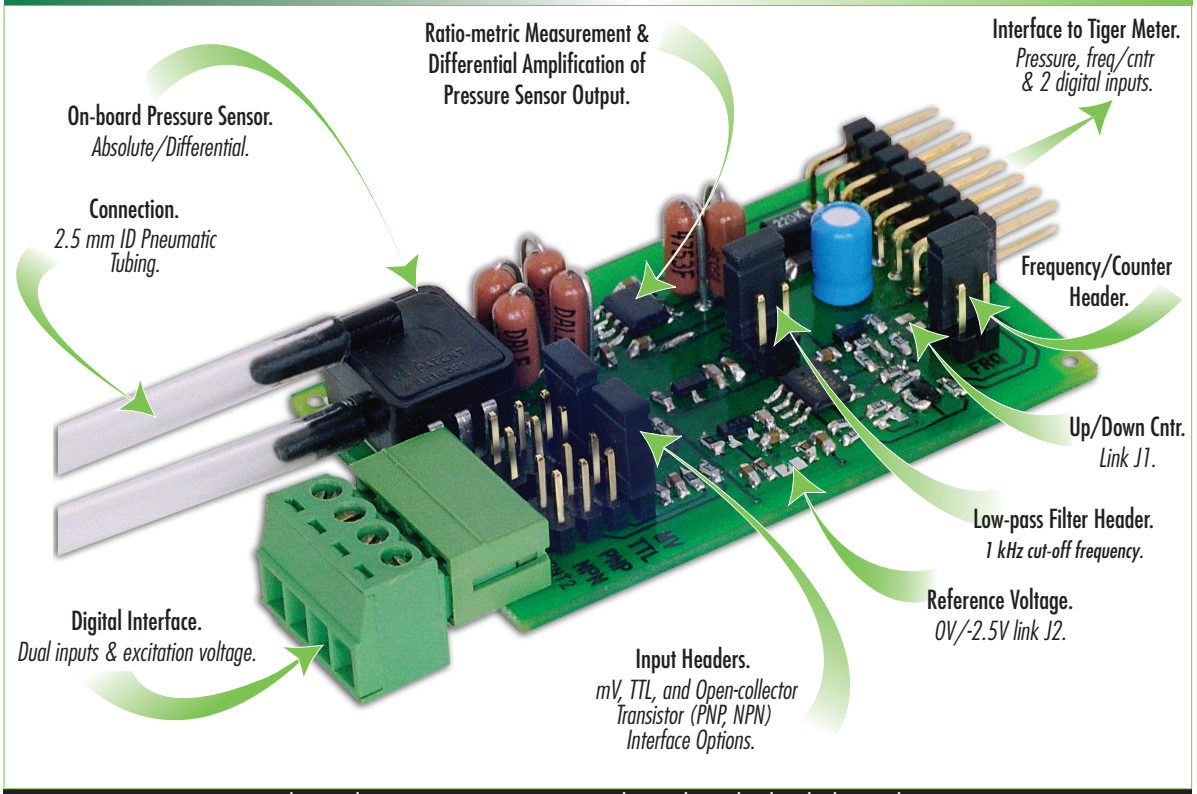
TEXMATE INC

Fits Tiger 320 Series

DIRECT PRESSURE SENSOR INPUT MODULE



An on-board pressure sensor combined with dual digital inputs.

A cost effective solution for pressure applications requiring monitoring and process control of non-corrosive, non-ionic working fluids such as air, dry gases and similar. The pressure sensor is available in absolute and differential models and pressure ranges from 0 to 100 psi. Two independent digital inputs and a 24 V excitation voltage provide additional transducer and/or logic interfaces for measuring such variables as flow rate of the fluid being monitored.

Input Module Order Code Suffix

IGYX

I	G		X

Sensor Range	CH1
1 psi absolute	A
1 psi differential	B
5 psi absolute	C
5 psi differential	D
15 psi absolute	E
15 psi differential	F
30 psi absolute	G
30 psi differential	H
100 psi absolute	J
100 psi differential	K

For Single Channel IGYX with two status inputs, the last digit of the order code is always X.

