

VXM Stepping Motor Controller

Application Note # AN101

Interfacing to a Counter/Totalizer for Cycle Recording/ Life Testing

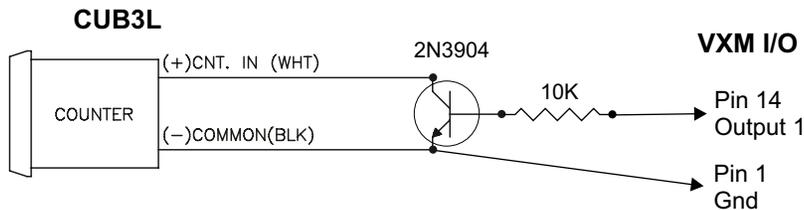
There are applications that involve testing materials for strength or wear. To keep track of the number of cycles, when doing repetitive testing, an external counter or totalizer is required. This Application Note demonstrates a method of using a low cost, battery powered counter to count test cycles from the VXM. By using a battery powered counter, the count will never be lost if a power failure interrupts the VXM.

Materials Needed:

1. General Purpose Battery Powered Electronic Counter (Red Lion CUB3L)
2. NPN Transistor (2N3904)
3. 10K ohm ¼ watt resistor
4. Auxiliary I/O Breakout Module or DB15HD (VGA) cable

Wiring:

An output on the VXM needs to be connected to the Counter's input. Most counters require an open collector device be connected to it. However, the VXMs outputs are totem poll/ push-pull type with protective diodes to +5V and Gnd. If the VXM is off and connected directly to the Counter there will be excess leakage current present causing rapid battery drain in the Counter. To minimize leakage current, an NPN transistor is used between the VXM and the Counter.



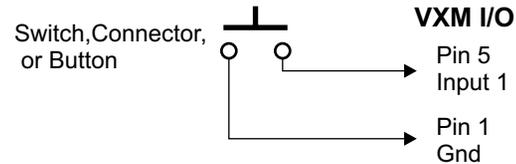
Program:

To advance the Counter by 1, it needs to get a pulse from the VXM. The **PA-x** command is the best way to make the appropriate pulse. The value of **x** must be long enough to meet the minimum pulse width specified by the manufacturer of the Counter. For the CUB3L the minimum width is specified at 5msec.

Example #1	Motors run	RAM used	Function
Auto-reverse	1	12	Auto-reverse with Output 1 to increment Counter

```
I1M400      ;Index out
I1M-400     ;Index back
PA-50       ;Make 5 ms pulse to Counter
L0          ;Loop forever
R
```

There are applications that require electrical testing for continuity. Electrical devices like connectors, switches, and buttons can be tested with the VXM. By wiring the device in series with Input 1 and 0V on the VXM, it is possible to test for continuity every cycle.



Example #2	Motors run	RAM used	Function
Auto-reverse With Wait	1	14	Index out, Wait for Input, Then Back with Output 1 to increment Counter

```
I1M400      ;Index out
U0          ;Wait for Input(Continuity)
I1M-400     ;Index back
PA-50       ;Make 5 ms pulse to Counter
L0          ;Loop forever
R
```