DATAFORTH®

2024 Catalog
SensorLex® 8B Products

Isolated Miniature
Signal Conditioning Products

Instrument Class®

Industrial Electronics

Celebrating

40 YEARS

Instrument Class®
INNOVATION

Table of Contents

The Company

"Our passion at Dataforth Corporation is designing, manufacturing, and marketing the best possible data acquisition and control, signal conditioning, and data communication products. Our mission is to set new standards of product quality, performance, and customer service." **Dataforth Corporation**, with 40 years of experience, is a worldwide leader in *Instrument Class*® **Industrial Electronics –** rugged, high-performance data acquisition and control, signal conditioning, and data communication products that play a vital role in maintaining the integrity of industrial automation, data acquisition, and quality assurance systems. Our products directly connect to most industrial sensors and protect valuable measurement and control signals and equipment from the dangerous and degrading effects of noise, transient power surges, internal ground loops, and other hazards.

Global Service and Support

Dataforth spans the globe with more than 50 International Distributors and US Representative Companies. Our customers benefit from a team of over 130 sales people highly trained in the application of precision products for industrial markets. In addition, we have a team of application engineers at our Tucson factory ready to solve any in-depth application questions, and we maintain ample inventory that allows small-quantity orders to be shipped from stock.

Research and Development Team

A professional staff of engineering and marketing personnel identify and develop products to satisfy our customers' most stringent requirements. Dataforth's design department specializes in innovative analog and isolation circuit development, high-performance mixed signal design, and software development, to ensure that our customers receive the highest performance products at an affordable price.

Automated Manufacturing and Test

Our products are manufactured in the USA on our state-of-the-art SMT systems to optimize time-to-ship and control costs. All products are tested multiple times, and many undergo a 48-hour burn-in at elevated temperatures to ensure performance and reliability.

Quality Control

Dataforth operates under the ISO9001:2015 quality management system. Since our products are used in critical industrial data acquisition, control, and test and measurement applications, we strive to produce the highest quality, premier performance products available on the market. Zero defects and complete customer satisfaction are our goals. To further strengthen our commitment to quality, Dataforth secures certifications such as UL, CSA, ATEX, and CE.

www.dataforth.com

Our website presents visitors with an intuitive, informative layout that quickly leads them to their areas of interest. A parametric search engine efficiently locates products by model number or functional description, and the ability to quickly access pricing information and place online orders. Fully detailed product data sheets and application and tech notes are available for download. Visitors can also view new product release data, sign up to receive our newsletters, get answers to technical questions, and quickly locate Distributors and Sales Representatives worldwide.

The Future

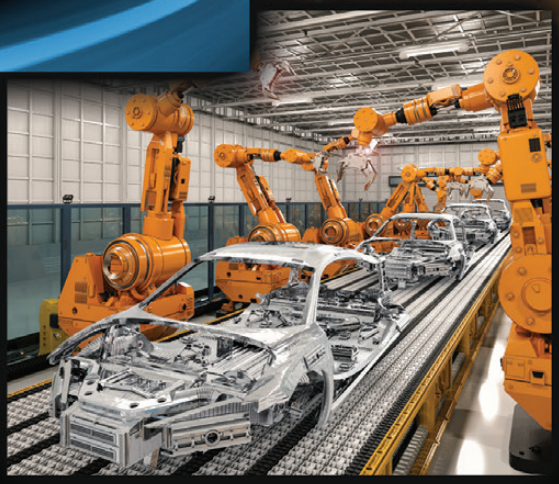
We fully understand that our ongoing success depends on satisfying our customers' requirements. Building upon our position as marketplace leader, Dataforth continues to seek out the most cost-effective emerging technologies in design and manufacturing in order to provide the highest performance quality products at an affordable price. By intelligently observing and responding to changing market needs, we ensure continuation of our critical customer partnerships.

Dataforth

- 2000+ Products for Industrial Data Acquisition and Control, Signal Conditioning, and Data Communications
- Energy Monitoring
- 40 Years of Experience
- Better than 6σ Reliability
- Products Manufactured and Designed in the USA per RoHS III Directive (EU) 2015/863
- Quality Management System is ISO9001:2015 Registered

Additional Resources

- Application Notes
- Tech Notes
- Press and Product Releases



Our Track Record Proves We are Dedicated to Your Success!

For Product Information, Certifications, System Builders, and Online Ordering, go to: **www.dataforth.com**

DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

SCM5B Isolated Analog Signal Conditioning Modules

True 3-way Isolation, 5V Supply Voltage, Unparalleled Performance

20 family groups of 300+ different modules: a wide selection of input and output functions

Each SCM5B module provides a single channel of isolated analog input or output. Input modules interface to all types of industrial sensors. Analog inputs include voltage and current in narrow and wide bandwidths, thermocouple, RTD, accelerometer, potentiometer, strain gauge, frequency, and 2-wire and 3-wire, as well as 4-wire transmitter. Output modules accept a high-level analog voltage signal from a host system and provide process current or voltage output to field devices.

SCM5B Key Features

- ±0.03% Accuracy (typ)
- ±0.005% Linearity
- 1500Vrms Transformer Isolation and 240Vrms Field-side Protection
- ANSI/IEEE C37.90.1 Transient Protection
- 5V Power Supply Voltage (30mA (typ))
- 4- to 6-pole Low-pass Filtering
- Low Output Noise
- –40°C to +85°C Operating Temperature
- CSA C/US Certified, (Class I, Division 2, Groups A, B, C, D)
- CE and ATEX Compliant
- Manufactured per RoHS III Directive 2015/863

SCM7B Isolated Process Control Signal Conditioning Modules

2-way Isolation, 14-35VDC Supply Voltage, Industrial Performance

15 family groups of 200+ different modules: a compact, low-cost solution for industrial data acquisition and process control applications

Each SCM7B module provides a single channel of isolated analog input or output. Various input modules accept analog voltage or current signals from all types of field sensors and sources; they provide high-level analog outputs suitable for use in a process control system. Output modules accept high-level analog voltage signals from a process control system and provide current or voltage output to a field device.

SCM7B Key Features

- ±0.03% Accuracy (typ)
- ±0.01% Linearity
- 1500Vrms Transformer Isolation and 120Vrms Field-side Protection
- ANSI/IEEE C37.90.1 Transient Protection
- 14-35VDC Wide Supply Voltage
- 5-pole Low-pass Filtering
- Low Output Noise
- –40°C to +85°C Operating Temperature
- CSA C/US Certified (Class I, Division 2, Groups A, B, C, D)
- CE and ATEX Compliant
- Manufactured per RoHS III Directive 2015/863

The SCM5B, SCM7B product lines include a complete selection of backpanels, DIN-rail mounting options, cables, racks, power supplies, and other accessory items.

Custom SCM5B, SCM7B modules are available: consult factory for minimum quantity and pricing details on custom input ranges, output ranges, bandwidth, and other key parameters.

DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

SensorLex® 8B Isolated Analog Signal Conditioning Modules

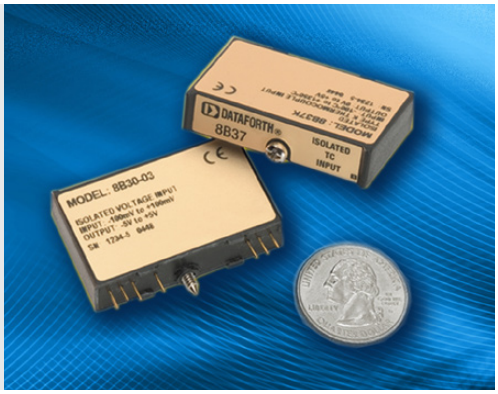
Miniature Size, 2-way Isolation, 5V Supply Voltage, *Instrument Class*® Performance

19 family groups of 130+ modules: an optimal solution for monitoring real-world process signals and providing high-level signals for data acquisition

Developed in response to customer requests for a smaller, isolated signal conditioner, SensorLex 8B modules are housed in a miniature package that is ideal for embedded and portable applications. All 8B modules are fully functional and provide *Instrument Class* analog voltage output. They interface to a wide variety of voltage, current, temperature, position, frequency, and strain measuring devices.

8B SensorLex Key Features

- ±0.05% Accuracy (typ)
- ±0.02% Linearity
- 1500Vrms Transformer Isolation and 240Vrms Field-side Protection
- ANSI/IEEE C37.90.1 Transient Protection
- 5V Power Supply Voltage (30mA (typ))
- 3- to 5-pole Low-pass Filtering
- Low Output Noise
- –40°C to +85°C Operating Temperature
- UL/cUL Listed (Class I, Division 2, Groups A, B, C, D)
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863



SCMD Isolated Digital I/O Modules

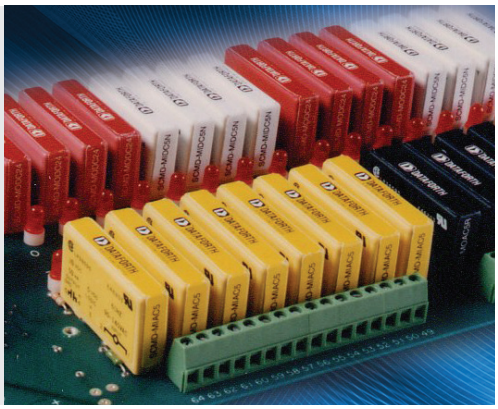
Miniature Digital I/O Modules with 4kV Isolation

A rugged, protective isolation barrier, effective to 4kV, between the field and computer system

SCMD miniature digital I/O modules are solid-state devices that send “On” and “Off” electrical signals to and from a computer. Input modules convert AC or DC voltages to DC logic signals and send them to the computer system. Output modules work in the opposite direction, switching either AC or DC circuits On or Off in response to logic-level voltage commands from the computer.

Key SCMD Features

- 4000Vrms Optical Isolation
- Industry Standard Packaging
- Input Modules Incorporate Input Filtering for Transient-free Switching
- Complete Selection of Backpanels and Accessories
- Optional Low-noise, Fast-switching Models
- UL Listed, CSA Certified, CE Compliant
- Manufactured per RoHS III Directive 2015/863



The SensorLex 8B and SCMD product lines include a complete selection of backpanels, DIN-rail mounting options, cables, racks, power supplies, and other accessory items.

Custom SensorLex 8B modules are available: consult factory for minimum quantity and pricing details on custom input ranges, output ranges, bandwidth, and other key parameters.

DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

DSCA High-Performance, DIN-rail Mount, Isolated Signal Conditioners

True 3-way Isolation, High Accuracy, *Instrument Class*® Performance

16 family groups of 375+ different modules: a wide selection of input and output functions

Each *Instrument Class* DSCA module provides a single channel of isolated analog input or output for use in data acquisition, test and measurement, and control system applications.

DSCA Key Features

- ±0.03% Accuracy (typ)
- ±0.01% Linearity
- 1500Vrms Transformer Isolation and 240Vrms Field-side Protection
- ANSI/IEEE C37.90.1 Transient Protection
- 15-30VDC Wide Supply Range
- Industry Standard Outputs of 0-10V, ±10V, 0-20mA, or 4-20mA
- 4- to 6-pole Low-pass Filtering
- Low Output Noise
- –40°C to +80°C Operating Temperature
- Plug-in Terminal Blocks Simplify Wiring
- UL/cUL Listed (Class I, Division 2, Groups A, B, C, D)
- CE and ATEX Compliant
- Manufactured per RoHS III Directive 2015/863

SCM9B Isolated Analog Signal Conditioning Modules

Isolated, Intelligent Signal Conditioning Products

11 family groups of 200+ different modules: a wide selection of input and output functions

High-quality 9B modules provide cost-effective protection and conditioning for a wide range of distributed data acquisition and control applications including but not limited to process monitoring and control, remote data logging, product testing, and motion and motor speed control.

Dataforth's extensive line includes fixed and programmable sensor-to-computer and computer-to-analog output interface modules, RS-232/RS-485 converters, RS-485 repeaters, and applications software. Accessories include a complete selection of backpanels, DIN-rail mounting options, interface cables, mounting racks, power supplies, and other accessory items.

SCM9B Key Features

SCM9B Sensor-to-Computer Modules

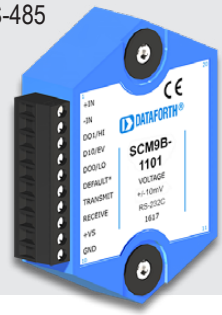
- 500Vrms Input Isolation
- Programmable Scaling and Linearization
- ASCII Command/Response Protocol
- 15-bit Measurement Resolution
- Continuous Self-calibration
- Analog Readback
- DIN-rail Mountable D100 Series

SCM9B Computer-to-Analog Output Modules

- 0-1V, ±1V, 0-5V, ±5V, 0-10V, ±10V, 0-20mA, 4-20mA Output Ranges
- 500Vrms Output Isolation
- 12-bit Output Resolution
- Programmable 0.01V/s (mA/s) to 10,000V/s (mA/s) Output Slopes
- Analog Readback
- Data Scaling

SCM9B Converters and Repeaters

- Transparent to Host
- Optically Isolated Bidirectional Data Flows
- Automatic Internal RS-485 Bus Supervision
- DIN-rail Mountable D192 Model



Custom DSCA modules are available: consult factory for minimum quantity and pricing details on custom input ranges, output ranges, bandwidth, and other key parameters.

DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

DSCL Industrial Loop Isolators and Transmitters

Passive, Active, Programmable 4-20mA Loop Products

Loop and universal AC/DC-powered isolators and transmitters in DIN-rail, component, and head-mount packages

This family includes basic loop-powered isolators, wide-range AC/DC-powered isolators and transmitters, and fixed-gain or hardware- and software-configurable models. They accept voltage, current, thermocouple, and RTD-input signals and provide high-level analog outputs for data acquisition, test and measurement, and control system applications.

Key DSCL Features

- Full Family of Loop Isolators and Transmitters
- Signal-powered Passive Loop Isolator Models
- Wide Range 24-60V or 85-230V AC/DC Powered Models
- Jumper and Software Configurable Models
- 4000Vrms Isolation
- PCB, DIN-rail, Panel Mount, or Instrument Head Mounting
- Multiple Channels per Package Available
- No Recalibration or Maintenance Required
- Fault Detection of Input Signal Available
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

Compact 6.2mm Signal Converters

- Ideal for Applications in Limited Space
- Dip-switch Configuration
- 3 Power Supply Options
- 3.67” x 0.24” x 4.04” (93.1mm x 6.2mm x 102.5mm) casing
- 1.6 oz (45g) Per Module

DSCP User-Programmable Transmitters

Passive, Active, Programmable 4-20mA Loop Products

Loop and universal AC/DC-powered isolators and transmitters in DIN-rail, component, and head-mount packages

This family includes basic loop-powered isolators, wide-range AC/DC-powered isolators and transmitters, and fixed-gain or hardware and software configurable models. They accept voltage, current, thermocouple, and RTD-input signals and provide high-level analog outputs for data acquisition, test and measurement, and control system applications. The compact 6.2mm DSCP dip-switch configurable signal converters are ideal when space is limited.

Key DSCP Features

- Full Family of Loop Isolators and Transmitters
- Signal-powered Passive Loop Isolator Models
- Wide Range 24-60V or 85-230V AC/DC Powered Models
- Jumper and Software Configurable Models
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DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

DSCT Loop-Powered Isolated Two-wire Transmitters

Instrument Class® Performance in a Low-Cost DIN-rail Mount Package

7 family groups of 45+ transmitter models: economical connections between sensors and control rooms

DSCT 2-wire transmitters condition and send analog signals from sensors located in the field to monitoring and control equipment—usually computers—located thousands of feet away in central control areas. The transmitters accept a wide range of inputs, including millivolt, volt, milliamp, thermocouple, RTD, potentiometer, and slide wire. They operate on power from a 2-wire signal loop and modulate the supply current to represent the input signal within a 4-20mA range.

Key DSCT Features

- ±0.03% Accuracy (typ)
- ±0.01% Linearity
- 1500Vrms Transformer Isolation and 240Vrms Field-side Protection
- ANSI/IEEE C37.90.1 Transient Protection
- 10.8-60V Wide Loop Supply Voltage
- 5-pole Low-pass Filtering
- –40°C to +80°C Operating Temperature
- Mounts on DIN-rail EN 50022, 35x7.5 or 35x15
- CSA C/US Certified (Class I, Division 2, Groups A, B, C, D)
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

DCP and LDM Industrial Data Communication Products

Line Drivers and Converters for RS-232, RS-422, and RS-485 Systems

9 family groups of 40+ transmitter models: economical connections between sensors and control rooms

Industrial LANs and data communication systems stretch over long distances, inside and outside, with signals exposed to electrical transients, noise, ground loops, power surges, and lightning. Our heavy duty products “harden” and protect these systems.

Key Data Communication Features

- Protects Equipment from Damage due to Power Surges, Transients, Lightning
- 1500Vrms Isolation with Optocouplers and Power DC-to-DC Converter (3000Vp, 1 min)
- Extends RS-232 Communication Distances without Expensive Low-capacitance Cabling
- Connects RS-232 Devices to RS-422 and RS-485 Devices
- Data Rates to 115.2kbps
- Distances to 12 Miles (20km)
- 2- or 4-wire Simplex/Duplex Connection
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

SCM5B isoLynx® SLX200 Data Acquisition System

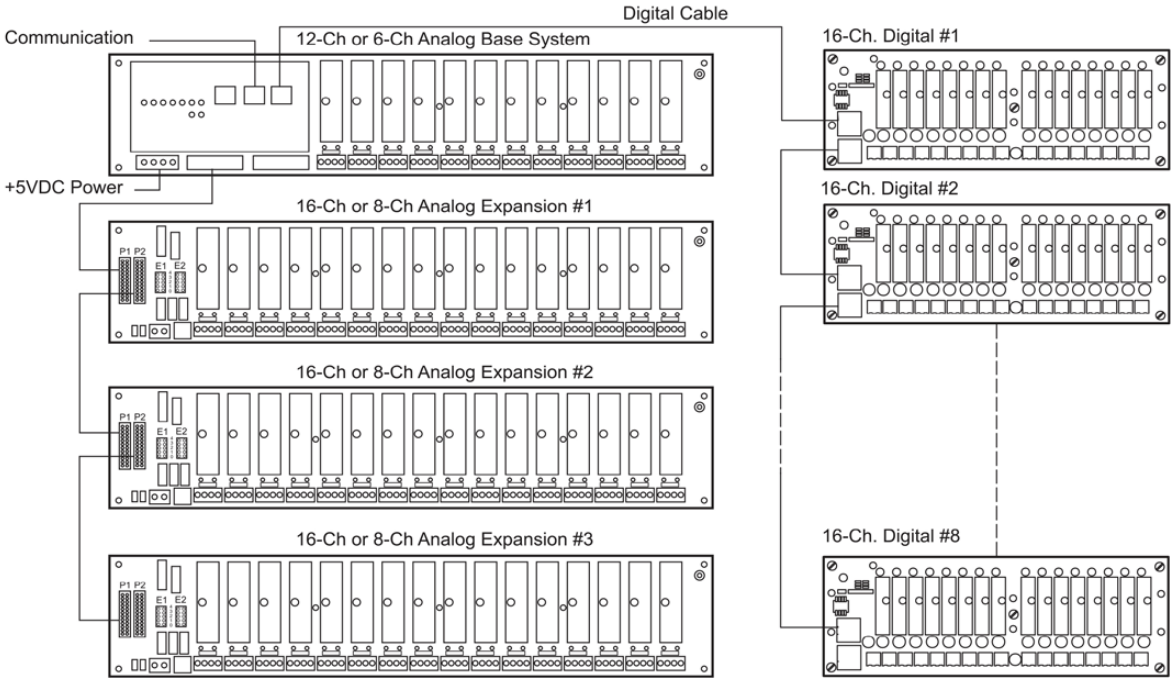
Fast, Intelligent, Modular, Fully Isolated

Implements industry-standard Modbus® RTU and TCP protocols, enabling communication with existing third-party software drivers and HMI/SCADA packages

Fully certified by Modbus-IDA and OPC compatible, the SCM5B isoLynx SLX200 provides superior reliability, accuracy, and isolation for a wide range of rugged industrial applications. The system offers maximum flexibility of analog and digital I/O selection; the modular design combines a 6- or 12-channel I/O Controller base system and optional 8- or 16-channel expansion backplanes, which can be panel or DIN-rail mounted. One I/O controller unit can operate up to 60 channels of differential analog I/O and 128 channels of digital I/O, using Dataforth's SCM5B analog and SCMD digital modules. All I/O is channel-to-channel and input-to-output isolated.

SCM5B isoLynx SLX200 Key Features

- Modbus RTU Support on RS-232 and RS-485
- Modbus TCP Support (optional)
- 1500Vrms Input-to-Output and Channel-to-Channel Isolation
- 240Vrms Field-side Protection
- Dual Ethernet for Redundancy
- System Expansion to 60 Analog Channels and 128 Discrete Channels
- All I/O Mix and Match Isolated
- Fast 16-Bit A/D, D/A
- Best I/O Selection with 250+ Different I/O Modules
- Drop-in Data Acquisition for Existing Installations
- Two Analog Scan Modes
- –40°C to +85°C Operating Temperature
- Free Configuration Software
- CSA C/US Certified (Class I, Division 2, Groups A, B, C, D)
- CE Compliant
- Manufactured per RoHS III Directive 2015/863



SCM5B isoLynx SLX200 System Example

DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

8B isoLynx® SLX300 Data Acquisition System

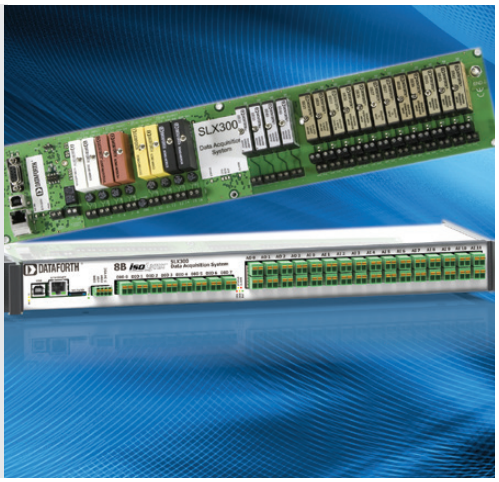
Flexible, Compact, Modular, Reliable

Configure with up to 12 isolated analog-input channels, 4 isolated analog-output channels, and 8 isolated digital I/O channels

Building on the proven reliability and outstanding performance of the SCM5B isoLynx SLX200 and miniature-sized SensorLex® 8B isolated signal conditioning modules, the 8B isoLynx SLX300 is a compact, low-cost solution for wide ranging rugged industrial applications. The system enables the mix and match of analog and digital I/Os at sustained rates of up to 3.0kS/s (100kS/s burst) and supports Modbus® RTU and TCP protocols. The SLX300 also offers 7 advanced special functions and 4 alarm states. The system can be panel or DIN-rail mounted.

8B isoLynx SLX300 Key Features

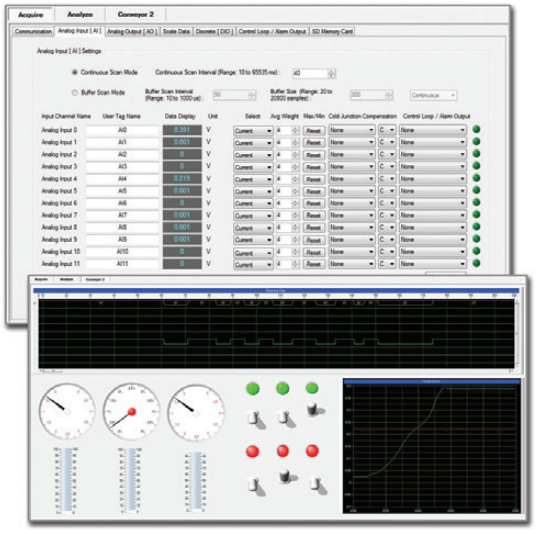
- Modbus RTU and TCP Support
- 1500Vrms Input-to-Output and Channel-to-Channel Isolation
- 240Vrms Field-side Protection
- Wide I/O Selection
  - – Analog – 19 product families, 130+ models
  - – Digital – 6 product families, 20+ models
- Mix and Match Analog and Digital I/O
- Advanced Features Including Alarms, Counters, Timers, PWMs, and more
- –40°C to +85°C Operating Temperature
- Free Configuration Software
- UL/cUL Listed (Class I, Division 2, Groups A, B, C, D)
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863



ReDAQ® Shape Software for SLX300

Out-of-the-box DAQ software for the 8B isoLynx SLX300 data acquisition system

ReDAQ Shape software for SLX300 provides the easiest and most efficient development tool to create, save, and open graphical user interface projects for test, process, data collection and data analysis applications. Built-in functions in the software are pre-configured and can be used without setup; just three easy steps are required to create data acquisition and control projects.



