

MODEL CUB4L8W - MINIATURE ELECTRONIC 8-DIGIT COUNTER W/VOLTAGE INPUT



- / COUNT INPUT FROM 10 to 300 VAC/DC
- / POSITIVE REFLECTIVE OR NEGATIVE TRANSMISSIVE WITH YELLOW/GREEN OR RED LED BACKLIGHTING
- / 0.46 INCH (11.7 mm) HIGH DIGITS
- / INTERNAL LITHIUM BATTERY PROVIDES UP TO 6 YEARS OF UNINTERRUPTED OPERATION
- / NEMA 4X/IP65 SEALED FRONT BEZEL
- / FRONT PANEL RESET, REMOTE RESET, OR BOTH
- / WIRE CONNECTION MADE VIA SCREW CLAMP TYPE TERMINALS



DESCRIPTION

The CUB4L8W is an 8-digit miniature counter. It has a large 0.46 inch high LCD display available in Positive Reflective (CUB4L8W0), Negative Image Transmissive with yellow/green backlighting (CUB4L8W1), or Negative Image Transmissive with red backlighting (CUB4L8W2).

The backlight versions require an external 9 to 28 VDC power supply. The optional RLC Model MLPS0000 power supply is designed to be attached directly to the rear of a CUB4L8W.

The CUB4L8W accepts most machine control voltage signals. The input accepts AC (50/60 Hz) or DC control voltages from 10 to 300 V at count speeds up to 30 counts per second (cps).

CUB4's can be mounted into the same panel cut-out as the RLC CUB2 series of products. The CUB4 counters are constructed using a CMOS LSI counter circuit chip, mounted on a gold-plated substrate, which is electrically connected by ultrasonic wire-bonding. Proven micro-electronic assembly and manufacturing techniques provide these units with the reliability and dependability required for industrial service.

The CUB4 series is housed in a lightweight, high impact plastic case with a clear viewing window. The sealed front panel with the silicone rubber reset button meets NEMA 4X/IP65 specifications for wash-down and/or dusty environments, when properly installed.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual 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.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBERS
CUB4L8W	Counter Positive Reflective	CUB4L8W0
	Counter w/Yel-Grn Backlighting	CUB4L8W1
	Counter w/Red Backlighting	CUB4L8W2
	Counter Positive Reflective w/V+ Terminal	CUB4L8WM
MLPS	Micro Line/Sensor Power Supply	MLPS0000

For more information on Pricing, Enclosures & Panel Mount Kits refer to the RLC Catalog or contact your local RLC distributor.



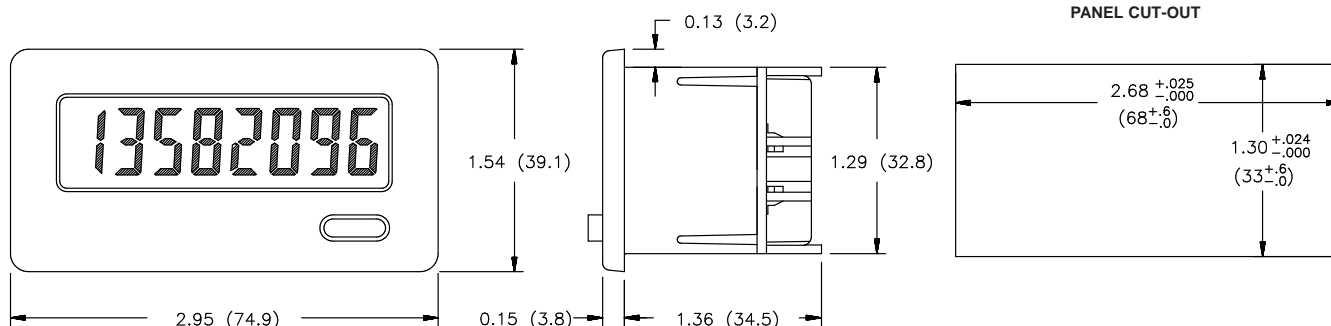
CAUTION: Read complete instructions prior to installation and operation of the unit.



CAUTION: Risk of electric shock.

DIMENSIONS "In inches (mm)"

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.3) H x 3.0" (76.2) W.



