red lion

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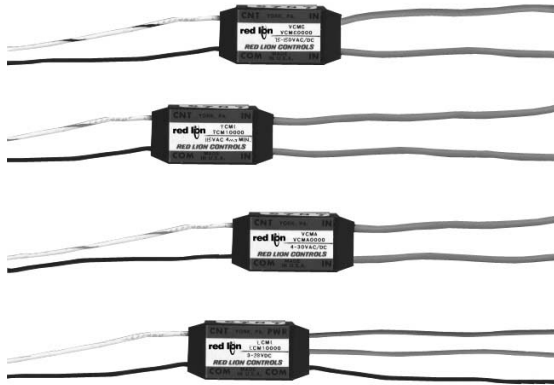Fax +1 (717) 764-0839
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CONVERTER MODULES
ADAPTS MANY RED LION CONTROLS' COUNTERS AND ACCESSORIES
TO A WIDE RANGE OF SIGNAL SOURCES

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

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

LCM - LOGIC CONVERTER MODULE
For interface with CMOS, TTL, and other logic circuits to +28 VDC, at speeds to 5000 cps. 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 the back of counter enclosures or to any nearby panel surface by a self-stick adhesive pad.

VCM - VOLTAGE CONVERTER MODULES
VCM's are provided in 2 series, VCM *[A-D]* and VCM *[E-H]*, to increase the application flexibility of many RLC Counters and Accessories.

VCM [A-D]
These modules provide a convenient way to adapt CUB Counters* to most any machine control voltage signal. They also make it easy to upgrade electro-mechanical counter installations with CUB Counters.
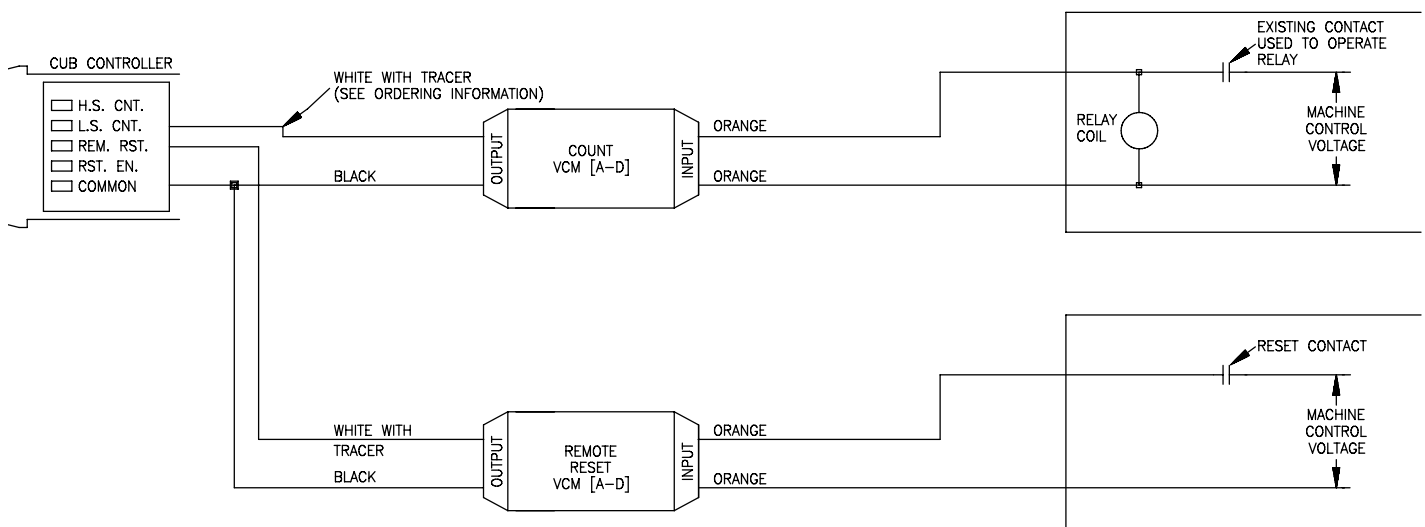
They are available in four overlapping input voltage ranges that cover the spectrum from 4-270 V *(See VCM [A-D] Ordering Information for specific input voltage ranges)*. The non-polarized input of these modules will accept A.C. *(50/60 Hz)* or D.C. control voltages and at count speeds up to 30 cps. The output is an NPN Open-Collector Transistor compatible with either the L.S. Count or Remote Reset inputs of Cub Counters. Electrical isolation between input and output is achieved by means of an internal opto-isolator.