For example, IGDX:
CH1 5 psi, differential pressure.

Hardware Module Specifications	
Pressure Inputs Channel 1	Absolute or differential connections
	via 2.5 mm I.D. pneumatic tubing.
Pressure Ranges	0-1, 0-5, 0-15, 0-30, and 0-100 psi.
	Temperature compensated 0-50 °C, ± 0.4% F.S.
Max Pressure any Port	150 psi.
Repeatability	± 0.2% F.S. typical.
Linearity/Hysteresis	± 0.2% F.S. typical.
Digital Inputs	Dual independent digital inputs.
	Input 1(Channel 2) can be configured to measure frequency,
	or as an UP/DOWN counter and as a digital input (D1).
	Input 2 is treated as a digital input only (D2).
	In both cases, frequency response is dependent on meter
	update rate.
Input Headers	Configured for mV, TTL, OC (NPN/PNP) interface.
	Millivolt reference to 0 V (open jumper J2)
	TTL/PNP/NPN referenced to -2.5 V (close jumper J2)
Excitation Voltage	24 V DC (50 mA) available for external signal excitation.
Low-pass Filter Header	Set to OFF position for high speed update.
	Set to ON for 1 kHz cut off frequency low-pass filter.
	(Does not apply to Input 2.)
Frequency/Counter Header	Input 1selected as either a frequency or counter input.
	Up counter: open jumper J1. Down counter: close jumper J1.
	(Does not apply to Input 2.)

DIRECT PRESSURE SENSOR

INPUTS

☆ DIRECT PRESSURE

PRESSURE

FREQUENCY RPM, Pulse, Counter

Connector Pinouts

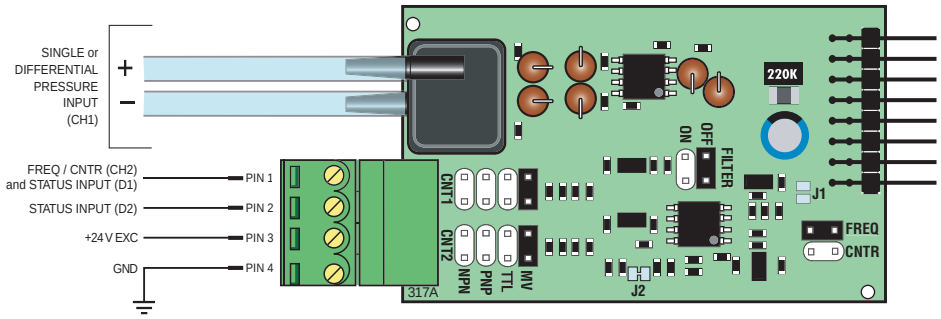


Figure 1 – IGYX Direct Pressure Sensor Input Module

Detailed Description

The Tiger 320 Series controller has four input channels capable of processing almost any input signal type. The direct pressure sensor input module IGYX uses only channels 1 and 2 and also the controller's digital inputs D1 and D2.

The input module processes the pressure input via a built-in pressure sensor capable of processing an absolute or differential pressure input. The pressure signal is then fed to CH1 for further processing. Gain setting resistors are factory installed to optimize the full scale output for each pressure range. Contact Texmate when ordering to discuss your pressure range requirements.

In addition to the pressure sensor, there is a digital interface with independent dual inputs and a 24 V excitation voltage. Each input uses an input header to interface to standard open collector (PNP or NPN), TTL, or millivolt digital signals. Frequency or counter inputs are fed through input 1 where they are conditioned and have the option of low-pass filtering, via a selection header, then fed to CH2 for further processing. Input 1 can also receive status inputs that are conditioned and fed to the controller's digital input D1, where it can be used for setpoint control or macro functions. Input 2 receives status inputs that are conditioned and fed to the controller's digital input D2, where it can also be used for setpoint control or macro functions.

