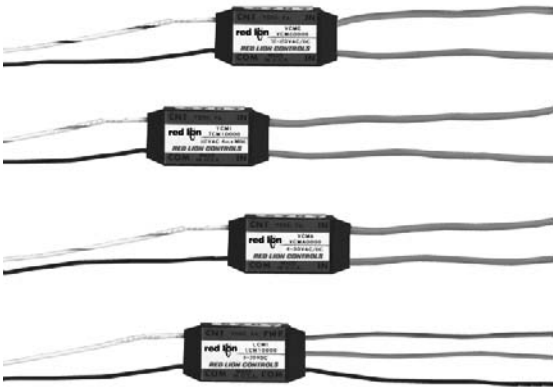
Bulletin No. VCM-A
Drawing No. LP0646
Released 02/10

CONVERTER MODULES

ADAPTS MANY RED LION CONTROLS' COUNTERS AND ACCESSORIES TO A WIDE RANGE OF SIGNAL SOURCES



VCM - VOLTAGE CONVERTER MODULES
Converts AC/DC voltages to an acceptable signal input for many RLC counters and accessories and provides input/output voltage isolation.

TCM - TRIAC CONVERTER MODULE
Accepts unloaded, high off-state leakage triac output from sensors and programmable controllers.

LCM - LOGIC CONVERTER MODULE
Interfaces with CMOS, TTL, and other logic circuits up to +28 VDC, at speeds to 50 KHz. Allows Cub Counters to share sensor outputs with other series counters.

These miniature sized modules are completely encapsulated in PVC, which provides protection against oil, water , dirt, and mechanical damage. They can be quickly and easily mounted to most surfaces by using the self-stick adhesive pad.

VCM - VOLTAGE CONVERTER MODULES

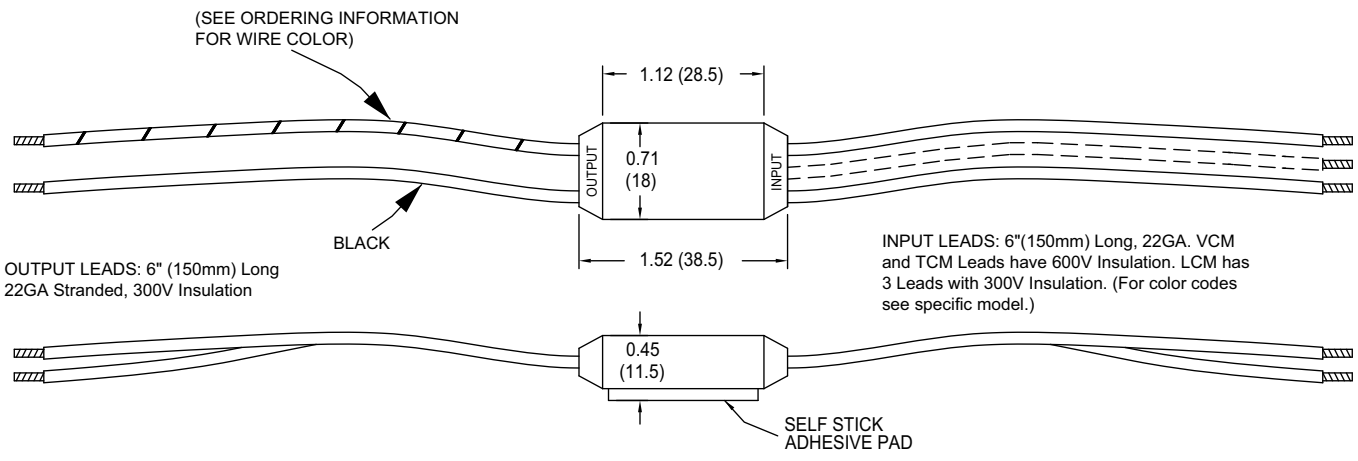
These modules provide a convenient way to adapt RLC Counters to most any machine control voltage signal. They also make it easy to upgrade electro-mechanical counter installations with RLC Counters.

VCM's are available in two input voltage ranges that cover the spectrum from 4-270 V. The non-polarized input of these modules will acceptA.C. *(50/60 Hz)* or D.C. voltages at input cycles up to 30 Hz. The output uses MOSFET technology that is compatible with either the L.S. Count or Remote Reset inputs of RLC Counters. Electrical isolation between input and output is achieved by means of an internal opto-isolator rated at 2300 V_{RMS}.