ReDAQ Shape for SLX300 Key Features

- 64 High-quality Toolbox Tools
- 3 Easy Steps to Create Data Acquisition and Control Projects
- Pre-configured Built-in Software Functions
- Supports Any Graphical File Format
- Integrated, Across-the-Board Applicability
- Most Effective Way to Set Up and Configure 8B isoLynx SLX300

Functions:

- – Continuous and Burst Scan Modes for 12 Analog Input and 4 Analog Output Channels
- – Automatically Scales Data from Counts to Engineering Units
- – 8 Discrete I/O with 7 Special Functions Pulse/Frequency Counter, Pulse/Frequency Counter with De-Bounce, Waveform Measurement, Time Between Events, Frequency Generator, PWM Generator, One-shot Pulse Generator
- – Customer User Tag Name for Any Input and Output
- – Cold Junction Compensation and Linearization for Thermocouple-input Modules
- – Control Loop and Alarm Output
- – Three-function Timer (Count-down, 24hr/ay, Day/Time) with 10 Programmable Events

DATAFORTH®

SensorLex® 8B ISOLATED ANALOG SIGNAL CONDITIONING PRODUCTS

MAQ®20 Industrial Data Acquisition and Control System

High Performance, Powerful, Flexible, Industrial, Rugged Design

The industry's lowest cost-per-channel Data Acquisition and Control System offering, integral PID loop control, ±0.035% system accuracy; ideal for test and measurement, factory, process, and machine automation, military and aerospace, power and energy, environmental monitoring, and oil and gas applications

Encompassing more than 35 years of design excellence and quality in the industrial test and measurement and control industry, the MAQ20 family consists of DIN-rail mounted, programmable, multi-channel, rugged industrial signal conditioning input and output modules and communication modules. Each I/O module has a 1500Vrms isolation barrier between field-side and system-side wiring, and many models offer per-channel isolation. The MAQ20 is supported by both ReDAQ® Shape software for MAQ20 and your own ModBus® compatible data acquisition/test and measurement software.

MAQ20 Key Features

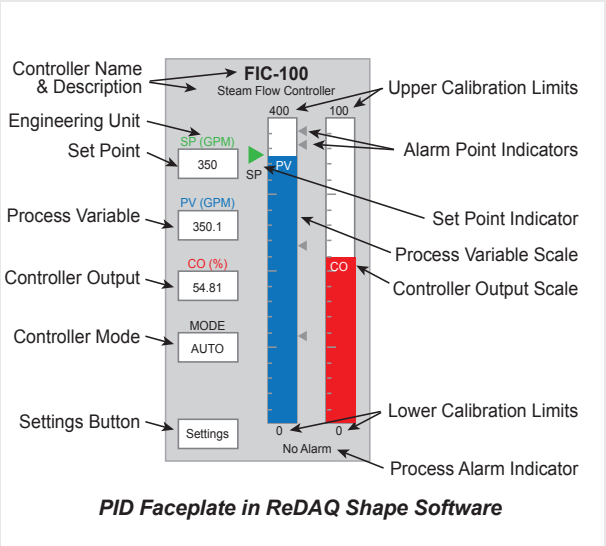
- Industry's Lowest Cost per Channel
- ±0.035% Accuracy (typ)
- 1500Vrms Channel-to-Bus Isolation
- Up to 240Vrms, Continuous Field I/O Protection
- ANSI/IEEE C37.90.1 Transient Protection
- Graphical Control Software
  - ReDAQ Shape for MAQ20 Software
  - Customer own ModBus® compatible DAQ Software
- Advanced Features Including Integral PID Control, Alarms, Counters, Timers, PWMs
- 7-34VDC Wide-range Input Power
- –40°C to +85°C Industrial Operating Temperature
- Heavy Industrial CE Compliant
- UL/cUL Listed (Class I, Division 2, Groups A, B, C, D)
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863

PID Loop Control

This highly effective controller operates in ReDAQ Shape for MAQ20 software

With ReDAQ Shape software, the MAQ20 Data Acquisition System runs in real time and provides up to 8 loops of PID control; faceplates within the software enable an engineer or operator to interact with the MAQ20 Data Acquisition System. Typical PID applications include steam, water, and chemical flow control; tank level control, heat-exchanger/reactor temperature control, and pressure control.

Key PID Controller Features... with ReDAQ Shape Software



PID Faceplate in ReDAQ Shape Software

- Separate Panels for Setting Basic, Advanced, and Alarm Items
- Noninteracting and Parallel PID Control Algorithms
- Proportional and Derivative Modes Can Act on Error or Process Variable
- Gap Control
- Built-in Process Variable Filtering
- Bumpless Transfer
- Change Tuning Settings Easily
- Process Variable Set Point Tracking
- Limit Controller Output Range
- Anti-reset Windup
- Four Process Alarms
- Full-featured Faceplate for Numeric and Visual Feedback
- Integrated Auto Tuner

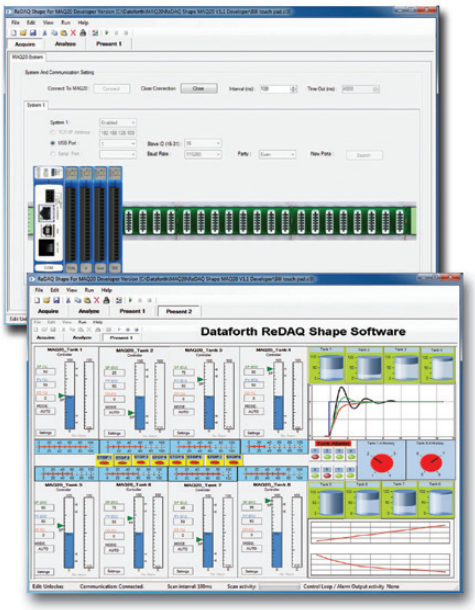
ReDAQ® Shape Software for MAQ®20

Ideal for data acquisition, monitoring and control; enables users to easily interact with the Dataforth MAQ20 Data Acquisition System

ReDAQ Shape software for MAQ20 is an easy and efficient development tool as well as an effective way to configure and customize MAQ20 functions for specific application requirements. Faceplates within the software enable an engineer or operator to interact with the MAQ20 Data Acquisition System and its features, for example PID Loop Control.

ReDAQ Shape for MAQ20 Key Features

- 3 Easy Steps to Create Customized Presentation Panels
- No Setup or Configuration Required to Acquire and Analyze Data
- Faceplates for PID Loop Control
- 65 High-quality Toolbox Tools
- Supports Any Graphical File Format
- Integrated, Across-the-board Applicability
- Most Efficient Way to Configure and Run MAQ20 Systems:
  - Continuous Acquisition and Burst Scan Modes
  - Automatically Scales Data from Counts to Engineering Units
  - Discrete I/O Offers 7 Special Functions: Pulse/Frequency Counter, Pulse/Frequency Counter with De-Bounce, Waveform Measurement, Time Between Events, Frequency Generator, PWM Generator, One-Shot Pulse Generator
  - Assign Tag Names for Any Input and Output
  - Configure Control Loops and Alarm Outputs
  - Three Function Timer (Count-Down, 24hr/Day, Day/Time) with 10 Programmable Events



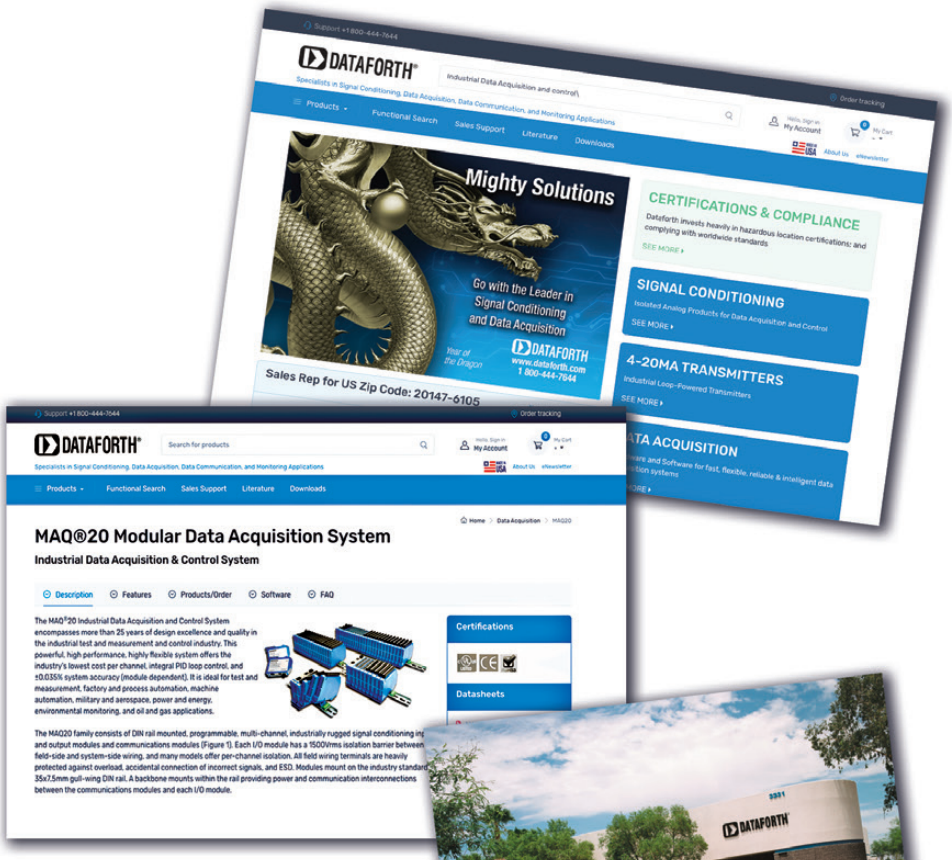
The Dataforth System Builder

Dataforth's System Builder is an innovative, interactive online tool that allows you to create your own system, module by module. Based on your stated requirements and parameters, suggestions are automatically given on which products to choose to build the most effective system. Pricing information is continuously updated, thereby enabling you to obtain the best system for your needs at the most cost-effective price.

Visit Dataforth's Website: dataforth.com

Dataforth's website is an easy-to-use, comprehensive source for sales, products, and applications information. The site includes:

- Fast, accurate parametric search capabilities for all Dataforth industrial signal conditioning, data acquisition, and data communication products
- Online product quote and purchase
- Online product data sheets, application notes, and user manuals
- Direct applications assistance, sales, and customer service help lines readily available
- Latest news on company operations and new products
- Comprehensive signal conditioning, data acquisition, and control tutorials
- Worldwide corporate and sales contact information



Online Help
Online Ordering
Data Sheets
Application Notes
Product Information

 ISO9001:2015-Registered QMS

SCM5B, SCM7B, 8B, SCM9B

Characteristic	SCM5B	SCM7B	8B	SCM9B
Mechanical Format	Modular Plug-in-board	Modular Plug-in-board	Modular Plug-in-board	Plug-in or Hockey Puck
Isolation: Voltage type	1500Vrms Transformer 3-way	1500Vrms Transformer 2-way	1500Vrms Transformer 2-way	500Vrms Transformer/Optical 2-way
CMR	160dB	110dB	100dB	100dB
NMR (60Hz) Rejection	95dB (4Hz Modules)	85dB (3Hz Modules)	70dB	Software Configurable
Bandwidth	4Hz to 10kHz	3Hz to 10kHz	3Hz to 20kHz	Software Configurable
Filter	6-pole	5-pole	3- to 5-pole	Digital
Input Voltage Withstand	240Vrms	120Vrms	240Vrms	120Vrms or 250Vrms
Input Signals	(1)	(2)	(1)	(3)
Output Range to System	0-5VDC, 0-10VDC, ±5VDC, ±10VDC, 0-1mA, 0-20mA, 4-20mA	1-5VDC, 0-5VDC, 0-10VDC, ±10VDC	0-5VDC, ±5VDC	RS-232 or RS-485
Output Range to Field	4-20mA, 0-20mA, ±20mA, ±5VDC, ±10VDC, 0-5VDC, 0-10VDC	±10VDC, 4-20mA, 0-20mA	4-20mA, 0-20mA, ±20mA, ±5VDC, ±10VDC, 0-5VDC, 0-10VDC	4-20mA, 0-20mA, 0-1VDC, ±1VDC, 0-5VDC, ±5VDC, 0-10VDC, ±10VDC
Gain/Offset Adjust	Fixed	Fixed	Fixed	Auto Zero, Auto Cal
Accuracy	0.03% (typ)	0.03% (typ)	0.05% (typ)	0.02% (typ)
Output Control	Enable/Disable	Always Enabled	Always Enabled	RS-232 or RS-485
Supply Voltage	+5VDC ±5% at 30-350mA	14-35VDC (+24V Nom) at 12-70mA	+5VDC ±5% at 25-225mA	12-30VDC at 0.75W Max
Dimensions (h)x(w)x(d)	2.28" x 2.26" x 0.6" (58mm x 57mm x 15mm)	2.13" x 1.7" x 0.6" (54.1mm x 43.3mm x 15.4mm)	1.11" x 1.65" x 0.4" (28.1mm x 41.9mm x 10.2mm)	3.60" x 2.45" x 1.10" (91.4mm x 62.2mm x 27.9mm)
Interface	14-pin	5- or 6-pin	5-, 6- or 7-pin	10- or 20-pos Term Block
Customization	Yes	Yes	Yes	No

DIN-rail, Head-mount Products - DSCA, DSCT, DSCL, DSCP

Characteristic	DSCA	DSCT	DSCL	DSCP
Mechanical Format	DIN-rail Mount	DIN-rail Mount	DIN-rail, Component, Panel	DIN-rail, Head Mount
Isolation: Voltage type	1500Vrms Transformer 3-way	1500Vrms Transformer 3-way	500Vrms to 4000Vrms Transformer/Optical	Non/1500Vrms/2300Vrms Transformer/Optical 3-way
CMR	160dB	160dB	70-110dB	Consult Data Sheet
NMR (60Hz) Rejection	85dB (3Hz Modules)	85dB (3Hz XMTRs)	20dB/Decade	SW or Dip-switch Config
Bandwidth	3Hz to 3kHz	3Hz	5Hz to 750Hz	SW or Dip-switch Config
Filter	6-pole	6-pole	2-pole	SW or Dip-switch Config
Input Voltage Withstand	240Vrms	240Vrms	N/A	N/A
Input Signals	(1)	(5)	4-20mA, 0-20mA	(4)
Output Range to System	0-10VDC, ±10VDC, 0-1mA, 4-20mA, 0-20mA	4-20mA	4-20mA, 0-20mA, V, and Selectable	SW or Dip-switch Config
Output Range to Field	4-20mA, 0-20mA, ± 20mA, ±10VDC, 0-10VDC	N/A	N/A	N/A
Gain/Offset Adjust	±5%	±10%	±10% on Some Models	Software Configurable
Accuracy	0.03% (typ)	0.03% (typ)	0.05% to 0.1% (typ)	0.1% (typ)
Output Control	Always Enabled	Always Enabled	Always Enabled	Always Enabled
Supply Voltage	15-30VDC (+24V Nom) at 25-80mA	10.8-100VDC Loop at 4-20mA	24VDC Loop at 4-20mA	24VDC Loop, or 24-230VDC/VAC
Dimensions (h)x(w)x(d)	2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm)	2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm)	Consult Data Sheet	Consult Data Sheet
Interface	8-pos Term Block	6-pos Term Block	Terminal Block	Terminal Block
Customization	Yes	Yes	No	SW or Dip-switch Config

NOTES:
(1) V, I, RTD, TC, Potentiometer, Strain, True RMS, 2-wire, Frequency
(2) V, I, RTD, TC, Potentiometer, 2-wire
(3) V, I, RTD, TC, Frequency, Digital I/O
(4) V, I, RTD, TC
(5) V, I, RTD, TC, Potentiometer

High-accuracy Energy Monitoring Module

Module	PWRM10-01	PWRM20-01
Phase Voltage Range	85-265VAC	85-525VAC
Phase Frequency	50/60Hz Input	
Electrical System		
	Single-phase (2-wire)	
Voltage Measurement	Two-phase (3-wire)	
(Direct Connection or VT)	Three-phase Wye or Delta (3-wire)	
	Three-phase Wye or Delta (4-wire)	
Current Measurement	Shunt, Ct, Rogowski Coil	
Measured Parameters and Accuracy		
RMS Voltage	±0.1% of Full-scale Range	
RMS Current	±0.1% of Full-scale Range	
Active Power	±0.2%	
Apparent Power	±0.2%	
Reactive Power	±0.2%	
Power Factor	±0.2%	
Frequency Range	45-65Hz	
Active Energy	±0.25%	
Apparent Energy	±0.25%	
Fundamental Active and Reactive Energy	±0.25%	
Phase Angles	±0.1%	
Line Periods	±0.1%	
Measurement Bandwidth		
RMS Voltage and Current (–3dB)		
Total Active Energy (–3dB)	3.3kHz	
Fundamental Reactive Energy (–3dB)	3.3kHz	
Harmonic (–3dB)	3.3kHz (2.8kHz No Attenuation Pass Band)	
Temperature Drift	±100ppm°C	
Events	Over-voltage, Over-current, Sag	
Security	Password to Access Control	
Data Logging	Configurable, Automatic Download and Storage	
Connectivity	Ethernet, TCP/IP	
Mounting	DIN-rail	
Dimensions (h)x(w)x(d)	4.01" x 0.89" x 5.04" (102mm x 22.6mm x 128mm)	

Data Acquisition (DAQ) System - MAQ20

Components - Communication - MAQ20-COM2, -COM4	
Standard Industrial Buses	Ethernet, RS-232, RS-485
USB Software Interfaces	Modbus TPC/IP or RTU
Components - Analog Input - MAQ20-MVDN, -VDN, -VSN, -IDN, -ISN, -FREQ, -BRDG1, -JTC, -KTC, -RSTC, -TTC, -RTD31, -RTD41, -ISOI1, -ISOMV1, ISOV2, -ISOV2, -ISOV3, -ISOV4, -ISOV5	
Channel Count	Up To 16 Channels, Independently Configurable
Voltage and Current Inputs	8 Differential or 16 Single-ended
Thermocouple	8-channel Measurement, 5 Thermocouple Types
RTD Inputs	2-, 3-wire Sensors, Including 6 RTD Types and Potentiometers
Strain Gauge Input	Connect to Full-Bridge Sensors, Narrow/Wide BW Filtering
Frequency Input	Zero Crossing and TTL Signals of 500Hz-100kHz Frequencies
Components - Analog Output - MAQ20-VO, -IO	
Voltage and Current Outputs	Up to 8 Channels of 300vrms Ch-to-Ch Isolated Output
Components - Discrete Input/Output - MAQ20-DIV20, -DIVC20, -DIOL, -DIOH, -DODC20SK, -DORLY20	
Channel Count	5 Input/5 Output Channels per Module
Inputs	3-60VDC Input; or, 90-280VAC/VDS at 3A
Outputs	3-60VDC Output; or, 24-280VAC at 3A
Overall System Specifications	
Accuracy	±0.035% (typ)
Voltage and Current Outputs	Up to 8 Channels of 300Vrms Ch-to-Ch Isolated Output
Field I/O Protection	Up to 240Vrms, Continuous
Transient Protection	ANSI/IEEE C.37.90.1
Wide-range Input Power	7-34VDC
ReDAQ Shape Software	Up to 8 PID Loops
Operating Temperature	–40°C to +85°C
Advanced PID Control	Alarms, Counters, Timers
Operating Temperature	–40°C to +85°C

High-voltage Attenuator Modules - SCMHVAS-Mxxxx

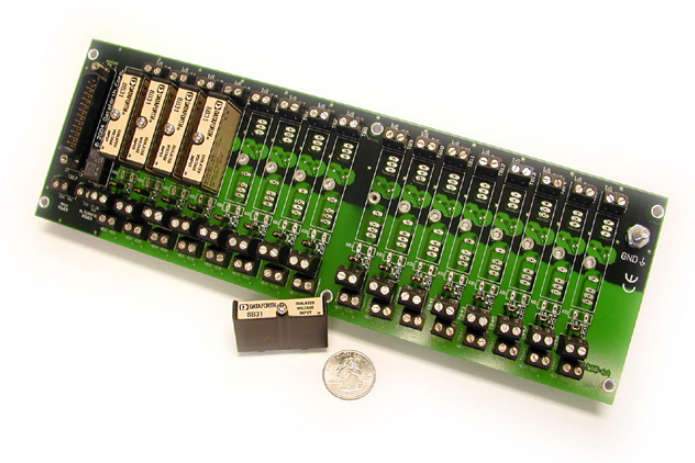
Module	SCMHVAS-Mxxx
Input Range	±100V_{PEAK} to ±2000V_{PEAK} (70VAC to 1414VAC)
Input Voltage (max)	±2000V_{PEAK}
Input Resistance	>10MΩ
Accuracy	±0.03%
Stability	±50ppm/ºC
Output Range	±1V
Output Resistance	<100kΩ
Mechanical Dimensions	2.13" x 1.705" x 0.605"
(h)x(w)x(d)	(54.1mm x 43.3mm x 15.4mm)
Environmental	
Operating Temp. Range	–40ºC to +85ºC
Storage Temp. Range	–40ºC to +85ºC
Relative Humidity	0 to 95% Noncondensing

*Contact factory or you local Dataforth sales office for maximum values.

See Discontinued Devices at the End of the Document.

8B

SensorLex® 8B Isolated Analog Signal Conditioners



8B Modules

Dataforth's SensorLex® 8B line of isolated analog signal conditioners includes 20 family groups with a total of 135 models that interface to a wide variety of voltage, current, temperature, position, frequency, and strain measuring devices. Housed in a package only one-fifth the size of competing products, the 8B modules offer fully functional *Instrument Class*® performance with superior specifications such as ±0.05% accuracy, ±0.02% linearity, 5-pole filtering, 1500Vrms isolation, low output noise and much more.

Custom Signal Conditioning

Custom modules are available: consult factory for minimum quantity and pricing details on custom input ranges, output ranges, bandwidth, and other key parameters.