* *VCM [A-D] intended for use with Cub 1, 2, 4, and 7 Counters and Cub 5 with DC Voltage.*
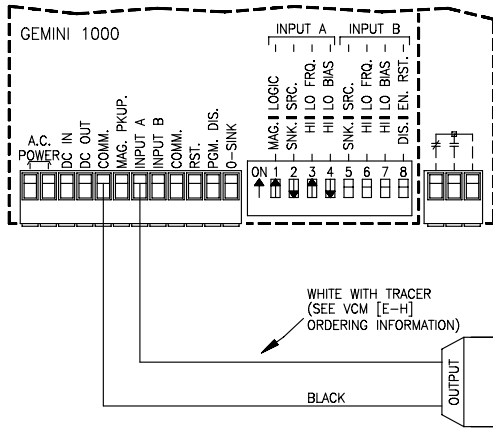
VCM [E-H]
These modules open up new application possibilities by adapting the Count Inputs of Gemini, Libra, Apollo, Lynx, Legends, PAXC, PAXI, CUBC, SC Series Counters, RMX - Rate Multiplier and the ACS Anti-Coincidence Summer to machine control voltage signals. The non-polarized input of these modules accept the four most widely used AC/DC voltage ranges and at count speeds up to 30 cps *(See VCM [E-H] Ordering Information for specific input voltage ranges)*. Electrical isolation between the input and the NPN Open-Collector Transistor output is achieved by means of a UL listed opto-isolator rated at 1500 V Peak continuous.

ELECTRICAL CONNECTIONS FOR VCM [A-D] & TCM
(Shown with optional VCM for Control Voltage Remote Reset)

ELECTRICAL CONNECTIONS FOR VCM [E-H]

GEMINI 1000

INPUT A   INPUT B

A.C. POWER
DC IN
DC OUT
COMM.
MAG. PKUP.
INPUT A
INPUT B
COMM.
RST.
PGM. DIS.
0-SINK

MAG. LOGIC
SNK. SRC.
HI LO FRQ.
HI LO BIAS
SNK. SRC.
HI LO FRQ.
HI LO BIAS
DIS. EN. RST.

ON 1 2 3 4 5 6 7 8

RLC UNITS	VCM [E-H] COUNT INPUT SWITCH SET-UP POSITIONS	
SC SERIES COUNTERS RMX & ACS	S1 = OFF (SNK)	
	S2 = ON (LO FRQ)	
	S3 = OFF (HI BIAS)	
GEMINI	S1 = ON (LOGIC)	
	S2 = OFF (SNK)	CHANNEL "A" SHOWN
	S3 = ON (LO FRQ)	
	S4 = OFF (HI BIAS)	

WHITE WITH TRACER (SEE VCM [E-H] ORDERING INFORMATION)

BLACK

OUTPUT   COUNT VCM [E-H]   INPUT

ORANGE

ORANGE

EXISTING CONTACT USED TO OPERATE RELAY

RELAY COIL

MACHINE CONTROL VOLTAGE

TCM - TRIAC CONVERTER MODULE

The TCM* is a specialized version of the VCM *[A-D]*. 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 of up to 4 mA and allows the application of CUB Counters to most unloaded Triac outputs. These modules are available for operation with 115 VAC ±10%
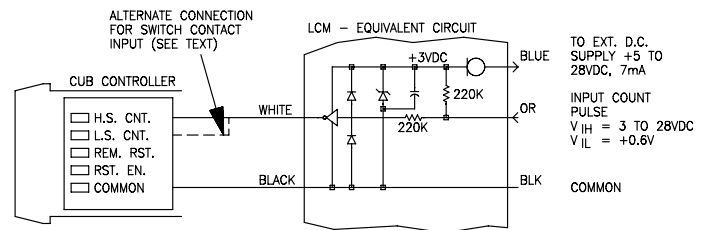
50/60 Hz only. They operate at count rates up to 10 cps, and also provide input/output electrical isolation. Connections for the TCM are the same as those for the VCM *[A-D]*.

