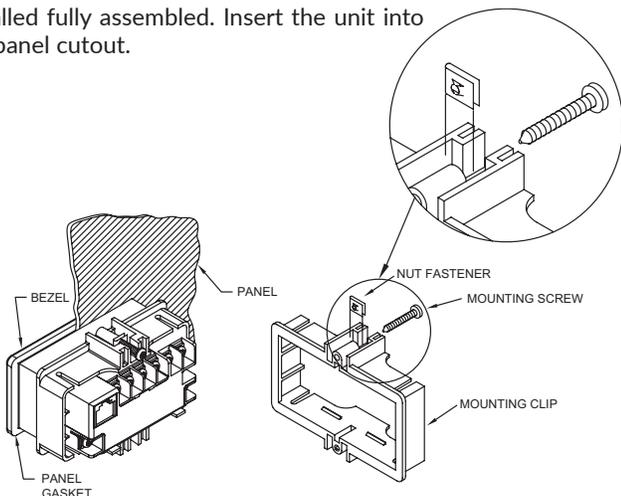
WARNING: Exposed line voltage exists on the circuit boards. Remove all power to the meter and load circuits before accessing inside of the meter.



INSTALLING THE METER

Installation

The meter meets NEMA 4X/IP65 requirements when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the unit. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.



Remove/Replace The Rear Cover

To remove the rear cover, locate the cover locking tab below the 2nd and 3rd input terminals. To release the tab, insert a small, flat blade screwdriver between the tab and the plastic wall below the terminals. Inserting the screwdriver will provide enough pressure to release the tab locks. To replace the cover, align the cover with the input terminals and press down until the cover snaps into place.

WIRING THE METER

Wiring Overview

Electrical connections are made via screw-clamp terminals located on the back of the meter. All conductors should conform to the meter's voltage and current ratings. All cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that the power supplied to the meter (DC or AC) be protected by a fuse or circuit breaker.

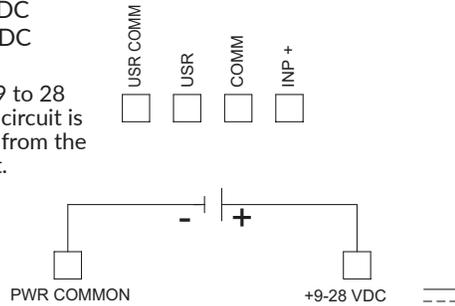
Power Wiring

DC Power

+9 to +28 VDC: +VDC
Power Common: -VDC



CAUTION: 9 to 28 VDC power circuit is not isolated from the signal circuit.

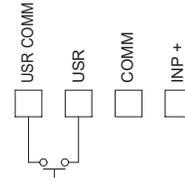


User Input Wiring

Sinking Logic

USR COMM } Connect external switching device between the
USR } User Input terminal and User Input Common.

The user input of the meter is internally pulled up to +9 to +28 V with 10 K resistance. The input is active when it is pulled low (<0.7 V).



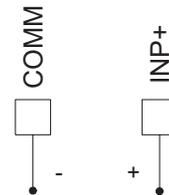
Input Wiring



CAUTION: Power input common is NOT isolated from user and input commons. In order to preserve the safety of the meter application, the power input common must be suitably isolated from hazardous live earth referenced voltage; or input common must be at protective earth ground potential. If not, hazardous voltage may be present at the signal or user inputs and input common terminals. Appropriate considerations must then be given to the potential of the user and input commons with respect to earth ground; and the common of the plug-in cards with respect to input common.

Before connecting signal wires, the Input Range Jumper should be verified for proper position.