FEATURES

- ±0.05% Accuracy (typ)
- ±0.02% Linearity
- 1500Vrms Transformer Isolation and up to 240Vrms Field-side Protection
- ANSI/IEEE C37.90.1 Transient Protection
- 5V Power (30mA typ)
- 5-Pole Low-pass Filtering
- Up to 120dB CMR
- 70dB NMR at 60Hz
- –40°C to +85°C Operating Temperature
- UL/cUL Listed (Class I, Division 2, Groups A, B, C, D)
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair
- Hot Swappable
- Calibration traceable to NIST standards
- Smallest Package Size Available
- Custom Modules Available

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments

8B Selection Guide

‡THERMOCOUPLE ALLOY COMBINATIONS
STANDARDS: DIN IEC 584, ANSI MC96-1-82, JIS C 1602-1981

Type	Material
J	Iron vs. Copper-Nickel
K	Nickel-Chromium vs. Nickel-Aluminum
T	Copper vs. Copper-Nickel
E	Nickel-Chromium vs. Copper-Nickel
R	Platinum-13% Rhodium vs. Platinum
S	Platinum-10% Rhodium vs. Platinum
B	Platinum-30% Rhodium vs. Platinum-6% Rhodium
C	Tungsten-5% Rhenium vs. Tungsten-26% Rhenium
N	Nickel-14.2% Chromium-1.4% Silicon vs. Nickel-4.4% Silicon- 0.1% Magnesium

****RTD STANDARDS**

Type	Alpha Coefficient	DIN	JIS	IEC
100Ω Pt 120Ω Ni	0.00385 0.00672	DIN 43760	JIS C 1604-1989	IEC 751

VOLTAGE INPUT MODULES, 3Hz BANDWIDTH

MODEL	INPUT RANGE	OUTPUT RANGE
8B30-01	±10mV	±5V
8B30-02	±50mV	±5V
8B30-03	±100mV	±5V
8B30-04	±10mV	0 to +5V
8B30-05	±50mV	0 to +5V
8B30-06	±100mV	0 to +5V
8B31-01	±1V	±5V
8B31-02	±5V	±5V
8B31-03	±10V	±5V
8B31-04	±1V	0 to +5V
8B31-05	±5V	0 to +5V
8B31-06	±10V	0 to +5V
8B31-07	±20V	±5V
8B31-08	±20V	0 to +5V
8B31-09	±40V	±5V
8B31-10	±40V	0 to +5V
8B31-12	±60V	±5V
8B31-1	±60V	0 to +5V

CURRENT INPUT MODULES, 3Hz BANDWIDTH

MODEL	INPUT RANGE	OUTPUT RANGE
8B32-01	4-20mA	0 to +5V
8B32-02	0-20mA	0 to +5V

ISOLATED TRUE RMS INPUT MODULES

MODEL	INPUT RANGE	OUTPUT RANGE
8B33-01	0 to +100mV	0 to +5V
8B33-02	0 to +1V	0 to +5V
8B33-03	0 to +10V	0 to +5V
8B33-04	0 to +150V	0 to +5V
8B33-05	0 to +300V	0 to +5V
8B33-06	0 to +1A	0 to +5V

LINEARIZED 2- OR 3-WIRE RTD MODULES, 0 to +5V OUTPUT, 3Hz BW

MODEL	TYPE	INPUT RANGE
8B34-01	100Ω Pt	–100°C to +100°C (–148°F to +212°F)
8B34-02	100Ω Pt	0°C to +100°C (+32°F to +212°F)
8B34-03	100Ω Pt	0°C to +200°C (+32°F to +392°F)
8B34-04	100Ω Pt	0°C to +600°C (+32°F to +1112°F)

LINEARIZED 4-WIRE RTD MODULES, 0 to +5V OUTPUT, 3Hz BW

MODEL	TYPE	INPUT RANGE
8B35-01	100Ω Pt	–100°C to +100°C (–148°F to +212°F)
8B35-02	100Ω Pt	0°C to +100°C (+32°F to +212°F)
8B35-03	100Ω Pt	0°C to +200°C (+32°F to +392°F)
8B35-04	100Ω Pt	0°C to +600°C (+32°F to +1112°F)

POTENTIOMETER-INPUT MODULES, 0 to +5V OUTPUT, 3Hz BW

MODEL	INPUT RANGE	OUTPUT RANGE
8B36-01	0 to 100Ω	0 to +5V
8B36-02	0 to 500Ω	0 to +5V
8B36-03	0 to 1kΩ	0 to +5V
8B36-04	0 to 10kΩ	0 to +5V

THERMOCOUPLE-INPUT MODULES, 0 to +5V OUTPUT, 3Hz BW

MODEL	TYPE	INPUT RANGE
8B37	J	–100°C to +760°C (–148°F to +1400°F)
8B37	K	–100°C to +1350°C (–148°F to +2462°F)
8B37	T	–100°C to +400°C (–148°F to +752°F)
8B37	R	0°C to +1750°C (+32°F to +3182°F)
8B37	S	0°C to +1750°C (+32°F to +3182°F)

STRAIN GAUGE INPUT MODULES

MODEL	INPUT RANGE	EXCITATION VOLTAGE	SENS	OUTPUT RANGE	BW
8B38-01	±10mV	+3.333V	3mV/V	±5V	8kHz
8B38-02	±30mV	+10.0V	3mV/V	±5V	8kHz
8B38-05	±20mV	+10.0V	2mV/V	±5V	8kHz
8B38-06	±10mV	+3.333V	3mV/V	0 to +5V	8kHz
8B38-07	±30mV	+10.0V	3mV/V	0 to +5V	8kHz
8B38-08	±20mV	+10.0V	2mV/V	0 to +5V	8kHz
8B38-31	±10mV	+3.333V	3mV/V	±5V	3Hz
8B38-32	±30mV	+10.0V	3mV/V	±5V	3Hz
8B38-35	±20mV	+10.0V	2mV/V	±5V	3Hz
8B38-36	±10mV	+3.333V	3mV/V	0 to +5V	3Hz
8B38-37	±30mV	+10.0V	3mV/V	0 to +5V	3Hz
8B38-38	±20mV	+10.0V	2mV/V	0 to +5V	3Hz

CURRENT OUTPUT MODULES, 100Hz BANDWIDTH

MODEL	INPUT RANGE	OUTPUT RANGE
8B39-01	0 to +5V	4-20mA
8B39-02	±5V	4-20mA
8B39-03	0 to +5V	0-20mA
8B39-04	±5V	0-20mA
8B39-07	±5V	±20mA

8B Selection Guide (Continued)

VOLTAGE INPUT MODULES, 1kHz BANDWIDTH

MODEL	INPUT RANGE	OUTPUT RANGE
8B40-01	±10mV	±5V
8B40-02	±50mV	±5V
8B40-03	±100mV	±5V
8B40-04	±10mV	0 to +5V
8B40-05	±50mV	0 to +5V
8B40-06	±100mV	0 to +5V
8B41-01	±1V	±5V
8B41-02	±5V	±5V
8B41-03	±10V	±5V
8B41-04	±1V	0 to +5V
8B41-05	±5V	0 to +5V
8B41-06	±10V	0 to +5V
8B41-07	±20V	±5V
8B41-08	±20V	0 to +5V
8B41-09	±40V	±5V
8B41-10	±40V	0 to +5V
8B41-12	±60V	±5V
8B41-13	±60V	0 to +5V

2-WIRE TRANSMITTER INTERFACE MODULES

MODEL	INPUT RANGE	OUTPUT RANGE
8B42-01	4-20mA	0 to +5V
8B42-02	4-20mA	+1 to +5V

DC LVDT INPUT MODULES, 1kHz BANDWIDTH

MODEL	INPUT RANGE	OUTPUT RANGE
8B43-01	±1V	±5V
8B43-02	±2V	±5V
8B43-03	±3V	±5V
8B43-04	±4V	±5V
8B43-05	±5V	±5V
8B43-11	±1V	0 to +5V
8B43-12	±2V	0 to +5V
8B43-13	±3V	0 to +5V
8B43-14	±4V	0 to +5V
8B43-15	±5V	0 to +5V

FREQUENCY INPUT MODULES

MODEL	INPUT RANGE	OUTPUT RANGE
8B45-01	0 to 500Hz	0 to +5V
8B45-02	0 to 1kHz	0 to +5V
8B45-03	0 to 2.5kHz	0 to +5V
8B45-04	0 to 5kHz	0 to +5V
8B45-05	0 to 10kHz	0 to +5V
8B45-06	0 to 25kHz	0 to +5V
8B45-07	0 to 50kHz	0 to +5V
8B45-08	0 to 100kHz	0 to +5V

LINEARIZED THERMOCOUPLE-INPUT MODULES, 0 to +5V OUTPUT, 3Hz BW

MODEL	TYPE	INPUT RANGE
8B47J-01	J	0°C to +760°C (+32°F to +1400°F)
8B47J-02	J	–100°C to +300°C (–148°F to +572°F)
8B47J-03	J	0°C to +500°C (+32°F to +932°F)
8B47J-12	J	–100°C to +760°C (–148°F to +1400°F)
8B47K-04	K	0°C to +1000°C (+32°F to +1832°F)
8B47K-05	K	0°C to +500°C (+32°F to +932°F)
8B47K-13	K	–100°C to +1350°C (–148°F to +2462°F)
8B47K-14	K	0°C to +1200°C (+32°F to +2192°F)
8B47T-06	T	–100°C to +400°C (–148°F to +752°F)
8B47T-07	T	0°C to +200°C (+32°F to +392°F)

VOLTAGE OUTPUT MODULES, 100Hz BANDWIDTH

MODEL	INPUT RANGE	OUTPUT RANGE
8B49-01	0 to +5V	±5V
8B49-02	±5V	±5V
8B49-03	±5V	0 to +5V
8B49-04	0 to +10V	±10V
8B49-05	±10V	±10V
8B49-06	±10V	0 to +10V
8B49-07	±5V	±10V

VOLTAGE INPUT MODULES, 20kHz BANDWIDTH

MODEL	INPUT RANGE	OUTPUT RANGE
8B50-01	±20mV	±5V
8B50-02	±50mV	±5V
8B50-03	±100mV	±5V
8B50-04	±20mV	0 to +5V
8B50-05	±50mV	0 to +5V
8B50-06	±100mV	0 to +5V
8B51-01	±1V	±5V
8B51-02	±5V	±5V
8B51-03	±10V	±5V
8B51-04	±1V	0 to +5V
8B51-05	±5V	0 to +5V
8B51-06	±10V	0 to +5V
8B51-07	±20V	±5V
8B51-08	±20V	0 to +5V
8B51-09	±40V	±5V
8B51-10	±40V	0 to +5V
8B51-12	±60V	±5V
8B51-13	±60V	0 to +5V

8B Selection Guide (Continued)

ACCESSORIES

MODEL	DESCRIPTION
8BP01	Single Channel DIN-rail Mount Carrier
8BP02	Standard 2-channel Backpanel
8BP02-1	8BP02 without Cold Junction Compensation Sensor
8BP02-2	8BP02 with DIN-rail Mounting Option
8BP02-3	8BP02-1 with DIN-rail Mounting Option
8BP04	Standard 4-channel Backpanel
8BP04-1	8BP04 without Cold Junction Compensation Sensor
8BP04-2	8BP04 with DIN-rail Mounting Option
8BP04-3	8BP04-1 with DIN-rail Mounting Option
8BP08	Standard 8-channel Backpanel
8BP08-1	8BP08 without Cold Junction Compensation Sensor
8BP08-2	8BP08 with DIN-rail Mounting Option
8BP08-3	8BP08-1 with DIN-rail Mounting Option
8BP16	Standard 16-channel Backpanel
8BP16-1	8BP16 without Cold Junction Compensation Sensor
8BP16-2	8BP16 with DIN-rail Mounting Option
8BP16-3	8BP16-1 with DIN-rail Mounting Option
8BPWR-2	Power Supply Module
SCMXPRT-001	Power Supply, 1A, 5VDC, 120VAC
SCMXPRE-001	Power Supply, 1A, 5VDC, 220VAC
SCMXPRT-003	Power Supply, 3A, 5VDC, 120VAC
SCMXPRE-003	Power Supply, 3A, 5VDC, 220VAC
PWR-4505	Power Supply, 5A, 5VDC, 85-264VAC
SCMXCA006-xx	System Interface Cable for Backpanels
8BXIF	DB25 to Screw Terminal Interface Board
8BXCJC	Cold Junction Compensation Sensor
8BPT	Non-isolated Signal Pass thru Module
8B-PROTO	Breadboard Kit
SCMXRK-002	19-inch Metal Rack for Mounting Backpanels
SCMXRAIL1-XX	DIN EN50022-35x7.5 (slotted steel), Length -XX in Meters
SCMXRAIL2-XX	DIN EN50035-G32 (slotted steel), Length -XX in Meters
SCMXRAIL3-XX	DIN EN50022-35x15 (slotted steel), Length -XX in Meters

‡THERMOCOUPLE ALLOY COMBINATIONS

STANDARDS: DIN IEC 584, ANSI MC96-1-82, JIS C 1602-1981

Type	Material
J	Iron vs. Copper-Nickel
K	Nickel-Chromium vs. Nickel-Aluminum
T	Copper vs. Copper-Nickel
E	Nickel-Chromium vs. Copper-Nickel
R	Platinum-13% Rhodium vs. Platinum
S	Platinum-10% Rhodium vs. Platinum
B	Platinum-30% Rhodium vs. Platinum-6% Rhodium
C	Tungsten-5% Rhenium vs. Tungsten-26% Rhenium
N	Nickel-14.2% Chromium-1.4% Silicon vs. Nickel-4.4% Silicon- 0.1% Magnesium

****RTD STANDARDS**

Type	Alpha Coefficient	DIN	JIS	IEC
100Ω Pt 120Ω Ni	0.00385 0.00672	DIN 43760	JIS C 1604-1989	IEC 751

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B30/31

Voltage-input Modules, Narrow Bandwidth

DESCRIPTION

The 8B30/31 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B30 or 8B31 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output (Figure below).

Signal filtering is accomplished with a 5-pole filter optimized for time and frequency response which provides 70dB of normal-mode rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other four are on the system side.

A special input circuit on the 8B30 and 8B31 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

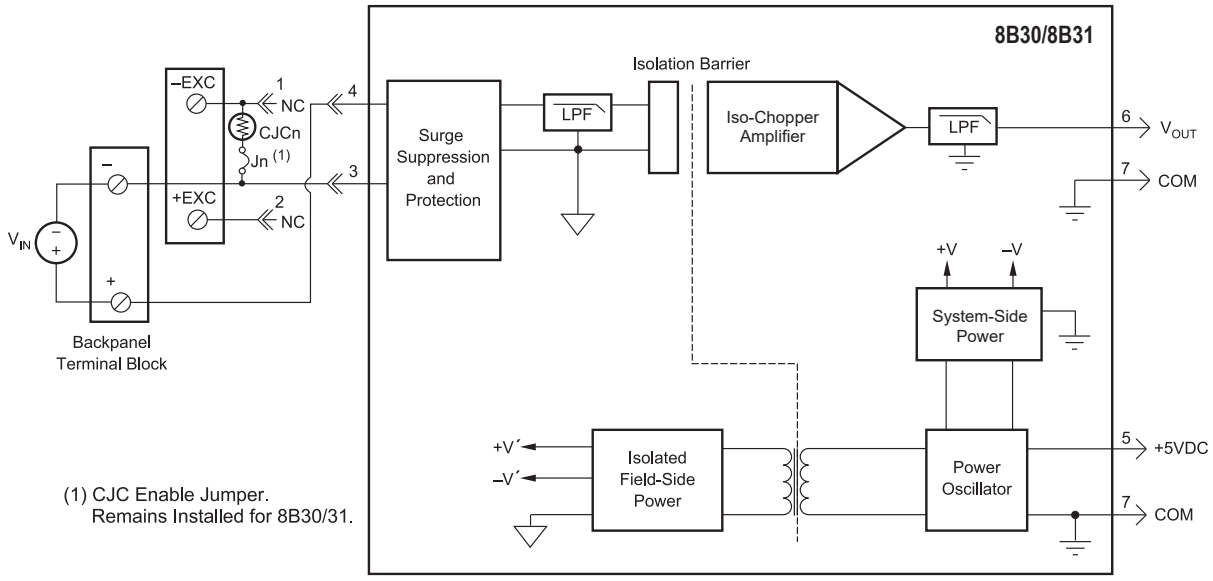
- Accepts Millivolt and Voltage Level Signals
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B30/31.

8B30/31 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B30	8B31
Input Range	±10mV to ±100mV	±1V to ±60V
Input Bias Current	±0.5nA	±0.05nA
Input Resistance		
Normal	50MΩ	500kΩ (min)
Power Off	100kΩ	500kΩ (min)
Overload	100kΩ	500kΩ (min)
Input Protection		
Continuous(1)	240VAC	240VAC
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMV, Input to Output	1500Vrms (max)	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	120dB	120dB
NMR	70dB at 60Hz	70dB at 60Hz
Accuracy(2)	±0.05% Span	±0.05% Span
Linearity	±0.02% Span	±0.02% Span
Stability		
Offset	±10ppm/°C	±10ppm/°C
Gain	±50ppm/°C	±75ppm/°C
Noise		
Output, 100kHz	250µVrms	250µVrms
Bandwidth, –3dB	3Hz	3Hz
Response Time, 90% Span	160ms	160ms
Output Range	See Ordering Information	See Ordering Information
Output Protection	Continuous Short-to-Ground	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%	+5VDC ±5%
Power Supply Current	25mA	25mA
Power Supply Sensitivity	±75ppm/%	±75ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental		
Operating Temp. Range	–40°C to +85°C	–40°C to +85°C
Storage Temp. Range	–40°C to +85°C	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1	ISM, Group 1
Radiated, Conducted	Class A	Class A
Immunity EN61000-6-2	ISM, Group 1	ISM, Group 1
RF	Performance A ±0.5% Span Error	Performance A ±0.5% Span Error
ESD,EFT	Performance B	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
2) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B30-01	–10mV to +10mV	–5V to +5V
8B30-02	–50mV to +50mV	–5V to +5V
8B30-03	–100mV to +100mV	–5V to +5V
8B30-04	–10mV to +10mV	0V to +5V
8B30-05	–50mV to +50mV	0V to +5V
8B30-06	–100mV to +100mV	0V to +5V
8B31-01	–1V to +1V	–5V to +5V
8B31-02	–5V to +5V	–5V to +5V
8B31-03	–10V to +10V	–5V to +5V
8B31-04	–1V to +1V	0V to +5V
8B31-05	–5V to +5V	0V to +5V
8B31-06	–10V to +10V	0V to +5V
8B31-07	–20V to +20V	–5V to +5V
8B31-08	–20V to +20V	0V to +5V
8B31-09	–40V to +40V	–5V to +5V
8B31-10	–40V to +40V	0V to +5V
8B31-12	–60V to +60V	–5V to +5V
8B31-13	–60V to +60V	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B32

Current Input Modules

DESCRIPTION

The 8B32 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B32 module isolates, filters, and amplifies a process current input signal and provides an analog voltage output (Figure below).

Current-to-voltage conversion is accomplished internal to the module to ensure high accuracy.

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 70dB of normal-mode rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the 8B32 module provides protection against accidental connection of power-line voltages up to 40VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

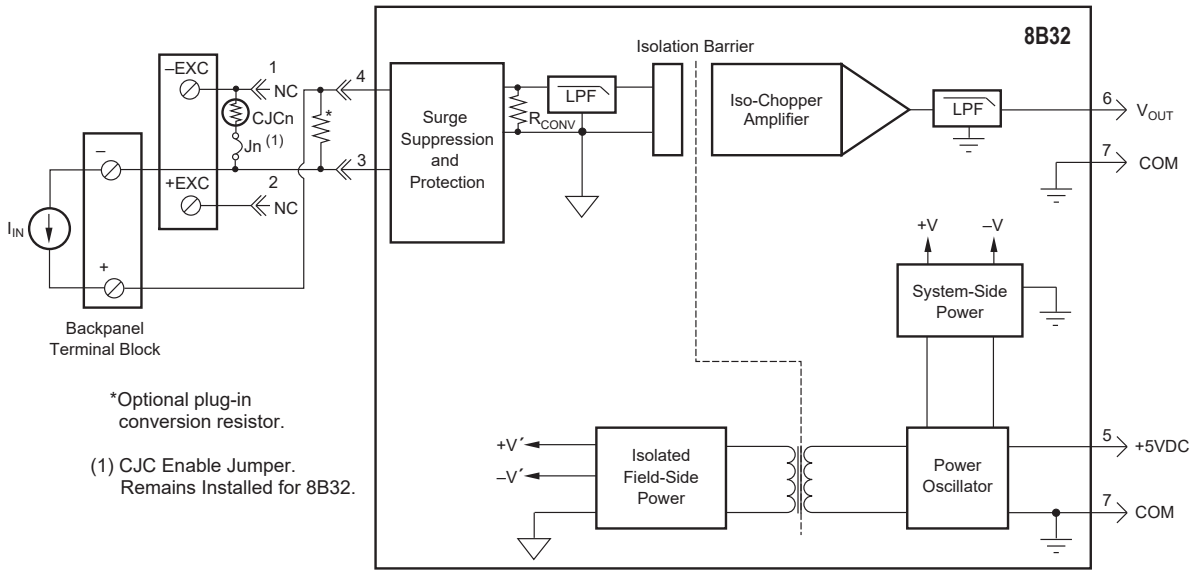
- Accepts Milliamp Level Signals
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 40VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



*Optional plug-in conversion resistor.

(1) CJC Enable Jumper. Remains Installed for 8B32.

8B32 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC power

Module	8B32
Input Range	0-20mA or 4-20mA
Input Resistance	
Normal	<50Ω
Power Off	<50Ω
Input Protection	
Continuous	40VAC
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	120dB
NMR	70dB at 60Hz
Accuracy(1)	±0.05% Span
Linearity	±0.02% Span
Stability	
Offset	±25ppm/°C
Gain	±50ppm/°C
Noise	
Output, 100kHz	250µVrms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	150ms
Output Range	0V to +5V
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%
Power Supply Current	30mA
Power Supply Sensitivity	±75ppm/%
Mechanical Dimensions	1.11" x 1.65" x 0.40"
(h)x(w)x(d)	(28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B32-01	4-20mA	0V to +5V
8B32-02	0-20mA	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B33

Isolated True RMS Input Modules

DESCRIPTION

Each 8B33 True RMS input module provides a single channel of AC input which is converted to its True RMS DC value, filtered, isolated, amplified, and converted to a standard process voltage output (Figure below).

The field voltage or current input signal is processed through a pre-amplifier and RMS converter on the field side of the isolation barrier. The converted DC signal is then chopped by a proprietary chopper circuit and transferred across the transformer isolation barrier, suppressing transmission of common-mode spikes and surges. The computer-side circuitry reconstructs, filters, and converts the signal to an industry-standard output of 0 to 5VDC.

Special input circuits provide protection against accidental connection of power-line voltages up to 350VAC and against transient events defined by ANSI/IEEE C37.90.1.

FEATURES

- Interfaces to RMS Voltage (0-300V) or RMS Current (0-1A)
- Designed for Standard Operation with Frequencies of 45Hz to 1000Hz (Extended Range to 10kHz)
- Compatible with Standard Current and Potential Transformers
- 0 to 5VDC Industry-standard Output
- ±0.25% Factory-calibrated Accuracy
- 1500Vrms Transformer Isolation
- Input Overload Protected to 350Vrms (max) (Peak AC and DC) or 2Arms Continuous
- 120dB CMR
- ANSI/IEEE C37.90.1 Transient Protection
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

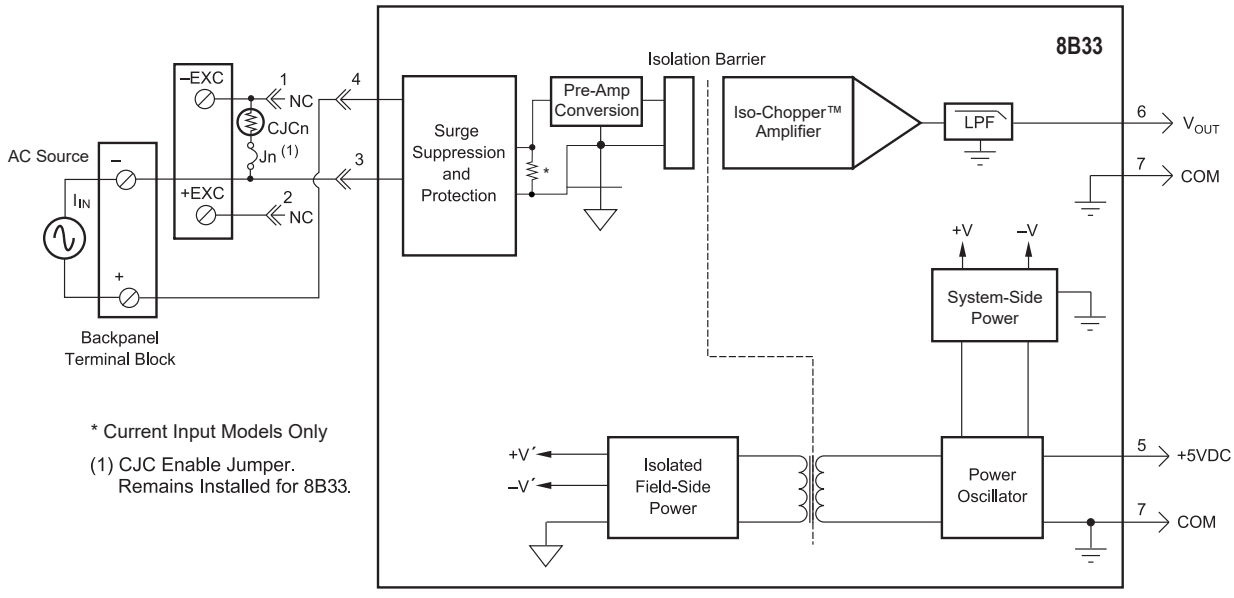
BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments

WARNING: The SensorLex 8B33 interfaces to hazardous voltages and should only be wired by qualified personnel or licensed electricians.



8B33 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B33
Input	
Signal Range	100mV to 300Vrms, 0 to 1Arms
Standard Frequency Range	45Hz to 1000Hz
Extended Frequency Range	1kHz to 10kHz
Impedance	499KΩ (–01, –02) 1MΩ (–03, –04, –05) 0.05Ω (–06)
Coupling	AC
Protection (1)	
Continuous (–01 thru –05)	350Vrms
Continuous (–06)	2Arms
Transient (–01 thru –05)	ANSI/IEEE C37.90.1
Transient (–06)	See Note 2
Output	
Signal Range	0V to 5V
Voltage Limit	±9V
Protection	Continuous Short-to-Ground
Ripple and Noise	0.0375% Span rms
Accuracy (5-100% Span)(3) (4)	
Sinusoid	
50/60Hz	±0.25% Span
45Hz to 1kHz	±0.625% Span
1kHz to 10kHz	±1.375% Span, ±3.25% Span(-06)
Non-Sinusoid	
Crest Factor = 1	±0.25% Span
Crest Factor = 2	±0.325% Span
Crest Factor = 3	±0.475% Span
Crest Factor = 4	±0.7% Span
Vs. Temperature	±100ppm/°C
Isolation (Common Mode)	
Input to Output, Input to Power	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50Hz to 60Hz)	120dB
Response Time, 90% Span	<120ms
Supply Voltage	+5VDC ±5%
Current	30mA
Sensitivity	±200ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 90% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT, Surge, Voltage Dips	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 8B33 and 8BP01, 8BP02, 8BP04, 8BP08, 8BP16, XEV rating only. Backpanels obtained from other sources may have lower ratings.
(2) For 1 to 25 seconds the max allowable transient current rating is $\sqrt{2500/(\text{event time})}$. For less than 1 second, ANSI/IEEE C37.90.1 applies with a 0.05 Ω load. For greater than 25 seconds, the 2Arms continuous rating applies.
(3) At standard 60Hz factory calibration. Consult factory for calibration at other frequencies.
(4) For 0-5% Span measurements add 1% accuracy error (-02, -03, -04, -05) or 1.5% accuracy error (-01, -06). Accuracy error includes linearity, hysteresis, and repeatability but not source or external shunt inaccuracy (if used).

Ordering Information

Model	Input Range	Output Range
8B33-01	0mV to 100mV	0V to +5V
8B33-02	0V to 1V	0V to +5V
8B33-03	0V to 10V	0V to +5V
8B33-04	0V to 150V	0V to +5V
8B33-05	0V to 300V	0V to +5V
8B33-06	0A to 1A	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B34

Linearized 2- or 3-wire RTD-input Modules

DESCRIPTION

The 8B32 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B34 input module isolates, filters, amplifies, and linearizes a single channel of temperature input from an RTD and provides an analog voltage output (Figure below).

