DATAFORTH®

2024 Catalog
DSCL/DSCP Products
Loop Isolators and
Transmitters

DSCT Products
DIN-rail Mount,
Two-wire Transmitters



Instrument Class®

Industrial Electronics

Celebrating 40 YEARS

Instrument Class®
INNOVATION

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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.

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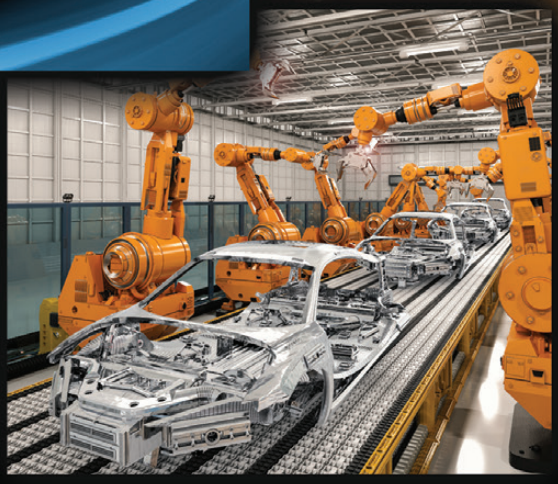
Dataforth

- 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

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

Additional Resources

- Application Notes
- Tech Notes
- Press and Product Releases



Our Track Record Proves We are Dedicated to Your Success!

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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.

SensorLex® 8B Isolated Analog Signal Conditioning Modules

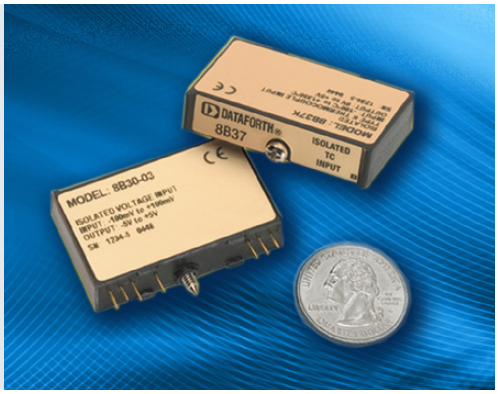
Miniature Size, 2-way Isolation, 5V Supply Voltage, *Instrument Class*® Performance

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

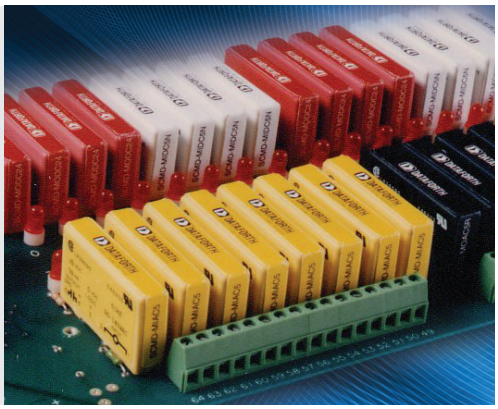
Miniature Digital I/O Modules with 4kV Isolation

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.

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

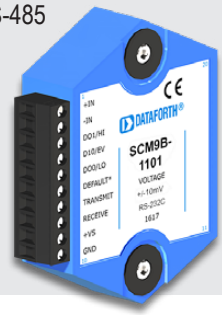
- 500Vrms Input Isolation
- Programmable Scaling and Linearization
- ASCII Command/Response Protocol
- 15-bit Measurement Resolution
- Continuous Self-calibration
- Analog Readback
- DIN-rail Mountable D100 Series

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.

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
- 4000Vrms Isolation
- PCB, DIN-rail, Panel Mount, or Instrument Head Mounting
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Compact 6.2mm Signal Converters

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- 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



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



SCM5B isoLynx® SLX200 Data Acquisition System

Fast, Intelligent, Modular, Fully Isolated

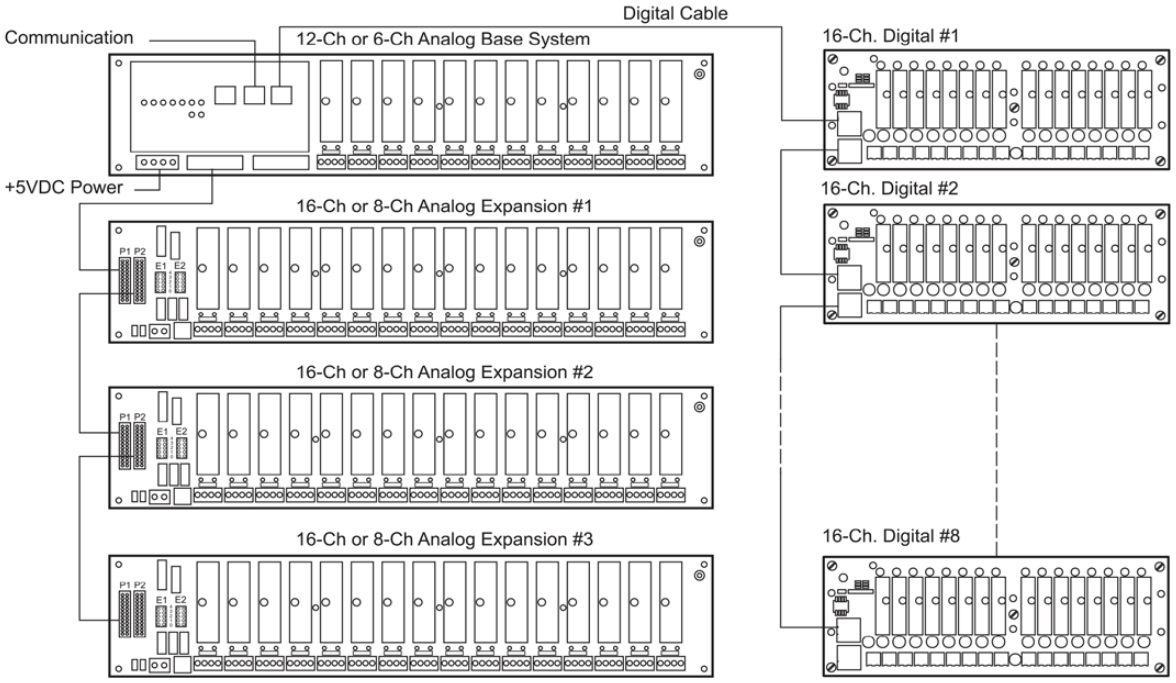
Implements industry-standard Modbus® RTU and TCP protocols, enabling communication with existing third-party software drivers and HMI/SCADA packages