SPECIFICATIONS

- DISPLAY:** 8-digit LCD, 0.46" (11.7 mm) high digits.
- POWER SOURCE:** Internal 3.0 V lithium battery to provide up to 7 years of continuous operation. Battery life is dependent upon usage. Reset contacts that remain closed for long periods of time reduce battery life.
- BACKLIGHT POWER REQUIREMENTS:**
+9 to +28 VDC; 35 mA typical, 50 mA max. Above 26 VDC, derate operating temperature to 50°C.
- L.S. INPUT:** 10 to 300 VAC/DC, 50/60 Hz, 30 cps max. $V_{IL} = 0.5$ VDC max. Unit counts on the positive going edge. Will not operate with Triac outputs.
- REMOTE RESET:** 15 msec min. pulse width (active low) from 3.0 V bipolar output or an open collector transistor or a switch contact to common. V_{IH} (high) = 2.0 V min. (3 Vmax), V_{IL} (low) = 0.5 V max.
- ENVIRONMENTAL CONDITIONS:**
Operating Temperature: 0 to 60°C (above 50°C, derate backlight operating voltage to 26 VDC max.).
Storage Temperature: -35 to 85°C
Operating and Storage Humidity: 85% max. relative humidity (non-condensing) from 0°C to 50°C.
Altitude: Up to 2000 meters
- CERTIFICATIONS AND COMPLIANCES:**

Immunity to EN 50082-2

electrostatic discharge	EN 61000-4-2	level 2; 4 Kv contact level 3; 8 Kv air
electromagnetic RF fields	EN 61000-4-3	level 3; 10 V/m 80 MHz - 1 GHz
fast transients (burst)	EN 61000-4-4	level 4; 2 Kv I/O level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	level 3; 10 V/rms 150 KHz - 80 MHz
power frequency magnetic fields	EN 61000-4-8	level 4; 30 A/m
simulation of cordless telephone	ENV50204	level 3; 10 V/m 900 MHz \pm 5 MHz 200 Hz, 50% duty cycle

Emissions to EN 50081-2

RF interference	EN 55022	enclosure class A
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Electromagnetic Compatibility

Refer to the EMC Installation Guidelines section of this bulletin for additional information.

- CONSTRUCTION:** This unit is rated for NEMA 4X/IP65 indoor use. Installation Category I, Pollution Degree 2.
- WEIGHT:** 3 oz. (85 g)

EMC INSTALLATION GUIDELINES

Although this unit is designed with a high degree of immunity to ElectroMagnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, source or coupling method into the unit may be different for various installations. The unit becomes more immune to EMI with fewer I/O connections. Cable length, routing and shield termination are very important and can mean the difference between a successful or a troublesome installation. Listed below are some EMC guidelines for successful installation in an industrial environment.

- Use shielded (screened) cables for all Signal and Control inputs. The shield (screen) pigtail connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.
 - Connect the shield only at the panel where the unit is mounted to earth ground (protective earth).
 - Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is above 1 MHz.
 - Connect the shield to common of the unit and leave the other end of the shield unconnected and insulated from earth ground.
- Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run in metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter.
- Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
- In extremely high EMI environments, the use of external EMI suppression devices, such as ferrite suppression cores, is effective. Install them on Signal and Control cables as close to the unit as possible. Loop the cable through the core several times or use multiple cores on each cable for additional protection. Install line filters on the power input cable to the unit to suppress power line interference. Install them near the power entry point of the enclosure. The following EMI suppression devices (or equivalent) are recommended:

Ferrite Suppression Cores for signal and control cables:

Fair-Rite # 0443167251 (RLC #FCOR0000)
TDK # ZCAT3035-1330A
Steward #28B2029-0A0

Line Filters for input power cables:

Schaffner # FN610-1/07 (RLC #LFIL0000)
Schaffner # FN670-1.8/07
Corcom #1VR3

Note: Reference manufacturer's instructions when installing a line filter.

- Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.

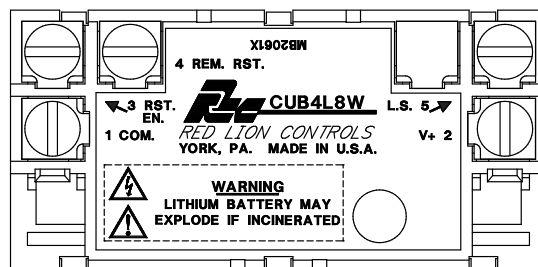
WIRING CONNECTIONS

The electrical connections are made via rear screw-clamp terminals located on the back of the unit. When wiring the unit, use the label to identify the wire position with the proper function.