RTD excitation is provided from the module using two matched current sources. When using a 3-wire connection, this method allows equal currents to flow through the sensor leads, canceling the effects of lead resistances. The excitation currents are small (0.25mA) which minimizes self-heating of the RTD.

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 70dB of normal-mode rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the 8B34 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

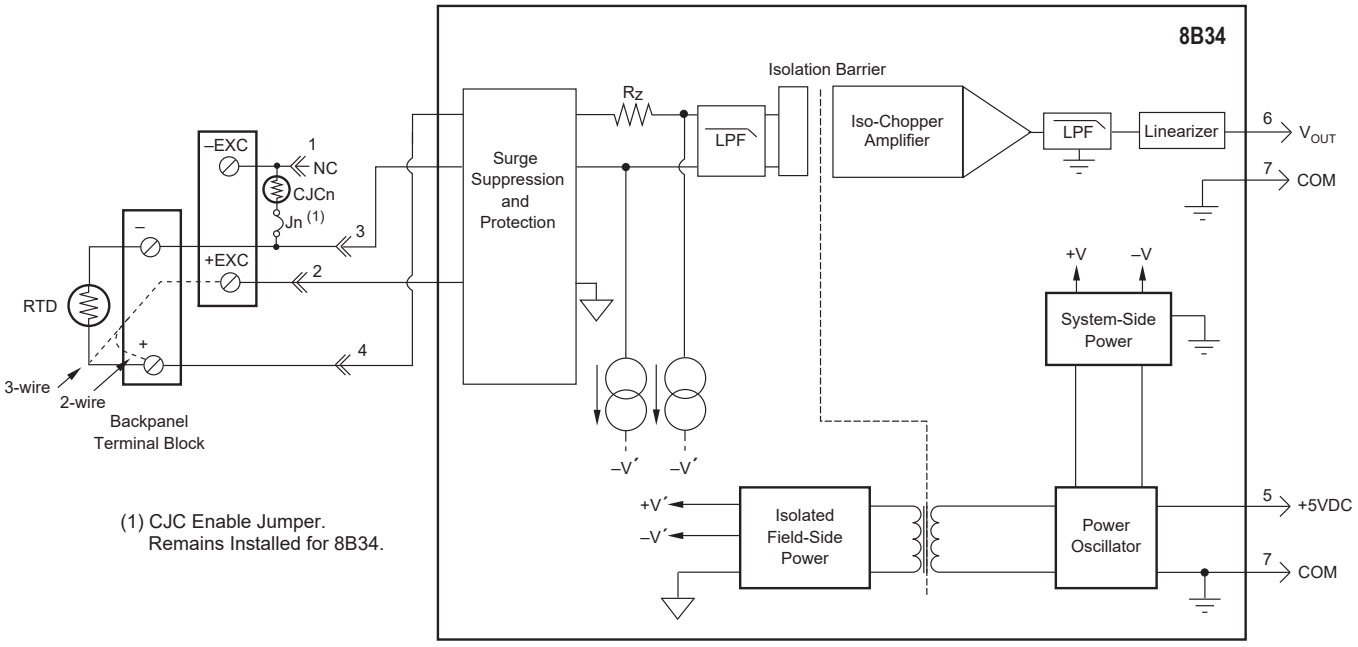
- Interfaces to 100Ω Platinum RTDs
- Linearizes RTD Signal
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B34.

8B34 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B34
Input Range Limits	–200°C to +850°C (100Ω Pt)
Input Resistance	
Normal	50MΩ
Power Off	200kΩ
Overload	200kΩ
Input Protection	
Continuous(1)	240VAC
Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current	0.25mA
Lead Resistance Effect	±0.02°C/Ω(2)
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	120dB
NMR	70dB at 60Hz
Accuracy	See Ordering Information
Stability	
Offset	±20ppm/°C
Gain	±50ppm/°C
Noise	
Output, 100kHz	200µVrms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	150ms
Output Range	See Ordering Information
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Open Input Response	Downscale
Open Input Detection Time	1s
Power Supply Voltage	+5VDC ±5%
Power Supply Current	25mA
Power Supply Sensitivity	±75ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B

NOTES :
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) "Ω" refers to the resistance in one lead.
(3) Includes conformity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range	Accuracy(3)
100Ω Pt **			
8B34-01	–100°C to +100°C (–148°F to +212°F)	0V to +5V	±0.20°C
8B34-02	0°C to +100°C (+32°F to +212°F)	0V to +5V	±0.10°C
8B34-03	0°C to +200°C (+32°F to +392°F)	0V to +5V	±0.20°C
8B34-04	0°C to +600°C (+32°F to +1112°F)	0V to +5V	±0.45°C

**RTD Standards

Type	Alpha Coefficient	DIN	JIS	IEC
100Ω Pt	0.00385	DIN 43760	JIS C 1604-1989	IEC 751

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B35

Linearized 4-wire RTD-input Modules

DESCRIPTION

The 8B35 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B35 input module isolates, filters, amplifies, and linearizes a single channel of temperature input from an RTD and provides an analog voltage output (Figure below).

RTD excitation is provided from the module using a precision current source. Excitation current does not flow in the input signal leads, which allows RTD measurements to be made independently of lead resistance. The excitation currents are small (0.25mA) which minimizes self-heating of the RTD.

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 70dB of normal-mode rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the 8B35 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

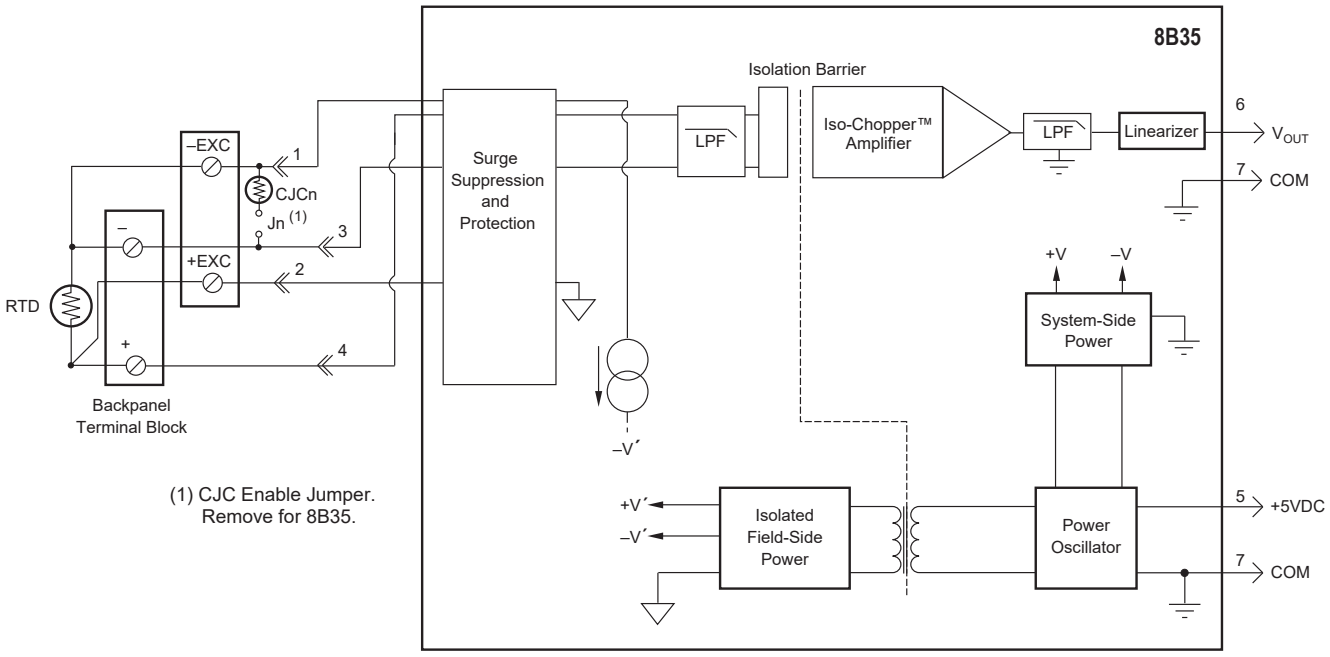
- Interfaces to 100Ω Platinum RTDs
- True 4-wire Input
- Linearizes RTD Signal
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remove for 8B35.

8B35 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B35
Input Range Limits	–200°C to +850°C (100Ω Pt)
Input Resistance	
Normal	50MΩ
Power Off	200kΩ
Overload	200kΩ
Input Protection	
Continuous(1)	240VAC
Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current	0.25mA
Lead Resistance Effect	±0.005°C/Ω(2)
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	120dB
NMR	70dB at 60Hz
Accuracy	See Ordering Information
Stability	
Offset	±20ppm/°C
Gain	±50ppm/°C
Noise	
Output, 100kHz	200µVrms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	150ms
Output Range	See Ordering Information
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Open Input Response	
+EXC, –EXC Lead	Downscale, 1s
–IN Lead	Downscale, 40s
+IN Lead	Upscale, 40s
Power Supply Voltage	+5VDC ±5%
Power Supply Current	25mA
Power Supply Sensitivity	±75ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B

NOTES :
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) "Ω" refers to the resistance in one lead.
(3) Includes conformity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range	Accuracy(3)
100Ω Pt **			
8B35-01	–100°C to +100°C (–148°F to +212°F)	0V to +5V	±0.20°C
8B35-02	0°C to +100°C (+32°F to +212°F)	0V to +5V	±0.10°C
8B35-03	0°C to +200°C (+32°F to +392°F)	0V to +5V	±0.20°C
8B35-04	0°C to +600°C (+32°F to +1112°F)	0V to +5V	±0.45°C

**RTD Standards

Type	Alpha Coefficient	DIN	JIS	IEC
100Ω Pt	0.00385	DIN 43760	JIS C 1604-1989	IEC 751

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B36

Potentiometer-input Modules

DESCRIPTION

The 8B36 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B36 input module isolates, filters, and amplifies a single channel of Potentiometer-input and provides an analog voltage output (Figure below).

Excitation for the potentiometer is provided by using two matched current sources. When using a 3-wire connection, this method allows equal currents to flow through the sensor leads, canceling the effects of lead resistances. The excitation currents are small (equal to or less than 0.25mA) which minimizes self-heating of the potentiometer.

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 70dB of normal-mode rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the 8B36 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

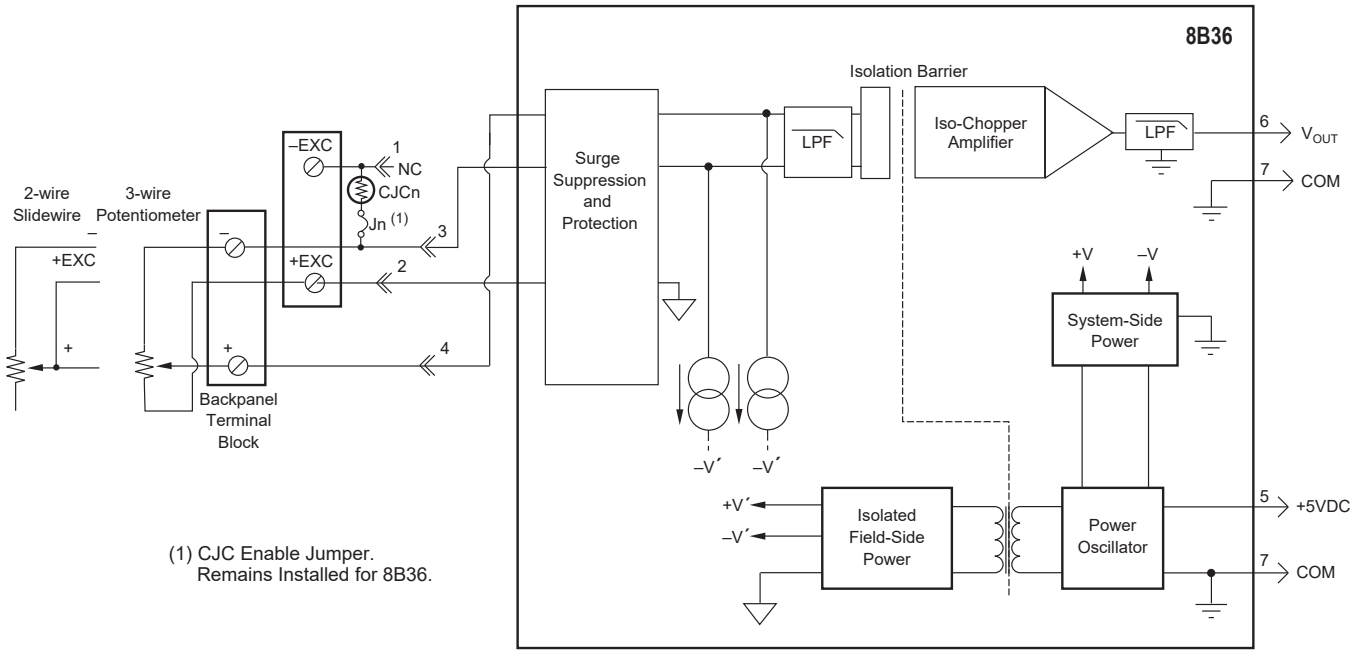
- Interfaces to Potentiometers up to 10,000Ω
- High-level Voltage Output
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B36.

8B36 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B36
Input Range	0 to 10kΩ
Input Resistance	
Normal	50MΩ
Power Off	200kΩ
Overload	200kΩ
Input Protection	
Continuous(1)	240VAC
Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current	0.25mA; 100Ω, 500Ω, 1kΩ Sensor 0.10mA; 10kΩ Sensor
Lead Resistance Effect	±0.01Ω/Ω; 100Ω, 500Ω, 1kΩ Sensor ±0.02Ω/Ω; 10kΩ Sensor
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	120dB
NMR	70dB at 60Hz
Accuracy(2)	±0.05% Span
Linearity	±0.02% Span
Stability	
Offset	±20ppm/°C
Gain	±50ppm/°C
Noise	
Output, 100kHz	200µVrms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	150ms
Output Range	0V to +5V
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Open Input Response	Downscale
Open Input Detection Time	1s
Power Supply Voltage	+5VDC ±5%
Power Supply Current	25mA
Power Supply Sensitivity	±75ppm/%
Mechanical Dimensions	1.11" x 1.65" x 0.40"
(h)x(w)x(d)	(28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B36-01	0 to 100Ω	0V to +5V
8B36-02	0 to 500Ω	0V to +5V
8B36-03	0 to 1kΩ	0V to +5V
8B36-04	0 to 10kΩ	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B37

Non-linearized Thermocouple-input Modules

DESCRIPTION

The 8B37 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B37 nonlinearized module isolates, filters, and amplifies a single channel of temperature input from a Thermocouple-input signal and provides an analog voltage output (Figure below).

The 8B37 can interface to industry-standard thermocouple types J, K, T, R, and S and has an output signal of 0 to +5V. Each module is cold junction compensated to correct for parasitic thermocouples formed by the thermocouple wire and screw terminals on the mounting backpanel. Upscale open thermocouple detect is provided by an internal pull-up resistor.

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 70dB of normal-mode rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the 8B37 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

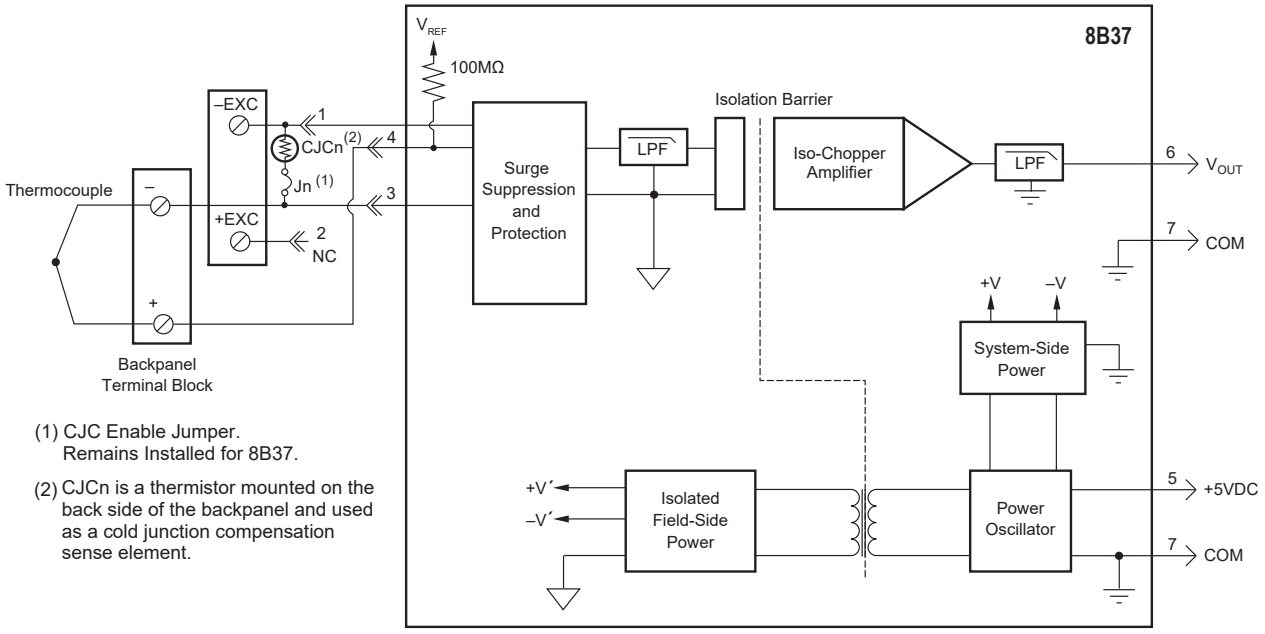
- Interfaces to Types J, K, T, R, and S Thermocouples
- High-level Voltage Output
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- Accurate CJC –40°C to +85°C
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B37.

(2) CJCn is a thermistor mounted on the back side of the backpanel and used as a cold junction compensation sense element.

8B37 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC power

Module	8B37
Input Range	See Ordering Information
Input Bias Current	–25nA
Input Resistance	
Normal	50MΩ
Power Off	200kΩ
Overload	200kΩ
Input Protection	
Continuous(1)	240VAC
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	120dB
NMR	70dB at 60Hz
Accuracy	See Ordering Information
Linearity	±0.02% Span
Stability	
Offset	±20ppm/°C
Gain	±50ppm/°C
Noise	
Output, 100kHz	250µVrms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	150ms
Output Range	0V to +5V
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Cold Junction Compensation	
Accuracy, 25°C	±0.5°C
Accuracy, –40°C to +85°C (J,K,T)	±1.5°C
Accuracy, –20°C to +65°C (R,S)	±3.0°C
Accuracy, –40°C to +85°C (R,S)	±5.0°C
Open Input Response	Upscale
Open Input Detection Time	<10s
Power Supply Voltage	+5VDC ±5%
Power Supply Current	30mA
Power Supply Sensitivity	±75ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis, and repeatability. Does not include CJC accuracy.

Ordering Information

Model	TC Type‡	Input Range	Output Range	Accuracy(2)	
8B37J	J	–100°C to +760°C (–148°F to +1400°F)	0V to +5V	±0.05%	±0.43°C
8B37K	K	–100°C to +1350°C (–148°F to +2462°F)	0V to +5V	±0.05%	±0.73°C
8B37T	T	–100°C to +400°C (–148°F to +752°F)	0V to +5V	±0.05%	±0.25°C
8B37R	R	0°C to +1750°C (+32°F to +3182°F)	0V to +5V	±0.05%	±0.88°C
8B37S	S	0°C to +1750°C (+32°F to +3182°F)	0V to +5V	±0.05%	±0.88°C

‡Thermocouple Alloy Combinations

Standards: DIN IEC 584, ANSI MC96-1-82, JIS C 1602-1981

Type	Material
J	Iron vs. Copper-nickel
K	Nickel-chromium vs. Nickel-aluminum
T	Copper vs. Copper-nickel
R	Platinum-13% Rhodium vs. Platinum
S	Platinum-10% Rhodium vs. Platinum

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.

2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.

3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B38

Strain Gauge Input Modules, Wide and Narrow Bandwidth

DESCRIPTION

The 8B38 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B38 module isolates, filters, and amplifies a full-bridge strain gauge input signal and provides an analog voltage output (Figure below).

The 8B38 can interface to transducers with a nominal resistance of 100Ω to 2kΩ. Bridge excitation is provided from the module with a stable 10.00V or 3.33V source. Full scale sensitivities of 2mV/V and 3mV/V are offered as standard.

Signal filtering is accomplished with a 5-pole filter optimized for time and frequency response which provides 100dB per decade of normal-mode rejection above the filter cutoff frequency. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other four are on the system side.

A special input circuit on the 8B38 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

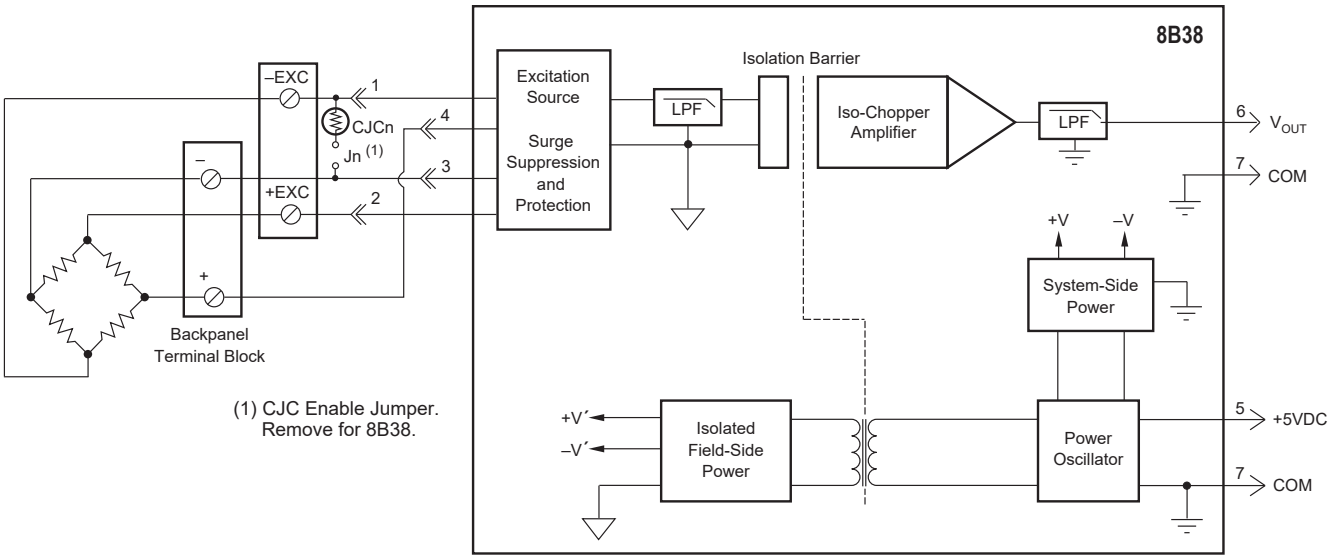
- Interfaces to 100Ω through 2kΩ Full-bridge Strain Gauges
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 100dB CMR
- 3Hz or 8kHz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



8B38 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B38-0x	8B38-3x
Input Range	±10mV to ±30mV	±10mV to ±30mV
Input Bias Current	±0.5nA	±0.5nA
Input Resistance		
Normal	50MΩ	50MΩ
Power Off	100kΩ	100kΩ
Overload	100kΩ	100kΩ
Input Protection		
Continuous(1)	240VAC	240VAC
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Excitation Output (-x1)	+3.333V ±2mV	+3.333V ±2mV
Load Resistance	100Ω to 2kΩ	100Ω to 2kΩ
Excitation Output (-x2,-x5)	+10V ±5mV	+10V ±5mV
Load Resistance	300Ω to 2kΩ	300Ω to 2kΩ
Excitation Load Regulation	15ppm/mA	15ppm/mA
Excitation Stability	50ppm/°C	50ppm/°C
Excitation Protection	120VAC	120VAC
CMV, Input to Output	1500Vrms (max)	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	100dB	100dB
NMR	100dB per Decade Above 8kHz	70dB at 60Hz
Accuracy(2)	±0.05% Span	±0.05% Span
Linearity	±0.02% Span	±0.02% Span
Stability		
Offset	±25ppm/°C	±25ppm/°C
Gain	±100ppm/°C	±75ppm/°C
Noise		
Output, 100kHz	1500µVrms	200µVrms
Bandwidth, –3dB	8kHz	3Hz
Response Time, 90% Span	70µs	160ms
Output Range	±5V	±5V
Output Protection	Continuous Short-to-Ground	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%	+5VDC ±5%
Power Supply Current	110mA No Exc. Load 150mA Full Exc. Load	110mA No Exc. Load 150mA Full Exc. Load
Power Supply Sensitivity	±75ppm/%	±75ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental		
Operating Temperature Range	–40°C to +85°C	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1	ISM, Group 1
Radiated, Conducted	Class A	Class A
Immunity EN61000-6-2	ISM, Group 1	ISM, Group 1
RF	Performance A ±0.5% Span Error	Performance A ±0.5% Span Error
ESD, EFT	Performance B	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Band-width	Input Range	Exc.	Sens.	Output Range
8B38-01	8kHz	–10mV to +10mV	+3.333V	3mV/V	–5V to +5V
8B38-02	8kHz	–30mV to +30mV	+10.0V	3mV/V	–5V to +5V
8B38-05	8kHz	–20mV to +20mV	+10.0V	2mV/V	–5V to +5V
8B38-06	8kHz	–10mV to +10mV	+3.333V	3mV/V	0V to +5V
8B38-07	8kHz	–30mV to +30mV	+10.0V	3mV/V	0V to +5V
8B38-08	8kHz	–20mV to +20mV	+10.0V	2mV/V	0V to +5V
8B38-31	3Hz	–10mV to +10mV	+3.333V	3mV/V	–5V to +5V
8B38-32	3Hz	–30mV to +30mV	+10.0V	3mV/V	–5V to +5V
8B38-35	3Hz	–20mV to +20mV	+10.0V	2mV/V	–5V to +5V
8B38-36	3Hz	–10mV to +10mV	+3.333V	3mV/V	0V to +5V
8B38-37	3Hz	–30mV to +30mV	+10.0V	3mV/V	0V to +5V
8B38-38	3Hz	–20mV to +20mV	+10.0V	2mV/V	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B39

Current Output Modules

DESCRIPTION

The 8B39 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B39 module accepts an input signal from a non-isolated source, then isolates, filters, and converts the signal to an analog process current output (Figure below).