SPECIFICATIONS

1. **INPUT:** VCM1 = 4 to 50 VAC/DC, 50/60 Hz
   VCM2 = 50 to 270 VAC/DC, 50/60 Hz
2. **OUTPUT:** Solid state DC contact closure
   Output rating: 30 VDC at 100 mA max
   Output Isolation: 2300 V_{RMS}
   Off State Leakage: 1 µA max
3. **FREQUENCY:** Max output frequency 20 Hz
4. **ENVIRONMENT:** 0-50 ºC

DIMENSIONS FOR VCM, TCM, & LCM In inches (mm)



TCM - TRIAC CONVERTER MODULE

The TCM is a specialized version of the VCM. It is specifically designed to operate with photo-electric sensors and programmable controllers that have 115 VAC Triac outputs. Due to protective suppression circuits connected in parallel with Triacs, these outputs have a high OFF-State Leakage current, which, if unloaded, is sufficient to keep a VCM in the ON condition continuously.

The TCM incorporates a current bias that offsets output leakage currents up to 4 mA and allows the application of RLC Counters to most unloaded Triac outputs. These modules are available for operation with 115 VAC ±10% 50/60 Hz only. They operate at count rates up to 10 cps, and also provide input/output electrical isolation. Connections for the TCM are the same as those for the VCM.

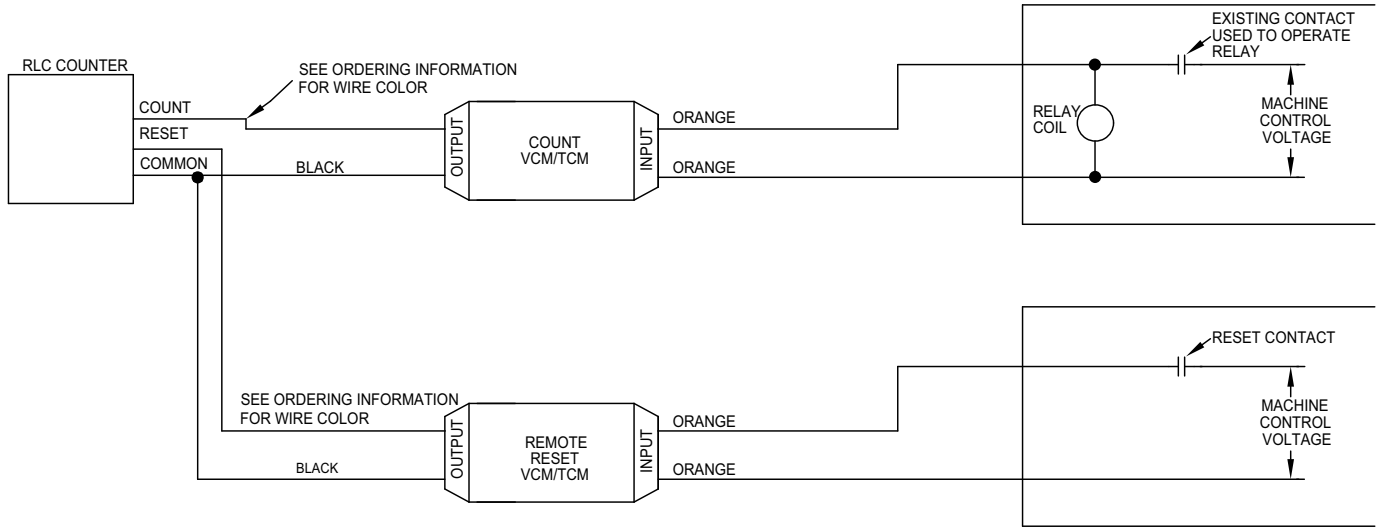
Note: VCM's can be used with Triac outputs that are also driving substantial loads, since the load will shunt the leakage current away from the VCM input.