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

8B isoLynx® SLX300 Data Acquisition System

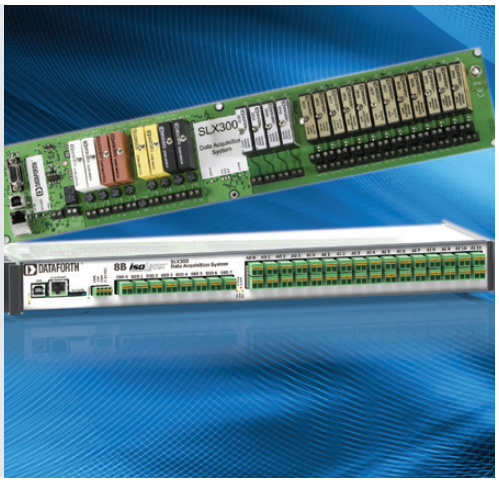
Flexible, Compact, Modular, Reliable

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

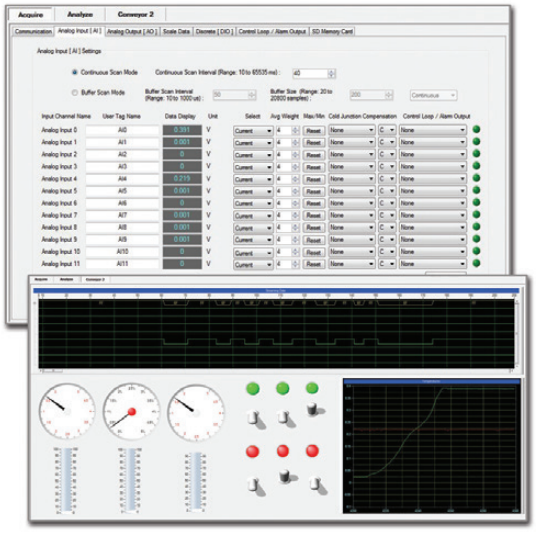
- Modbus RTU and TCP Support
- 1500Vrms Input-to-Output and Channel-to-Channel Isolation
- 240Vrms Field-side Protection
- Wide I/O Selection
  - – Analog – 19 product families, 130+ models
  - – Digital – 6 product families, 20+ models
- Mix and Match Analog and Digital I/O
- Advanced Features Including 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