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 60dB per decade of normal-mode rejection above 100Hz. One pole of this filter is on the system side and the other two are on the isolated field side.

A special output circuit in the 8B39 module provides protection against accidental connection of power-line voltages up to 40VAC continuous. Clamp circuits on the I/O and power terminals protect against harmful transients.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

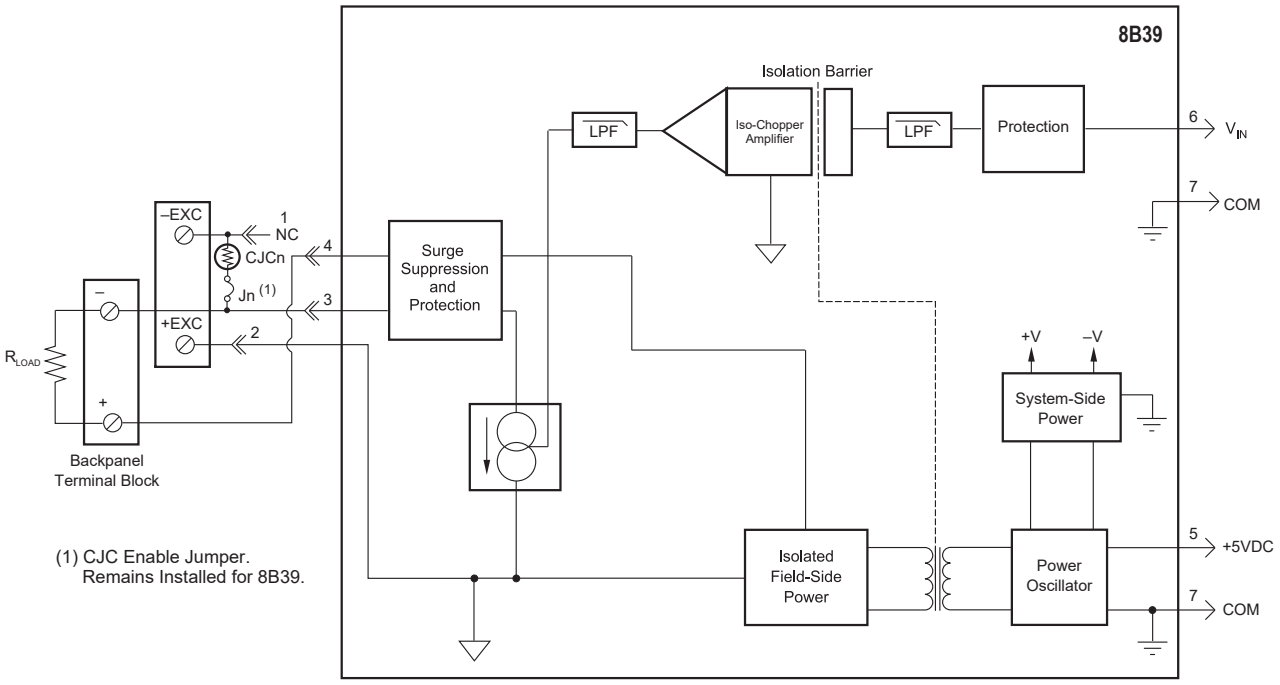
- Accepts High-level Voltage or Process Current Input
- Process Current Output
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Output Protection to 40VAC Continuous
- 110dB CMR
- 100Hz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B39.

8B39 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B39-01,-02,-03,-04	8B39-07
Input Voltage Range	±5V or 0V to +5V	±5V
Input Voltage Maximum	±20V (no damage)	±20V (no damage)
Input Resistance	50MΩ	50MΩ
Output Current Range	0-20mA or 4-20mA	±20mA
Over Range Capability	10%	10%
Output Compliance Voltage		
(Open Circuit)	15VDC	±12VDC
Load Resistance Range	0 to 500Ω	0 to 400Ω
Output I Under Fault, max	26mA	±26mA
Output Protection		
Continuous	40VAC	40VAC
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMV, Output to Input	1500Vrms (max)	1500Vrms (max)
Transient, Output to Input	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	110dB	110dB
NMR (–3dB at 100Hz)	60dB per Decade Above 100Hz	60dB per Decade Above 100Hz
Accuracy(1)	±0.05% Span	±0.05% Span
Linearity	±0.02% Span	±0.02% Span
Stability		
Offset	±10ppm/°C	±10ppm/°C
Gain	±50ppm/°C	±100ppm/°C
Noise		
Output, 100kHz	2µArms	2µArms
Bandwidth, –3dB	100Hz	100Hz
Rise Time, 10 to 90% Span	5ms	5ms
Power Supply Voltage	+5VDC ±5%	+5VDC ±5%
Power Supply Current	100mA	100mA
Power Supply Sensitivity	±100ppm/%	±100ppm/%
Mechanical Dimensions	1.11" x 1.65" x 0.40"	1.11" x 1.65" x 0.40"
(h)x(w)x(d)	(28.1mm x 41.9mm x 10.2mm)	(28.1mm x 41.9mm x 10.2mm)
Environmental		
Operating Temperature Range	–40°C to +85°C	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1	ISM, Group 1
Radiated, Conducted	Class A	Class A
Immunity EN61000-6-2	ISM, Group 1	ISM, Group 1
RF	Performance A ±0.5% Span Error	Performance A ±0.5% Span Error
ESD, EFT	Performance B	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B39-01	0V to +5V	4-20mA
8B39-02	–5V to +5V	4-20mA
8B39-03	0V to +5V	0-20mA
8B39-04	–5V to +5V	0-20mA
8B39-07	–5V to +5V	±20mA

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B40/41

Voltage Input Modules, 1kHz Bandwidth

DESCRIPTION

8B40/41 modules are an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B40 or 8B41 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output (Figure below).

Signal filtering is accomplished with a 5-pole filter optimized for time and frequency response which provides 100dB per decade of normal-mode rejection above 1kHz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other four are on the system side.

A special input circuit on the 8B40 and 8B41 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

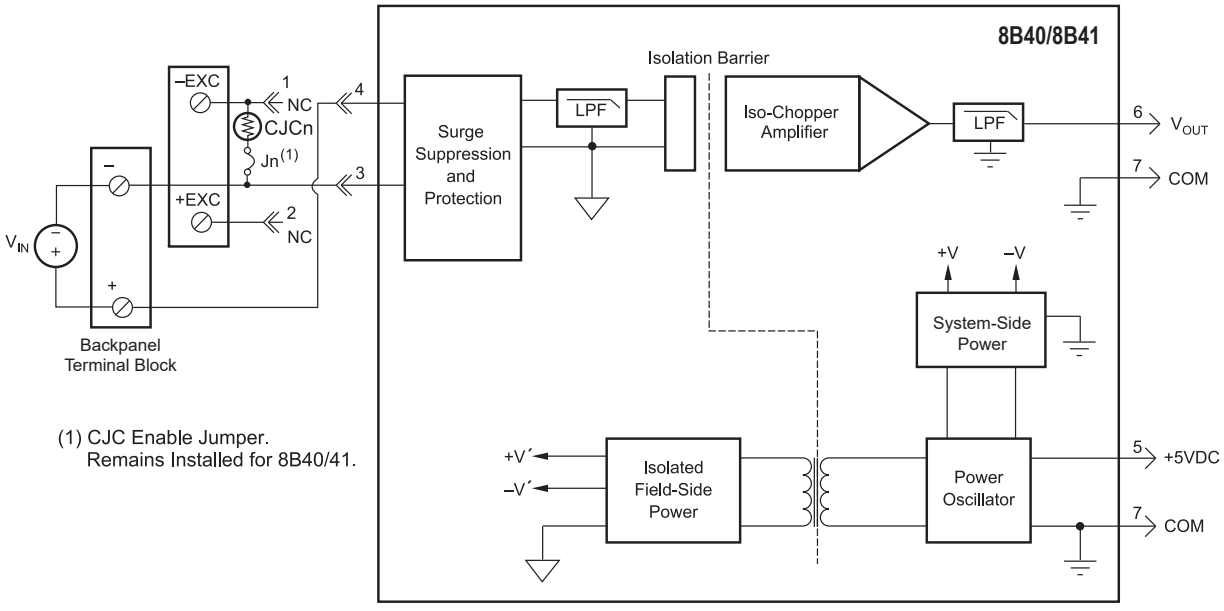
- Accepts Millivolt and Voltage Level Signals
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 100dB CMR
- 1kHz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper.
Remains Installed for 8B40/41.

8B40/41 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B40	8B41
Input Range	±10mV to ±100mV	±1V to ±60V
Input Bias Current	±0.5nA	±0.05nA
Input Resistance		
Normal	50MΩ	500kΩ (min)
Power Off	100kΩ	500kΩ (min)
Overload	100kΩ	500kΩ (min)
Input Protection		
Continuous(1)	240VAC	240VAC
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMV, Input to Output	1500Vrms (max)	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	100dB	100dB
NMR (-3dB at 1kHz)	100dB per Decade Above 1kHz	100dB per Decade Above 1kHz
Accuracy(2)	±0.05% Span	±0.05% Span
Linearity	±0.02% Span	±0.02% Span
Stability		
Offset	±10ppm/°C	±10ppm/°C
Gain	±50ppm/°C	±75ppm/°C
Noise		
Output, 100kHz	500µVrms	500µVrms
Bandwidth, –3dB	1kHz	1kHz
Response Time, 90% Span	550µs	550µs
Output Range	See Ordering Information	See Ordering Information
Output Protection	Continuous Short-to-Ground	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%	+5VDC ±5%
Power Supply Current	25mA	25mA
Power Supply Sensitivity	±75ppm/%	±75ppm/%
Mechanical Dimensions	1.11" x 1.65" x 0.40"	1.11" x 1.65" x 0.40"
(h)x(w)x(d)	(28.1mm x 41.9mm x 10.2mm)	(28.1mm x 41.9mm x 10.2mm)
Environmental		
Operating Temp. Range	–40°C to +85°C	–40°C to +85°C
Storage Temp. Range	–40°C to +85°C	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1	ISM, Group 1
Radiated, Conducted	Class A	Class A
Immunity EN61000-6-2	ISM, Group 1	ISM, Group 1
RF	Performance A ±0.5% Span Error	Performance A ±0.5% Span Error
ESD, EFT	Performance B	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B40-01	–10mV to +10mV	–5V to +5V
8B40-02	–50mV to +50mV	–5V to +5V
8B40-03	–100mV to +100mV	–5V to +5V
8B40-04	–10mV to +10mV	0 to +5V
8B40-05	–50mV to +50mV	0 to +5V
8B40-06	–100mV to +100mV	0 to +5V
8B41-01	–1V to +1V	–5V to +5V
8B41-02	–5V to +5V	–5V to +5V
8B41-03	–10V to +10V	–5V to +5V
8B41-04	–1V to +1V	0V to +5V
8B41-05	–5V to +5V	0V to +5V
8B41-06	–10V to +10V	0V to +5V
8B41-07	–20V to +20V	–5V to +5V
8B41-08	–20V to +20V	0V to +5V
8B41-09	–40V to +40V	–5V to +5V
8B41-10	–40V to +40V	0V to +5V
8B41-12	–60V to +60V	–5V to +5V
8B41-13	–60V to +60V	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B42

2-wire Transmitter-interface Modules

DESCRIPTION

The 8B42 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B42 module provides power to a current transmitter, then isolates, filters, and amplifies the resulting process current input signal and provides an analog voltage output (Figure below).

Current-to-voltage conversion is accomplished internal to the module to ensure high accuracy.

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 60dB per decade of normal-mode rejection above 100Hz.

A special input circuit on the 8B42 module provides protection against accidental connection of power-line voltages up to 40VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

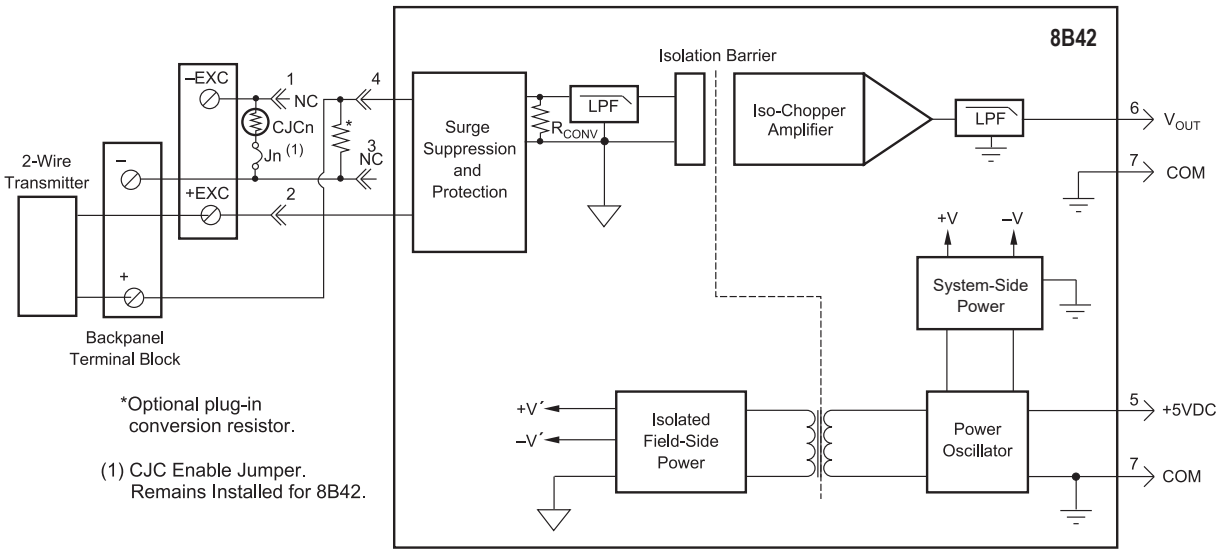
- +12VDC Loop Supply
- Provides Isolation for Non-isolated 2-wire Transmitters
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 40VAC Continuous
- 100dB CMR
- 100Hz Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



8B42 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B42
Input Range	4-20mA
Input Resistance	
Normal	35Ω
Power Off	35Ω
Input Protection	
Continuous	40VAC
Transient	ANSI/IEEE C37.90.1
Loop Supply Voltage	12VDC
Loop Supply Protection	40VAC
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	100dB
NMR	60dB per Decade Above 100Hz
Accuracy(1)	±0.05% Span
Linearity	±0.02% Span
Stability	
Offset	±25ppm/°C
Gain	±75ppm/°C
Noise	
Output, 100kHz	500µVrms
Bandwidth, –3dB	100Hz
Response Time, 90% Span	5ms
Output Range	0V to +5V
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%
Power Supply Current	140mA
Power Supply Sensitivity	±200ppm/%
Mechanical Dimensions	1.11" x 1.65" x 0.40"
(h)x(w)x(d)	(28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B42-01	4-20mA	0V to +5V
8B42-02	4-20mA	+1V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May ImpairSuitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B43

DC LVDT Input Modules

DESCRIPTION

The 8B43 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B43 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output (Figure below).

The 8B43 can interface to transducers that will operate on a 10V excitation voltage and up to 30mA excitation current.

Signal filtering is accomplished with a 5-pole filter optimized for time and frequency response which provides 100dB per decade of normal-mode rejection above 1kHz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other four are on the system side.

A special input circuit on the 8B43 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

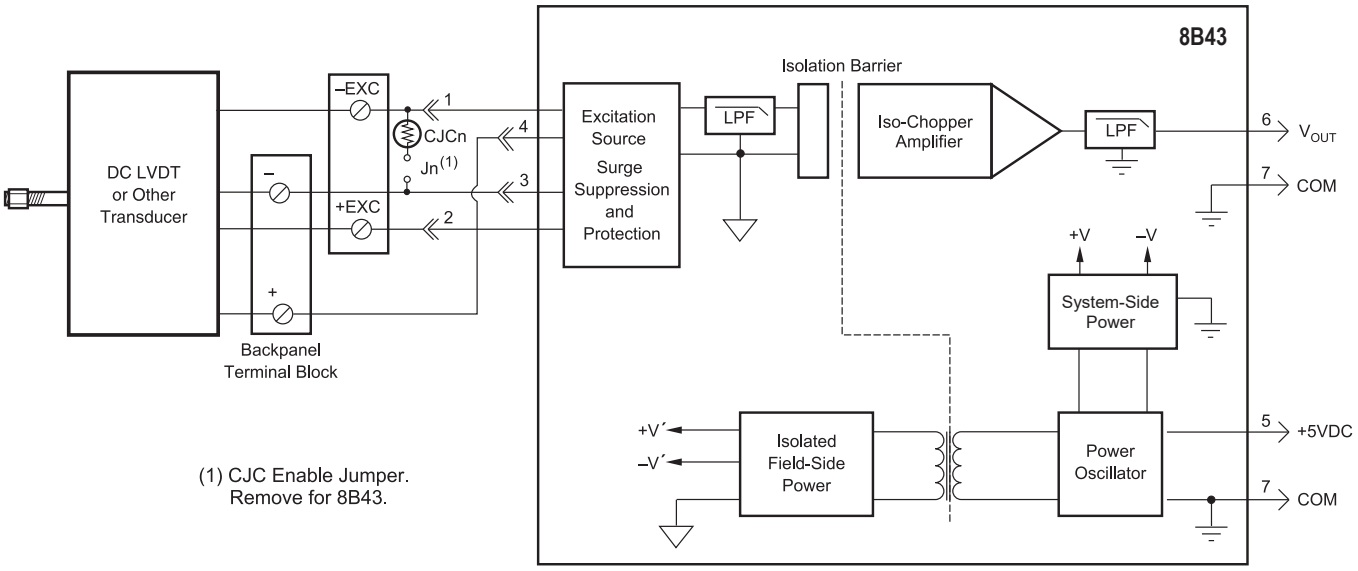
- Interfaces to DC Linear Voltage Displacement Transducers
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 100dB CMR
- 1kHz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remove for 8B43.

8B43 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B43
Input Range	±1V to ±5V
Input Bias Current	±0.05nA
Input Resistance	
Normal	2MΩ (min)
Power Off	2MΩ (min)
Overload	2MΩ (min)
Input Protection	
Continuous(1)	240VAC
Transient	ANSI/IEEE C37.90.1
Excitation	
Voltage	+10V ±5mV
Current	5mA (min), 30mA (max)
Load Regulation	15ppm/mA
Stability	50ppm/°C
Protection	120VAC
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	100dB
NMR (–3dB at 1kHz)	100dB per Decade Above 1kHz
Accuracy(2)	±0.05% Span
Linearity	±0.02% Span
Stability	
Offset	±25ppm/°C
Gain	±100ppm/°C
Noise	
Output, 100kHz	500µVrms
Bandwidth, –3dB	1kHz
Response Time, 90% Span	550µs
Output Range	See Ordering Information
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%
Power Supply Current	160mA Full Exc. Load
Power Supply Sensitivity	±100ppm/%
Mechanical Dimensions	1.11" x 1.65" x 0.40"
(h)x(w)x(d)	(28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temp. Range	–40°C to +85°C
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD,EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B43-01	–1V to +1V	–5V to +5V
8B43-02	–2V to +2V	–5V to +5V
8B43-03	–3V to +3V	–5V to +5V
8B43-04	–4V to +4V	–5V to +5V
8B43-05	–5V to +5V	–5V to +5V
8B43-11	–1V to +1V	0V to +5V
8B43-12	–2V to +2V	0V to +5V
8B43-13	–3V to +3V	0V to +5V
8B43-14	–4V to +4V	0V to +5V
8B43-15	–5V to +5V	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.

2) WARNING - Explosion Hazard - Substitution of Any Components May ImpairSuitability for Class I, Division 2.

3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B45

Frequency Input Modules

DESCRIPTION

The 8B45 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B45 module isolates and conditions a frequency input signal and provides an analog voltage output (Figure below).

The frequency input signal can be either a TTL level or zero crossing with as little as ±100mV amplitude. Input circuitry for each signal type has built-in hysteresis to prevent spurious noise from corrupting the module output. TTL signals are applied to the + and – terminals while zero crossing signals are applied to the +EXC and – terminals. Reference the block diagram below.

A 5V excitation is available for use with magnetic pick-up or contact closure type sensors. The excitation is available on the –EXC terminal with return on the – terminal.

A special input circuit on the 8B45 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by optical coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

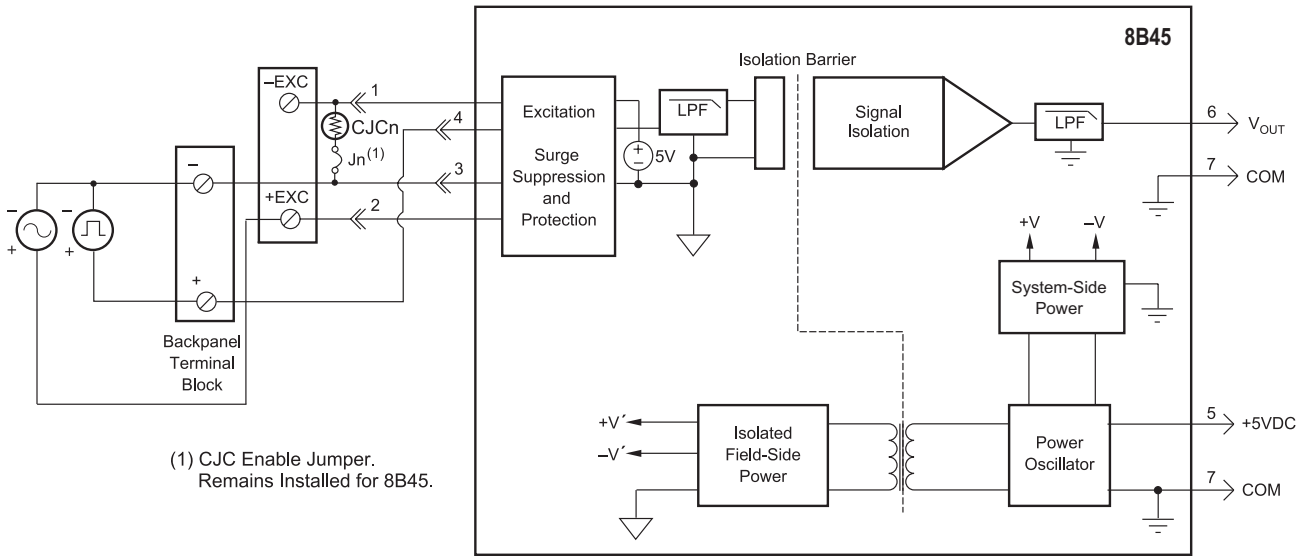
- Accepts Frequency Input Signals 0 to 100kHz
- TTL or Zero-crossing Signal Inputs
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 100dB CMR
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B45.

8B45 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B45
Input Range	0Hz to 100kHz
Input Threshold	Zero Crossing
Minimum Input	100mVp-p
Maximum Input	350Vp-p TTL, 170Vp-p Zero Crossing
Minimum Pulse Width	4µs
TTL Input Low	0.8V (max)
TTL Input High	2.4V (min)
Input Hysteresis	
Zero Crossing	±50mV
TTL	1.5V
Input Resistance	
Normal	68kΩ
Power Off	68kΩ
Overload	68kΩ
Input Protection	
Continuous(1)	240Vrms (max)
Transient	ANSI/IEEE C37.90.1
Excitation	+5V at 8mA (max)
CMV, Input to Output	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	100dB
Accuracy(2)	±0.05% Span
Linearity	±0.02% Span
Stability	
Offset	±25ppm/°C
Gain	±100ppm/°C
Noise	
Output Ripple	<10mVp-p at Input >2% Span
Response Time (0 to 90%)	
8B45-01, -02, -03	160ms, 80ms, 35ms
8B45-04, -05, -06	16ms, 8.5ms, 3.4ms
8B45-07, -08	1.6ms, 0.8ms
Output Range	0 to +5V
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%
Power Supply Current	45mA
Power Supply Sensitivity	±75ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temp. Range	–40°C to +85°C
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD,EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis and repeatability.

