



COMMITTED TO:

- INNOVATION
- QUALITY
- PERFORMANCE



CIRRUS™ Series Counters User's Manual

FSI Technologies Inc.

668 Western Avenue • Lombard, IL 60148-2097

Phone: (630) 932-9380 • Fax: (630) 932-0016

(800) 468-6009

www.fsinet.com
fsi@fsinet.com

HISTORY

Founded in 1959, FSI Technologies Inc. Had its beginnings in the design and manufacture of precision tuning fork time standards, primarily for use in military applications. In the mid 1960's FSI entered into the industrial market with a line of high performance logic compatible photoelectric sensors and controls for factory automation.

During the following years FSI continued development of its sensor line while branching into high speed IR sensors, optical rotary shaft encoders, machine vision, fiber optics and other leading edge sensor and control technologies. Presently FSI manufactures state of the art sensors and electronic products for use in industrial, commercial, military, and medical applications.

IN HOUSE CAPABILITIES

- Standard sensors & encoders
- Custom sensors & encoders
- Application engineering & testing
- Electrical & mechanical engineering
- Prototype & production machining
- Darkroom & technical graphics
- Prototype PCB etching & fabrication
- PBC & mechanical assembly

The above capabilities and a creative, quality conscious staff make FSI the company of choice for both standard and custom products. FSI is committed to innovation, quality and customer satisfaction.

All of us at FSI and our capable network of Distributors look forward to assisting you.

Please call for the location of your nearest Distributor.

(630) 932-9380 - FAX (630) 932-0016 - (800) 468-6009

668 Western Ave., Lombard, IL 60148-2097

Email: info@fsinet.com

Table Of Contents

	Section	Page
Introduction	1.0	2
Operation	2.0	3
Dip Switch Setup Guide	3.0	4
Dip Switch Programming	3.1	5
Wiring, Mounting, and Dimensions	4.0	8
Cirrus Specifications	5.0	10
Controlling Outputs	6.0	11
Single Preset Counter	6.1	11
Dual Preset Counter	6.2	11
Batch Counter	6.3	12
Resetting the Counter	7.0	13
Calculating the Scale Factor	8.0	13
Example Count Diagrams	9.0	14
Count Up Mode	9.1	14
Count Down Mode	9.2	14
Interval Mode	9.3	15
Quadrature x4 Mode	9.4	15
Ordering Information	10.0	16
Safety	11.0	16

1.0 INTRODUCTION

The Cirrus Series Counter is a predetermining counter that will count high speed unidirectional, bi-directional, or quadrature input signals and will activate an output when the predetermined preset value is reached. The unit is available in both Single and Dual Preset models, and includes an internal totalizer. Also, the Cirrus Counter will operate as a Batch Counter using the second preset as a Batch Preset. The Cirrus comes with a variety of counting modes (some of which are only available in the dual preset model). The counter allows the users to set:

Count Up from Zero to a given Preset

The Output in the Counter is activated when the Count equals the Preset. In the Dual Preset Model, the Counter counts up from zero and Output 1 is activated when Preset 1 is reached and Output 2 is activated when Preset 2 is reached.

Count Down from a Preset to Zero

When Reset is pressed, the Counter is set to the Preset value. When the Count value equals zero, the Output is activated. In the Dual Preset Model, the Counter counts down from the High Preset value and activates one Output when it reaches the Low Preset value; the other Output is activated when the Counter counts down from the Low Preset value and reaches zero.

Interval Mode

In this mode, the Counter will not begin counting until Input 2 is turned ON, indicating a Start Signal. Once the Start Signal is received, the Output will turn ON and the Counter will count. The Output will then turn OFF at the preset or zero. The Start Signal must be activated each time the process is reset, even when the Counter is set to Auto Reset.

Batch Mode - Dual Preset Models only

In the Batch Mode, Input 1 is the Count input and will turn ON at Preset 1. Each time Output 1 turns ON, the Batch Counter will record a count. When the Batch Counter value equals the value in Preset 2, Output 2 will turn ON. The Batch Mode must be Manually Reset (unless T2 is set to .5 w/AR (00.00) for Auto Reset).

Timed Outputs

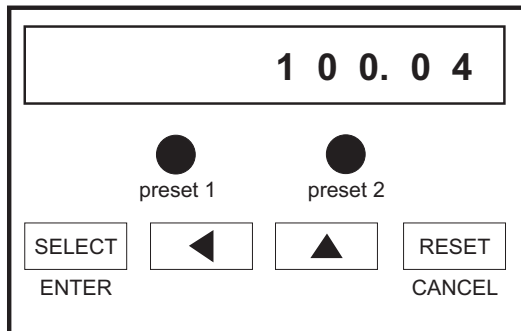
The Outputs can be delayed before turning OFF by setting time delay values for each output. Once the Preset is reached, a time delay, according to the time value set, will occur before the Outputs turn OFF. This value can range from 0.00 sec. (OFF at Preset) to 99.99 sec. (Latched ON). In addition, the outputs can also be set to turn OFF upon reaching the preset for the other output in the Dual Preset Model.

Scale Factor

A Prescale value can be set to allow viewing and setting counts using real units of measure. The Prescale value is a multiplier which is applied to the count input(s) to determine the count display and preset values. The Prescale value can be set from 0.00001 to 9.99999. In addition, the decimal point can be set on the display to any one of 6 positions.

2.0 OPERATION

To operate the Counter, there are four push button keys located on the front of the unit. These buttons are provided to allow the user to select, change and save various values. These key operations are dependent on the DIP Switch settings of the unit (see Section 3.0).



This figure shows the front of the panel with the Process Count value displayed. Pressing SELECT will scroll through a menu of options. After one of these options is displayed for a second, the value for that option is automatically displayed. Pressing the < key will move one digit to the left and the ^ key will increment the value by one. The SELECT key must be pressed to save the new value. Pressing RESET will return to the process count display. The change will not be entered if SELECT is not pressed. Selections in addition to Process Count are:

Totalizer: Counts accumulated since last Totalizer Reset. When the total counts exceeds 99,999,999 the Totalizer display will blink. Pressing RESET will scroll through the actual value until pressing RESET a final time will reset the value to Zero.