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

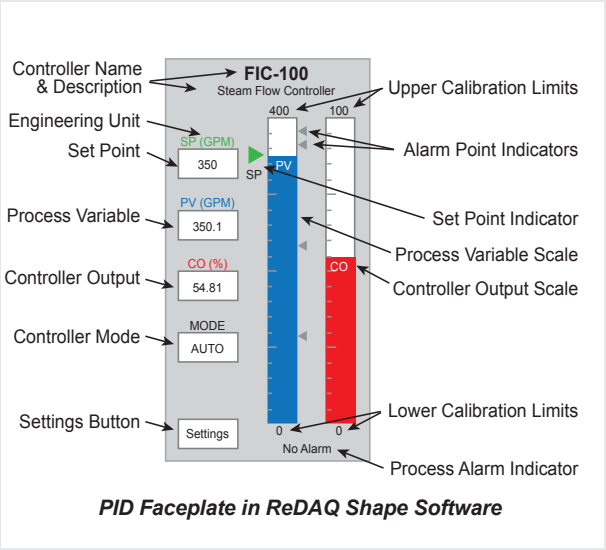


PID Loop Control

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

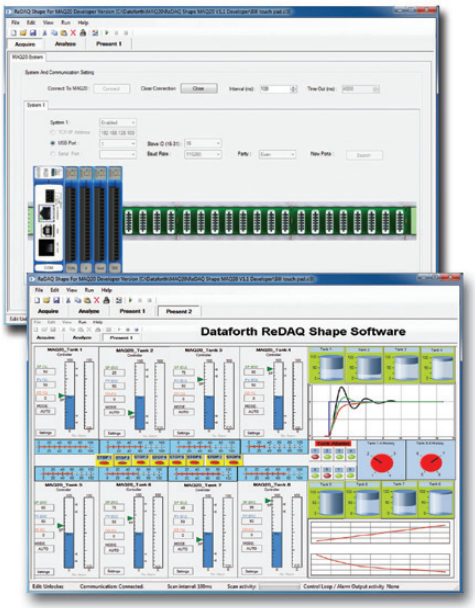
ReDAQ® Shape Software for MAQ®20

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



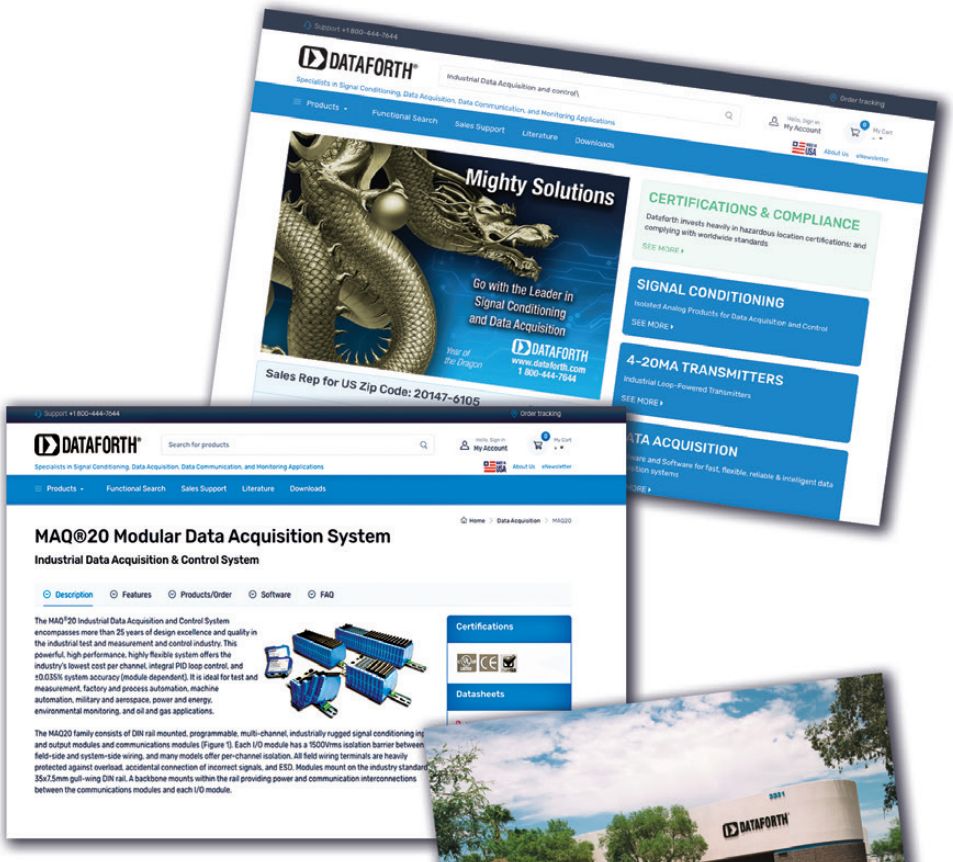
The Dataforth System Builder

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



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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

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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

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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.

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DSCL and DSCP

Industrial Loop Isolators and Transmitters

DESCRIPTION

Dataforth's DSCL and DSCP series of products is a complete family of loop and universal AC/DC powered isolators and transmitters in component, DIN and head-mount packages. They include basic loop-powered isolators, wide-range AC/DC powered isolators and transmitters, and fixed-gain or hardware and software configurable models. Depending on the model, they accept a wide range of voltage, current, thermocouple, or RTD-input signals then filter, isolate, amplify, linearize, and convert these signals to high-level analog outputs suitable for use in data acquisition, test and measurement, and control system applications. They protect valuable measurement and control signals as well as connected equipment from the dangerous and degrading effects of noise, transient power surges, internal ground loops, and other hazards present in industrial environments.



FEATURES

- Full Family of Loop Isolators and Transmitters
- Signal-powered Passive Loop Isolator Models
- Wide Range 24V to 60V or 85V to 230V AC/DC Powered Models
- Jumper and Software Configurable Models
- 6.2mm Dip-switch Configurable Models
- 4000Vrms Isolation
- Multiple Channels per Package Available
- PCB, DIN-rail, Panel, and Instrument Head Mounting Options
- No Recalibration or Maintenance Required
- Fault Detection of Input Signal Available
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

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Loop Isolators and Transmitters Selection Guide

Characteristic	DSCL20	DSCL21
Channels per Module	1	1
Mechanical Format	Component	DIN
Isolation Voltage Type	500Vrms Signal and Power	500Vrms Signal and Power
Input Range from Field	0/4-20mA	0/4-20mA
Output Range to System	0/4-20mA	mA or V
Output Split to 2 Channels	—	—
Accuracy	<±0.1%	<±0.1%
Bandwidth	750Hz	750Hz
Load Range Current Voltage	0-600Ω —	0-600Ω >5MΩ
Power Supply	Passive	Passive
Dimensions (h x w x d)	0.8 x 0.4 x 1.6 in	2.9 x 0.5 x 1.9 in
Operating Temp Range	–20°C to +65°C	–20°C to +65°C

Configurable Transmitters Selection Guide

Characteristic	DSCP20	DSCP55	DSCP61	DSCP62	DSCP63	DSCP64	DSCP65	DSCP81
Channels per Module	1	1	1	1	1	1	1	1
Mechanical Format	DIN	DIN	DIN	DIN	DIN	DIN	DIN	DIN
Isolation Voltage Type	Non-Isolated —	1500Vrms Signal	1500Vrms Signal	1500Vrms Signal	1500Vrms Signal	1500Vrms Signal	1500Vrms Signal	2300Vrms 3-Way
Input Range from Field	Configurable	mV, V, mA, TC, RTD	RTD	TC	mA or V	mA or V for 2WTX	mV	Configurable
Output Range to System	Configurable	mA	mA or V	mA or V	mA or V	mA or V	mA or V	Configurable
Accuracy	<±0.2%	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%	<±0.2%
Bandwidth	Configurable	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	Configurable
Load Range Current Voltage	0-900Ω —	500Ω 1kΩ	500Ω 2kΩ	500Ω 2kΩ	500Ω 2kΩ	500Ω 2kΩ	500Ω 2kΩ	0-600Ω >2kΩ
Power Supply	Loop Power	Passive/DC Pwr	19.2-30VDC	19.2-30VDC	19.2-30VDC	19.2-30VDC	19.2-30VDC	Univ AC/DC Pwr
Dimensions (h x w x d)	2.4 x 0.7 x 2.7 in	3.67 x 0.24 x 4.04 in	3.67 x 0.24 x 4.04 in	3.67 x 0.24 x 4.04 in	3.67 x 0.24 x 4.04 in	3.67 x 0.24 x 4.04 in	3.67 x 0.24 x 4.04 in	2.7 x 0.7 x 4.5 in
Operating Temp Range	–25°C to +80°C	–20°C to +65°C	–20°C to +65°C	–20°C to +65°C	–20°C to +65°C	–20°C to +65°C	–20°C to +65°C	–25°C to +55°C