Ordering Information

Model	Input Range	Output Range
8B45-01	0Hz to 500Hz	0V to +5V
8B45-02	0Hz to 1kHz	0V to +5V
8B45-03	0Hz to 2.5kHz	0V to +5V
8B45-04	0Hz to 5kHz	0V to +5V
8B45-05	0Hz to 10kHz	0V to +5V
8B45-06	0Hz to 25kHz	0V to +5V
8B45-07	0Hz to 50kHz	0V to +5V
8B45-08	0Hz to 100kHz	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.

2) WARNING - Explosion Hazard - Substitution of Any Components May ImpairSuitability for Class I, Division 2.

3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B47

Linearized Thermocouple-input Modules

DESCRIPTION

The 8B47 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B47 module isolates, filters, amplifies, and linearizes a single channel of temperature input from a thermocouple and provides an analog voltage output (Figure below).

Linearization is accomplished using a four breakpoint piecewise linear approximation.

The 8B47 can interface to industry standard thermocouple types J, K, and T and has an output signal of 0 to +5V. Each module is cold-junction compensated to correct for parasitic thermocouples formed by the thermocouple wire and screw terminals on the mounting backpanel. Upscale open thermocouple detect is provided by an internal pull-up resistor.

Signal filtering is accomplished with a 3-pole filter optimized for time and frequency response which provides 70dB of normal-mode rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the 8B47 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

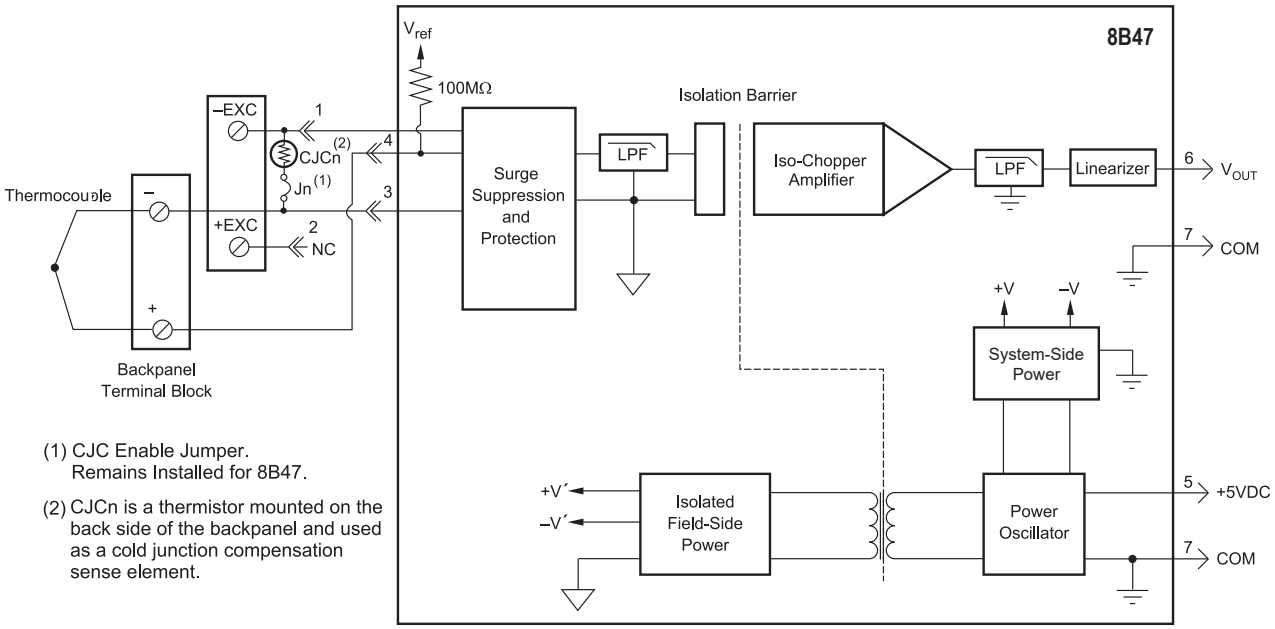
- Interfaces to Types J, K, and T Thermocouples
- Linearizes Thermocouple Signal
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- Low Drift with Ambient Temperature
- Accurate CJC –40°C to +85°C
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B47.

(2) CJCn is a thermistor mounted on the back side of the backpanel and used as a cold junction compensation sense element.

8B47 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B47
Input Range	–0.1V to +0.5V
Input Bias Current	–25nA
Input Resistance	
Normal	50MΩ
Power Off	200kΩ
Overload	200kΩ
Input Protection	
Continuous(1)	240VAC
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	120dB
NMR	70dB at 60Hz
Accuracy	See Ordering Information
Stability	
Offset	±20ppm/°C
Gain	±75ppm/°C
Noise	
Output, 100kHz	250µVrms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	150ms
Output Range	0V to +5V
Output Protection	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1
Cold Junction Compensation	
Accuracy, 25°C	±0.5°C
Accuracy, –40°C to +85°C	±1.5°C
Open Input Response	Upscale
Open Input Detection Time	<10s
Power Supply Voltage	+5VDC ±5%
Power Supply Current	30mA
Power Supply Sensitivity	±100ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD, EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes conformity, hysteresis, and repeatability. Does not include CJC accuracy.

Ordering Information

Model	TC Type‡	Input Range	Output Range	Accuracy(2)	
8B47J-01	J	0°C to +760°C (+32°F to +1400°F)	0V to +5V	±0.10%	±0.76°C
8B47J-02	J	–100°C to +300°C (–148°F to +572°F)	0V to +5V	±0.20%	±0.80°C
8B47J-03	J	0°C to +500°C (+32°F to +932°F)	0V to +5V	±0.20%	±1.00°C
8B47J-12	J	–100°C to +760°C (–148°F to +1400°F)	0V to +5V	±0.20%	±1.72°C
8B47K-04	K	0°C to +1000°C (+32°F to +1832°F)	0V to +5V	±0.15%	±1.50°C
8B47K-05	K	0°C to +500°C (+32°F to +932°F)	0V to +5V	±0.15%	±0.75°C
8B47K-13	K	–100°C to +1350°C (–148°F to +2462°F)	0V to +5V	±0.15%	±2.18°C
8B47K-14	K	0°C to +1200°C (+32°F to +2192°F)	0V to +5V	±0.15%	±1.80°C
8B47T-06	T	–100°C to +400°C (–148°F to +752°F)	0V to +5V	±0.20%	±1.00°C
8B47T-07	T	0°C to +200°C (+32°F to +392°F)	0V to +5V	±0.20%	±0.40°C

‡Thermocouple Alloy Combinations

Standards: DIN IEC 584, ANSI MC96-1-82, JIS C 1602-1981

Type	Material
J	Iron vs. Copper-nickel
K	Nickel-chromium vs. Nickel-aluminum
T	Copper vs. Copper-nickel

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.

2) WARNING - Explosion Hazard - Substitution of Any Components May ImpairSuitability for Class I, Division 2.

3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B49

Voltage-output Modules

DESCRIPTION

The 8B49 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B49 module accepts an input signal from a non-isolated source, then isolates, filters and converts the signal to a high-level process voltage output (Figure below).

Signal filtering is accomplished with a 4-pole filter optimized for time and frequency response which provides 80dB per decade of normal-mode rejection above 100Hz. One pole of this filter is on the system side and the other three are on the isolated field side.

A special output circuit in the 8B49 module provides protection against accidental connection of power-line voltages up to 40VAC continuous. Clamp circuits on the I/O and power terminals protect against harmful transients.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

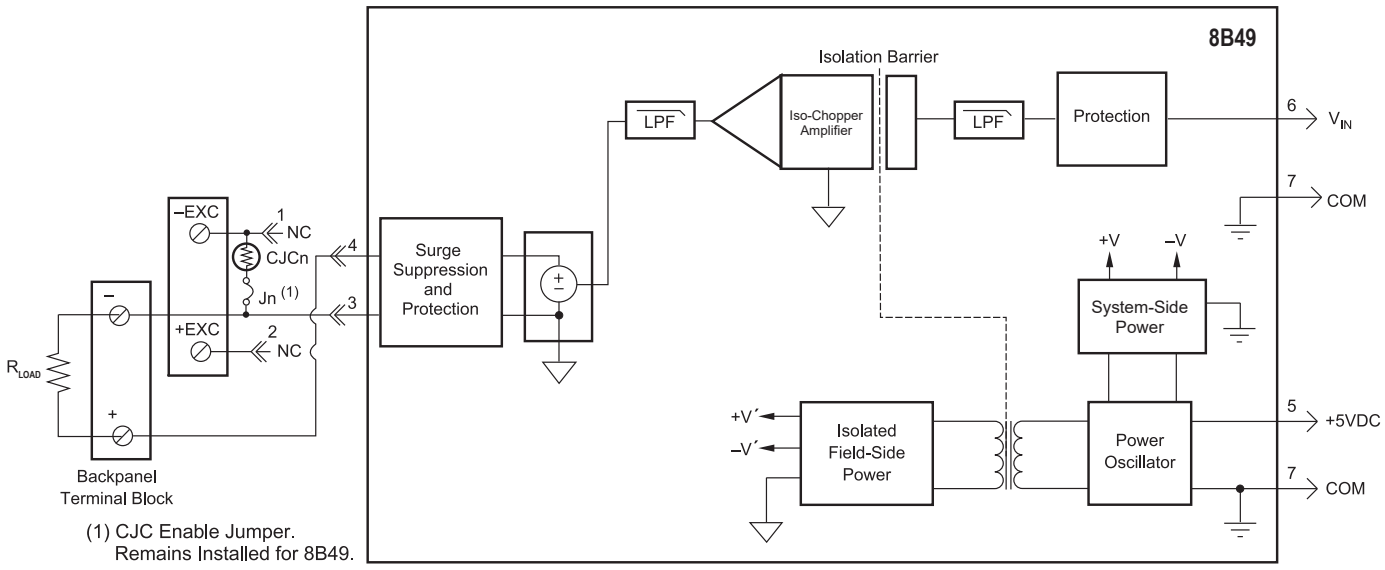
- Accepts High-level Voltage
- Isolated Process Voltage Output
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Output Protection to 40VAC Continuous
- 110dB CMR
- 100Hz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



8B49 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B49
Input Voltage Range	±5V, 0 to +5V, ±10V, 0 to +10V
Input Voltage Maximum	±20V (no damage)
Input Resistance	≥1MΩ
Output Voltage Range	±5V, 0 to +5V, ±10V, 0 to +10V
Over Range Capability	5% at 10V output
Output Drive	±20mA (max)
Output I Under Fault, max	30mA
Output Protection	
Continuous	40VAC (max)
Transient	ANSI/IEEE C37.90.1
CMV, Output-Input	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	110dB
NMR (–3dB at 100Hz)	80dB per Decade Above 100Hz
Accuracy(1)	±0.05% Span (0 to 10mA Load) ±0.075% Span (10 to 20mA Load)
Linearity	±0.02% Span
Stability	
Offset	±10ppm/°C
Gain	±50ppm/°C
Noise	
Output, 100kHz	800µVrms
Bandwidth, –3dB	100Hz
Response Time, 90% Span	5ms
Power Supply Voltage	+5VDC ±5%
Power Supply Current	100mA Full Load, 30mA No Load
Power Supply Sensitivity	±100ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental	
Operating Temperature Range	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD,EFT	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B49-01	0V to +5V	–5V to +5V
8B49-02	–5V to +5V	–5V to +5V
8B49-03	–5V to +5V	0V to +5V
8B49-04	0V to +10V	–10V to +10V
8B49-05	–10V to +10V	–10V to +10V
8B49-06	–10V to +10V	0V to +10V
8B49-07	–5V to +5V	–10V to +10V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.

2) WARNING - Explosion Hazard - Substitution of Any Components May ImpairSuitability for Class I, Division 2.

3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B50/51

Voltage-input Modules, 20kHz Bandwidth

DESCRIPTION

8B50/51 modules are an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B50 or 8B51 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output (Figure below).

Signal filtering is accomplished with a 5-pole filter optimized for time and frequency response which provides 100dB per decade of normal-mode rejection above 20kHz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other four are on the system side.

A special input circuit on the 8B50 and 8B51 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

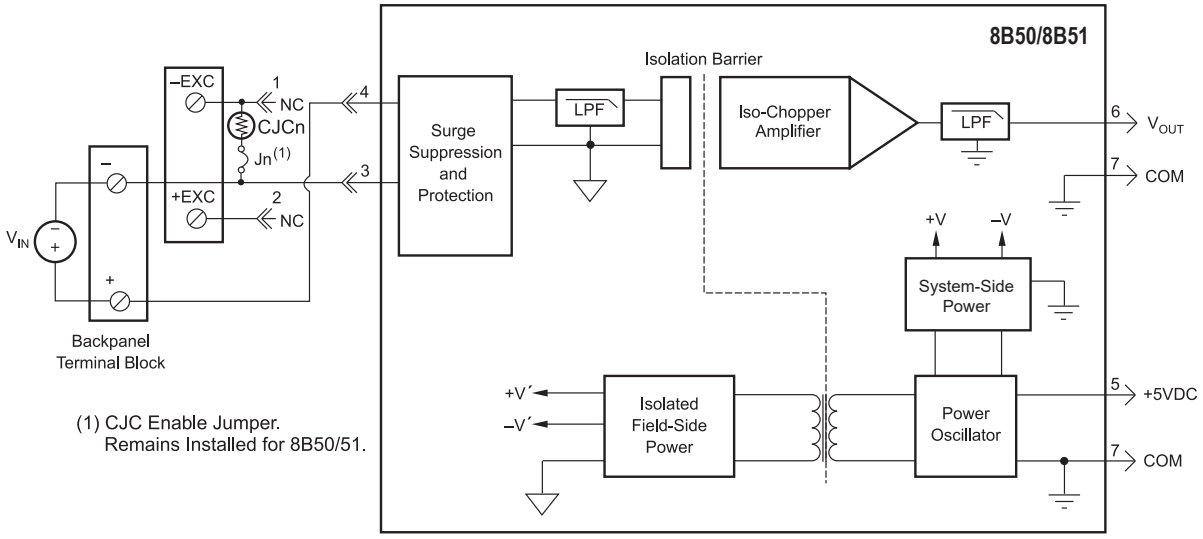
- Accepts High-level Voltage
- Isolated Process Voltage Output
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Output Protection to 40VAC Continuous
- 110dB CMR
- 100Hz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remains Installed for 8B50/51.

8B50/51 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B50	8B51
Input Range	±20mV to ±100mV	±1V to ±60V
Input Bias Current	±0.5nA	±0.05nA
Input Resistance		
Normal	50MΩ	500kΩ (min)
Power Off	100kΩ	500kΩ (min)
Overload	100kΩ	500kΩ (min)
Input Protection		
Continuous(1)	240VAC	240VAC
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMV, Input to Output	1500Vrms (max)	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	100dB	100dB
NMR (–3dB at 20kHz)	100dB per Decade Above 20kHz	100dB per Decade Above 20kHz
Accuracy(2)	±0.05% Span	±0.05% Span
Linearity	±0.02% Span	±0.02% Span
Stability		
Offset	±10ppm/°C	±10ppm/°C
Gain	±50ppm/°C	±75ppm/°C
Noise		
Output, 100kHz	500µVrms	500µVrms
Bandwidth, –3dB	20kHz (15kHz, 50-01)	20kHz (15kHz, 50-01)
Rise Time, 10 to 90% Span	25µs	25µs
Output Range	See Ordering Information	See Ordering Information
Output Protection	Continuous Short-to-Ground	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%	+5VDC ±5%
Power Supply Current	25mA	25mA
Power Supply Sensitivity	±75ppm/%	±75ppm/%
Mechanical Dimensions	1.11" x 1.65" x 0.40"	1.11" x 1.65" x 0.40"
(h)x(w)x(d)	(28.1mm x 41.9mm x 10.2mm)	(28.1mm x 41.9mm x 10.2mm)
Environmental		
Operating Temp. Range	–40°C to +85°C	–40°C to +85°C
Storage Temp. Range	–40°C to +85°C	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1	ISM, Group 1
Radiated, Conducted	Class A	Class A
Immunity EN61000-6-2	ISM, Group 1	ISM, Group 1
RF	Performance A ±0.5% Span Error	Performance A ±0.5% Span Error
ESD, EFT	Performance B	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Output Range
8B50-01	–20mV to +20mV	–5V to +5V
8B50-02	–50mV to +50mV	–5V to +5V
8B50-03	–100mV to +100mV	–5V to +5V
8B50-04	–20mV to +20mV	0 to +5V
8B50-05	–50mV to +50mV	0 to +5V
8B50-06	–100mV to +100mV	0 to +5V
8B51-01	–1V to +1V	–5V to +5V
8B51-02	–5V to +5V	–5V to +5V
8B51-03	–10V to +10V	–5V to +5V
8B51-04	–1V to +1V	0V to +5V
8B51-05	–5V to +5V	0V to +5V
8B51-06	–10V to +10V	0V to +5V
8B51-07	–20V to +20V	–5V to +5V
8B51-08	–20V to +20V	0V to +5V
8B51-09	–40V to +40V	–5V to +5V
8B51-10	–40V to +40V	0V to +5V
8B51-12	–60V to +60V	–5V to +5V
8B51-13	–60V to +60V	0V to +5V

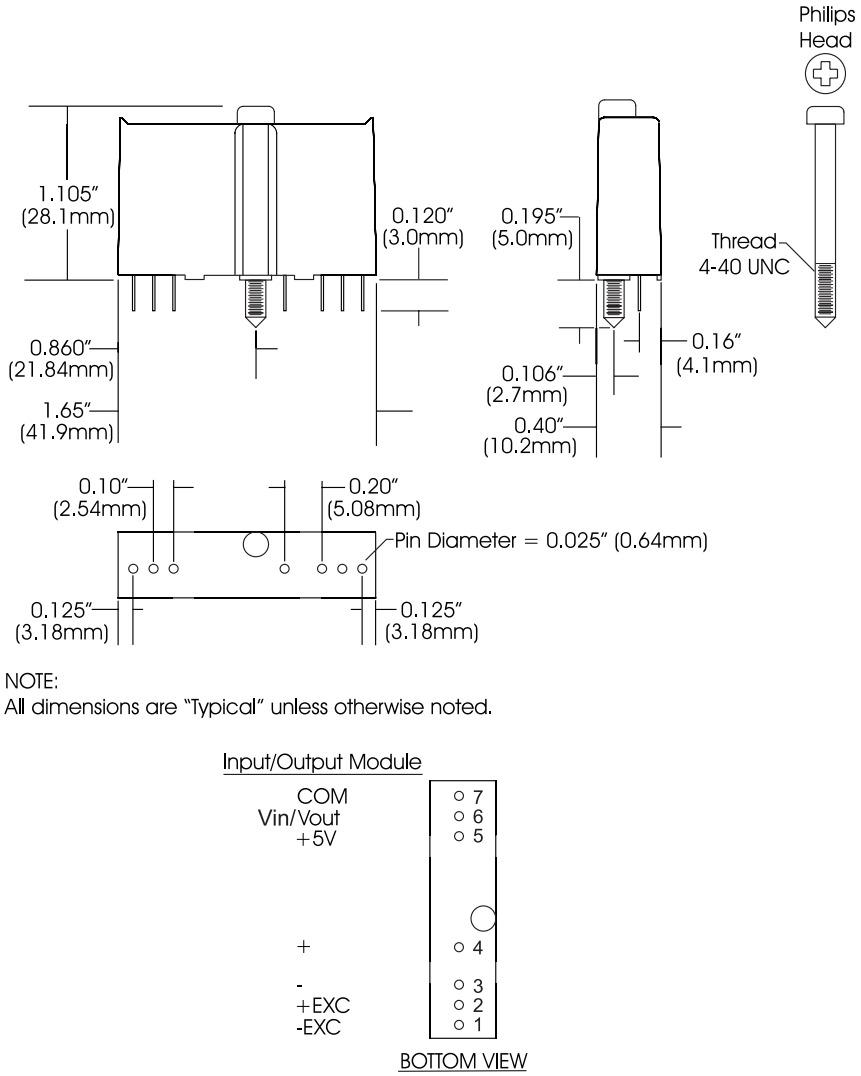
Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

8B

Module Dimensions and Pinouts

The following mechanical drawing is useful when designing circuit boards to mount the 8B modules. Many sockets are available which accept the mounting pins. As an example, Mill-Max provides a socket with part number 0660. The captive nut for the 4-40 mounting screw can be obtained from PEM (Penn Engineering and Manufacturing), part number KFS2-440.



8B Module Package Drawing Dimensions Typical

Accessories for 8B Analog Modules

8BP01

Single-channel, DIN-rail Mount Carrier

DESCRIPTION

The 8BP01 provides simple mounting and I/O connections for any of the 8B signal conditioners. 8BP01-205 and 8BP01-305 models accept 5V power and provide it to the module. 8BP01-224 and 8BP01-324 models accept wide range 7-34VDC power and provide 5V power to the module through an on-board power converter. The 8B carrier can be mounted on any standard DIN-rail (EN 50022-35 and EN 50035-G32). The 8BP01 measures only 2.32" x 3.54" x 0.65" (59mm x 90mm x 16.5mm), making it ideal for use in high-density installations (see Figure). It has a flammability rating of UL94 V-0.

Specifications

Typical* at T_A = +25°C and +5VDC power
Typical* at T_A = +25°C and +24VDC power

Module	8BP01-205, -305	8BP01-224, -324
Input Voltage Range	4.85 to 5.2VDC	7 to 34VDC
Over-Voltage Protection	6V TVS, 1A Fuse, OV Detection	36V TVS, 1A Fuse, OV Detection
Over-Voltage Shutdown Voltage	5.6V (max)	35.5V (max)
Under-Voltage Turn-on	–	6.5V (min)
Reverse Voltage Protection	1A Fuse	1A Fuse
Output Voltage Regulation	–	5VDC ±1%
Power Indicator	Green LED	Green LED
Output Voltage Temp. Coeff.	±200ppm/°C	±200ppm/°C
Output Current	250mA (max) (–40°C to +85°C)	250mA (max) (–40°C to +85°C)
Output Current Limit	–	0.8A, Auto Recovery
Line Regulation	–	±0.25%
Load Regulation	–	±0.5%
Efficiency	–	75%
Output Ripple	–	<50mVpk-pk
Mechanical Dimensions (h)x(w)x(d)	2.32" x 3.54" x 0.65" 59mm x 90mm x 16.5mm	2.32" x 3.54" x 0.65" 59mm x 90mm x 16.5mm

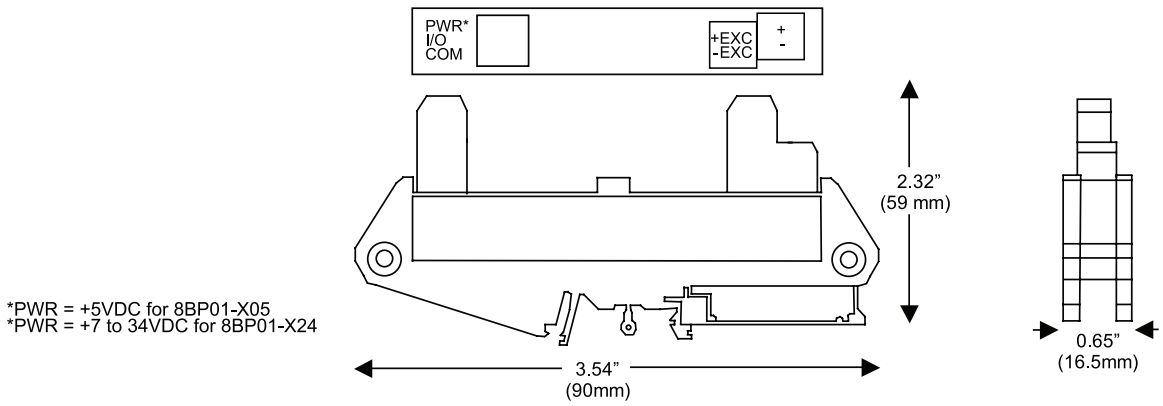
NOTES: *Contact factory or your local Dataforth sales office for maximum values.

Ordering Information

Part Number	Description
8BP01-205	5V Power, No CJC
8BP01-305	5V Power, CJC
8BP01-224	24V Power, No CJC
8BP01-324	24V Power, CJC

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.



*PWR = +5VDC for 8BP01-X05
*PWR = +7 to 34VDC for 8BP01-X24

8BP01 Single-channel, DIN-rail Mount Carrier

8BP02, 8BP04, 8BP08, 8BP16

2-, 4-, 8-, and 16-position Analog I/O Backpanels

DESCRIPTION

The 8BP02, 04, 08, and 16 backpanels can accept any of the 8B analog I/O modules in any mixture and can be mounted on the SCMXRK-002 19-inch metal rack. Analog I/O signal channels provide each module with its own analog bus. All module outputs are simultaneously accessible to high-speed data acquisition (ADC) boards. A temperature sensor is mounted on each channel to provide cold junction compensation for Thermocouple-input modules (see Figure 1. for schematic). Field connections are terminated with four screw terminals at each module site. Use system interface cable SCMXCA006-XX for connection to the host system.