0 0 0 9 9 8 9 8

Batch: Number of cycles elapsed in Batch Mode.

B 1 0

Preset 1/Preset 2: Value compared with the actual count. When the Preset value is displayed, the Preset LED on the panel will light, indicating which preset is displayed.

0 0 0 5 0 0

Prescale: This factor will scale the input counts. The count signal is multiplied by the prescale value (range - 0.00001 to 9.99999) to determine the count displayed.

1.0 0 0 0 0

Note: If the prescale value is fractional, the output will energize when the count value passes the preset value.

Output 1/Output 2: Time delay setting for outputs.

L A T C H E D

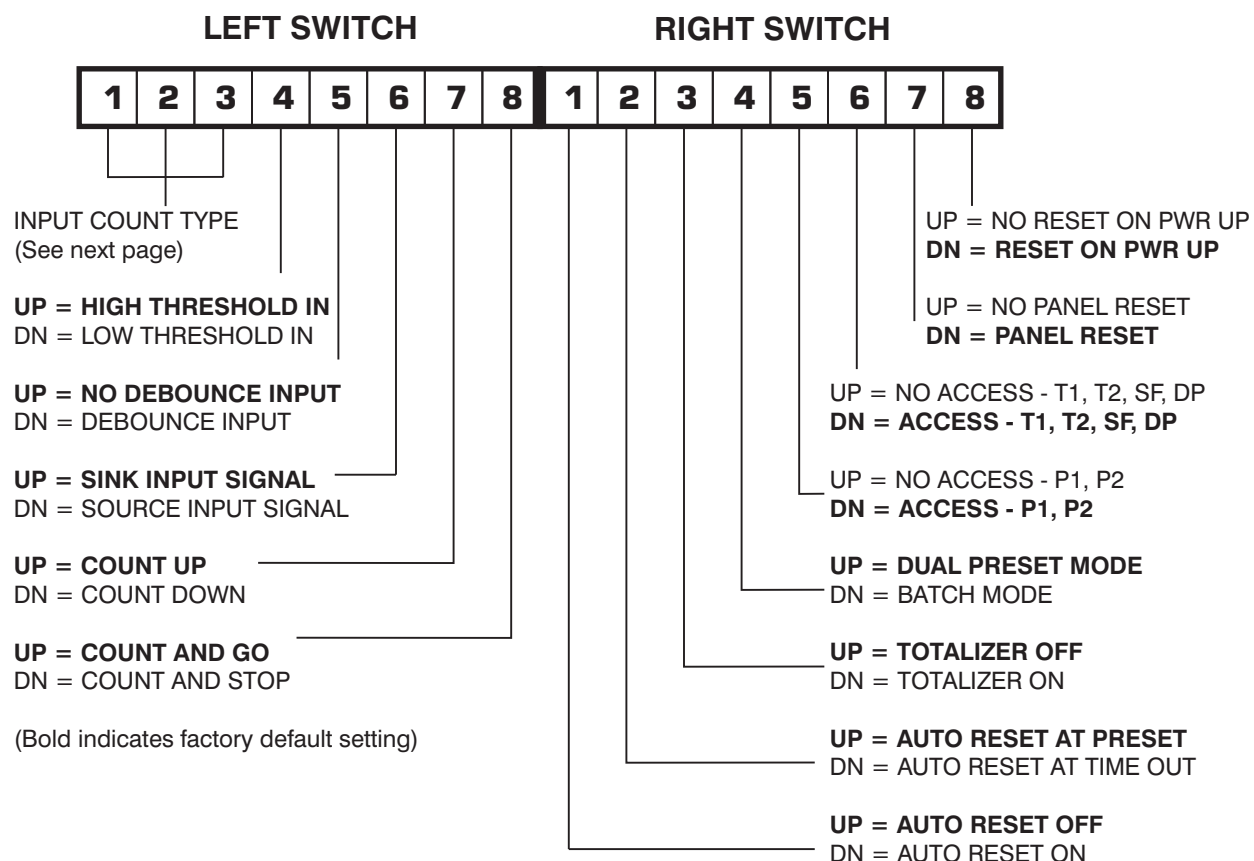
Decimal: The number of decimal positions for the display.

D P 0

When the Counter reaches its presets, the output will activate and the LEDs on the panel will flash, indicating which output is activated.

3.0 DIP SWITCH SETUP GUIDE

To set up the Counter for operation, a series of DIP switches located inside the unit must be set UP or DOWN. To access these DIP switches, loosen the two screws on the front panel and pull the unit from its housing.



NOTES:

RIGHT SWITCH Pin 4, DUAL PRESET/BATCH MODE, is only active on Dual Preset Models.

RIGHT SWITCH Pin 2, AUTO RESET AT PRESET/TIME OUT, is active only when RIGHT SWITCH Pin 1 is set to AUTO RESET ON (DN). The automatic reset takes place after the Preset (or zero) is reached (depending on the setting of LEFT SWITCH Pin 7, COUNT UP/DOWN) and will occur either immediately at the Preset, or after the Timed Output value has elapsed. For Dual Preset Mode, the automatic reset occurs after the highest of the two presets has been reached. For Batch Mode, the automatic reset only applies to Preset 1 (Count preset). For automatic reset of Preset 2 (Batch preset) in Batch mode refer to Section 6.3.2.

Changing the RIGHT SWITCH Pins 1,2 & 4 and LEFT SWITCH Pins 1,2 & 3 may cause the counter to load the default P1, P2, T1, T2, SF, and DP values of 500, 1000, 00.01, 00.01, 1.00000 and 0, respectively.

