



# Totalizer Counter

## S660 Preset Totalizer Counter

- *Easily Programmed from the Front Panel*
- *Software Functions Include:*
  - Password*                      *Display Scaling*
  - Set Point Programming*      *Decimal Point Selection*
- *Screw Terminal Connectors for Easy Installation*
- *Rugged, High-Impact Plastic Case Fits Standard 1/8 DIN Cutout*
- *3.24" (82mm) for Restricted Space Behind Panel*
- *Remote Reset Capability*
- *Input Variety: Quadrature, Switch, TTL, CMOS, NAMUR, PNP, NPN*
- *Optional 5 Amp Relay Outputs*



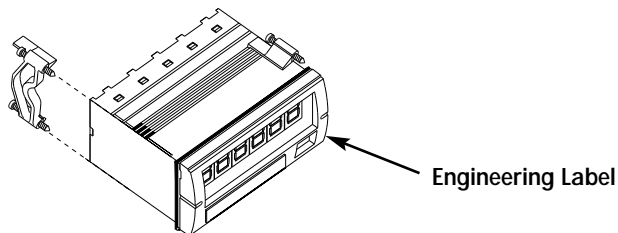
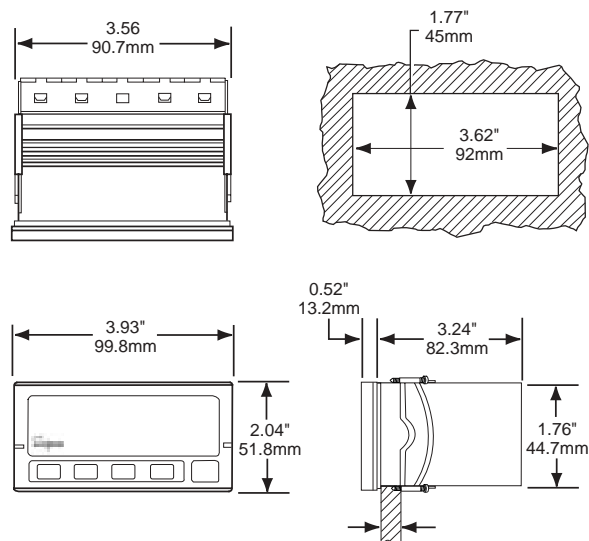
The S660 is a versatile totalizing counter that can be adapted to a wide variety of counting, measuring and controlling applications. The control inputs offer several counter operation modes: count/direction, add/add, add/subtract, subtract/subtract, quadrature and reverse quadrature. Optional relay outputs enhance the counter from a passive device to an integral control element for your application.

The S660 is compactly designed and features a standard 1/8 DIN case made of PBT-ABS alloy. Screw terminals are standard for easy installation and removal of the meter.

The counter is powered from 120 or 240VAC and has a non-volatile EEPROM to retain all programming and count information when the power source is removed or interrupted. The S660 accepts pulses from Quadrature, CMOS or TTL circuits and PNP or NPN devices. The optional 12VDC (100 mA) excitation output module can provide power for external sensors.

Other programmable software features include programmable decimal point and a password lockout feature. By using the password feature, the meter's programming functions and set points are protected from accidental reprogramming.

### Installation and Panel Cutout



#### Mounting Requirements

The S660 series 1/8 DIN counters require a panel cutout of 1.77" (45mm) high by 3.62" (92mm) wide. To install the counter into a panel cutout, remove the clips from the side of the meter. Slide the meter through your panel cutout, then slide the mounting clips back on the meter. Press evenly to ensure a proper fit.

#### Engineering Label Placement

If replacement of the engineering unit label is required, place the tip of a ball-point pen into the small hole at the base of the engineering label in the bezel. Slide the label up until it pops out. Grasp and remove. Slide the new label half the distance in, then use the ball-point pen to slide it down into place.

## Specifications

### DISPLAY

**Type:** 6-digit, 7-segment, red LED  
**Height:** 0.56" (14.2mm)  
**Decimal Point:** User-programmable  
**Count Direction:** "+" indication implied, "-" indication displayed  
**Display Range:** -99,999 to +999,999  
**Output Indicators:** 1 and 2

### POWER REQUIREMENTS

**AC Voltages:** 120, 240VAC,  $\pm 10\%$   
**Power Consumption:** 3VA

### INPUT RATINGS

**Current Sinking:** 10K $\Omega$  5% Resistor pull-up to (9.0 - 16 VDC)  $\pm 10\%$   
**Current Sourcing:** 5.1K $\Omega$  5% Resistor pull-down to common