Specifications

Operating Temperature Relative Humidity	–40°C to +85°C 95% Noncondensing
Interface Connector: Field System	 High-density Screw Clamp, 16 AWG (max) High-density Screw Clamp, 16 AWG (max)
Isolation: Input-to-Output Channel-to-channel	 1500Vrms Continuous (max) 1500Vrms Continuous (max)

FEATURES

- 2-, 4-, 8-, 16-position Analog I/O Backpanels
- 19-inch Mounting Rack for Backpanels
- DIN-rail Mounting Option
- Mix and Match 8B Modules on Same Backpanel
- Interface Cables
- Module Evaluation Board
- Cable-to-screw-terminal Interface Board

BENEFITS

- Easy Installation
- All Channels Provide Module with Its Own Analog Bus
- All Outputs Simultaneously Accessible to High-speed Data Acquisition (ADC) boards
- Optional Temperature Sensor Provided for Each Channel
- 2 Power Supply Options:
  - +5VDC ±5%
  - Wide Range 7-34VDC

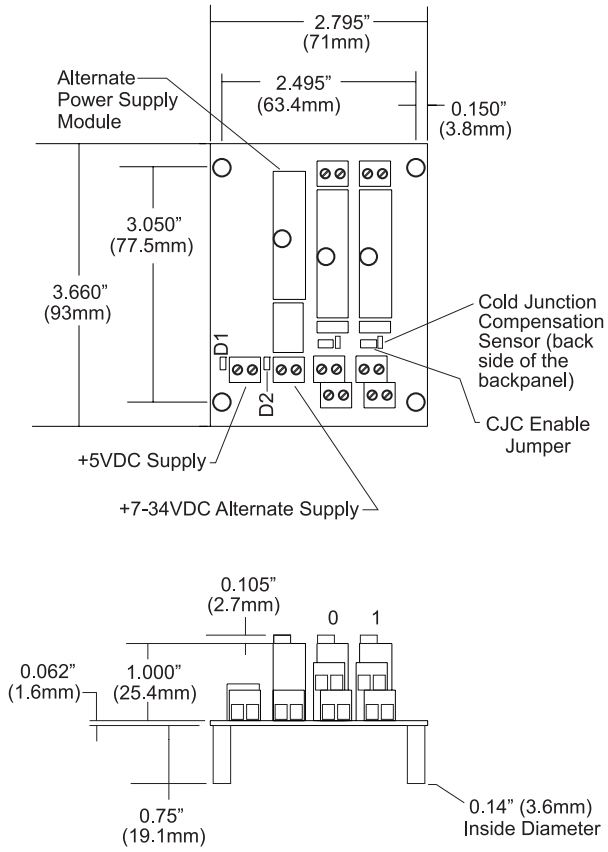


Figure 1: 8BP02 Analog I/O Backpanel

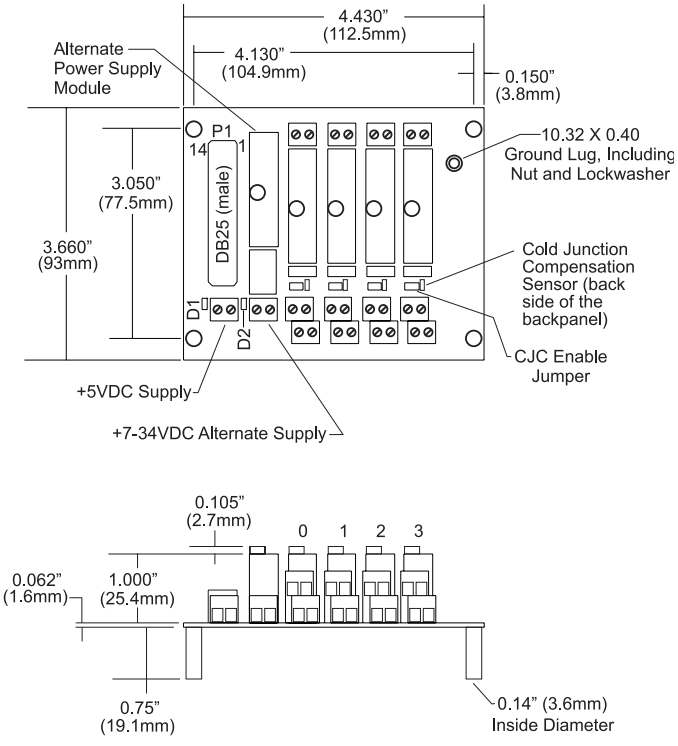


Figure 2: 8BP04 Analog I/O Backpanel

Electrical

Power

The 8B backpanels have two power supply options. A +5VDC ±5% supply can be connected to the '+5V Supply' terminal block, or alternatively, a wide ranging 7-34VDC supply can be connected to the 'Alternate Supply' terminal block. In the latter case, the 8BPWR-2 module must be installed on the backpanel. The backpanel contains circuitry which automatically switches between the supplies such that only one at a time provides power to the modules. When power connections are made to both terminal blocks simultaneously, the 7-34VDC supply takes precedence over the +5VDC supply.

Fusing

Backpanel power is fuse-protected through F1 and F2. Zener diodes D3 and D4 provide extra protection from overvoltage and supply reversal.

Grounding

For full protection against large electrical disturbances on the field-side of the 8B modules, a #10-32 ground stud is provided on the backpanel. An electrical connection between this ground stud and the system ground should be provided with a large-gauge wire of the shortest possible length.

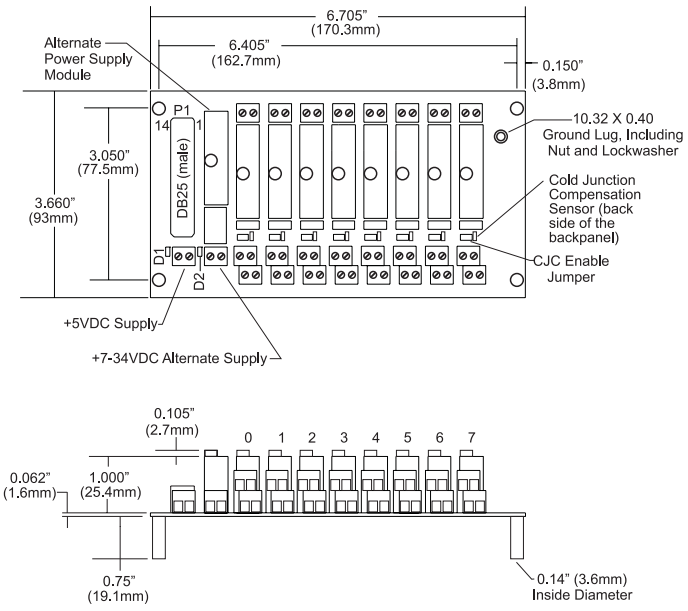


Figure 4: 8BP08 Analog I/O Backpanel

Ordering Information

Part Number	Description
8BP02	Standard 2-channel Backpanel with Standoffs for Mounting.
8BP02-1	8BP02 without Cold Junction Compensation Sensor. Use When Cost Savings are Desired and Thermocouple-input Modules 8B37 and 8B47 will Not be Used.
8BP02-2	8BP02 with DIN-rail Mounting Option. The Backpanel Is Captured by DIN-rail Mounting Elements and is Shipped Fully Assembled.
8BP02-3	8BP02-1 with DIN-rail Mounting Option.
8BP04	Standard 4-channel Backpanel with Standoffs for Mounting.
8BP04-1	8BP04 without Cold Junction Compensation Sensor. Use When Cost Savings are Desired and Thermocouple-input Modules 8B37 and 8B47 will Not be Used.
8BP04-2	8BP04 with DIN-rail Mounting Option. The Backpanel is Captured by DIN-rail Mounting Elements and is Shipped Fully Assembled.
8BP04-3	8BP04-1 with Din-rail Mounting Option.
8BP08	Standard 8-channel Backpanel with Standoffs for Mounting.
8BP08-1	8BP08 without Cold Junction Compensation Sensor. Use When Cost Savings are Desired and Thermocouple-input Modules 8B37 and 8B47 will Not be Used.
8BP08-2	8BP08 with DIN-rail Mounting Option. The Backpanel is Captured by DIN-rail Mounting Elements and is Shipped Fully Assembled.
8BP08-3	8BP08-1 with DIN-rail Mounting Option.
8BP16	Standard 16-channel Backpanel with Standoffs for Mounting.
8BP16-1	8BP16 without Cold Junction Compensation Sensor. Use When Cost Savings are Desired and Thermocouple-input Modules 8B37 and 8B47 will Not be Used.
8BP16-2	8BP16 with DIN-rail Mounting Option. The Backpanel is Captured by DIN-rail Mounting Elements and is Shipped Fully Assembled.
8BP16-3	8BP16-1 with DIN-rail Mounting Option.

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.

2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.

3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

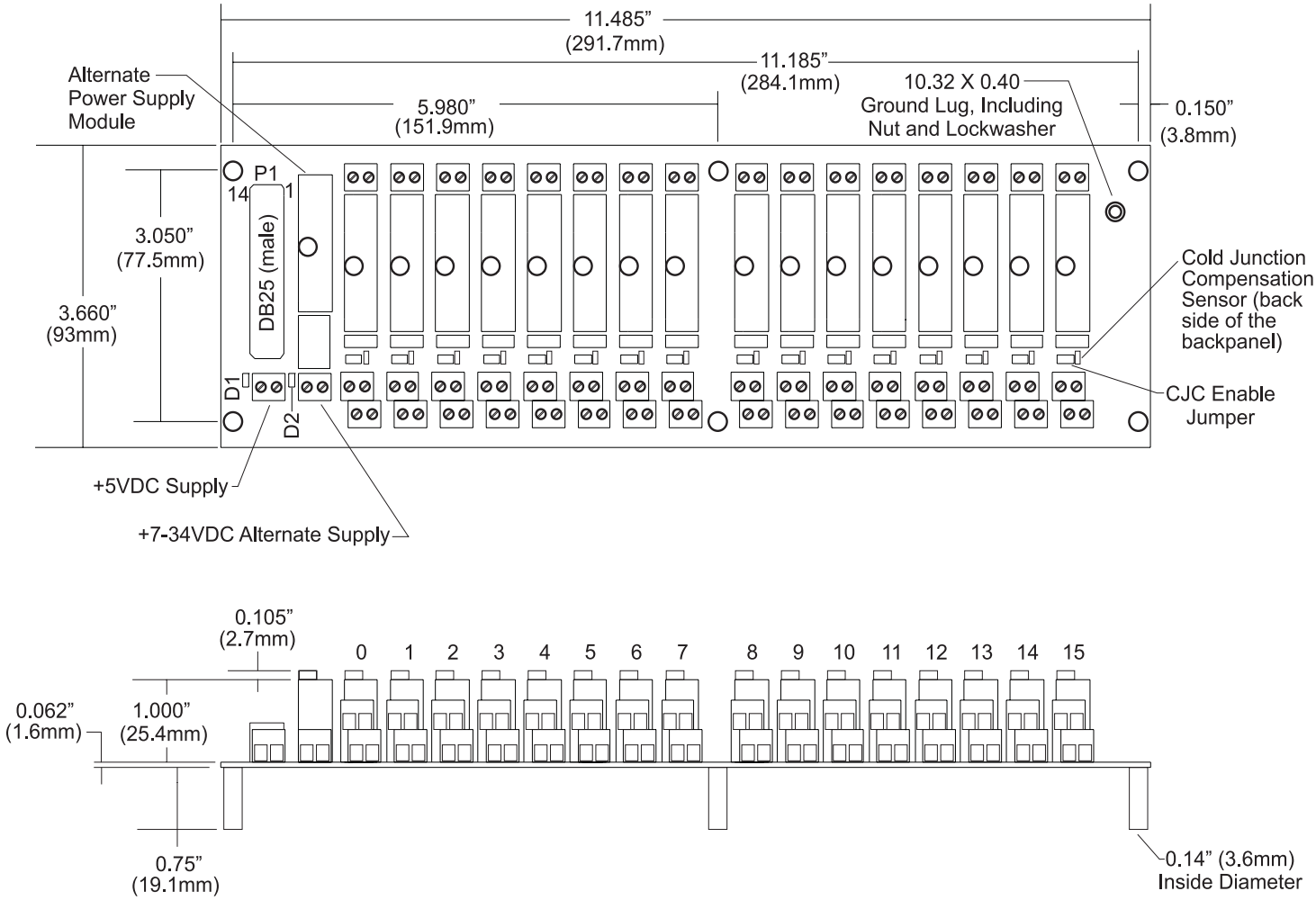
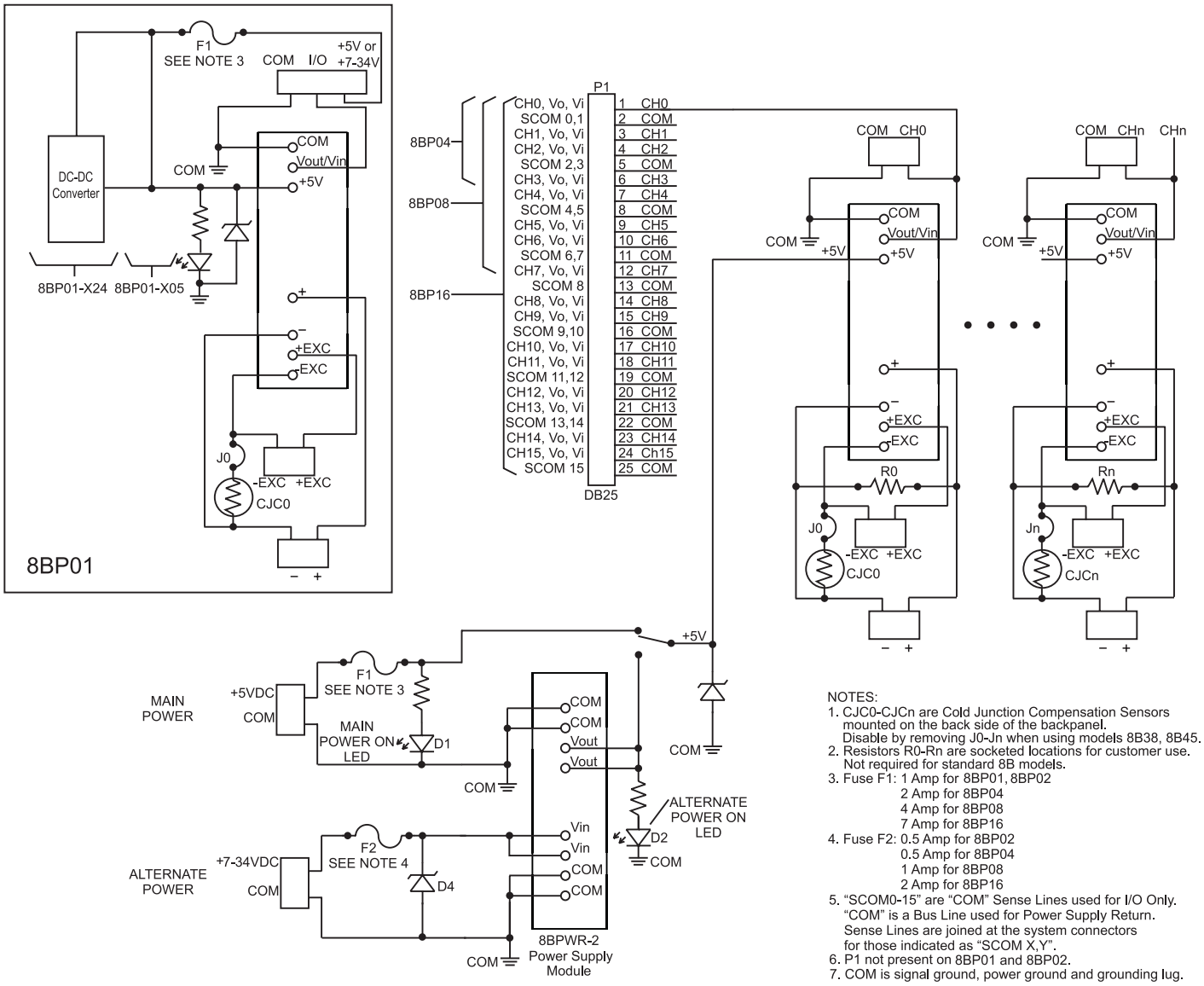


Figure 4: 8BP16 Analog I/O Backpanel



NOTES:
1. CJC0-CJCn are Cold Junction Compensation Sensors mounted on the back side of the backpanel. Disable by removing J0-Jn when using models 8B38, 8B45.
2. Resistors R0-Rn are socketed locations for customer use. Not required for standard 8B models.
3. Fuse F1: 1 Amp for 8BP01, 8BP02
   2 Amp for 8BP04
   4 Amp for 8BP08
   7 Amp for 8BP16
4. Fuse F2: 0.5 Amp for 8BP02
   0.5 Amp for 8BP04
   1 Amp for 8BP08
   2 Amp for 8BP16
5. "SCOM0-15" are "COM" Sense Lines used for I/O Only. "COM" is a Bus Line used for Power Supply Return. Sense Lines are joined at the system connectors for those indicated as "SCOM X,Y".
6. P1 not present on 8BP01 and 8BP02.
7. COM is signal ground, power ground and grounding lug.

Figure 5: 8BP01/8BP02/8BP04/8BP08/8BP16 Schematic

8BPWR-2

Power Supply Module

DESCRIPTION

The 8BPWR-2 encapsulated power supply has a wide-ranging 7-34VDC input-voltage range and provides 5VDC output suitable for all 8B modules. It is designed to mount on the 8B backpanels. The compact size and low weight are ideal for high-density applications (see Figure 1).

Specifications Typical* at T_A = +25°C and +24VDC power

Module	8BPWR-2
Input Voltage Range	7-34VDC
Overvoltage Protection	None (Provided On Backpanel)
Reverse Voltage Protection	None (Provided On Backpanel)
Output Voltage	5VDC ±1%
Output Voltage Temp. Coeff.	±200ppm/°C
Output Current	3A (–40°C to +65°C) 2A (85°C)
Output Current Limit	4A, Auto Recovery
Line Regulation	±0.20%
Load Regulation	±0.30%
Efficiency	85%
Output Ripple	50mVp-p
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)

NOTES: *Contact factory or your local Dataforth sales office for maximum values.

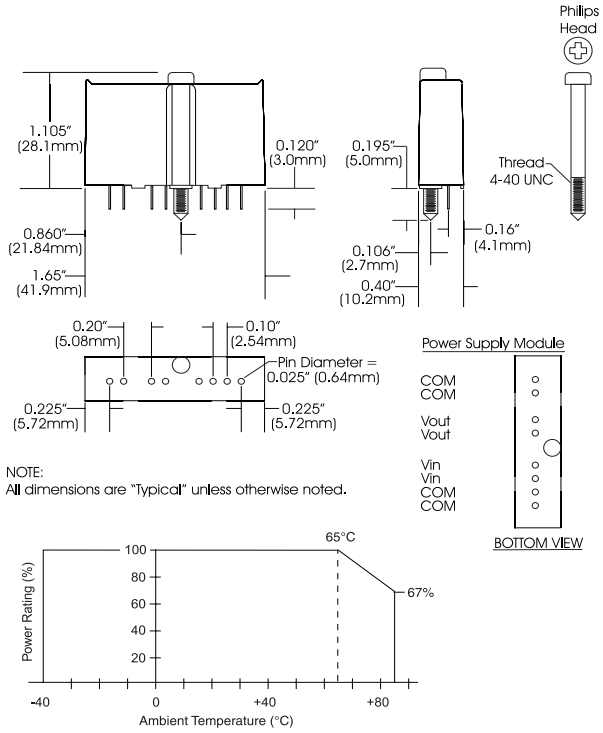


Figure 1: 8BPWR-2 Power Supply Module

SCMXPRT-001/D, SCMXPRE-001/D

Power Supplies

DESCRIPTION

The SCMXPRT-001/D and SCMXPRE-001/D encapsulated power supplies are available in 120VAC or 220VAC input voltage ranges and provide 5VDC outputs suitable for all 8B modules. They are designed to mount on the SCMXRK-002 metal rack (see Figure 1) or DIN-rail EN 50022-35x7.5 (D versions). The supplies are UL-recognized. Their compact size and low weight are ideal for high-density applications (see Figure 2).

Specifications Typical* at T_A = +25°C

Module	SCMXPRT-001/D	SCMXPRE-001/D
Input Voltage Range, 47Hz to 420Hz	105-125VAC	210-250VAC
Output Voltage	5VDC	5VDC
Output Current, +50°C	1A	1A
Operating Temperature	–20°C to +71°C	–20°C to +71°C
Line Regulation	±0.05%	±0.05%
Load Regulation	±0.25%	±0.25%
Output Ripple, max	1mVrms	1mVrms
Weight	1.25 lbs (567g)	1.25 lbs (567g)

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
Supplies are UL recognized, File No. E45344.

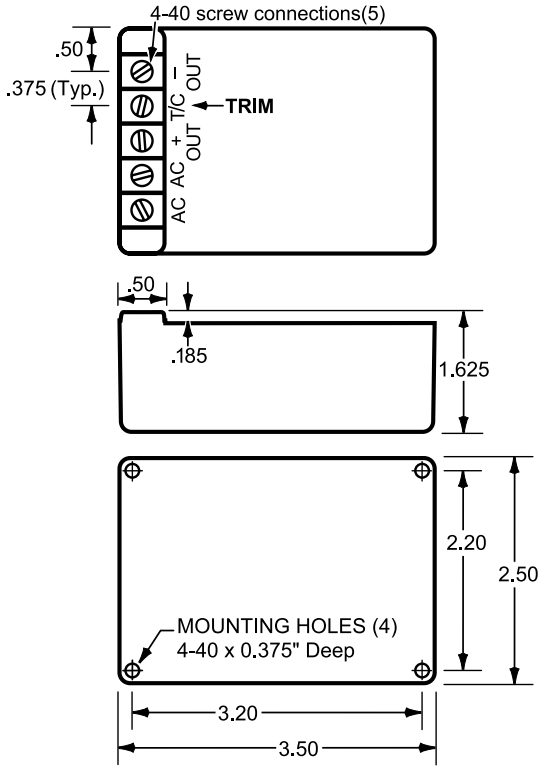


Figure 2: SCMXPRT-001/D and SCMXPRE-001/D Physical Dimensions

SCMXPRT-003, SCMXPRE-003

Power Supplies

DESCRIPTION

The SCMXPRT/E-003 linear power supplies are available in 120VAC or 220VAC input. They have sufficient output current capacity to supply any combination of 8B modules. The SCMXRK-002 metal rack provides mounting capability for the SCMXPRT/E-003 power supplies (see Figure 3).

Specifications Typical* at T_A = +25°C

Module	SCMXPRT-003	SCMXPRE-003
Input Voltage Range, 47Hz to 63Hz	104 to 132VAC	207 to 265VAC
Output Voltage	5VDC ±1%	5VDC ±1%
Output Current (at +70°C)	3A	3A
Output Current (at +50°C)	6A	6A
Operating Temp	0°C to +70°C	0°C to +70°C
Dielectric Withstand Voltage (input to ground)	3750VAC	3750VAC
Line Regulation (10% line change)	±0.05%	±0.05%
Load Regulation (50% load change)	±0.05%	±0.05%
Output Ripple (max)	5mVp-p	5mVp-p
Overvoltage Protection (factory set)	6.2V ±0.4V	6.2V ±0.4V

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
Both supplies are tested and certified by TUV to VDE 0806 and IEC 380. They are UL recognized (File Number E55974), CSA Certified (CSA File Number LR38879), and CE Compliant.