3.1 DIP SWITCH PROGRAMMING

3.1.1 LEFT DIP SWITCH

Pins 1,2, and 3 - the first three DIP switches define how the input count signals, Input 1 and Input 2, will be read. Determine which of the six available settings is needed for your application and set the switches accordingly:

INPUT COUNT TYPE:

Single and Bi - directional Counter

Input 1 = Count signal

Input = Directional Signal

Counter will count the trailing edges of input 1.

Counter will read a positive count when Input 2 is LOW and will read a negative count when Input 2 is HIGH.

LEFT SWITCH

1	2	3
---	---	---

UP UP UP

Quadrature Counter

Input 1 = Quadrature Count Signal

Input 2 = Directional Signal

Input 1 will count the trailing edges of the input signal.

If Input 2 trails, the Counter will read a positive count.

If Input 2 leads, the Counter will read a negative count.

DN UP UP

Quadrature Count x 2

Input 1 = Quadrature Count Signal x 2

Input 2 = Directional Signal

The leading and trailing edges of Input 1 are counted.

If Input 2 trails, the Counter will read a positive count.

If Input 2 leads, the Counter will read a negative count.

UP DN UP

Quadrature Count x 4

Input 1 = Count Signal x 2

Input 2 = Directional Count Signal x 2

Same as Quadrature Count x 2 except that the leading and trailing edges of the Input 2 are also counted.

DN DN UP

Count with Inhibit

Input 1 = Count Signal

Input 2 = Halts Input 1 counting when active.

Counter will count the trailing edges of Input 1 and read positive counts only when Input 2 is OFF. When Input 2 is ON, no counts are read.

UP UP DN

Interval Mode (Counter with Start Signal Input)

Input 1 = Count Signal

Input 2 = Start Signal

The Outputs will turn ON when Input 2 (Start Signal) is turned ON. Counter will count the trailing edges of Input 1 and register positive counts only after the Start Signal is detected. When the Preset(s) are reached and Timed Output values have elapsed, the Outputs will turn OFF.

DN UP DN

Pin 4 determines the threshold level for the Input Signal is:

High (UP):	5.5 V & 7.5 V trigger levels (Proximity Switch)
Low (DN):	1.5 V & 3.75 V trigger levels (TTL)

Pin 5 determines if the signals from Input 1 are filtered before being counted.

No Debounce (UP):	Signal is unfiltered with a max. freq. of 10 kHz.
Debounce (DN):	Signal is filtered to a max. freq. of 100 Hz.

Pin 6 determines whether the Inputs 1 and 2 operate as:

Sinking (UP):	Max. Current = 1.25 mA.
Sourcing (DN):	Max. Voltage = 30 VDC @ 7 mA.

Pin 7 determines the counting mode of the device:

Count Up Mode (UP):	The input will count up from zero and the output(s) will switch at their preset values(s).
Count Down Mode (DN)	The input will count down from the high preset and the output will switch at zero. For Dual Preset Mode, the other output will switch at the low preset.

Pin 8 determines the status of the Process Counter:

Count and Go (UP):	The Counter continues to accumulate counts after the preset is reached (or past zero).
Count and Stop (DN):	The Counter stops accumulating counts after the high preset is reached (or at zero).

3.1.2 RIGHT DIP SWITCH

Pin 1 determines whether the Counter will automatically reset or not:

Auto Reset Off (UP):	The Counter will not automatically reset.
Auto Reset On (DN):	The Counter will automatically reset upon reaching the high preset (or zero). The reset will occur either immediately or after the Timed Output value has elapsed. (See RIGHT SWITCH Pin 2). Note: Auto Reset does not apply to the Batch Counter when in Batch Counting Mode. Refer to Section 7.0 for addition information on Auto Reset.

Pin 2 determines when the Auto Reset will occur (RIGHT SWITCH Pin 1 must be set DOWN - Auto Reset On):

Reset at Preset (UP):	The Counter will automatically reset after the high preset is reached (or at zero).
Reset at Time-out (DN):	The Counter will continue counting after the high preset is reached (or at zero) until the Timed Output value has elapsed, and then will automatically reset.

Pin 3 determines if the Totalizer Counter is active:

Totalizer Off (UP):	The Totalizer is disabled.
Totalizer ON (DN):	The Totalizer is enabled and will count all pulses into the unit. The Totalizer can be reset by displaying the Totalizer value on the display and pressing the Reset button.

Pin 4 sets the Dual Preset Model to DUAL PRESET or BATCH MODE (this switch is not active on Single Preset models):

Dual Preset Mode (UP):	In the Dual Preset Mode, Preset 1 is the Preset for Output 1 and, Preset 2 for Output 2.
Batch Mode (DN):	In the Batch Mode, Preset 1 is the target Count value for Output 1 and Preset 2 is the number of cycles that will occur in the Batch process, before Output 2 switches.

Pin 5 establishes operator access to Preset 1 and Preset 2:

No Access - P1/P2 (UP):	This prevents access to these Presets from the front panel during operation.
Access - P1/P2 (DN):	This allows the Preset values to be adjusted from the front panel during operation.

Pin 6 establishes operator access to the values of Timed Output 1, Timed Output 2, Scale Factor, and Decimal Point position.

No Access - T1, T2, SF, DP (UP):	This prevents access to these values from the front panel during operation.
Access to - T1, T2, SF, DP (DN):	This allows these values to be adjusted from the front panel during the process.