**Minimum Pulse Width:**  $\sim 5\mu s$   
**Low Pass Filter:** <200Hz  
**Low Bias:** VLT = 1.6V  $\pm 10\%$   
VUT = 3.6V  $\pm 10\%$   
**High Bias:** VLT = 5.0V  $\pm 10\%$   
VUT = 7.0V  $\pm 10\%$   
**Count Rate:** 20KHz (Pulse Max)  
5KHz (Quadrature X4 Max)  
**Maximum Voltage Input**  
**A, B, and User:** 30VDC (Max)

### INPUT

**User Input:** (Display Hold) Display is frozen when the User Input is pulled low.  
**Standard Input:** VLT  $\leq 0.2$ VDC guaranteed low VUT = 3.0VDC (max)  
**Quadrature Input:** VLT  $\leq 0.9$ VDC VUT = 3.15VDC (max)

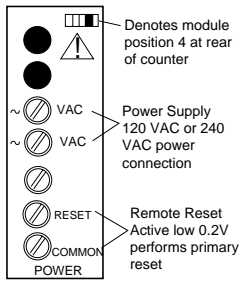
### ENVIRONMENTAL

**Operating Temp.:** 0°C to +40 °C  
**Storage Temp.:** -10 °C to +60 °C  
**Relative Humidity:** 0-80% for temperatures less than 32°C, decreasing linearly to 50% at 40 °C  
**Ambient Temperature:** 25°C  
**Temp. Coefficient (per °C):**  $\pm 100$ PPM/ °C  
**Warmup Time:** 15 minutes

### MECHANICAL

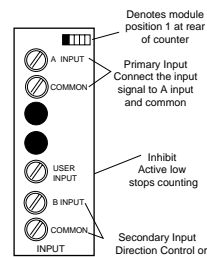
**Bezel:** 3.93" x 2.04" x .52"  
(99.8mm x 51.8mm x 13.2mm)  
**Depth:** 3.24" (82mm)  
**Panel Cutout:** 3.62" x 1.77" (92mm x 45mm)  
**Case Material:** PBT-ABS  
**Weight:** 9oz (255.1g)

## Wiring Diagram



AC Power Module

**Power Module:** The AC power module allows the S660 to be operated from standard 50/60 Hz line power. The power module will be configured as 120 or 240VAC per markings on the back panel. Ensure the input rating of the supply matches your line voltage. The power supply module has provisions for a hard-wire Count Reset. This control can be a switch, relay contact or solid state device. The reset circuit is independent of the power circuit.



Standard Input Module

**Note:** The input boards are designed so that selecting sourcing or sinking is based on the type of sensor that is being used. If a PNP (sinking) sensor is being used, set the input board for sinking also (switches 3 and 6 = OFF). If channel B is not used, default settings for switch positions 1 through 3 should be selected.

The Input module also provides for a User input signal. On the S660, this input serves as a count enable / disable control. Connecting User to Common will disable counting.

**Input Module:** The DIP switch SW1 is used to set up the counter to conform to the electrical characteristics of the sensor or signal being detected. Switch positions 1-3 configure channel B, while switches 4-6 configure channel A. These switches select bias (threshold voltages), low pass filter (enable/disable) and sensor type (sink or source). Refer to the sensor's documentation for related information.

## Programming

Menu Category	Parameter Name	Choices/Format	Description
	Pass	000 *	<b>Password Entry and Verification</b>
	Access <—	—> denied	<b>Password Fail</b> <i>Appears if incorrect password entered.</i>
	ChPass	000	<b>Password Change</b> <i>Appears if correct password entered. 000 = password protection disabled. 001-099 = secures all parameters. 100-999 = enable SPs/ ResPos access in display mode.</i>
Input Setup	A Chan	UP * Down Quad r quad	<b>Chan A Mode</b> Select count mode of A channel.
	B Chan Down	Dir * UP	<b>Chan B Mode</b> Select count mode of B channel. Note: If A channel set to Quad or R quad, this item is not accessible.
CountSetup	prescl	1.0 * 0.1 0.01 0.001	<b>Pre-scale</b> Set prescaling multiplier.
	scale	01.0000 *	<b>Scale</b> Set Display Value scaling multiplier. Values: -9.9999 to 99.9999.

