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Bulletin No. CUB7N-B
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MODEL CUB7 – MINIATURE ELECTRONIC 8 DIGIT COUNTER or TIMER



- 0.35" (8.9 mm) **HIGH LCD DIGITS, REFLECTIVE OR TRANSMISSIVE WITH YELLOW/GREEN OR RED BACKLIGHTING** (6-26 VDC power supply required for version with LED backlighting)
- **INTERNAL LITHIUM BATTERY PROVIDES UP TO 7 YEARS OF TYPICAL UNINTERRUPTED OPERATION**
- **COUNT SPEEDS UP TO 10KHZ**
- **9 PROGRAMMABLE TIME RANGES**
- **CONTACT, LOGIC, OPEN COLLECTOR, OR HIGH VOLTAGE INPUTS**
- **STANDARD WIRE CONNECTIONS OR OPTIONAL PLUG-IN TERMINAL BLOCK**
- **NEMA 4X/IP65 SEALED FRONT BEZEL THAT FITS 1/32 DIN CUT-OUT**

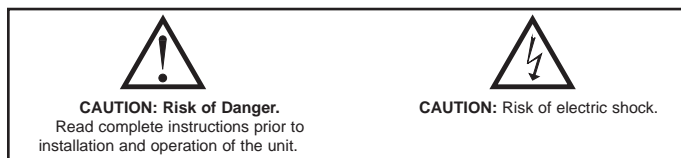
DESCRIPTION

The CUB7 series is an 8-digit lithium battery powered miniature counter or timer with large 0.35" (8.9 mm) high digits. It has an LCD read-out available in Positive Image Reflective, Negative Image Transmissive with yellow/green or red backlighting. The backlight versions require an external 6-26 VDC power supply. The CUB7 series is housed in a lightweight, high impact plastic case with a clear viewing window. The sealed front panel with silicon rubber keypad meets NEMA 4X/IP65 specification for wash-down and/or dusty environments, when properly installed with supplied panel gasket and mounting clip.

Both counter and timer CUB7 models are available with a low voltage input (28 VDC max) or an isolated high voltage input (50-250 VDC/VAC). The low voltage input has DIP switch selections for SINKING or SOURCING along with a HIGH/LOW FREQUENCY selection (low frequency for contact inputs). Both units have front panel keypads that can be used to reset the display. The keypad can be enabled/disabled via a single DIP switch. The standard unit uses 22 gauge wires for external connections, an optional plug-in terminal block is available.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



SPECIFICATIONS

- DISPLAY:** 8-digit LCD, 0.35" (8.90 mm) high digits
- POWER:** Non-replaceable internal 3.6 VDC lithium battery provides 7 years of typical continuous operation (high count speeds in SNK mode & extreme ambient temperatures will decrease battery life, use of SRC mode can extend battery life)
OPTIONAL LED BACKLIGHT POWER: 6-26 VDC @ 25 mA max.
- LOW VOLTAGE INPUT:**

COUNTERS: CUB7CCS0, CUB7CCR0, CUB7CCG0

SNK mode (DIP switch 1 off, internal pull-up to battery)

V_{IN} High Min = 1.25 VDC; V_{IN} Low Max = 0.45 VDC

I_{IN} Max = 5 μ A; V_{IN} Max = 3.6 VDC

Count Speed: (count on negative edge)

High freq mode (DIP switch 2 off): max 5 kHz @ 50% duty cycle

Low freq mode (DIP switch 2 on): max 50 Hz @ 50% duty cycle

Note: The three models listed above may be used for count inputs with 10-50 VAC signals when using a VCM10000 converter module. DIP switches must be set for SNK and Low frequency.

SRC mode (DIP switch 1 on, internal 20 k Ω pull-down to common)

V_{IN} High Min = 1.25 VDC; V_{IN} Low Max = 0.45 VDC

I_{IN} Max = 5 mA; V_{IN} Max = 28 VDC

Count Speed: (count on negative edge)

High freq mode (DIP switch 2 off): max 10 kHz @ 50% duty cycle

Low freq mode (DIP switch 2 on): max 500 Hz @ 50% duty cycle

TIMERS:

Models: CUB7TCS0, CUB7TCR0, CUB7TCG0 **For these models, the unit will time when the CUB7 input is low.**

SNK mode (DIP switch 1 off, internal pull-up to battery)

V_{IN} High Min = 1.25 VDC; V_{IN} Low Max = 0.45 VDC

I_{IN} Max = 5 μ A; V_{IN} Max = 3.6 VDC

Note: The three models listed above may be used with 10-50 VAC signals when using a VCM10000 converter module.

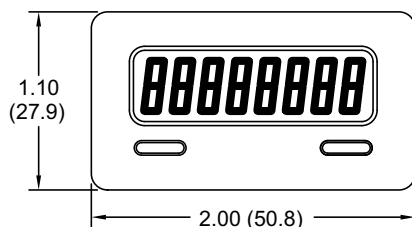
SRC mode (DIP switch 1 on, internal 20 k Ω pull-down to common)

V_{IN} High Min = 1.25 VDC; V_{IN} Low Max = 0.45 VDC

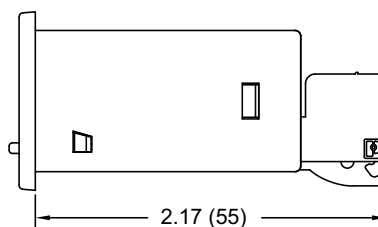
I_{IN} Max = 5 mA; V_{IN} Max = 28 VDC

DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.5" (140) W.