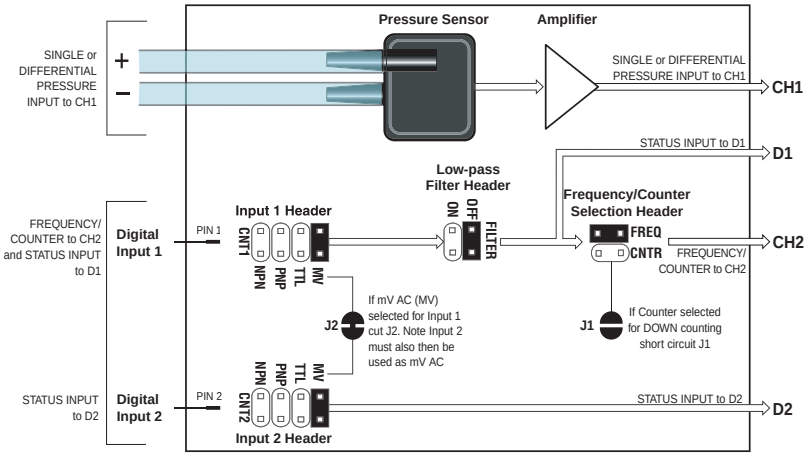


Figure 2 – IGYX Direct Pressure Sensor Input Module Signal Flow Diagram

Tiger 320 Series Meter Settings

Channel 1 (CH1) and channel 2 (CH2) configuration settings for the IGYX input module are selected in Codes 2 and 4 of the Tiger 320 Series meter's main programming mode. CH1 single or dual pressure input settings are configured in Code 2 and must be selected as a voltage input. CH2 frequency and counter settings are configured in Code 4.

CH1 ➔ PRESSURE INPUT ➔ CODE 2 ➔ [X00] Select analog sample and output rate as required.

1st Digit: X

FIRST DIGIT ANALOG SAMPLE RATE	Example: 10 Samples/Second
0 Sample Rate: Typically 10 samples/second (60 Hz) Control Output Rate: 0.1 seconds See Example	1 Channel = 10 samples/second
1 Sample Rate: Typically 10 samples/second (50 Hz). Control Output Rate: 0.1 seconds See Example	2 Channels = 5 samples/second
2 Sample Rate: Typically 10 samples/second (60 Hz) Counter or 10 millisecs Control Output Rate See Example	3 Channels = 3.33 samples/second
3 Sample Rate: Typically 10 samples/second (50 Hz) Counter or 10 millisecs Control Output Rate See Example	4 Channels = 2.5 samples/second
Note: *Output Rate refers to setpoint and macro outputs, and input rates from smart input modules.*	
Note: *All above sample rates are quoted for single channel operation. Where more than one channel is available, sample rates are divided by the number of active channels. See Example.*	

See the Tiger 320 Series Programming Code Sheet for a complete list of main and setpoint mode programming code settings.

2nd Digit: 0 — Selects **Voltage, Current**. (any other selection will not work)

3rd Digit: 0 — Selects **No function**. (any other selection will not work)

CH2 → FREQUENCY or COUNTER → CODE 4 → [3X0]

1st Digit: 3 — Selects second digital input channel.

2nd Digit: X — Select required **Frequency** or **Counter** setting.

DIGITAL INPUT	
0	**Frequency - 99.999 Hz range from 0.001 Hz**
1	Frequency - 999.99 Hz range from 0.01 Hz
2	Frequency - 99.999 kHz range from 1 Hz (1 s gate)
3	Frequency - 500 kHz range from 10 Hz (0.1 s gate)
4	Period - 9.9999 s (100 µs resolution)
5	Period - 999.99 ms (10 µs resolution)
6	Up/Down Counter with Prescaler
7	Set Prescaler

3rd Digit: 0 — Set to 0.

Status inputs D1 and D2 are an activation source for any of the six available setpoints. The selected setpoint is individually configured in the setpoint control function settings menu of the setpoint programming mode. Enter the setpoint programming mode, adjust the activation value of the selected setpoint, and then enter the relevant setpoint control function menu (SPC_X) and select the required status input (D1 or D2).