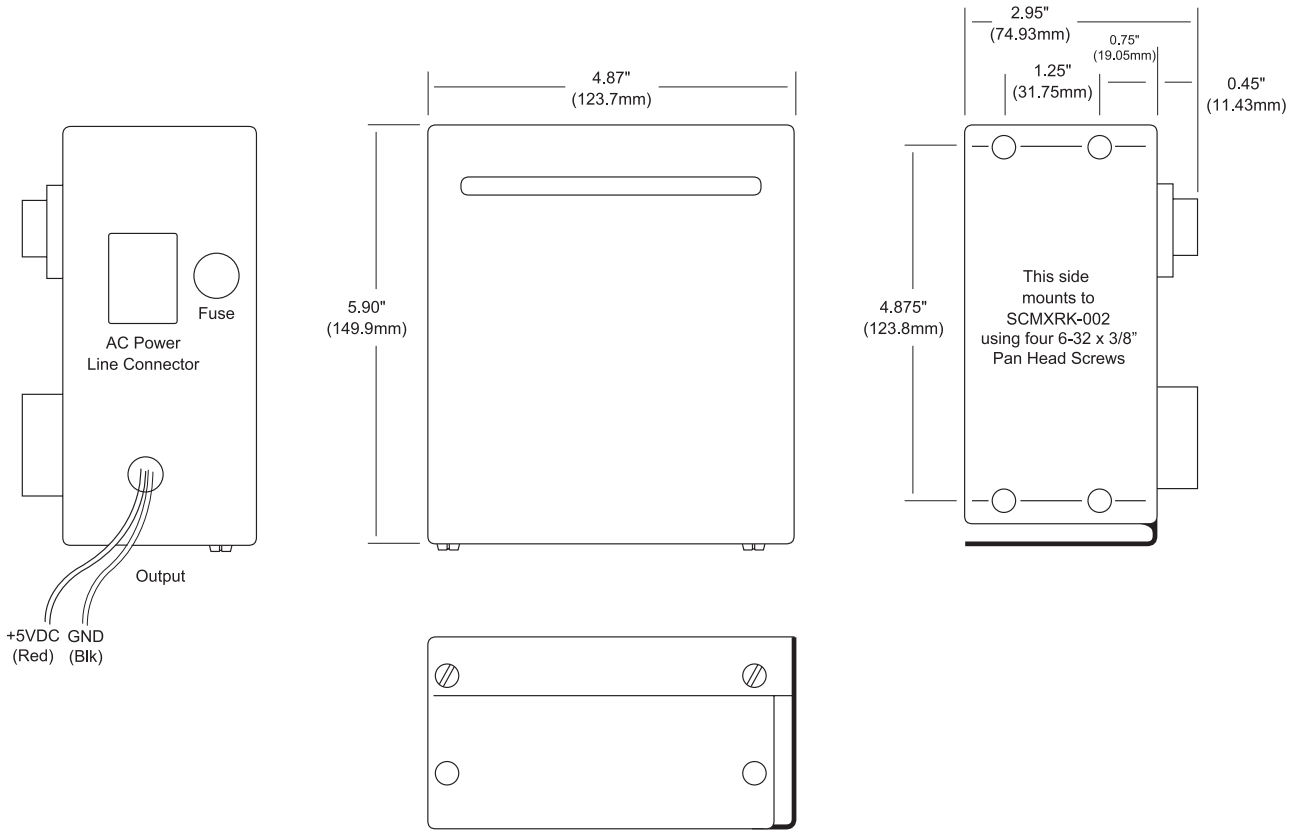


Figure 3: SCMXPRT-003/E-003 Physical Dimensions

PWR-4505

25W, Single-output, Industrial, DIN-rail, Switching Power Supply

Specifications Typical* at T_A = +25°C

Module	PWR-4505
Input Frequency Input Current Inrush Current Efficiency	85 to 264VAC, 120 to 370VDC 47 to 63Hz 1.5A/115VAC, 0.75A/230VAC Cold start 30A/115VAC, 60A/230VAC 72%
Output Voltage & Current Rating Temperature Coefficient Ripple Voltage	5V, 5A ±0.03%/°C 100mVp-p
Overload Protection Over Voltage Protection Over Temperature Protection	105 To 150% Rated Output Power 5.75 To 6.75v 135°C Detect on Heatsink of Power Transistor
Dielectric Strength	Between Input and Output Terminals: 3kv, 1 Minute Between Input and Fg: 1.5kv, 1 Minute Between Output and Fg: 0.5kv, 1 Minute
Insulation Resistance	Between Input and Output Terminals/Input and Fg/Output and Fg: 100mω/500VDC
Operating Temperature Storage Temperature Relative Humidity	–10°C to +50°C –20°C to +85°C 10-95%
Mechanical Dimensions (l)x(w)x(h)	3.66" x 3.07" x 2.24" (93mm x 78mm x 57mm)
Terminal Screw	M3

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.

FEATURES

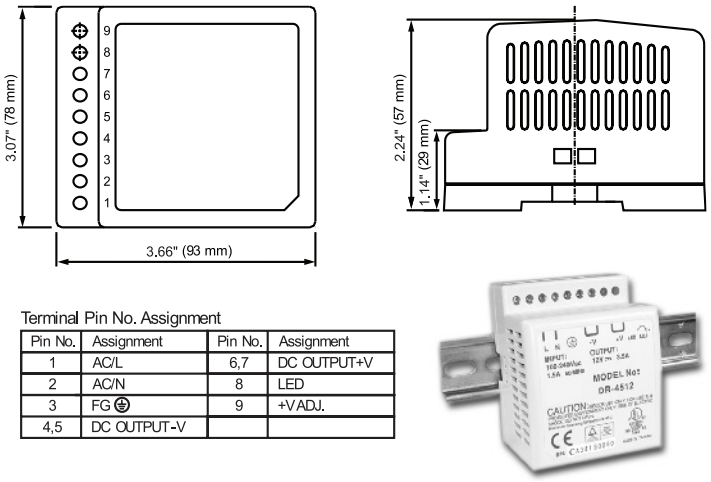
- Universal AC Input (85 to 264VAC)
- DC Compatible Input (120 to 370VDC)
- Protections: Short Circuit, Overload, Over Voltage, Over Temperature
- Mounts on DIN-rail TS-35/7.5 & 15
- Approvals: UL/cUL, TUV, CB, CE
- CE Compliant, UL 508 Listed
- TUV EN60950-1 Approved
- Compliant with EMC Directive EN50082-2
- LED Indicator for Power On

BENEFITS

- Small and Lightweight
- Performance Matching Dataforth Signal Conditioning Module Requirements
- Wide Input Voltage Range
- More Efficient Than A Linear Power Supply
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments
- Dataforth Signal Conditioning Modules



Terminal Pin No. Assignment

Pin No.	Assignment	Pin No.	Assignment
1	AC/L	6,7	DC OUTPUT+V
2	AC/N	8	LED
3	FG ⏚	9	+VADJ.
4,5	DC OUTPUT-V		

Figure 4: PWR-4505 Physical Dimensions

SCMXCA006-01, -02, -07

Interface Cables

DESCRIPTION

The SCMXCA006-xx is a system interface cable for the 8BP04/08/16 backpanels. This interface cable is a DB25 Male/Female cable assembly. It can be ordered in lengths of 1m, 2m, and 7m (see Figure 5).

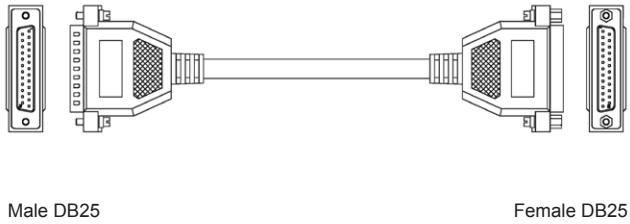


Figure 5: SCMXCA006-XX System Interface Cable

8BXIF (-DIN)

Universal Interface Board

DESCRIPTION

The 8BXIF is a universal interface board which converts a DB25 cable input to 25 screw terminals for discrete wire. It can be mounted on the back of the SCMXRK-002 mounting rack (8BXIF) or on a DIN-rail (8BXIF-DIN). Required mounting hardware is included. Use SCMXCA006-XX cable (see Figure 6 for dimensions).

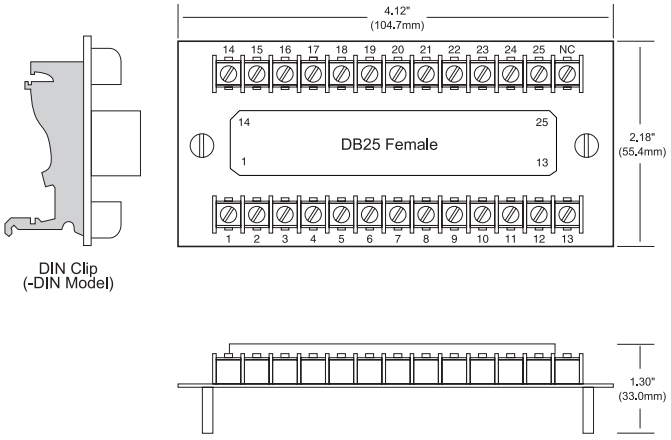


Figure 6: 8BXIF Universal Interface Board Dimensions

SCMXRK-002

19-inch Metal Mounting Rack

DESCRIPTION

The SCMXRK-002 is a 19-inch metal rack for mounting the 8BP04/08/16 backpanels and the 8BXIF interface board (see Figure 7 for dimensions).

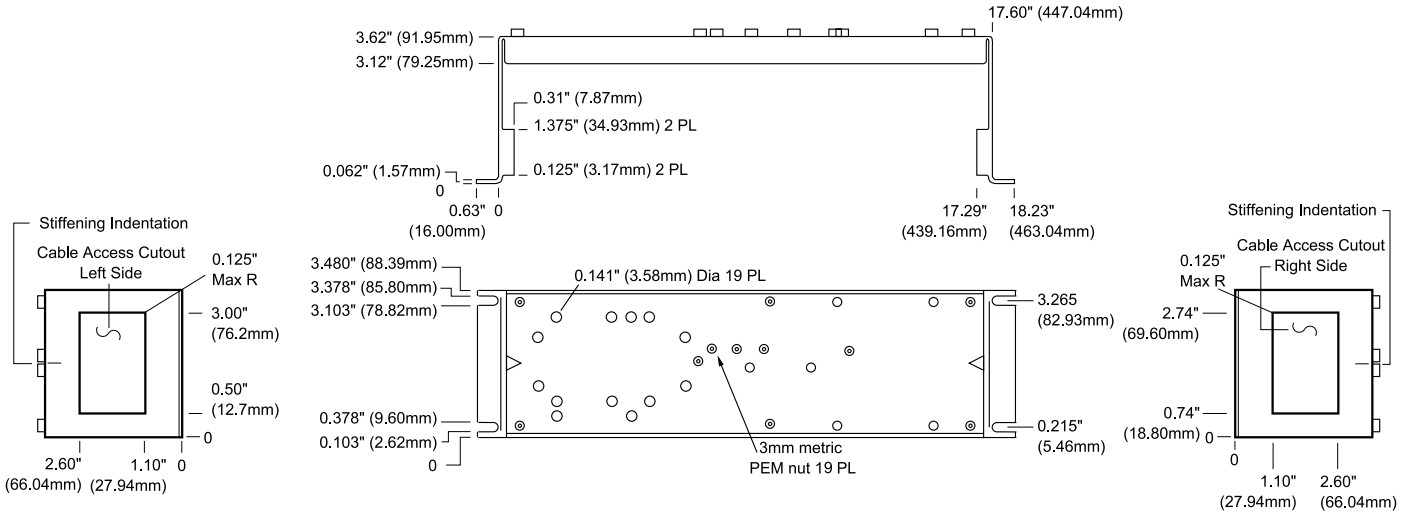


Figure 7: SCMXRK-002 Metal Rack Dimensions

SECTION 3 - 8B

SCMXRAIL1-XX, SCMXRAIL2-XX, SCMXRAIL3-XX

DIN-rail

RoHS III COMPLIANT 2015/863 CE

DESCRIPTION

Three styles of DIN-rail are available. Specify length (-xx) in meters when ordering, -01 for 1 meter or -02 for 2 meter.

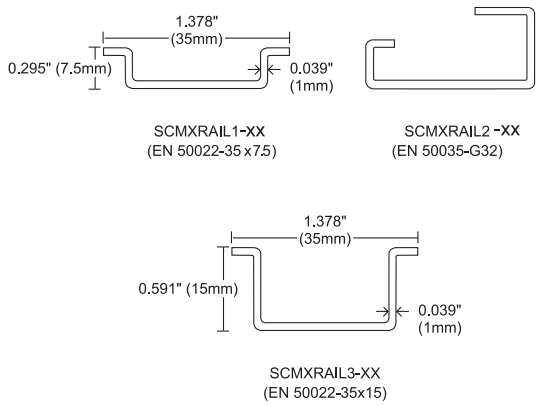


Figure 8: DIN-rail Styles

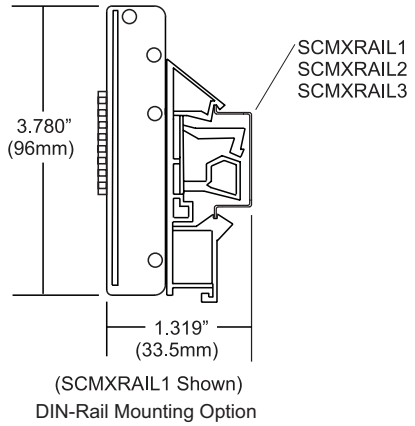


Figure 9: 8BPxx-2, 8BPxx-3 Backpanel DIN-rail Mounting Option

Ordering Information

Part Number	Description
SCMXRAIL1-XX	DIN EN 50022-35x7.5 (slotted steel)
SCMXRAIL2-XX	DIN EN 50035-G32 (slotted steel)
SCMXRAIL3-XX	DIN EN 50022-35x15 (slotted steel)

8B-PROTO

Breadboard Kit

RoHS III COMPLIANT 2015/863 CE

DESCRIPTION

The 8B-PROTO breadboard kit was designed to allow users to incorporate their own module functions using an 8B format. The kit includes a PC board with pins designed for breadboard circuits, a module case, header and mounting screw. Contact the factory for additional information.

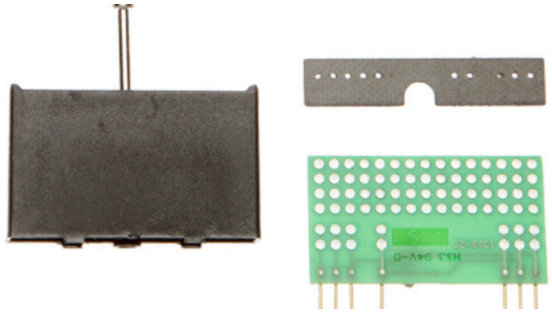


Figure 10: 8B-PROTO Breadboard Kit

8BXCJC

Cold Junction Compensation Sensor

RoHS III COMPLIANT 2015/863 CE

DESCRIPTION

Packaged for use in customer-designed mounting boards. This part has an initial tolerance of ±0.25% and comes in a standard 1206 resistor format.

8BPT

Pass thru Module

RoHS III COMPLIANT 2015/863 CE

DESCRIPTION

The 8BPT is a pass-through module used to establish a direct connection between an input signal and the 8B series backplane analog bus. It has unity gain and no isolation. It accepts up to ±10V input and provides up to ±10V output.

Downloads

Corporate Brochure
Full-Line Product Catalog
SCM5B/SCMHVAS Attenuator System Catalog
SCM7B Catalog
8B Catalog
DSCA Catalog
SCM9B/SCMD Catalog
MAQ®20 DAQ System Catalog
isoLYNX DAQ Systems Catalog
Loop Isolators and Transmitters Catalog
Data Communications Catalog
IoT Energy Monitoring Catalog

Press Releases

- Dataforth Introduces Next Generation High-Voltage Attenuator System
- Latest ISO 9001:2015 Quality Standards
- Dataforth's DSCA High-Performance DIN Modules Receive Latest ATEX Certification
- Dataforth's DSCT Two-Wire Transmitter Modules Receive ATEX Certification

See all PRESS RELEASES

Application Notes

ENGINEERING BASICS

- Measuring RMS Values of Voltage and Current (AN101)
- IC Op Amp Errors: What Are They and How Bad Can They Be (AN102)
- Common-Mode Voltage (AN103)
- 4-20mA Transmitters (AN104)
- Practical Thermocouple Temperature Measurements (AN107)
- When Good Grounds Go Bad (AN108)
- Single Phase AC Measurements Revisited (AN109)
- 3-Phase AC Calculations Revisited (AN110)
- Current Modules Measure Power Factor (AN111)
- Filtering in Signal Conditioning Modules, SCMs (AN112)
- Phase Angles and Time Delays (AN113)
- Accuracy versus Resolution (AN114)
- Sampling Law (AN115)
- Why Use Isolated Signal Conditioners? (AN116)
- Basic Bridge Circuits (AN117)
- Strain Gauge Signal Conditioner (AN118)
- Six Sigma: What? Why? How? (AN119)
- Wind Turbines Today (AN120)
- Low-pass Filter Rise Time vs Bandwidth (AN121)
- Introduction to PID Control (AN122)
- Tuning Control Loops for Fast Response (AN123)
- Tuning Control Loops with the IMC Tuning Method (AN124)
- Tuning Level Control Loops (AN125)
- Tuning Surge Tank Level Control Loop (AN126)
- Op Amp Errors, Another View (AN127)
- RMS Revisited (AN128)
- Harmonics and Utility Costs (AN129)

SCM5B MODULES

- Thermocouple Voltage-to-Temperature Conversion Method (AN501)
- SCM5B Ground Connections and Host System Interfaces (AN502)
- SCM5B Failure Rate Calculation and Prediction (AN503)
- Interpreting Drift Specifications (AN504)
- Hardware Linearization of Non-Linear Signals (AN505)
- ANSI/IEEE C37.90.1-1989 Transient Specification (AN506)
- Shield Grounding (AN507)
- Protecting Signal Lines Against EMI (AN508)
- SCM5B43 - DC LVDT Input Module (AN509)

SCM7B MODULES

- SCM7B Thermocouple Modules and CJC (AN701)
- SCM7B Frequency and Time Response (AN702)
- Failure Rate Calculation and Prediction (AN704)

DSCA MODULES

- DSCA Calibration Procedure (AN801)
- DSCA, SCM5B, SCM7B and 8B Failure Rate Calculation and Prediction (AN802)

LDM485, RS-485 DEVICES

- SCM9B/LDM422/LDM485 RS-485 Connection (AN201)
- LDM485-to-LDM485 to Other RS-485 Devices Configuration (AN202)

MAQ®20 MODULES

- Cross Point Switch Using MAQ20-DORLY Module (AN901)
- MAQ20 PID Control in a Home Heating Application (AN902)

Tech Notes

- Active, Analog, Elliptic Filter
- Eddy Current - Skin, and Proximity Effects
- Could We Actually Achieve "Warp Speed"?
- What is This Crest Factor Thing?
- Coulomb's Law
- Faraday's Law of Induction
- Power Supply Isolation
- When to Use Closed-Loop Control Instead of Open-Loop Control
- Aliasing, Anti-Aliasing - What is That Anyway?
- Made in the USA
- MAQ20 Data Acquisition System Features
- Advanced CJC Method
- MAQ20-BRDG1, Strain Gauge Bridge Module
- 3-Year Warranty
- ISO9001
- Hazardous Locations in the European Union - ATEX Directive
- Hazardous Locations in North America
- Certifications
- Why Should Sensors Be Isolated
- Signal Conditioning and Alias Filters
- Low-pass Filter Rise Time vs Bandwidth
- Strain Gauge Signal Conditioners
- Why Isolate Analog Signals?
- RTD Tutorial
- Six Sigma - What? Why? How?
- Windmill Applications
- Introduction to Thermocouples
- RTD, Resistance Temperature Detector
- Shielding and Grounding
- 5B for Piezo-Electric Accelerometers
- Configurable 5B Module
- Hysteresis Specifications
- Miniature Electronics... 8B Modules
- A Question from Dataforth's President
- Unbalanced Voltages Increase Cost
- Dataforth Test Reports
- Normal Mode Rejection, NMR
- Bridge Circuit Measurements
- Signal-to-Noise Ratio, SNR
- Accuracy versus Resolution
- Filtering - Phase Angles and Time Delays
- Uncertainty Principle
- Galvanic Isolation
- Quick Reference for RS-323, -422, -423, -485
- It's All About Isolation and Protection
- Serial Data
- Signal Conditioner with Power Supply
- Isolated I/O to Serial Data
- Loop Isolators
- Test Reports
- Measuring True RMS
- 2-wire, 4-20mA Applications
- System Accessories
- Why True RMS?
- Analog-to-Serial
- Transient Protection
- Signal Conditioner Life
- Common-Mode Voltage
- Thermocouples
- 5B or 7B
- DIN or 5B/7B Option
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- Easy Recalibration Procedure
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- Sampling Rates and THE LAW
- Signal Conditioning Article
- Measured vs Combinational Error
- Power Supply Sensitivity
- Filtering Noise
- Filtering in Signal Conditioning Modules
- Resistor Thermal Noise
- Sampling Law
- Signal Conditioners - Buy vs Build
- Confident Strain-Gauge Measurements
- Advanced CJC Method Used in Dataforth Thermocouples Significantly Improves Accuracy

DISCONTINUED DEVICES - Isolator Products

Affected Devices	Replacement Devices	Affected Devices	Replacement Devices
DSCL22-01	None Available	DSCL24-11-1648	None Available
DSCL22-11	None Available	DSCL24-11-1675	None Available
DSCL22-21	None Available	DSCL24-11-1676	None Available
DSCL23-01	None Available	DSCL24-12-1540	None Available
DSCL23-02	None Available	DSCL24-12-1552	None Available
DSCL24-01	DSCP81-01	DSCL24-12-1553	None Available
DSCL24-02	DSCP81-02	DSCA24-12-1559	None Available
DSCL24-11	None Available	DSCL24-12-1617	None Available
DSCL24-12	None Available	DSCL24-12-1618	None Available
DSCL24-11-1575	None Available	DSCL24-12-1626	None Available

DISCONTINUED DEVICES - Backpanels

Affected Devices	Replacement Devices
SCMD-PB4RD	NONE
SCMD-JM8	Use To Depletion No Available Replacement
SCMD-PB8	SCMD-PB4, SCMD-PB16SM, SCMD-PB24SM
SCMD-PB8H	SCMD-PB4D, SCMD-PB16SMD, SCMD-PB24SMD
SCMD-PB8SM	SCMD-PB4, SCMD-PB16SM, SCMD-PB24SM
SCMD-PB8SMD	SCMD-PB4D, SCMD-PB16SMD, SCMD-PB24SMD
SCMD-PB16	SCMD-PB4, SCMD-PB16SM, SCMD-PB24SM
SCMD-PB16H	SCMD-PB4D, SCMD-PB16SMD, SCMD-PB24SMD

DISCONTINUED DEVICES - Power Supply

Affected Devices	Replacement Devices
PWR-4504	Use To Depletion No Available Replacement

DISCONTINUED DEVICES

Affected Devices	Replacement Devices
SLX200-20	None Available
SLX200-30	None Available
SLX200-21	None Available
SLX200-31	None Available
SLX200-20D	None Available
SLX200-30D	None Available
SLX200-21D	None Available
SLX200-31D	None Available

DISCONTINUED DEVICES - Sensor-to-Computer Products

Affected Devices	Replacement Devices	Affected Devices	Replacement Devices
SCM9B-1212	None Available	SCM9B-2562	None Available
SCM9B-1551	None Available	SCM9B-2611	None Available
SCM9B-1552	None Available	SCM9B-2612	None Available
SCM9B-1561	None Available	SCM9B-2641	None Available
SCM9B-1611	None Available	SCM9B-2642	None Available
SCM9B-1641	None Available	SCM9B-3161	None Available
SCM9B-2151	None Available	SCM9B-3162	None Available
SCM9B-2212	None Available	SCM9B-4121	None Available
SCM9B-2221	None Available	SCM9B-4131	None Available
SCM9B-2222	None Available	SCM9B-4162	None Available
SCM9B-2231	None Available	SCM9B-5311	None Available
SCM9B-2232	None Available	SCM9B-5331	None Available
SCM9B-2241	None Available	SCM9B-5341	None Available
SCM9B-2531	None Available	SCM9B-5342	None Available
SCM9B-2542	None Available	SCM9B-D132	None Available

DISCONTINUED DEVICES - Line Drivers and Converters

Affected Devices	Replacement Devices
LDM30-PE	None Available
LDM30-SE	None Available
LDM70-P	None Available
LDM70-PE	None Available
LDM70-PT	None Available
LDM70-SE	None Available
LDM80-S-025	None Available
LDM85-P	None Available
LDM85-PE	None Available
LDM85-PE-025	None Available
LDM85-S	None Available
LDM85-S-025	None Available
LDM85-SE-025	None Available
LDM85-ST	None Available
LDM422-PE	None Available
LDM422-SE	None Available
LDM485-PT	None Available
LDM485-ST	None Available
LDM485-PT-025	None Available
LDM485-SE	None Available

DATAFORTH®

High Performance Industrial Signal Conditioning, Data Acquisition & Control, and Data Communication Products Since 1984

DATAFORTH WARRANTY

Applying to Products Sold by Dataforth Corporation

To view the current Dataforth Corporation Warranty, please click on the link below for the Dataforth Standard Terms and Conditions of Sale Applying to Products Sold by Dataforth Corporation. The Warranty in its entirety is Section 3. Please check this link periodically for updates.

https://www.dataforth.com/terms-and-conditions-sale

Application Support

Dataforth provides timely, high-quality product support. Call +**1-800-444-7644 TOLL-FREE**

Returns/Repair Policy

All warranty and repair requests should be directed to the Dataforth Customer Service Department at+1-520-741-1404. If a product return is required, visit dataforth.com, choose Sales Support on the blue bar and you will see the link to "Obtain an RMA". Fill out the online Return Materials Authorization (RMA) form. Be ready to provide the following information:

1. Complete product model number.
2. Product serial number.
3. Name, address, and telephone number of person returning product.
4. Special repair instructions or reason for return.
5. Purchase order number for out-of-warranty repairs.

The product should be carefully packaged, making sure the RMA number appears on the outside of the package, and shipped prepaid to:

Dataforth Corporation
ATTN: RMA Coordinator
6230 S. Country Club
Tucson, AZ 85706 USA

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All Dataforth Products Manufactured per RoHS III Directive EU 2015/863

The Dataforth Quality Management System is ISO9001:2015 Registered

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