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.

* *TCM intended for use with Cub 1, 2, 4, and 7 Counters and Cub 5 with DC Voltage.*
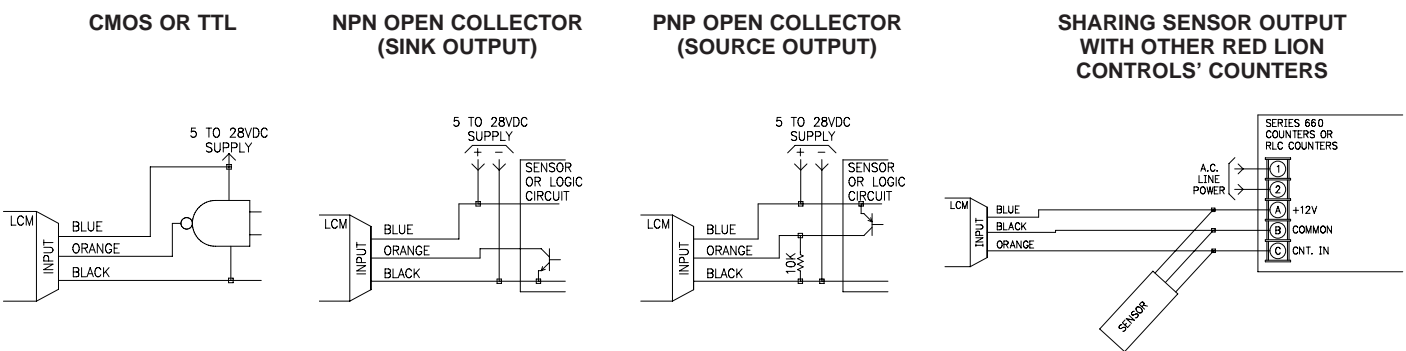
LCM - CONVERTER MODULE

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 similar to other Red Lion Controls' counter series. 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. The LCM will operate from any D.C. power source ranging from +5 to +28 VDC, and draws a maximum of 7 mA. No filtering or de-bounce circuits are included in the LCM itself, since these are already provided within the CUB Counters. When the LCM output is applied to the H.S. input of CUB Counters, count rates to 5000 cps can be accommodated *(100 μsec minimum pulse width)*.** 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.
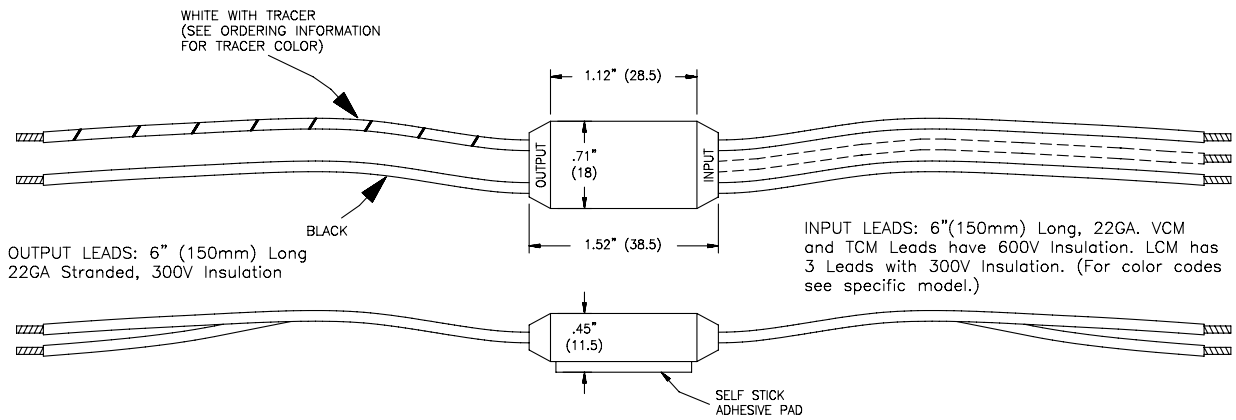
ALTERNATE CONNECTION FOR SWITCH CONTACT INPUT (SEE TEXT)