D1 → STATUS INPUT → SPC_X → [X3X]

1st Digit: X — Select the required relay energize function for the selected setpoint.

2nd Digit: 3 — Selects digital input **D1** as the selected setpoint activation source.

3rd Digit: X — Select the required setpoint function for the selected setpoint.

D2 → STATUS INPUT → SPC_X → [X4X]

1st Digit: X — Select the required relay energize function for the selected setpoint.

2nd Digit: 4 — Selects digital input **D2** as the selected setpoint activation source.

3rd Digit: X — Select the required setpoint function for the selected setpoint.

Interface Configuration Examples

The following example diagrams show the various header settings required for a range of digital inputs to the digital interface (inputs 1 and 2). Inputs to the pressure sensor are not shown, but can be either absolute or differential.

Example 1 – Frequency Input with 1 kHz Low-pass Filter

Figure 3 shows a transducer with an open collector NPN transistor output connected to digital input 1 (CH2/D1). In this case the transducer has its own power supply and the signal output is an open collector NPN transistor. By positioning input header CNT1 to the NPN position, a 10 kΩ pull-up resistor ties the signal output to +24 V. The negative supply of the transducer is common to the ground (GND) pin of the input module. When the transistor switches ON, the voltage of digital input 1 changes from +24 V to –2.5 V (J2 closed).

Header Note:
- ***Input 1 Header CNT1 set to NPN.***
- ***Low-pass Filter Header set to ON.***
- ***FREQ/CNTR Header set to FREQ.***

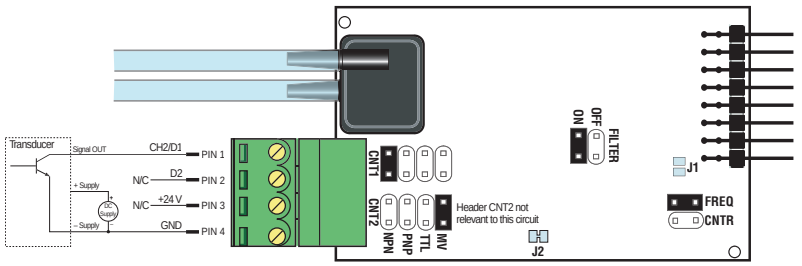


Figure 3 – Open Collector PNP Transistor Connected to Digital Input 1

Example 2 – Monitoring Voltage Level Shifts

Figure 4 shows a transducer with an open collector PNP transistor output type connected to digital input 2 (D2) to monitor voltage level shifts. In this example the transducer uses the +24 V supply of the Tiger meter. By positioning input header CNT2 to the PNP position, a 10 kΩ pull-down resistor ties the transducer signal to –2.5 V (J2 closed). When the transducer switches ON, the signal output changes from –2.5 V to +24 V DC. The Tiger 320 Series controller software reads digital input D2.

Header Note:
In this case the position of headers Input 1 Header CNT1, Low-pass Filter Header, and FREQ/CNTR Header do not matter as the digital status input is only fed via input 2 to digital input D2.

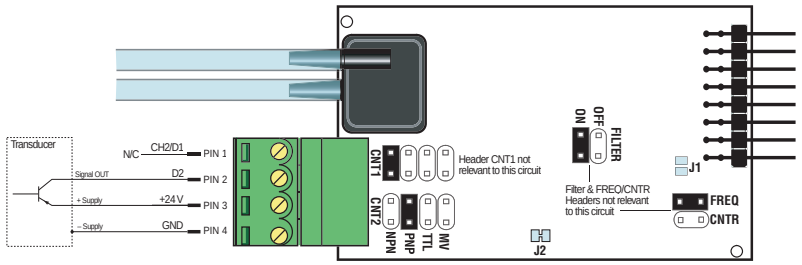


Figure 4 – Open Collector PNP Transistor Connected to Digital Input 2

Example 3 – TTL Output Configured as a HS Down Counter

Figure 5 shows a transducer having its own external power supply of +5 V DC connected to digital input 1 and configured as a high speed down counter on CH2. Input header CNT1 is positioned for TTL and this forces the 0 to 5 V transducer signal to be pulled down to –2.5 V (J2 closed). This ensures the input signal varies about 0 V and all counts are detected.