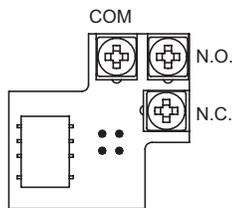
Voltage Signal (self powered)



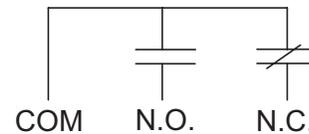
JUMPER POSITION	MAX INPUT VOLTAGE
200 mV/2 VDC	75 VDC
20V/200 VDC	250 VDC

Setpoint (Output) Wiring

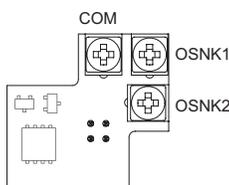
SINGLE SETPOINT RELAY PLUG-IN CARD



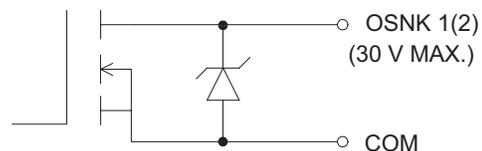
ELECTRICAL CONNECTIONS



DUAL SETPOINT N-FET OPEN DRAIN PLUG-IN CARD

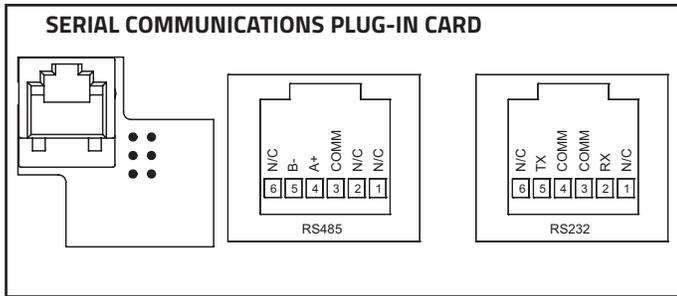


ELECTRICAL CONNECTIONS

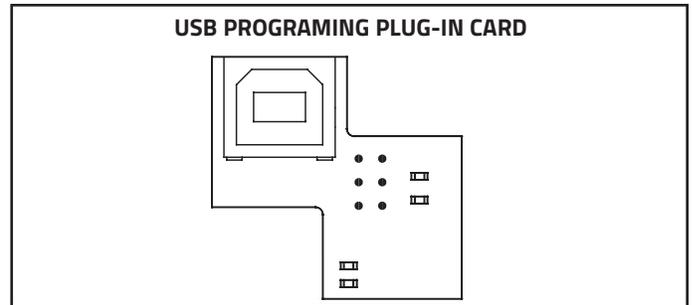


Output Common is not isolated from DC Power Common. Load must be wired between OSNK terminal and V+ of the load supply.

Serial Communication Wiring



USB Programming



RED LION CONTROLS TECHNICAL SUPPORT

If for any reason you have trouble operating, connecting, or simply have questions concerning your new product, contact Red Lion’s technical support.

Support: support.redlion.net
 Website: www.redlion.net
 Inside US: +1 (877) 432-9908
 Outside US: +1 (717) 767-6511

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(a) Red Lion Controls Inc. (the “Company”) warrants that all Products shall be free from defects in material and workmanship under normal use for the period of time provided in “Statement of Warranty Periods” (available at www.redlion.net) current at the time of shipment of the Products (the “Warranty Period”). **EXCEPT FOR THE ABOVE-STATED WARRANTY, COMPANY MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE PRODUCTS, INCLUDING ANY (A) WARRANTY OF MERCHANTABILITY; (B) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; OR (C) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.** Customer shall be responsible for determining that a Product is suitable for Customer’s use and that such use complies with any applicable local, state or federal law.

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(c) Subject to paragraph (b), with respect to any such Product during the Warranty Period, Company shall, in its sole discretion, either (i) repair or replace the Product; or (ii) credit or refund the price of Product provided that, if Company so requests, Customer shall, at Company’s expense, return such Product to Company.

(d) **THE REMEDIES SET FORTH IN PARAGRAPH (c) SHALL BE THE CUSTOMER’S SOLE AND EXCLUSIVE REMEDY AND COMPANY’S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN PARAGRAPH (a).**

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