Accessory

Model	Description
DSCP70	Power Supply Connection Module for DIN-rail Power Bus

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DSCL20

Loop-powered Isolators —"Component Module"

DESCRIPTION

The DSCL20 loop-powered isolator provides a single channel of analog signal protection by electrically isolating its input from output for any DC process signal in the range of 0-20mA (or 4-20mA). The DSCL20 operates passively, obtaining its power from the transmitted signal (see Figure 1).

The input signal is chopped by a proprietary DC chopper circuit, isolation is provided by transformer coupling, a proprietary technique is used to suppress transmission of common-mode spikes or surges, and the output signal from the secondary of the transformer is reconstructed to the original input signal.

FEATURES

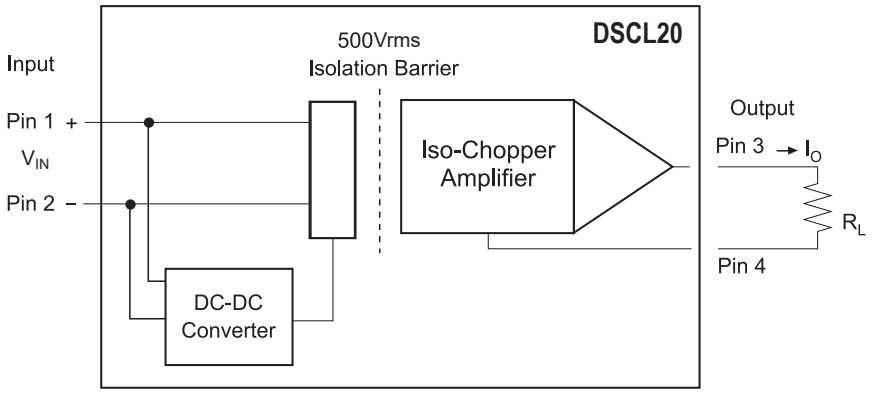
- No Power Supply Required, Signal Powered from 0-20mA (or 4-20mA) Input
- Simplified Wiring, Easy-to-Install Plug-In Accessories
- Small OEM Modular Package Ideal for PCB Mounting
- I/O Packaging for Vertical or Horizontal Mounting
- 500Vrms Transformer Isolation
- Prevents Ground-loop Problems
- Prevents the Transfer of Interference Voltages and Currents
- High Accuracy Over Full Span
- CE Compliant

BENEFITS

- No Recalibration or Maintenance Required
- Multiple Mounting Options
- No Extra Power Supply Required, Powered From 0-20mA or 4-20mA Signal

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems
- Current Repeater
- Resistive Load Drives
- Medical, Industrial, etc. Needing Electrical Isolation for Safety



The compliance voltage or loop voltage must not exceed 17V, as this may damage the module.

DSCL20 Block Diagram - For Module Dimensions and Pinouts, See Page 7-7

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Specifications

Typical* at T_A = +25°C

Module	DSCL20
Input Range	0-20mA, 4-20mA
Input Current	50mA (max) at 18V (max)
CMV Input to Output	500Vrms, 1 Minute
Accuracy (at 100Ω Load)(1)	±0.05% Span (typ)
	±0.1% Span (max)
Linearity	Included in Accuracy
Stability	<50ppm/°C
Overshoot	<20µA ((typ) 5µA)
Compliance Voltage(2) (V_{IN})	17V (max)
Voltage Drop	<2V (for 500Ω Load)
Output Range	0-20mA, 4-20mA
Limit Upper Range	30mA
Bandwidth, –3dB	750Hz
CMR (50Hz or 60Hz)	90dB
NMR	20dB per Decade Above 750Hz
Response Time	1ms, to 90% Span
Load-resistance Range	0-600Ω
Output Noise	<20mV Peak-to-Peak (typ <5mV)
Environmental	Weight Approximately 1.5g
Housing Material	Lexan 940 (UL 94 V-O)
Shock Test	50g (10 Shocks, 3 Axis)
Operating Temp. Range	–20°C to +65°C
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 75% Noncondensing
Emissions	EN50081-2 (Radiated, Conducted)
Immunity	EN50082-2 (ESD, RF, EFT)

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Additional error <0.2% at 500Ω load
(2) $V_{IN} = I_O R_L$ + <2V

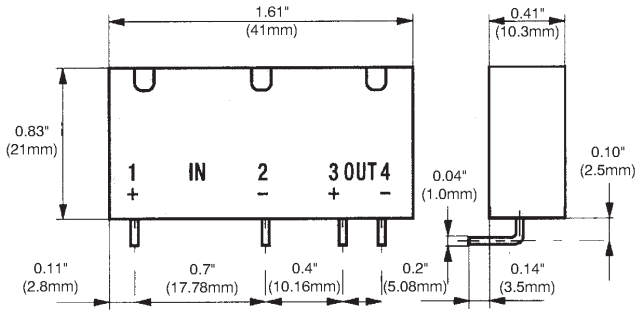


Figure 1: DSCL20-01 (Bent Pins)