Pin 7 determines whether the Reset Key on the panel is active during operation:

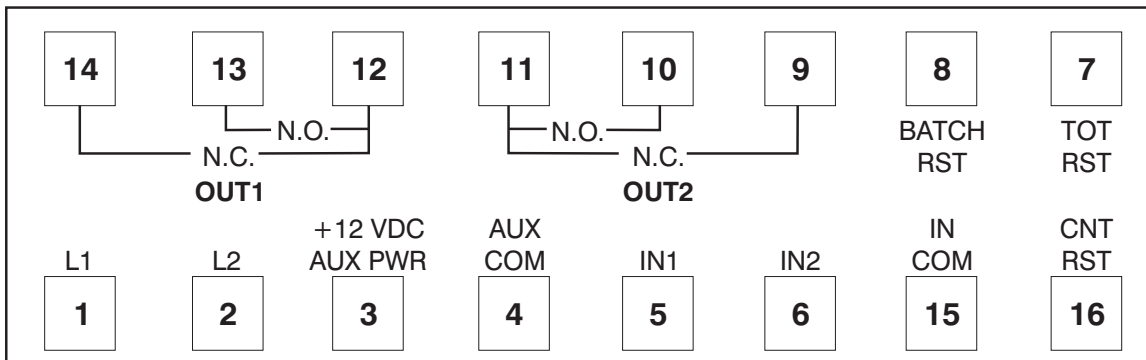
No Panel Reset (UP):	The count can not be reset by pressing the Reset Key on the panel. (Note: the three hardware reset terminals are always active and are not affected by this setting.)
Panel Reset (DN)	The displayed Count, Batch or Totalizer value will be reset when the Reset Key is pressed.

Pin 8 determines whether the Counter will reset when power is lost.

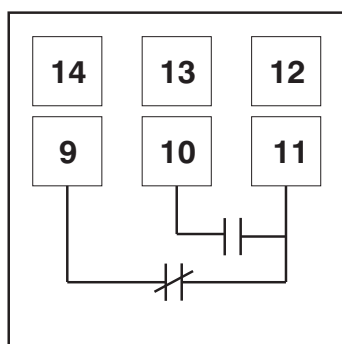
No Reset on Power Up (UP):	The Counter will resume counting from where it was before the power loss. (Note: any Outputs that were ON before the power loss will be set to OFF when power is restored.)
Reset on Power Up (DN):	If power is lost, the Counter will reset when power is restored.

4.0 WIRING, MOUNTING, AND DIMENSIONS

TERMINALS



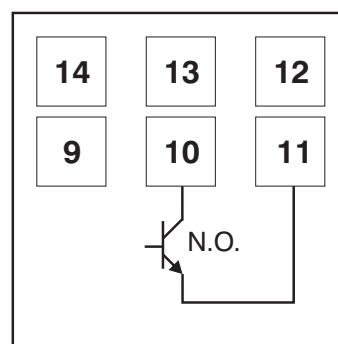
OUTPUT WIRING



RELAY

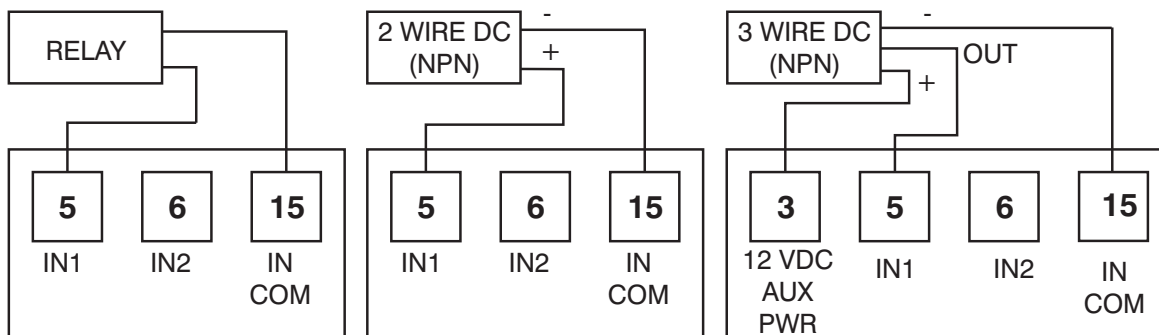
OUT 1

OUT 2



NPN TRANSISTOR
(Open Collector)

COUNT INPUT WIRING - SINK INPUT SIGNAL (Left Switch Pin 6 - UP)



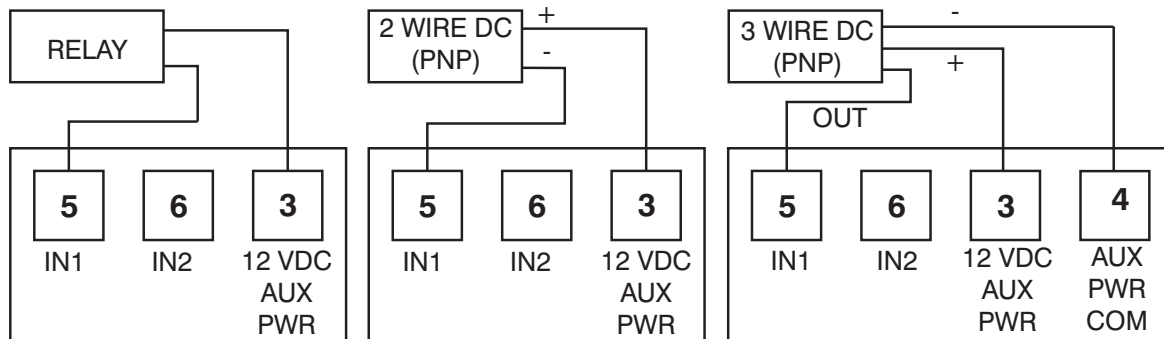
Note: Counter will read positive counts with terminal 6 not connected.

For negative counts, connect terminal 6 to terminal 15.

Note: For Count Inhibit or Interval Mode Start, wire terminal 6 in the same manner as terminal 5.

