



**BLH**

**PS1010T**

**Web Tension Transmitter  
Operator's Manual**



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## **SECTION 1. Introduction**

The PS1010T DIN Rail transmitter is designed for Web Tension applications. The transmitter functionality is to condition, amplify, filter and convert the load cell analog output signal into a calibrated voltage or current analog output signal. The transmitter provides full isolation between the load cell input signal, analog output signal and supply voltage.

## **SECTION 2. Description**

The PS1010T transmitter is intended for field mounting close to the system transducers, thereby reducing installation costs. The transmitter provides the user with a selectable voltage or current output directly proportional to the load cell input signal. The DC analog current output supports 'sourcing', via an external pull down resistor, current mode operation only. The transmitter is designed to operate from a single DC power supply in the range of 20 to 30 V (nominally 24 VDC). The PS1010T unit is easily configured and calibrated via push-buttons and status LED's on the front of the panel. The calibration data are stored in non-volatile microcontroller EEPROM memory. The transmitter module includes a yellow LED on the front panel to provide visual indication for the push-buttons when they are pressed. Additionally, a green LED is provided to indicate the internal power status.

## SECTION 3. General Specifications

### Performance

Full Scale Input	3.0 to +3.0 mV/V full bridge
Dead Load Range	± 100% of full scale input
Calibration Range	0.2 to 2.5 mV/V for nominal output
Linearity	0.01% of full scale output
Common Mode Rejection	120 dB minimum
Common Mode Input	±20% of excitation voltage
Temperature Stability	50 ppm/°C
Response Time	<100 ms
Input Impedance	>250 Mohms nominal

### Environment

Operating Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-25 to 55°C (-13 to 131°F)
Humidity	85% at 55 degrees C
Atmosphere	nonflammable and noncorrosive

### Transducer Supply

Excitation	10 volts DC (symmetric ±5V)
Gage Resistance	175 -1000 Ohms
Gage Type	foil (2-3mV/V), full bridge
Number of load cells	two (2) per tension zone

### Power Supply

Input	24 VDC, +/-5% @ 125 mA
Range	20 to 30 VDC

### Analog Output Signals

Voltage	0-10 VDC @ >2K Ohms
Current	4-20mA @ < 700 Ohms
Galvanically Isolated	Yes

### Interface

Panel indicator or PLC input

### Enclosure

Type	DIN-Rail mount
Overall Size	45 x 75 x 105 mm L x H x D (1.77 x 2.95 x 4.13 in)
Weight	185 grams (6.5 oz)
Terminals	

### Approvals

CE	conforms to IEC 61326
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### Operating Conditions

Pollution	pollution degree 2
Protection	IP20 enclosure

### Ordering information

The basic Unit part number is PS1010T.

**Note: Data and specifications are subject to change without notice.**

## SECTION 4. Installation

Carefully remove the PS1010T unit from its packing. Check that the unit is complete and undamaged. The transmitter power input and output wiring are inserted at one side of the unit, while the load cell input wirings are inserted at the other side. Therefore to prevent noise coupling problems, it is recommended to separate the power and transmitter output wirings from the load cell signal wirings. Terminals are standard screw clamp type and accept wide range of wire sizes (14 AWG, max. for big terminals and 18 AWG, max. for small terminals). There should be provision to ground the cable shields to local (Mecca) ground, e.g. ground terminal on the DIN rail.

The installation location should be free of vibration. The transmitter should not be located next to strong electrical fields and should have easy access to the module.

The supply voltage should be protected from a short circuit, via fuse or resettable fuse.

For application, which uses a four-wire load cell cable, two jumpers must be installed between +SEN to +EXC and between -SEN to -EXC. Figure 1 illustrates the electrical wiring for the PS1010T transmitter module.