Ordering Information

Model	Input Range	Output Range	Package
DSCL20-01	0-20mA (4-20mA)	0-20mA (4-20mA)	Bent Pins
DSCL20-02	0-20mA (4-20mA)	0-20mA (4-20mA)	Straight Pins

Accessory

Model	Description
DSCX-01	Socket for DSCL20-02

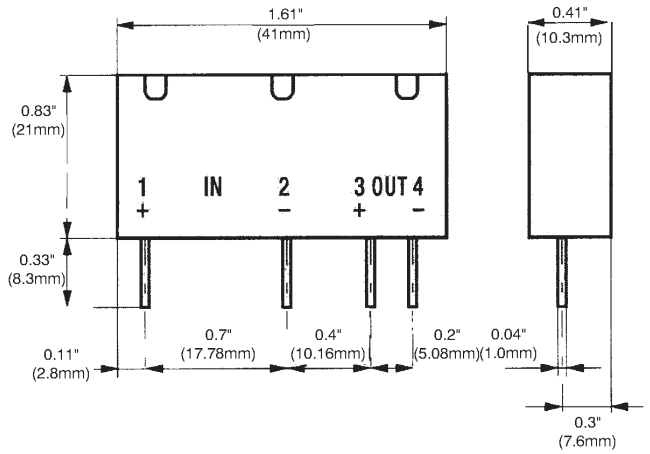


Figure 2: DSCL20-02 (Straight Pins)

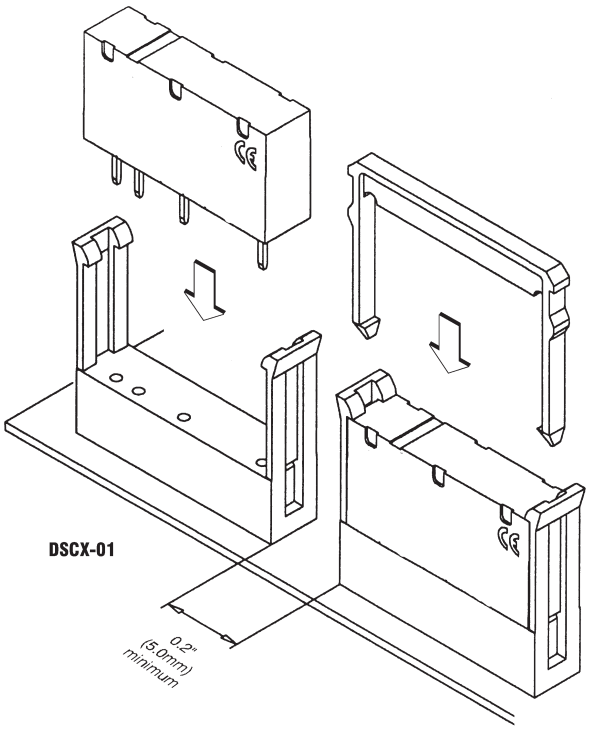


Figure 3: DSCX-01 Socket and Hold-down Accessory for DSCL20-02 (Straight Pin Modules)

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DSCL21

Loop-powered Isolator - DIN-mount

DESCRIPTION

The DSCL21 loop-powered isolator provides a single channel of analog signal protection by electrically isolating its input from output for any DC process signal in the range of 0-20mA (or 4-20mA). The DSCL21 operates passively, obtaining its power from the transmitted signal (see Figure).

The input signal is chopped by a proprietary DC chopper circuit, isolation is provided by transformer coupling, a proprietary technique is used to suppress transmission of common-mode spikes or surges, the output signal from the secondary of the transformer is reconstructed to the original input signal.

FEATURES

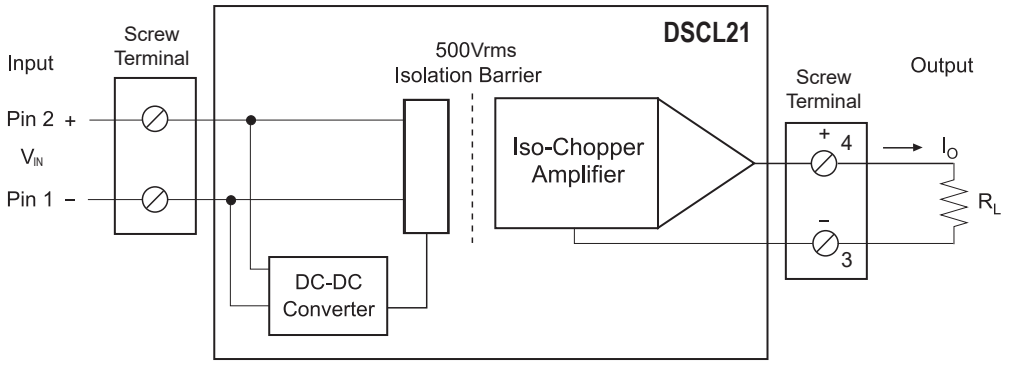
- No Power Supply Required, Signal Powered from 0-20mA (or 4-20mA) Input
- Simplified Wiring for Fast Installation
- Narrow 12.5mm DIN Package for High-density Mounting
- 500Vrms Transformer Isolation
- Prevents Ground-loop Problems
- Prevents the Transfer of Interference Voltages and Currents
- High Accuracy Over Full Span
- CE Compliant

BENEFITS

- No Recalibration or Maintenance Required
- Multiple Mounting Options
- No Extra Power Supply Required, Powered From 0-20mA or 4-20mA Signal

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems
- Current Repeater
- Resistive Load Drives
- Medical, Industrial, etc. Needing Electrical Isolation for Safety



The compliance voltage or loop voltage must not exceed 17V, as this may damage the module.