All conductors should meet voltage and current ratings for each terminal. Also cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that power supplied to the unit (AC or DC) be protected by a fuse or circuit breaker.

Strip the wire, leaving approximately 1/4" bare wire exposed (stranded wires should be tinned with solder). Insert the wire into the screw-clamp terminal and tighten down the screw until the wire is clamped in tightly. Each terminal can accept up to two #14 AWG wires.

Note: The CUB4L8W0 will not have a screw terminal installed at the V+ terminal, since it is not required for operation, and is not internally connected. The CUB4L8WM uses the V+ screw terminal to mount the MLPS power supply. It is not internally connected to the unit.



Warning: Lithium battery may explode if incinerated.

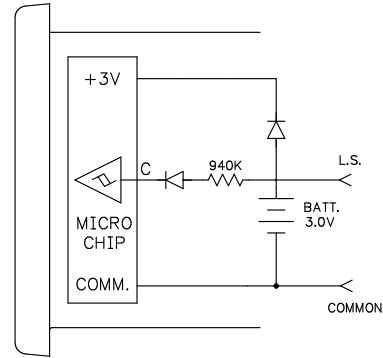
Caution: All leads will be at the same line potential as the input leads.

L.S. INPUT, 30 CPS MAX.

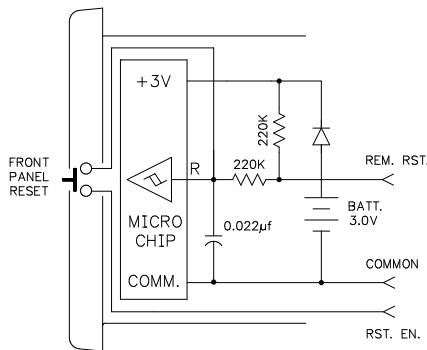
The CUB4L8W accepts most machine control voltage signals. The input accepts AC (50/60 Hz) or DC control voltages from 10 to 300 V at count speeds up to 30 cps. The unit counts on the positive going edge of the input signal.



WARNING: Any lead may be at hazardous live input potential. External wiring and devices connected to the unit must be rated the same as applied signal input voltage and be properly isolated from Class 2 or SELV circuitry.



RESET OPTIONS



Connecting a wire from the "RST. EN." (Reset Enable) Input terminal to Common will enable the front panel Reset button.

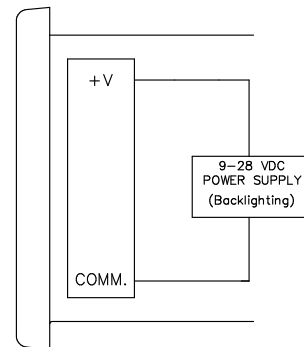
When Remote Reset is required, a wire is connected from the "REM. RST." input terminal to Common. Pulling this input low causes the counter to reset. The "REM. RST." can be pulled low by either a mechanical switch or solid-state transistor switch. The switch load is 14 μ A (max. voltage drop 0.5 V) when ON. The OFF-state leakage current must be less than 2 μ A.

Note: The RC protection circuit on the "REM. RST." Input causes a delay of approximately 15 msec in Reset response.

BACKLIGHT OPTION

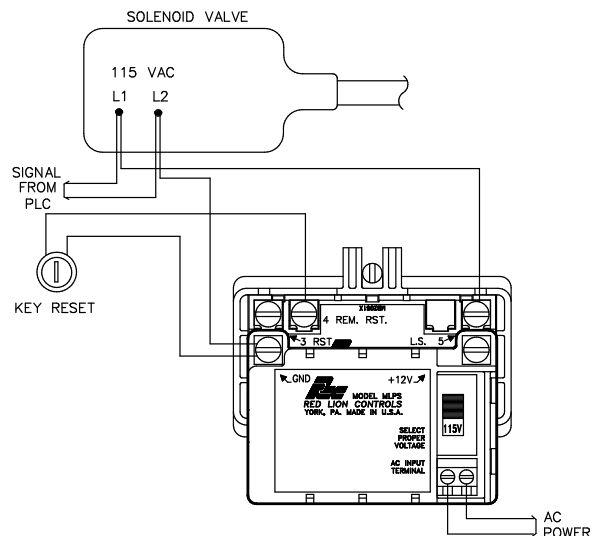
Optional backlight versions of the CUB4L8W require an external 9-28 VDC power supply. The external supply is connected between the V+ and common terminals as shown in the drawing.