4.0 WIRING, MOUNTING, AND DIMENSIONS (Continued)

COUNT INPUT WIRING - SOURCE INPUT SIGNAL (Left Switch Pin 6 - DN)

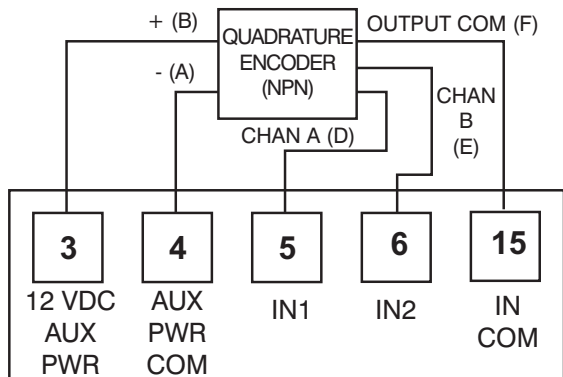


Note: Counter will read positive counts with terminal 6 not connected.

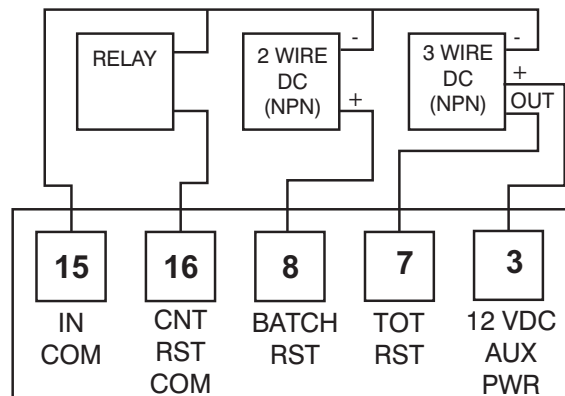
For negative counts, connect terminal 6 to terminal 3.

Note: For Count Inhibit or Interval Mode Start, wire terminal 6 in the same manner as terminal 5.

ENCODER INPUT WIRING SINK INPUT SIGNAL (Left Switch Pin 6 - UP)

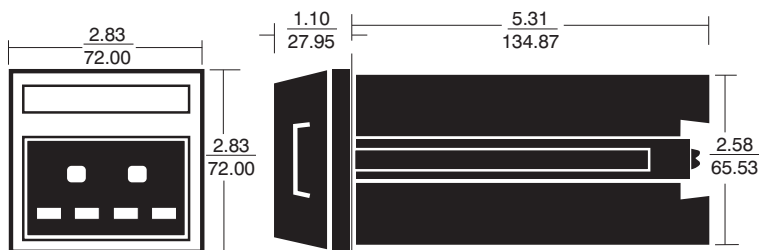


RESET INPUT WIRING (Sink Input Signals)

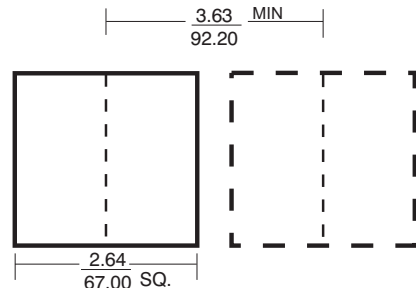


MOUNTING AND DIMENSIONS

INCHES
MILLIMETERS



PANEL CUTOUT SHOWING DISTANCE
BETWEEN ADJACENT CUTOUTS.



5.0 CIRRUS SPECIFICATIONS

Settings (Front Panel):

Presets: 1 to 999,999
Scale Factor: 0.00001 to 9.99999
Timed Outputs: 00.01 to 99.98 sec.
 Latched
 Off at Preset
Decimal Positions: 0 to 6

Count Input Modes:

(Switch Selectable)
Bi - Directional
Quadrature X1
Quadrature X2
Quadrature X4
Count with Inhibit
Interval with Start Input

Operating Features:

(Switch Selectable)
Count Up or Count Down
Count/Go or Count/Stop
Sink or Source Count Input
High or Low Threshold (Bias)
Auto Reset at:
 High preset (Count Up)
 Zero (Count Down)
 After Timed output
Totalizer
Dual Preset / Batch mode
Security lockout:
 Access to Presets
 Access to T1, T2, SF, DP
 Front panel Reset
Reset on Power Up

Maximum Counting Frequency:

10 kHz - Count Up mode
9 kHz - Count Down Mode
(Reduce by 3 kHz when
Totalizer Counter is enabled).
(Reduce by 2 kHz when Auto
Reset is enabled).
Min. pulse 10 usec. on: 90 usec. off.

Count Inputs:

Sink - 9.4 K ohm pull up.
Max. current = 1.25 ma.
Source - 4.7 K ohm pull down.
Max. voltage = 30 VDC @ 7 ma.
High Bias: ViL = 5.5 V Max.
 ViH = 7.5 V Min.
Low Bias: ViL = 1.5 V Max.
 ViH = 3.75 V Min.

Debounce - reduces count Input 1
to 100 Hz. (Input 2 no debounce).

Interval start requires
15 msec min. pulse.
(Can be momentary or sustained).

Remote Resets:

Count, Batch, Totalizer
Min. 15 ms. pulse
 Pulled to 5V via 8K ohm res.
Active Low. ViL = 0.5 V Max.
Max. current = .625 ma.

Output - Solid State:

Current Sinking
I sink = 100 ma Max.
VoL = 1.0 VDC Max.
Max. Voltage = 30 VDC

Output - Relay:

Life - 100 million operations (no
load). Contact Rating - 10 amp.
30 VDC or 250 VAC, 1/3 HP.

DC supply for external sensors:

12 VDC Regulated, +/- 4%.
Max. current = 120 ma.

Memory:

Non-Volatile EEPROM.
196,000 power losses min.
10 Year Retention

Models:

Single and Dual Preset with
either NPN (Solid State) or Relay
Outputs.

Power:

120 VAC: 95 - 132 VAC
240 VAC: 190 - 264 VAC
50 / 60 Hz.
Max. power = 8 VA.

Display:

8 Digit, 14 Segment
5 mm. X 4.1 mm. (0.2" x 0.16")
Blue Vacuum Fluorescent

Housing:

Plug in.
72 mm. sq. DIN Plug in. Fully
Gasketed. Dust and Water tight.

Terminals:

16 screw terminals
accessible from rear.