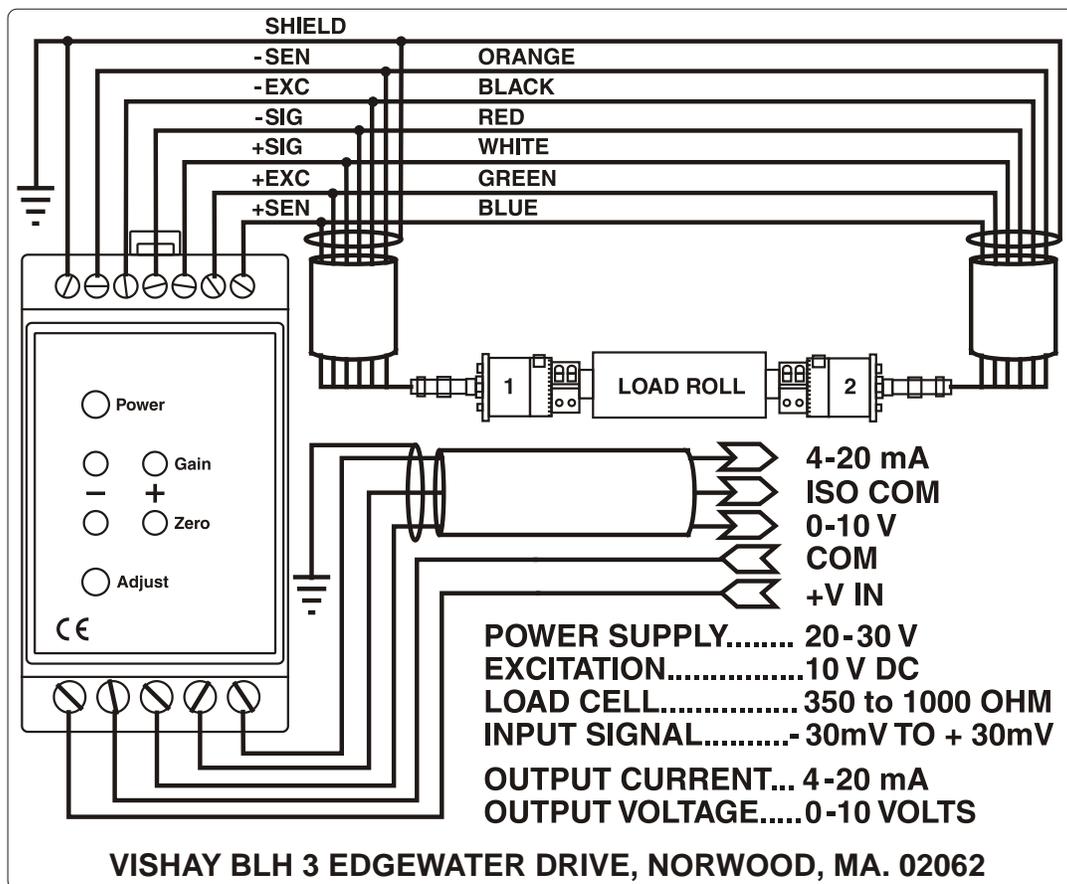


Figure 1. PS1010T Electrical Wiring.

## 4.1 PS1010T connections

### Load cell connection

Terminal	Description
SHIELD	Load cell cable shield input
-SEN	Negative sense input
-EXC	Negative excitation voltage input
-SIG	Negative output signal
+SIG	Positive output signal
+EXC	Positive excitation voltage input
+SEN	Positive sense input

### Power & Analog output connection

Terminal	Description
4-20 mA	4-20 mA current output signal
ISO COM	Isolated common return for current and voltage output signal
0-10V	0-10V voltage output signal
COM	Supply voltage return
+Vin	Supply input voltage

## 4.2 Mounting

The PS1010T transmitter has a slotted back panel for standard 35 mm DIN Rail mounting. Figure 2 shows the PS1010T mechanical dimension.