DSCL21 Block Diagram - **For Module Dimensions and Pinouts, See Page 7-7**

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Specifications

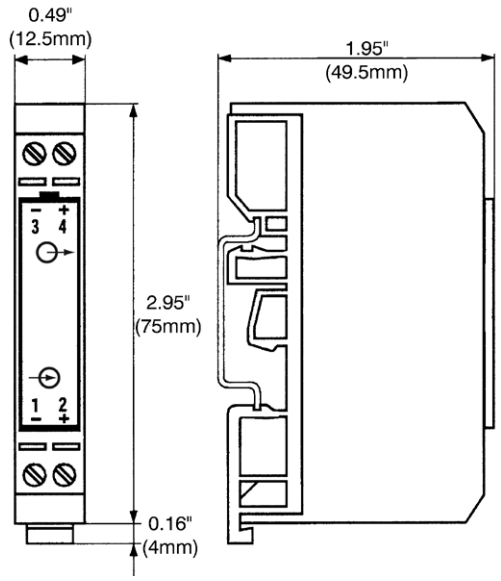
Typical* at T_A = +25°C; Load R = 100Ω (I_{OUT}), ≥5MΩ(V_{OUT})

Module	DSCL21-01
Input Range	0-20mA, 4-20mA
Input Current	50mA (max) at 18V (max)
CMV Input to Output	500Vrms, 1 Minute
Accuracy (at 100Ω Load)(1)	±0.1% Span (typ)
	±0.2% Span (max)
Linearity	Included in Accuracy
Stability	<50ppm/°C
Overshoot	<20µA (5µA typ)
Compliance Voltage(2) (V_{IN})	17V (max)
Voltage drop	<2V (for 500Ω Load)
Output Range	0-20mA, 4-20mA
Limit Upper Range	30mA
Bandwidth, –3dB	750Hz
CMR (50Hz or 60Hz)	90dB
NMR	20dB per Decade Above 750Hz
Response Time	1ms, to 90% Span
Load Resistance Range	0-600Ω
Output Noise	<20mV (<5mV typ)
Environmental	Weight Approximately 35g
Housing Material	Lexan 940 (UL 94 V-O)
Shock Test	50g (10 Shocks, 3 Axis)
Operating Temp. Range	–20°C to +65°C
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 75% Noncondensing
Emissions	EN50081-2 (Radiated, Conducted)
Immunity	EN50082-2 (ESD, RF, EFT)

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Additional error <0.2% at 500Ω load (I_{OUT})
(2) $V_{IN} = I_O R_L$ + <2V

Ordering Information

Model	Input Range	Output Range
DSCL21-01	0-20mA (4-20mA)	0-20mA (4-20mA)



DSCL21 Dimensions

Dimensional and Wiring Information

The DSCL21 DIN-mount package accepts EN50022 (35 x 7.5) and EN50035 (G32) type rails; Dataforth SCMXRAIL1-xx or SCMXRAIL2-xx. Multiple DSCL21 modules may be mounted next to each other without affecting input or output signals.

Screw terminals with wire protection clamps sized for 0.2 to 4mm^2 solid or 0.2 to 2.5mm^2 stranded wires. The DSCL21 may be mounted in any position. The DSCL21 requires no maintenance.

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DSCP20

Programmable 2-wire Temperature Transmitters, DIN-mount

DESCRIPTION

The DSCP20 2-wire transmitter is designed for measuring temperature using thermocouples or RTDs (Figure below). The input type, measurement range, and other features are software configurable. A PC, the DSCX-887 and DSCX-416 interface cables, and the DSCX-895 configuration software are required to configure the transmitter. Communication is serial RS-232C.

The DSCP20 can interface to 12 industry-standard thermocouple types: J, K, T, E, R, S, B, N, L, U, C, and D. Cold junction compensation is selectable as either internal or external. Three RTD types, Pt 100, Ni 100, and Cu 50* can be interfaced in a 2-, 3- or 4-wire connection. All inputs are linearized using up to 23 points of interpolation, and total errors are less than ±0.2%.

Other configurable features include: zero point and input range adjustment, output response for open or short-circuit sensor or cable failure, normal or inverted output, ripple suppression for 50Hz or 60Hz, and output time response. The DSCX-895 configuration software allows query, print-out and saving of configuration settings, display of input measurement value, and display of interpolation table points.

*Call factory for Cu RTD information.

FEATURES

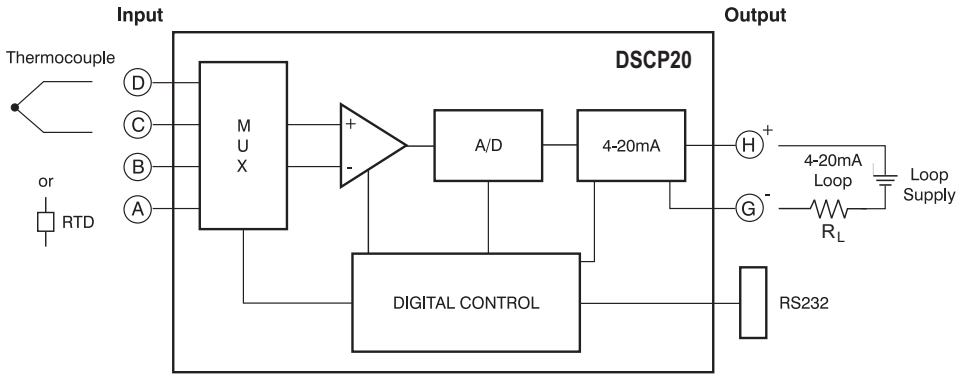
- Low-cost Non-isolated 4-20mA Transmitter
- No Power Supply Required, Powered from Output Loop Current
- Interfaces to All Standard Thermocouples and RTDs
- Software-configurable Input Type and Range
- Open and Short-circuit Input Detection
- Configurable with or without Output Loop Power Connected
- Mounts on Standard DIN-rail
- –25°C to +80°C Operating Temperature
- CE Compliant

