SCM7B35

Isolated 2-Wire Transmitter Interface Modules With Loop Power

Description

SCM7B35 current input modules accept input signals in the 4-20mA range from the field and provide a high-level voltage output to the process control system (Figure 1). Current to voltage conversion occurs internal to the module, which is factory calibrated to ensure the highest accuracy.

Loop power is provided by the module, enabling a 2-wire transmitter to be directly connected without the need for a separate dc power supply for the 2-wire transmitter.

These modules incorporate a five-pole filtering approach to maximize both time and frequency response by taking advantage of both Thomson (Bessel) and Butterworth characteristics. One pole of the filter is on the field side of the isolation barrier; four are on the process control system side.

After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit and transferred across the transformer isolation barrier, suppressing transmission of common mode spikes and surges. The signal is then reconstructed and filtered for process control system output.

Modules accept a wide 18 - 35VDC power supply range (+24VDC nominal). Their compact packages (2.13"x1.705"x0.605" max) save space and are ideal for high channel density applications. They are designed for easy DIN rail mounting using any of the "-DIN" backpanels.

▶ Features

- 2-Wire Transmitter Interface
- Accepts 4-20mA Signals
- Provides an Isolated +24VDC Supply to Power the Loop
- Provides High-Level Voltage Outputs
- 1500Vrms Transformer Isolation
- Accuracy, ±0.03% of Span Typical, ±0.1% Max
- ANSI/IEEE C37.90.1 Transient Protection
- 120Vrms Input Protection
- 105dB CMRR
- Easy DIN Rail Mounting
- CSA C/US Certified
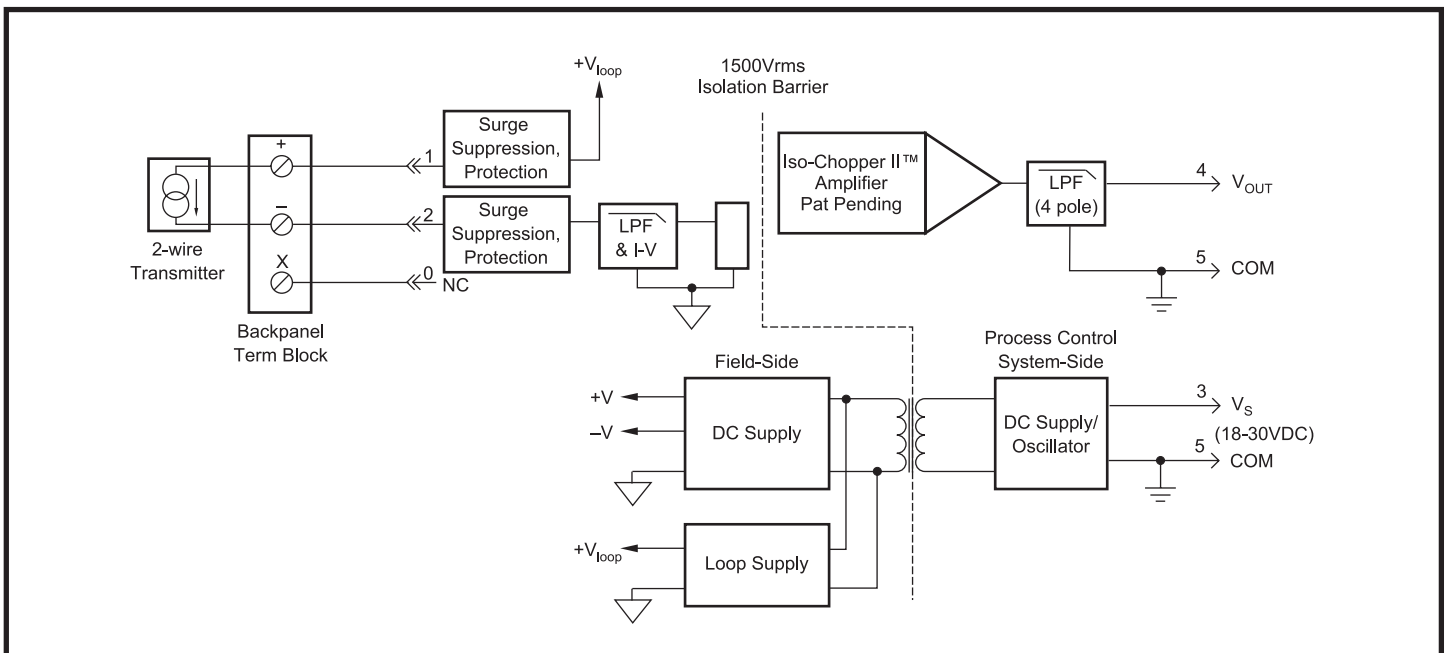- CE and ATEX Compliant

Figure 1: SCM7B35 Block Diagram

Specifications
Typical* at 25°C and +24VDC

Module	SCM7B35

Input
Signal Range
Protection
    Continuous
    Transient
Loop Voltage[1]
	
	4-20mA
	
	120Vrms max
	ANSI/IEEE C37.90.1
	+24VDC

Output Signal Range[2] Effective Available Power[2] Resistance Protection Voltage/Current Limit	 See Ordering Information 40mW <1Ω Continuous Short-to-Ground ±16V, ±14mA
CMV (Input-to-Output) Continuous Transient CMRR (50 or 60Hz)	 1500Vrms ANSI/IEEE C37.90.1 105dB
Accuracy[3] **Linearity**[4] **Stability (−40°C to +85°C)** Gain Input Offset Output Offset **Noise** Peak at 5MHz B/W RMS at 10Hz to 100kHz B/W Peak at 0.1Hz to 10Hz B/W	±0.03% Span typical, ±0.1% Span max ±0.01% Span typical, ±0.02% Span max ±40ppm/°C N/A[5] ±0.003% Span/°C 5mV 500µV 3µV RTI
Frequency and Time Response Bandwidth, −3dB NMR (−3dB at 100Hz) Step Response, 90% Span	 100Hz 80dB per decade above 100Hz 5ms
Supply Voltage Current[2] Sensitivity	18 to 30VDC 56mA ±0.0002%/%V_S
Mechanical Dimensions (h)(w)(d)	2.13" x 1.705" x 0.605" max 54.1mm x 43.3mm x 15.4mm max
Environmental Operating Temperature Range Storage Temperature Range Relative Humidity Emissions EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF ESD, EFT	 −40°C to +85°C −40°C to +85°C 0 to 95% Noncondensing ISM, Group 1 Class A ISM, Group 1 Performance A ±0.5% Span Error Performance B

NOTES:
* Contact factory or your local Dataforth sales office for maximum values.
(1) +24V will be supplied to the loop for an open loop condition. Approximately +22V to +16V will be supplied for a corresponding 4mA to 20mA input. Loop voltage is independent of supply voltage.
(2) Output Range and Supply Current specifications are based on minimum output load resistance. Minimum output load resistance is calculated by V_{OUT}^2/P_E, where P_E is the Output Effective Available Power that guarantees output range, accuracy, and linearity specifications.
(3) Accuracy includes the effects of repeatability, hysteresis, and linearity.
(4) Linearity is calculated using the best-fit straight line method.
(5) Input offset term included in output offset specification.

Ordering Information

Model	Input Range	Output Range
SCM7B35-01	4 to 20mA	+1 to +5V
SCM7B35-01A	4 to 20mA	0 to +5V
SCM7B35-01D	4 to 20mA	0 to +10V
SCM7B35-02	4 to 20mA	+2 to +10V

SCM7B