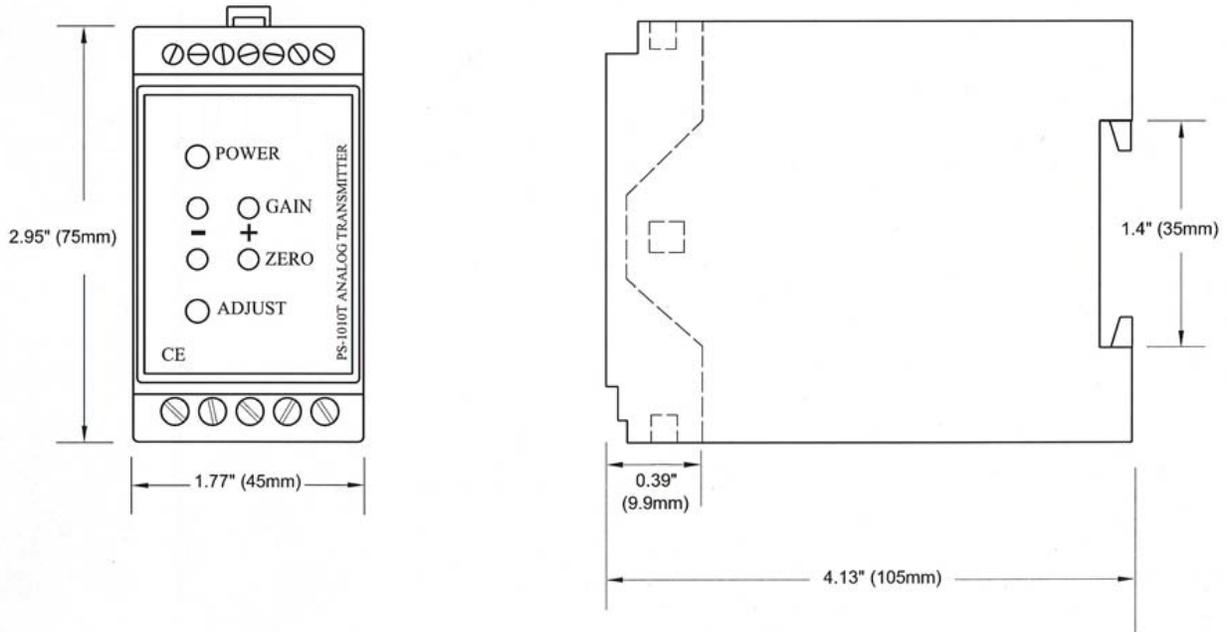


Figure 2. PS1010T Mechanical Dimensions.

## SECTION 5. Calibration Procedure

The PS1010T transmitter provides both current and voltage output simultaneously; however the transmitter can only be calibrated for one output at a time. The zero and full scale calibration of the transmitter are accomplished via the transmitter front panel ZERO "+", "-" and GAIN "+", "-" push buttons, and the transmitter status LED. The following procedure is recommended for proper calibration of the transmitter.

### 5.1 Procedure

- Connect the PS1010T transmitter as shown in Figure 1.
- Apply power to the transmitter and check for the transmitter's green LED.
- Connect analog output to voltage or current meter.
- Apply the load cell "zero" input signal and press ZERO "+" or ZERO "-" until zero output signal is adjusted. If the signal output is outside normal range and does not respond to the ZERO buttons, press both buttons GAIN "+" and GAIN "-" simultaneously to set lowest gain. Continue to adjust zero by pressing ZERO "+" or ZERO "-" until the transmitter output signal is adjusted to zero output level.
- Apply the load cell "full-scale" input signal and press GAIN "+" or GAIN "-" until the transmitter output signal is adjusted to full-scale output level.
- When transmitter output signals (low and high levels) are satisfied, push simultaneously the GAIN "+" and ZERO "+" to save the calibration data in non-volatile memory.
- Calibration is completed. If you want to interrupt the calibration process, do not perform the save command. You can always recall the last saved calibration data by pressing simultaneously the GAIN "-" and ZERO "-" or power down and up the unit.

### Notes:

- Note that every time a calibration push-button is pressed, the yellow LED is turned on.
- If the push-button is pressed one time, it causes the transmitter output signal to increment or decrement by small amount. If a large amount of signal change in output signal is required, then press and hold down the pushbutton accordingly.
- After a dual button command the functionality of the buttons are inhibited for 10 seconds. Release the buttons within this time in order to correctly save or recall calibration data.
- The end to end gain adjustment time is <1.5 min. At any gain, the time to adjust the output signal from 0 to 10 V (or 4 to 20 mA) is < 1 min. If the maximum gain is applied (then <1 min is the time to balance 0.2mV/V referred to input), the time to balance 2mV/V can be up to 10 minutes. To avoid this delay then go to next bullet.
- If the two gain buttons are pushed (GAIN "-" and "+"), the lowest gain is applied. This is useful to find the signal and save calibration time.
- If the two zero buttons (Zero "-" and "+") are pushed, 'zero' balance is achieved at the unit output (assuming the input is set to 0 V).

**Caution:** Do not insert sharp or oversized objects into the push-button switch openings as this may damage the unit. When depressing the push-buttons, use a blunt tipped object and apply pressure gradually until you see the yellow LED lit up.

## **SECTION 6. Field Engineering**

Authorized BLH Field Service Engineers are available around the world to install PS 1010T based web tension measurement systems and/or train factory personnel to do so. The field service department at BLH is the most important tool to assure the best performance from your application. Field service phone numbers are listed below.

**Factory: (Main Number)  
(781) 298-2000**

**Canada: (416) 251-2554  
or  
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