BENEFITS

- Improved Signal Integrity Over Long Distances
- Shielded Twisted-pair Wiring Provides Higher EMI Resistance
- Improved Accuracy
- Less Expensive Wiring
- Simplified Maintenance
- Retrofit/Upgrade Flexibility

APPLICATIONS

- Automotive
- Industrial Equipment
- Calibration and Instrumentation
- HVAC
- Power and Utilities
- Lab and Testing Applications



DSCP20 Block Diagram

The following grounding condition must be observed when programming the instrument.

If one of the power supply or input wires is grounded to earth, a PC without an earth connection must be used when programming (e.g. a laptop running on batteries).

Under no circumstances should a PC be used running from a power supply with an earth connection, as this will damage the module.

Thermocouple Type and Material

Type	Material	Type	Material
B	Pt30Rh-Pt6Rh	R	Pt13Rh-Pt
E	NiCr-CuNi	S	Pt10Rh-Pt
J	Fe-CuNi	T	Cu-CuNi
K	NiCr-Ni	U	Cu-CuNi
L	Fe-CuNi	C	W5 Re/W26 Re
N	NiCrSi-NiSi	D	W3 Re/W25 Re

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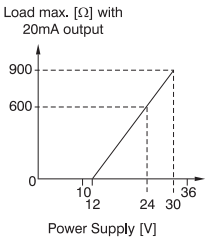
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Specifications

Typical* at T_A = +25°C, 24VDC Loop Supply Voltage, R_L = 250Ω; PT100, 3-wire, 0-600°C

Module	DSCP20
Input Range, Thermocouple Thermocouple Types: B,E,J,K,N,R,S,T,L,U,C,D Cold Junction Compensation Internal External Input Resistance	Reference Table 1 Incorporated Pt 100 0 to 60°C, Configurable >10MΩ
Input Range, RTD RTD Types: Pt 100, Ni 100 RTD Excitation Current Input Resistance Lead Resistance	Reference Table 1 ≤0.20mA >10MΩ ≤30Ω per Lead
Output Range Output Noise Loop Supply Voltage Reverse Supply Protection Load Resistance Output Response for Input Failure Output Time Response	4-20mA or Inverse 20-4mA <1% p-p 12-30VDC Continuous See Note 1 Configurable to Hold Value of Output Immediately Prior to Input Failure, or Value Between 4 and 21.6mA Configurable, see Table 2
Accuracy(2)	±0.1% Span (typ), ±0.2% Span (max)†
Linearity	±0.03% Span (typ), ±0.1% Span (max)
Stability	≤±(0.015%+0.015°C)/°C
Mechanical Dimensions (h)(w)(d)	2.44" x 0.67" x 2.56" (62mm x 17mm x 65mm)
Mounting	DIN EN 50022-35x7.5 or EN 50035-G32
Housing Material	Polyamide, Flammability Class V2 According to UL 94
Environmental Operating Temp. Range Storage Temp. Range Relative Humidity Emissions Immunity	 –25°C to +80°C –40°C to +80°C 0 to 75% Noncondensing EN50081-2 (Radiated, Conducted) EN50082-2 (ESD, RF, EFT)

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Load Resistance: $R_L(\max) = \frac{\text{Loop Supply (V)} - 12V}{I_{OUTPUT}(\max)}$



(2) Includes hysteresis, conformity and repeatability at reference conditions. Does not include CJC error.
(3) Shipped as PT 100 for 3-wire connection, 0 to 600°C range, 4-20mA output, open circuit detect = 21.6mA output.
(4) Downloadable from website.
(5) Many different ranges may be programmed as long as the min/max limits are observed. For minimum range examples, a K type thermocouple could be programmed for +30°C to +78.5°C, or +100°C to +149°C, or +900°C to +995°C, and so on.

Table 1: Input Range-Thermocouple and RTD

Measured Variables	Measuring Ranges Limits	Span (min)	Span (max)
RTD: 2-, 3-, or 4-wire Pt 100, Standard IEC 60 751 Ni 100, Standard DIN 43 760	 –200 to +850°C –60 to +250°C	 50°C 50°C	 850°C 250°C
Thermocouple Type B, E, J, K, N, R, S, T; Standard IEC 60 584-1 Type L and U; Standard DIN 43 710 Type C: W5 Re/W26 Re, Type D: W3 Re/W25 Re; Standard ASTM E 988-90	 According to Type	 2mV(5)	 80mV(5)

Table 2: Output Response Times

Measuring Mode	Open Sensor Circuit	Short-Circuit	Possible Response Times [s]						
TC int. comp.	active	–	1.5	2.5	3.5	6.5	11	20.5	40
TC int. comp.	off	–	1.5	2.5	3.5	6.5	13.5	24.5	49.5
TC ext. comp.	active	–	1.5	2.5	3.5	6.5	11	20.5	40
TC ext. comp.	off	–	1.5	2.5	4	6.5	13.5	24.5	48.5
RTD 2L	active	–	2	2.5	3	5	9.5	17.5	33.5
RTD 3L, 4L	active	active	2	2.5	4	6.5	11.5	21	40.5
RTD 2L, 3L, 4L	off	off	1.5	2.5	3.5	7.5	14	26.5	50.5