With Wires



With Terminal Block

Models: CUB7TCS1, CUB7TCR1, CUB7TCG1 **For these models, the unit will time when the CUB7 input is high.**

SNK mode (DIP switch 1 off - **DO NOT USE**)

SRC mode (DIP switch 1 on, internal 20 kΩ pull-down to common)

V_{IN} High Min = 1.25 VDC; V_{IN} Low Max = 0.45 VDC

I_{IN} Max = 5 mA; V_{IN} Max = 28 VDC

4. HIGH VOLTAGE INPUT:

COUNTERS: CUB7CVS0, CUB7CVR0, and CUB7CVG0

The unit adds one count with voltage present

V_{IN} Range = 50-250 VDC/VAC 50/60 Hz, 5 mA max

Isolation: 2500 VAC 1 min

TIMERS: CUB7TVS0, CUB7TVR0, and CUB7TVG0

Unit will time with voltage present

V_{IN} Range = 50-250 VDC/VAC 50/60 Hz, 5 mA max

Isolation: 2500 VAC 1 min

5. RESET INPUT:

V_{IN} Low Max = 1.5 VDC (internal pull-up to battery)

I_{IN} Max = 20 μA

5 msec min (active low)

Note: Reset input is active low to clear display to zero

6. TIMER ACCURACY: 0.025%

7. ENVIRONMENTAL CONDITIONS:

Operating Temperature: 0 to 50 °C

Storage Temperature: -30 to 80 °C

Vibration according to IEC 68-2-6: Operational 5 to 500 Hz, in X, Y, Z direction for 1.5 hours, 5 g.

Shock according to IEC 68-2-27: Operational 30 g, 11 msec in 3 directions.

Operating and Storage Humidity: 85% max. (non-condensing)

8. CONNECTIONS: 22 gauge wire; wire length minimum 10"

OPTIONAL TERMINAL BLOCKS: Wire clamping terminals

Wire Strip Length: 0.275" (7 mm)

Wire Gauge: 24-16 AWG copper wire

9. CONSTRUCTION: High impact plastic case with clear viewing window.

The front panel meets NEMA 4X/IP65 requirements for outdoor use when properly installed. Installation Category II, Pollution Degree 2. Panel gasket and mounting clip are included.

10. CERTIFICATIONS AND COMPLIANCES:

Type 4X Outdoor Enclosure rating (Face only), UL50

IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.

IP65 Enclosure rating (Face only), IEC 529

ELECTROMAGNETIC COMPATIBILITY

Emissions and Immunity to EN 61326:2006: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:

Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m (80 MHz to 1 GHz) 3 V/m (1.4 GHz to 2 GHz) 1 V/m (2 GHz to 2.7 GHz)
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 1 kV I/O signal
Surge	EN 61000-4-5	Criterion A power 1 kV L to L, 2 kV L to G
RF conducted interference	EN 61000-4-6	Criterion A 3 Vrms
Power freq magnetic fields	EN 61000-4-8	Criterion A 30 A/m
AC power	EN 61000-4-11	Criterion A Voltage dip 0% during 1 cycle 40% during 10/12 cycle 70% during 25/30 cycle
		Criterion B Short interruptions 0% during 250/300 cycles

Emissions:

Emissions EN 55011 Class B

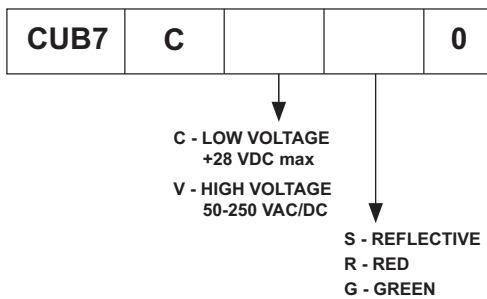
Notes:

1. Criterion A: Normal operation within specified limits.
 2. Criterion B: Temporary loss of performance from which the unit self-recovers.
- Refer to the EMC Installation Guidelines section of the bulletin for additional information.

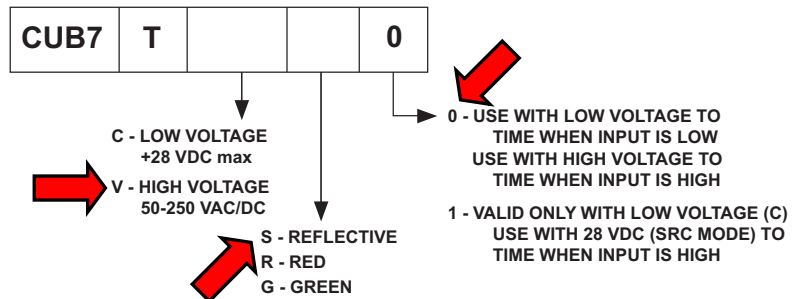
11. WEIGHT: 0.11 lbs. (0.05 Kg)

ORDERING INFORMATION

COUNTERS



TIMERS



Accessories Part Numbers

TYPE	DESCRIPTION	PART NUMBER	USED WITH
Plug-in Terminal Block	3 Position Terminal Block	TB100003	CUB7CCS0, CUB7TCS0, CUB7TCS1
	4 Position Terminal Block	TB100004	CUB7CCG0, CUB7TCG0, CUB7TCG1, CUB7CCR0, CUB7TCR0, CUB7TCR1, CUB7CVS0, CUB7TVS0
	5 Position Terminal Block	TB100005	CUB7CVG0, CUB7TVG0, CUB7CVR0, CUB7TVR0
Enclosure *	CUB7 Enclosure	ENC13000	
Base Mount *	CUB7 Base Mount	BMK80000	

See Wiring the Meter section to determine the terminal block needed.

* Enclosure and base mount will NOT function with plug-in terminal block option.