Operating Temperature:

0° F to 140° F.
-20° C to 60° C

Humidity:

0% to 80% RH
Non-condensing

6.0 CONTROLLING OUTPUTS

6.1 SINGLE PRESET COUNTER

Time Delayed Output

To make the output remain energized for a time delay, set the Output 1 value to a time value. This time value can be set to a range of 00.01 to 99.98 seconds. Upon reaching the preset, the output will remain ON for this period of time, or until it is reset via the Reset key on the panel or the external Count Reset input.

Latched Output

(Note: Auto Reset must be set OFF for the Latched output setting to be allowed (RIGHT SWITCH PIN 1 - UP). Also, the Latched output setting is not active when the Counter is set for Interval Mode). To latch the output ON until the Counter is reset, set the Output 1 value to 99.99. The display will show "LATCHED". Upon reaching the preset, the output will remain ON until it is reset via the Reset key on the panel or the external Count Reset input.

Output OFF at Preset

(Note: The Counter must be set to Interval Mode for the OFF at Preset setting to be allowed). To make the output turn OFF upon reaching the preset, set the Output 1 value to 00.00, the display will show "OFF at P1". (If the Counter is set to Count Down the display will show "OFF AT 0"). Upon reaching the preset, the output will turn OFF.

6.2 DUAL PRESET COUNTER

Time Delayed Output

To make either output remain energized for a time delay, set the Output 1 and/or the Output 2 value to a time value. This time value can be set to a range of 00.01 to 99.98 seconds. Upon reaching the preset, the output will remain ON for this period of time, or until it is reset via the Reset key on the panel or the external Count Reset input.

Latched Output

(Note: Auto Reset must be set OFF for the Latched output setting to be allowed (RIGHT SWITCH PIN 1 - UP). Also, the Latched output setting is not active when the Counter is set for Interval Mode). To latch either output ON until the Counter is reset, set the Output 1 and/or the Output 2 value to 99.99. The display will show "LATCHED". Upon reaching the preset, the output will remain ON until it is reset via the Reset key on the panel or the external Count Reset input.

Output ON at Low Preset, OFF at High Preset

To make the output controlled by the lower preset turn OFF at the higher preset, set the Output value of the output controlled by the lower preset to 00.00. If Output 1 has the lower preset, the Output 1 value display will show "OFF AT P2". If Output 2 has the lower preset, the Output 2 value display will show "OFF AT P1". (If the Counter is set to Count Down the output value display will show "OFF AT 0"). Upon reaching the Low Preset, the output will remain ON until the High Preset is reached, or until it is reset via the Reset key on the panel or the external Count Reset input.

6.2 DUAL PRESET COUNTER (continued)

Output OFF at Preset

(Note: The Counter must be set to Interval Mode for the OFF at Preset setting to be allowed). To make either output turn OFF upon reaching the preset, set the Output value to 00.00. The display will show "OFF at P1" for Output 1 or "OFF at P2" for Output 2. (If the Counter is set to Count Down the display will show "OFF at 0"). Upon reaching the preset, the output will turn OFF.

6.3 BATCH COUNTER

6.3.1 Output 1 - Process Counter

When the Counter is set up as a Batch Counter, Output 1 operates the same as the Single Preset Counter. Refer to Section 6.1 for operation of this output.

6.3.2 Output 2 - Batch Counter

Time Delayed Output

To make Output 2 remain energized for a time delay, set the Output 2 value to a time delay value. This time value can be set to a range of 00.01 to 99.98 seconds. Upon reaching Preset 2 (Batch Preset), Output 2 will remain ON for this period of time, or until it is reset via the Reset key on the panel or the external Batch Reset input.

Latched Output

To latch Output 2 ON until the Batch Counter is reset, set the Output 2 value to 99.99. The display will show "LATCHED". Upon reaching Preset 2 (Batch Preset), Output 2 will remain ON until it is reset via the Reset key on the panel or the external Batch Reset input.

Pulse for .5 sec and Automatically Reset the Batch Counter

To make Output 2 turn on for .5 seconds and automatically reset the Batch Counter upon reaching Preset 2 (Batch Preset), set the Output 2 value to 00.00. the display will show ".5 W/AR". Upon reaching Preset 2 (Batch Preset), Output 2 will turn ON for .5 sec and the Batch Counter will automatically reset, allowing inputs for the next batch to counted. This allows the Batch Counter to automatically repeat its cycle without being manually reset via the Reset key on the panel or the external Batch Reset input.

Note: When Preset 2 is to ".5 W/AR" and the Counter is set to Auto Reset (RIGHT SWITCH, PIN 1 - DN), The maximum count frequency is reduced by 4 kHz.

7.0 RESETTING THE COUNTER

7.1 Manual Reset

The Counter can be manually reset via the Reset key on the panel or via the external Reset inputs. Pressing the Reset key on the panel will reset the Counter which is currently displayed on the panel. To reset the Process Counter, press the Reset key when the Process Count is being displayed. To reset the Batch Counter, press the Reset key when the Batch Count is displayed. To reset the Totalizer, press the Reset key when the Totalizer Count is displayed. The three external Reset inputs will reset the Process, Batch, or Totalizer Counters when activated.

Reset of the Counters will occur within 15 msec. of a signal being received by the Reset key on the panel or from the external Reset inputs. Upon reset, the appropriate outputs will turn OFF and the Counter will be reset to zero (or the high preset for count down mode). The Counter will not read count inputs while the reset signal is being received. When the reset signal is removed, the Counter will again begin to count.

7.2 Auto Reset (RIGHT SWITCH, PIN 1 -DN)

Auto Reset allows the Counter to automatically reset upon reaching the high preset (or zero for count down). The Auto Reset will occur either immediately at the high preset, or after the Output time delay has elapsed, depending on the position of RIGHT SWITCH, PIN 2. This allows the Counter to operate with repeating cycles, without waiting for a manual reset signal from the Reset key on the panel or the external Count Reset input.