Red Lion Controls optional power supply (MLPS0000) is designed to be attached directly to the rear of a CUB4L8W and is powered from a 115/230 VAC source. The MLPS0000 supply provides power for unit backlighting and a sensor.



APPLICATION

Stamping machine maintenance plan is enhanced by the use of a CUB4L8W1. Replacement or repair of the die in a metal stamping process is required after 2.5 million plates. The signal input of the CUB4L8W1 is the 115 VAC pulse that triggers the press's stamping head. The 10 to 300 VAC/VDC input capability of the counter eliminates the need for an external AC to DC converter. The CUB4L8W accomplishes this conversion internally. Green backlighting is an advantage in poorly lighted areas. A lithium battery retains the count value during the non-operating phases of the day and weekends. DC power is not available on the machine for the 9 to 28 VDC backlighting requirement. An MLPS0000 power supply was chosen because of ease of attachment and switch selectable 115/230 VAC capabilities. After replacement or repair of the die, the counter is reset by a key switch connected to the Remote Reset input.



INSTALLATION ENVIRONMENT

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

The bezel should be cleaned only 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.

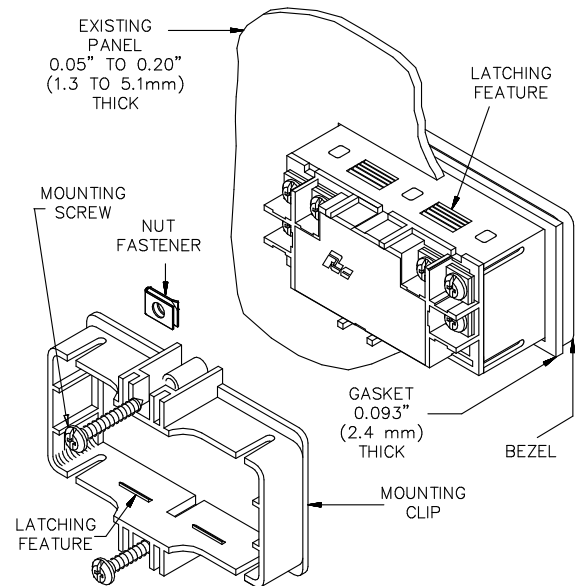
Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.

INSTALLATION

The CUB4 series of products meet NEMA 4X/IP65 requirements for indoor use, when properly installed. The units are intended to be mounted into an enclosed panel. The viewing window and reset button are factory sealed for a washdown environment. A sponge rubber gasket and mounting clip are provided for sealing the unit in the panel cut-out.

The following procedure assures proper installation:

1. Cut panel opening to specified dimensions. Remove burrs and clean around panel opening.
2. Carefully remove and discard center section of gasket. Slide gasket over the rear of the unit to the back of the bezel.
3. Assemble nut fastener first and then the mounting screw onto both sides of mounting clip. Tip of screw should not project from hole in mounting clip.
4. Insert CUB4 unit through the panel cut-out until front bezel flange contacts the panel mounted gasket.
5. Slide the mounting clip over the rear of the unit until the mounting clip is against the back of the panel. The mounting clip has latching features which engage into mating features on the CUB4 housing.
Note: It is necessary to push in on CUB4 front bezel when sliding mounting clip into position.
6. Alternately tighten each screw to ensure uniform gasket pressure. Visually inspect the front panel gasket. The gasket should be compressed about 75 to



- 80% of its original thickness. (Recommended torque is 28 to 36 in.-oz.) If not, gradually turn mounting screws to further compress gasket.
7. If gasket is not adequately compressed and the mounting screws can no longer be turned, loosen mounting screws, and check that mounting clip is latched as close as possible to panel. Repeat procedure for tightening mounting screws.

TROUBLESHOOTING

For further technical assistance, contact technical support at the appropriate company numbers listed.