PI Module 3382S2

This figure is a simplified schematic of the Model 3382S2 PI Module.

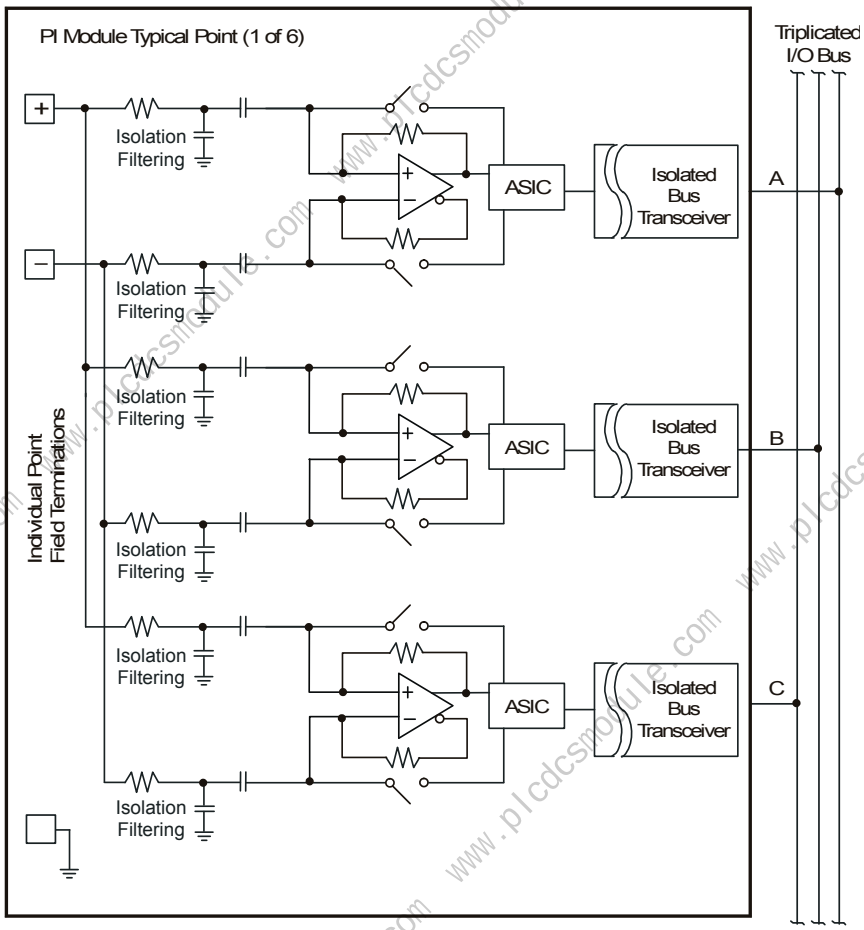

Figure 72 3382S2 PI Module Simplified Schematic

This table lists specifications for the Model 3382S2 PI Module.

Table 37 3382S2 PI Module Specifications

Feature	Specification
Points	6
Input type	Differential, channel-isolated Single-ended, commoned ground
Sensor compatibility	Magnetic, active, open collector
Maximum operating voltage	± 33 VDC
Minimum operating voltage	
Differential	500 mV P-P, 2 Hz–32,000 Hz 1 V P-P, 0.5 Hz–2 Hz
Single-ended	1V P-P, 2 Hz–32,000 Hz 2V P-P, 0.5 Hz–2 Hz
Input frequency range	0.5 Hz–32 kHz
Duty cycle	20% to 80%, or 10 µsec minimum pulse width (positive and negative)
Absolute error of input frequency[a]	± 0.01%, 2,000–32,000 Hz ± 0.1%, 0.5–2,000 Hz
Maximum acceleration rate	4,000 Hz/sec
Absolute error of acceleration (Hz/sec)[a]	< 0.01 times the numeric value of the input frequency when the frequency range is 3kHz–32 kHz
Maximum jerk rate	500,000 Hz/sec^2
Absolute error of jerk (Hz/sec^2)[a]	< 2.5 times the numeric value of the input frequency when the frequency range is 3 kHz–32 kHz
Programmable number of gear teeth (G) per point	1–255[b]
Termination resistor	Baseplate configurable
Pull-up resistor	Baseplate configurable
Measurement algorithm	Gear multiple tracking
Diagnostic	Precision frequency reference test
Functional-to-protective-earth isolation	500 VDC, minimum
Functional-to -functional-earth (logic) isolation	800 VDC, minimum

a. Absolute error of speed, acceleration, and jerk, does not include error introduced by the field device. The reporting of speed acceleration and jerk is susceptible to noise and inaccuracies in the gear manufacturing (tooth-tooth spacing).

b. Absolute error of acceleration and jerk may exceed the specified values if the number of gear teeth per point "G" is not within the range of 255 > n*G >= 240, where n is an integer.

The Model 3382S2 PI Module is compatible with Tri-GP v2.1 and later systems. For more compatibility information, see the Product Release Notice for Tri-GP v2.*x*, available on the Invensys Global Customer Support (GCS) website.

The Model 3382S2 PI Module measures speed, angular acceleration (rate of speed change), and jerk rate (rate of acceleration change). The speed is reported to the control program in revolutions per minute (RPM). Acceleration is reported in RPM/second and Jerk is reported as RPM/second^2.

The absolute error of the acceleration measurement is less than 0.01 times the numeric value of the input frequency, with a frequency greater than 3000 Hz.

The absolute error of the jerk measurement is less than 2.5 times the numeric value of the input frequency, with a frequency greater than 3000 Hz.

Note To meet the specifications for absolute error of acceleration and absolute error of jerk, the number of gear teeth per point must be a number that when multiplied by an integer is greater than or equal to 240 and less than 255.

A formulaic expression of this is:

$$240 \leq n \times G < 255$$

Where:
- n must be an integer
- G equals the number of gear teeth

Absolute error of acceleration and absolute error of jerk may exceed the specified value if the number of gear teeth is not within this range.

Examples

Gear:120
Input Frequency:3,000 Hz

Frequency Error Calculations
Input frequency:3,000 Hz
Absolute error of Acceleration:[0.01 * (3,000 Hz)]/sec = 30 Hz/sec
Absolute error of Jerk:[2.5 * (3,000 Hz)]/sec^2 = 7,500 Hz/sec^2

RPM Error Calculations
RPM:(3,000 Hz * 60 sec/min)/Gear = 1,500 RPM
Absolute error of Acceleration:[0.01 * (1,5000 RPM)]/sec = 15 RPM/sec
Absolute error of Jerk:[2.5 * (1,500 RPM)]/sec2 = 3,750 RPM/sec^2

It can take up to three minutes for the Model 3382S2 PI Module to reach the Pass State, upon initial power-up, which is indicated by steady, green Pass status indicator on the front panel of the module.