\*Default Setting

## Programming (Cont'd)

Menu Category	Parameter Name	Choices/Format	Description
count SETUP	dp	000000 * 000000. 00000.0 0000.00 000.000 00.0000 0.00000	<b>DP</b> Display Value 1 (Count) Decimal Point location. Affects appearance of RstPos and any associated set point parameters.
OPUT 1 SETUP	mmode1	Di sabl timmed Latch * bound	<b>Output 1 Mode</b> Set the mode of operation for Output 1. Can be disabled, timed, latched or boundary mode.
	Timmed <— Latched <— SP1=Lo <—	—> At SP1 —> At SP1 * —> SP2=hi	<b>Output 1 Bindings</b> Reminder message indicates which and how the set points are used for comparison. Which message is displayed is determined by the Output 1 Mode selected.
	Del ay1	010.00 *	<b>Delay 1</b> Output 1 delay time. <i>Appears only if Output 1 mode set to timed.</i>
	Until 1	Reset * SP1 SP2 SP3 SP4 RstPos	<b>Until 1</b> Output 1 latched until parameter. <i>Appears only if Mmode1 = Latch.</i>
OPUT 2 SETUP	MMode2	Di sabl timmed Latch * bound	<b>Output 2 Mode</b> Set the mode of operation for Output 2. Can be disabled, timed, latched or boundary mode.
	Timmed <— Latched <— SP3=Lo <—	—> At SP3 —> At SP3 * —> SP4=Hi	<b>Output 2</b> Reminder message indicates which and how the set points are used for comparison. Which message is displayed is determined by the Output 2 mode selected.
	Del ay2	010.00 *	<b>Delay 2</b> Output 2 delay time. <i>Appears only if Output 2 mode set to timed.</i>
	Until 2	Reset * SP1 SP2 SP3 SP4 RstPos	<b>Until 2</b> Output 2 latched until parameter. <i>Appears only if MMode2 = Latch.</i>
SetPnt SETUP	SP1	000010 *	<b>SP1</b> Set Point #1 Low. Values: -99999 to 999999. Decimal point will appear according to the current DP setting.
	SP2	000020 *	<b>SP2</b> Set Point #1 High. Values: -99999 to 999999. Decimal point will appear according to the current DP setting.
	SP3	000030 *	<b>SP3</b> Set Point #2 Low. Values: -99999 to 999999. Decimal point will appear according to the current DP setting.
	SP4	000040 *	<b>SP4</b> Set Point #2 High. Values: -99999 to 999999. Decimal point will appear according to the current DP setting.
	RSTPOS	000000 *	<b>Reset Position</b> Count value is set to this when an Auto or Manual Reset event occurs. Values: -99999 to 999999. Decimal point will appear according to the current DP position.
Reset SETUP	Areset	Di sabl * At SP1 At SP2 At SP3 at SP4 AftOP1 AftOP2	<b>Auto Reset Mode</b> Selects when an auto reset function is to occur Disabled at a set point or after output times out. See also the RSTPOS parameter in the Setpnt Setup category.

\*Default Setting

## Programming (Cont'd)

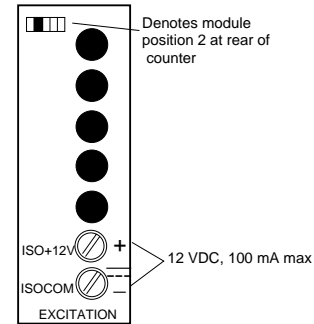
Menu Category	Parameter Name	Choices/Format	Description
Reset SETUP	RstBtn	enable * disabl	<b>Reset Button</b> Enable or disable front panel reset button.
	PonRst	No * Yes	<b>Power On Reset</b> select whether count reset event will occur at power-up.
End			<b>Exit Programming Menu</b>

\*Default Setting

## Excitation Output

The Excitation Module can supply 12VDC at up to 100mA for external sensors or encoders. This excitation is isolated from the counter internal logic supply.

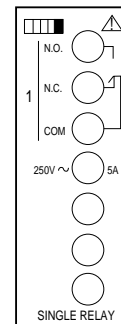
When using sensors or encoders that do not have a signal return or imply a signal return that is in common with the supply voltage, a common attachment that ties the excitation supply to the logic input common may be required.



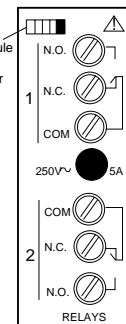
## Single and Dual Relay Modules

The Single and Dual Relay modules can activate circuit loads of up to 5 amps at 250VAC. A Form C configuration allows use of normally-open (NO) and normally-closed (NC) circuit action.

Only the output 1 channel is implemented in the single relay module.



Single Relay Module



Dual Relay Module

## Application Example

A Simpson Encoder and Counter are to be used to measure and cut raw material to length. A dual-speed motor is used to allow selection of high speed, low speed and stop. A pneumatic shear allows the material to be cut.

Material is initially to be fed at high speed. In the final six inches, low speed will be used. When the desired length is reached, the motor will be temporarily stopped and the shear activated for two seconds. The feed and cut cycle then resumes for a new piece.

**Process:**

Minimum and maximum piece length will be 12 inches and 6000 inches (500 feet) respectively. Material is a light colored textile, so skidding by measuring device is to be avoided.