CUB CONTROLLER
H.S. CNT.
L.S. CNT.
REM. RST.
RST. EN.
COMMON

LCM – EQUIVALENT CIRCUIT

WHITE
BLACK

+3VDC
220K
220K

BLUE
OR
BLK

TO EXT. D.C. SUPPLY +5 TO 28VDC, 7mA

INPUT COUNT PULSE
V_{IH} = 3 to 28VDC
V_{IL} = +0.6V

COMMON

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

** *Some Red Lion Controls' sensors and accessories deliver a 50 μsec output pulse that will not be accepted by CUB Counters. (The PSMA Power Supply and Interface Module has a 50 to 100 μsec pulse stretcher circuit which can be used. See data sheet on PSMA).*

TYPICAL INPUTS TO LCM

CMOS OR TTL

5 TO 28VDC SUPPLY

LCM
INPUT
BLUE
ORANGE
BLACK

NPN OPEN COLLECTOR (SINK OUTPUT)

5 TO 28VDC SUPPLY
+ −
SENSOR OR LOGIC CIRCUIT

LCM
INPUT
BLUE
ORANGE
BLACK

PNP OPEN COLLECTOR (SOURCE OUTPUT)

5 TO 28VDC SUPPLY
+ −
SENSOR OR LOGIC CIRCUIT

LCM
INPUT
BLUE
ORANGE
BLACK
10K

SHARING SENSOR OUTPUT WITH OTHER RED LION CONTROLS' COUNTERS

SERIES 660 COUNTERS OR RLC COUNTERS

A.C. LINE POWER
1
2
A +12V
B COMMON
C CNT. IN

LCM
INPUT
BLUE
BLACK
ORANGE

SENSOR

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

WHITE WITH TRACER
(SEE ORDERING INFORMATION
FOR TRACER COLOR)

1.12" (28.5)

OUTPUT   .71" (18)   INPUT

BLACK

1.52" (38.5)

OUTPUT LEADS: 6" (150mm) Long
22GA Stranded, 300V Insulation

INPUT LEADS: 6"(150mm) Long, 22GA. VCM
and TCM Leads have 600V Insulation. LCM has
3 Leads with 300V Insulation. (For color codes
see specific model.)

.45" (11.5)

SELF STICK
ADHESIVE PAD

ORDERING INFORMATION

VCM [A-D] Intended For Use With Cub Counters**

MODEL NO.	DESCRIPTION	INPUT VOLTAGE	INPUT CURRENT	TRACER COLOR	PART NUMBER
*VCM [A-D]	Voltage Converter Module	4-30 V AC/DC	1-15 mA	orange	VCMA0000
		20-70 V AC/DC	1.2-3.5 mA	yellow	VCMB0000
		60-160 V AC/DC	1.5-2.5 mA	none (all white)	VCMC0000
		150-270 V AC/DC	1.2-1.8 mA	red	VCMD0000
*TCM	Triac Converter Module	115 VAC ±10%	9 mA	green	TCM10000
*LCM	Logic Converter Module	+3 to +28 VDC (signal) +5 to +28 VDC (supply)	115 µA max. (signal) 7 mA max. (supply)	none	LCM10000
* For use with CUB 1, 2, 4, and 7 counters and also Cub 3 and Cub 5 with DC Voltage.					
** VCM's are not recommended for use with rate indicators.					

VCM [E-H] Intended For Use With Gemini, Libra, Apollo, Lynx, SC Series, Legend, C48C, C48T, PAXC, PAXI and CUBC Counters, & Also RMX & ACS**

MODEL NO.	DESCRIPTION	INPUT VOLTAGE	INPUT CURRENT	TRACER COLOR	PART NUMBER
VCM [E-H]	Voltage Converter Module	4-16 V AC/DC	1.3-12 mA	blue	VCME0000
		20-55 V AC/DC	2.4-8.4 mA	violet	VCMF0000
		75-150 V AC/DC	1.6-3.7 mA	black	VCMG0000
		160-260 V AC/DC	1.6-3.0 mA	brown	VCMH0000
** VCM's are not recommended for use with rate indicators.					

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to one year from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

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