Header Note:
- ***Input 1 Header CNT1 set to TTL.***
- ***Low-pass Filter Header set to OFF.***
- ***Jumper J1 CLOSED for down counter.***
- ***FREQ/CNTR Header set to CNTR.***

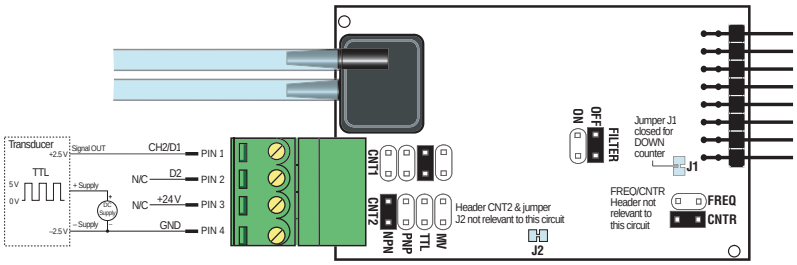


Figure 5 – TTL Signal Connected to Digital Input 1

Example 4 – Transducer Input Configured as Up Counter

Figure 6 shows a transducer that produces a slow 300 mV peak-to-peak output. The magnitude of the signal is less than 2.5 V peak-to-peak. This means jumper J2 must be cut so that the mean signal passes through zero. The signal is connected to input 1 as an up counter with low-pass filtering.

Header Note:
- ***Input 1 Header CNT1 set to MV (mV AC).***
- ***Low-pass Filter Header set to ON.***
- ***Jumper J2 OPEN for AC (mV) <2.5 V.***
- ***FREQ/CNTR Header set to CNTR.***

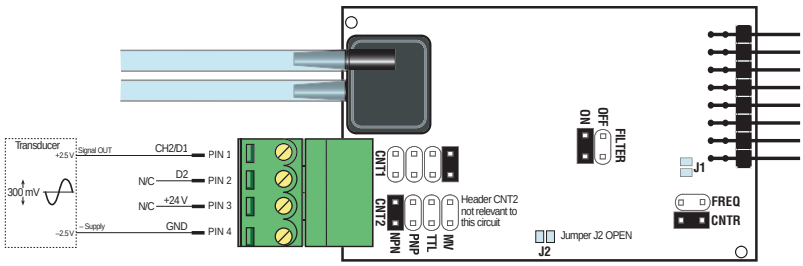


Figure 6 – mV AC Signal Connected to Digital Input 1

Example 5 – Switch Closure

Figure 7 shows a switch connected to both digital inputs. Digital input 1 acts as an up counter with low-pass filtering to record the number of switch closures. Digital input 2 acts as a status input on D2. Input 1 header (CNT1) and input 2 header (CNT2) are set to NPN for 10 k pull-up resistors to +24 V. Closing the switch sets both inputs to –2.5 V.

Header Note:
- ***Input 1 Header CNT1 set to NPN.***
- ***Input 2 Header CNT2 set to NPN.***
- ***Low-pass Filter Header set to ON.***
- ***FREQ/CNTR Header set to CNTR.***

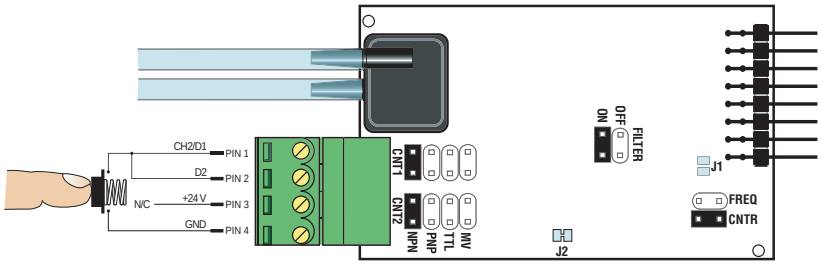


Figure 7 – Switch Closure for Digital Input 1 and 2

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