**Display:**

Desired display and entry of lengths is in inches with two decimal places (1/100 inch resolution). i.e. The customer would like to enter 0.25 inch increments.

### Machine Specifications

**Motor and Control:** Motor runs in low speed when 120VAC applied to Run-Lo terminal. Hi Speed selected with 120VAC to Run-Hi Terminal. Maximum control current is 3 amps at either terminal. Hi speed = 1725 RPM, Lo speed = 430 RPM.

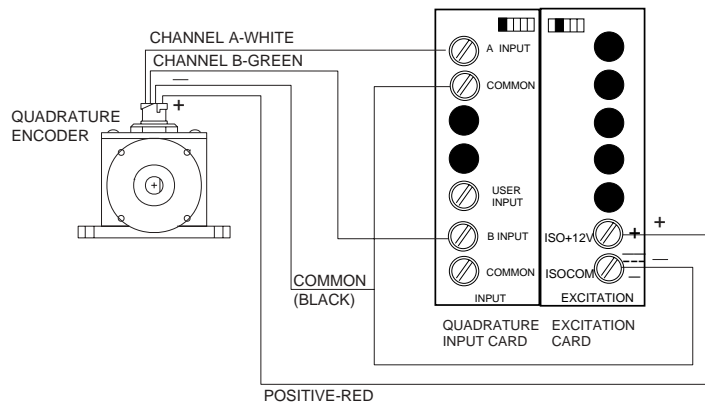
**Shear Specifications:** The pneumatic cutting blade is activated by applying 120VAC (0.5 amp maximum) to a control valve.

**Mechanical:** A motor reducer and drive pulley result in 1" of linear travel for every five motor revolutions.

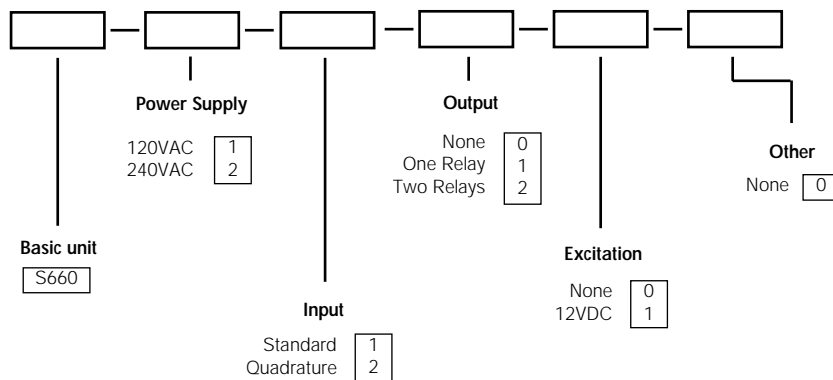
### Product Ordering Information

In the application example, a Simpson S660 Preset Totalizing Counter with a 120VAC power supply, Quadrature Input, Dual Relay Output, and 12VDC excitation is used (catalog no. S660-1-2-2-1-0). The encoder used is the SE Quadrature Encoder with 600 pulses-per-revolution (SE-600). An encoder chariot (46012) and 12" measuring wheel with 83A durameter non-marking tires (46005) are also required.

## Application Example (Cont'd)



## Ordering Information



## Safety Symbols



The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury.



The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly adhered to could result in damage to, or destruction of part or all of the instrument.

## Accessories



### SE Quadrature Encoder

The cube-style, dual-shaft SE Encoder is available with a choice of five different resolutions (pulses/revolution) to handle a broad range of measuring jobs. When the encoder is affixed to a chariot with measuring wheels and wired to one of the S660 series counters, cut-to-length measurement applications are assured an accurate and reliable reading.



### Chariot

The Chariot is used to mount most cube-style quadrature encoders and measuring wheels. Made of anodized aluminum, the chariot includes mounting hardware and selectable pivotal points. Wheels, tires, and flexible shaft couplings are sold separately.

### 12" Circumference Measuring Wheels with Tires

These 12-inch wheels are precision-machined anodized aluminum with a printed alignment scale. Replaceable tires are available in four different durometers, for use on a wide range of materials including non-marking tires to prevent tearing, damaging or marking up delicate materials.

#### Pulses Per Revolution

60  
100  
120  
360  
600

#### Catalog Number

SE-060  
SE-100  
SE-120  
SE-360  
SE-600

#### Tire Durometer

80A, black tire; longer service life for plastics, metals  
83A, non-marking tire for textiles, medium textures  
92A, non-marking tire for plastics, metals, coarse wood  
70A, non-marking tire for soft textiles

#### Catalog No.

46004  
46005  
46006  
46007