Note: Auto Reset will only reset the Process Count value. The outputs will remain ON until the Output time delay has elapsed. Auto Reset does not affect the Batch Count. To Auto Reset the Batch Count, refer to Section 6.3.2.

Note: When the Counter is set to Auto Reset, the maximum count frequency is reduced by 2 kHz.

8.0 CALCULATING THE SCALE FACTOR

The Prescale value is factory set to provide 1 count on the display for each input pulse received by the Counter. To make the display show real units, such as "gallons" or "feet", set the prescale value to calculate these units for the display. The Prescale value is determined as follows:

$$\text{PRESCALE VALUE} = \text{DISPLAY UNITS} / \text{NUMBER OF PULSES}$$

The DISPLAY UNITS represents the number of units that should be displayed after the NUMBER OF PULSES has been counted.

The NUMBER OF PULSES is the number of pulses required to achieve the DISPLAY UNITS.

The Prescale value can be set from 0.00001 to 9.99999.

9.0 EXAMPLE COUNT DIAGRAMS

9.1 COUNT UP MODE / DUAL PRESET / MANUAL RESET / NO OUTPUT DELAY

LEFT SWITCH								RIGHT SWITCH							
U	U	U	U	U	U	U	U	U	U	U	U	D	D	D	U
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8

Preset Values:

Low Preset (P1) = 3

(Range: 1 to 999,999)

High Preset (P2) = 5

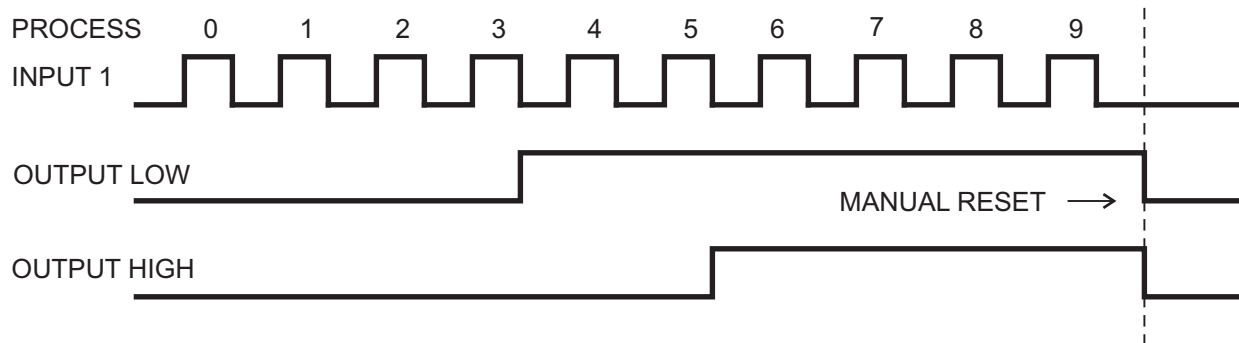
(Range: 1 to 999,999)

Output 1 (T1) = Latched

(Range: Off at P2/ 0.01 to 99.98 / Latched)

Output 2 (T2) = Latched

(Range: 0.01 to 99.98 / Latched)



9.2 COUNT DOWN MODE / DUAL PRESET / AUTO RESET / AFTER TIME OUT

LEFT SWITCH								RIGHT SWITCH							
U	U	U	U	U	U	D	U	D	D	U	U	D	D	D	U
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8

Preset Values:

Low Preset (P1) = 3

(Range: 1 to 999,999)

High Preset (P2) = 5

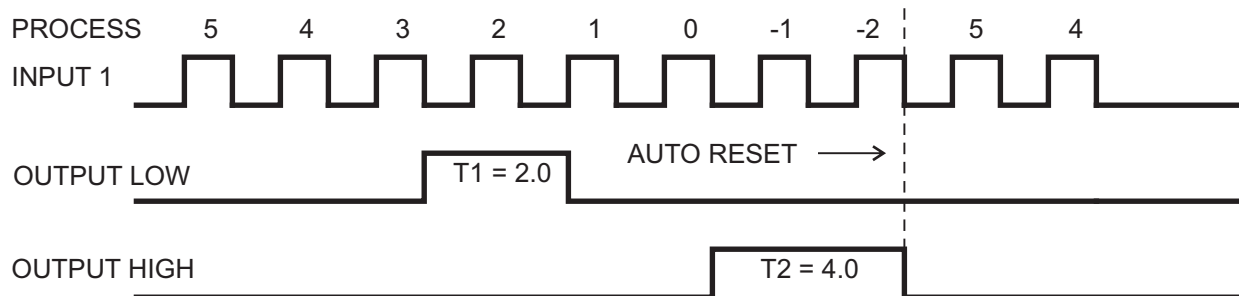
(Range: 1 to 999,999)

Output 1 (T1) = 2.0

(Range: Off at Zero/0.01 to 99.98)

Output 2 (T2) = 4.0

(Range: 0.1 to 99.98)



9.3 INTERVAL MODE / COUNT DOWN MODE / DUAL PRESET / MANUAL RESET

LEFT SWITCH								RIGHT SWITCH							
D	U	D	U	U	U	D	U	U	U	U	U	D	D	D	U
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8

Preset Values:

Low Preset (P1) = 3

(Range: 1 to 999,999)