SPECIFICATIONS

1. **INPUT:** 115 VAC ± 10% (50/60 Hz) 10 mA max current draw
2. **FREQUENCY:** 10 Hz max output
3. **OUTPUT:** Solid state DC contact closure
   Output rating: 30 VDC at 100 mA
   Output Isolation: 2300 V_{RMS}
   Off State Leakage: 1 µA max
4. **ENVIRONMENT:** 0-50 ºC

TYPICAL CONNECTION EXAMPLE FOR VCM & TCM
(Shown with optional VCM for Control Voltage Remote Reset)

Consult Connections and Configurations set up information in counter instruction literature for wiring. Reference switch and contact input information.



LCM - CONVERTER MODULE

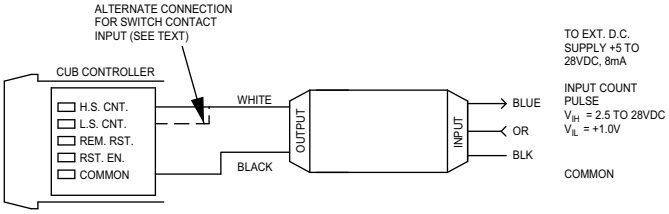
The LCM adapts CUB* Counters to practically any type of logic and sensor output, and to any count signal voltage from +3 to +28 VDC. The module accepts input count pulses from NPN Open-Collector Transistor outputs, Bi-Polar outputs, or sourcing outputs such as Emitter-Follower or PNP Open-Collector Transistors *(Sourcing outputs must be externally loaded with a load of 10 Kohms or less)*. The LCM output is a Bi-Polar drive that is compatible with either the Low-Speed or High-Speed Counter inputs as well as the Remote Reset input** of the CUB Counters. The output is inverted with respect to the input which causes the CUB Counter to increment on the leading *(positive going)* edge of a count pulse. Power for operation of the LCM can be normally obtained from the existing D.C. power supply used to operate the sensor or other logic circuitry. When count pulse signals are generated by switch contacts the LCM output can be applied to the L.S. input of the CUB to de-bounce these pulses. Minimum pulse width when driving the L.S. input is 10 msec and maximum count rate is 50 cps.

* *LCM intended for use with CUB1,2,3,and 7.*

** *When used to operate Remote Reset input, the LCM will reset counter when input to LCM goes high due to signal inversion.*

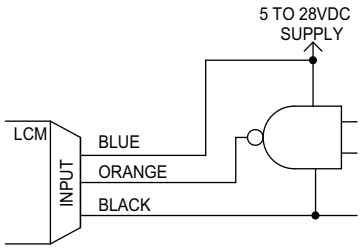
SPECIFICATIONS

1. **POWER:** 5 to 28 VDC, 8 mA max
2. **INPUT:** V_{IH} = +2.5 to 28 VDC, 500 µA max source
   V_{IL} = +1.0 VDC, 50 µA max sink
3. **OUTPUT:** Bipolar 3 VDC with 1 mA sink/source (output should not be connected to voltage levels above 3.5 VDC)
4. **FREQUENCY:** MAX input/output frequency = 50 KHz (see counter input for frequency limitations)
5. **ENVIRONMENT:** 0-50 ºC

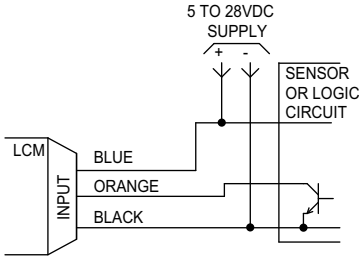


TYPICAL INPUTS TO LCM

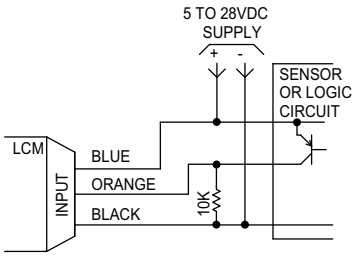
CMOS OR TTL



NPN OPEN COLLECTOR (SINK OUTPUT)



PNP OPEN COLLECTOR (SOURCE OUTPUT)



ORDERING INFORMATION

MODEL NO.	DESCRIPTION	INPUT VOLTAGE	OUTPUT WIRE COLOR	PART NUMBER
VCM	Voltage Converter Module	4 - 50 V AC/DC	yellow	VCM10000
		50 - 270 V AC/DC	white	VCM20000
TCM	Triac Converter Module	115 VAC ±10%	white/green trace	TCM10000
LCM	Logic Converter Module	+3 to +28 VDC (signal) +5 to +28 VDC (supply)	white	LCM10000