High Preset (P2) = 5

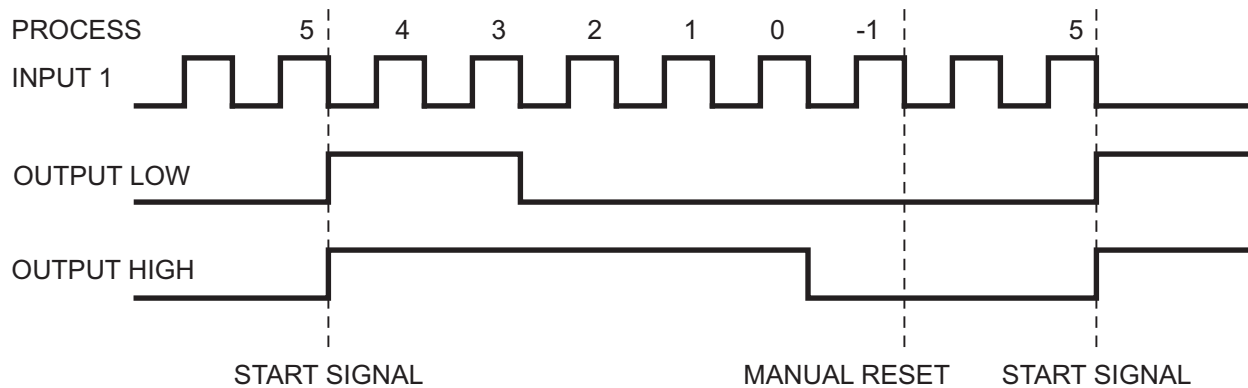
(Range: 1 to 999,999)

Output 1 (T1) = Off at P1

(Range: Off at P1 / 0.01 to 99.98)

Output 2 (T2) = Off at 0

(Range: Off at 0 / 0.01 to 99.98)



9.4 QUADRATURE x 4 / COUNT DOWN MODE / BATCH MODE / BATCH AUTO RESET

LEFT SWITCH								RIGHT SWITCH							
D	D	U	U	U	U	D	U	D	D	U	D	D	D	D	U
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8

Preset Values:

Count Preset (P1) = 16

(Range: 1 to 999,999)

Batch Preset (P2) = 2

(Range: 1 to 999,999)

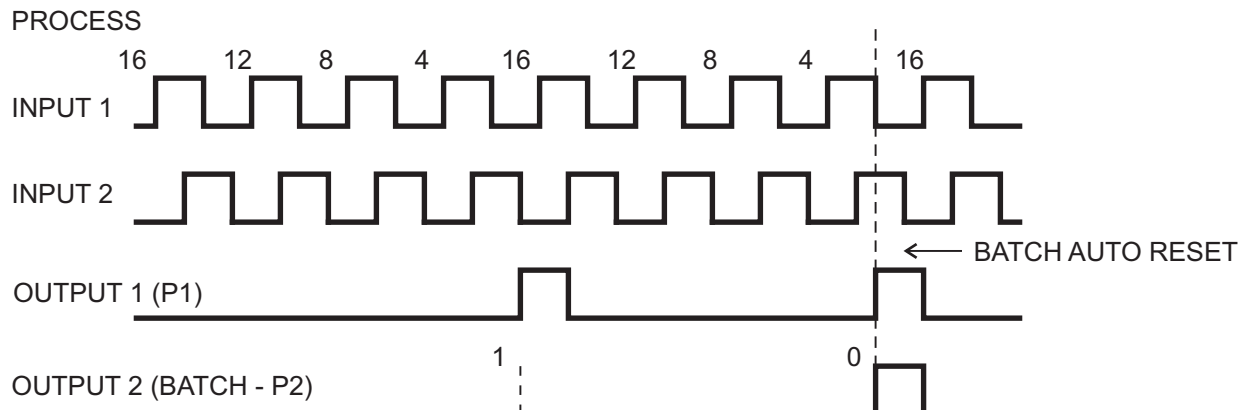
Output 1 (T1) = 0.5

(Range: 0.01 to 99.98)

Output 2 (T2) = 0.5 sec. with Auto Reset*

(Range: .5 with AR / 0.01 to 99.98 / Latched)

* This is the only way to Auto Reset the Batch Count.



10.0 ORDERING INFORMATION

		CRS - - - - -
BASIC MODEL TYPE		
PRESETS		
SP	Single Preset	
DP	Dual Preset (w/ Batch)	
VOLTAGE / FREQUENCY		
120	120 VAC, 50/60 Hz	
240	240 VAC, 50/60 Hz	
OUTPUT TYPE		
NPN	NPN Transistor	
RLY	Relay	
FEATURES		
NONE	Standard	
X	Special	

11.0 A WORD ABOUT SAFETY

Most of FSI's products are designed for general and not for specific applications. Because of this, we usually are not aware of how they eventually will be used. However, they are frequently employed in controlling automatic machinery or processes.

Although FSI makes products of high reliability, every product, given enough time, can be expected to fail. Statistically, devices can fail after a short period of time or a long period of time or anything in between. In essentially all cases, failure means (1) failure to provide a logic signal or power to an electrical load when it should or (2) the providing of such a signal or power when it should be absent. Less often, failure means failure to meet some other specification. But, in all cases, it means to do something unwanted or unexpected.

Since the failure of automatic machinery or processes can create hazardous conditions for personnel or property, whatever the definition of failure might be, it is necessary to consider the consequences of failure and design the application in which the FSI product is used so that failure will not create a hazard to personnel or property. The design must insure that any failure will result in a fail-safe condition and there will be no danger to personnel and/or property involved in the use of the product. *FSI products are not intended for use as final safety devices.*

Designs incorporating controls of any kind should be carefully considered to provide for their eventual failure.

IMPORTANT NOTICE:

The use of this product is beyond the control of the manufacturer, no guarantee or warranty, expressed or implied, is made as to such effects incidental to such use, handling or possession or the results to be obtained, whether in accordance with the directions of the claimed so to be. The manufacturer expressly disclaims responsibility therefore. Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing laws and/or patents covering any material or use.

Warranties of Sale, disclaimer thereof and limitations of liability are covered exclusively by FSI's printed warranty statement for controls. These instructions do not expand, reduce, modify or alter FSI's warranty statement and no warranty or remedy in favor of a customer or any other person arises out of these instructions.

Over 750 Distributors within North America to Serve You



668 Western Avenue Lombard, IL. 60148-2097
ph: 800-468-6009 fax: 630-932-0016 sales@fsinet.com www.fsinet.com