†Additional Errors

Low Measuring Range Resistance Thermometer (<200°C Span) Thermocouples (<500°C Span)	 ±0.015% Span (typ), ±0.05% Span (max) ±0.015% Span (typ), ±0.05% Span (max)
High Initial Value Factor: Error:	±0.0002 (typ), ±0.0005 (max) (Factor)*(Initial Value/Span)*100 [%]
Influence of Lead Resistance	±0.01% per Ω
Internal Cold Junction Compensation	±(0.5°C/Span)*(100) [%]

Ordering Information

Model	Input Range/Description	Output Range
DSCP20 (Basic Configuration)(3)	Configurable RTD or Thermocouple, User Programmed	4-20mA, or Inverted

Accessories

Model	Description
DSCX-887	PC-interface Cable
DSCX-416	Module-interface Cable
DSCX-895(4)	Configuration Software

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Table 3: Temperature Measuring Ranges

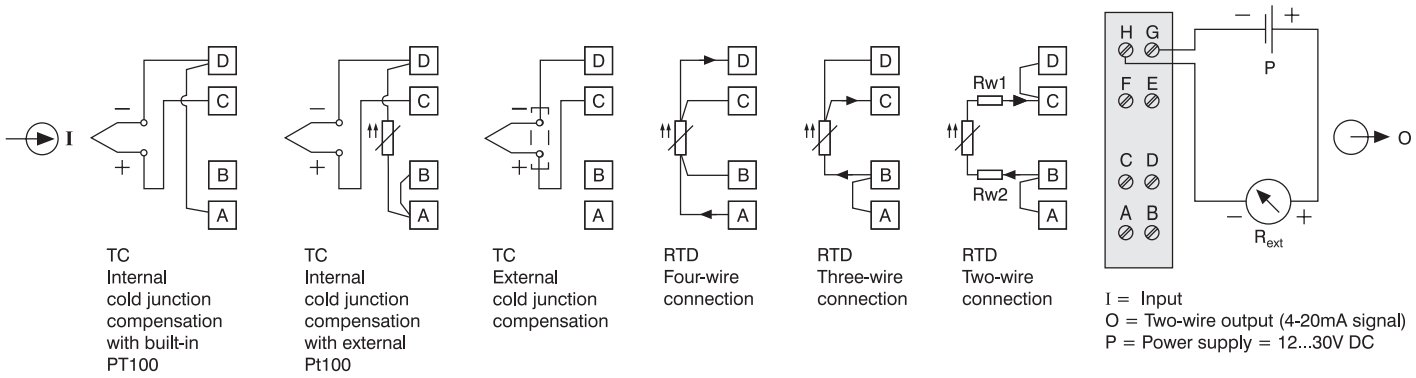
Measuring Range Examples	Resistance Thermometers (1)		Thermocouples (2)											
[°C]	Pt100	Ni100	B	E	J	K	L	N	R	S	T	U	C(3)	D(4)
0...40	X			X	X		X							
0...50	X	X		X	X	X	X				X	X		
0...60	X	X		X	X	X	X				X	X		
0...80	X	X		X	X	X	X	X			X	X		
0...100	X	X		X	X	X	X	X			X	X		
0...120	X	X		X	X	X	X	X			X	X		
0...150	X	X		X	X	X	X	X			X	X	X	
0...200	X	X		X	X	X	X	X			X	X	X	X
0...250	X	X		X	X	X	X	X			X	X	X	X
0...300	X			X	X	X	X	X	X	X	X	X	X	X
0...400	X			X	X	X	X	X	X	X	X	X	X	X
0...500	X			X	X	X	X	X	X	X		X	X	X
0...600	X			X	X	X	X	X	X	X		X	X	X
0...800	X		X	X	X	X	X	X	X	X			X	X
0...900			X	X	X	X	X	X	X	X			X	X
0...1000			X	X	X	X		X	X	X			X	X
0...1200			X		X	X		X	X	X			X	X
0...1500			X						X	X			X	X
0...1600			X						X	X			X	X
0... 1800			X										X	X
0... 2000													X	X
50...150	X	X		X	X	X	X	X			X	X		
100...300	X			X	X	X	X	X			X	X	X	X
200...500	X			X	X	X	X	X	X	X		X	X	X
300...600	X			X	X	X	X	X	X	X		X	X	X
600...900			X	X	X	X	X	X	X	X			X	X
600...1000			X	X	X	X		X	X	X			X	X
900...1200			X		X	X		X	X	X			X	X
600...1600			X						X	X			X	X
600...1800			X										X	X
–10...40	X	X		X	X	X	X					X		
–30...60	X	X		X	X	X	X	X			X	X		
Measuring Range Limits [°C]	–200 to 850	–60 to 250	0 to 1820	–270 to 1000	–210 to 1200	–270 to 1372	–200 to 900	–270 to 1300	–50 to 1769	–50 to 1769	–270 to 400	–200 to 600	0 to 2315	0 to 2315

NOTES:
(1) Minimum span is 15Ω when the end value(3) is less than or equal to 400Ω. Minimum span is 150Ω when the end value(3) is greater than 400Ω and not exceeding 4000Ω. The ratio of the min value to the span must be less than or equal to 10. For two-wire connections, the end value is made up of the measured end value (Ω) plus the total resistance of the leads.
(2) Range of span is 2mV (min) to 80mV (max). The ratio of the min value to the span must be less than or equal to 10.
(3) W5 Re W26 Re (ASTM E 988-90)
(4) W3 Re W25 Re (ASTM E 988-90)

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Electrical Connections



TC Internal cold junction compensation with built-in PT100

TC Internal cold junction compensation with external Pt100

TC External cold junction compensation

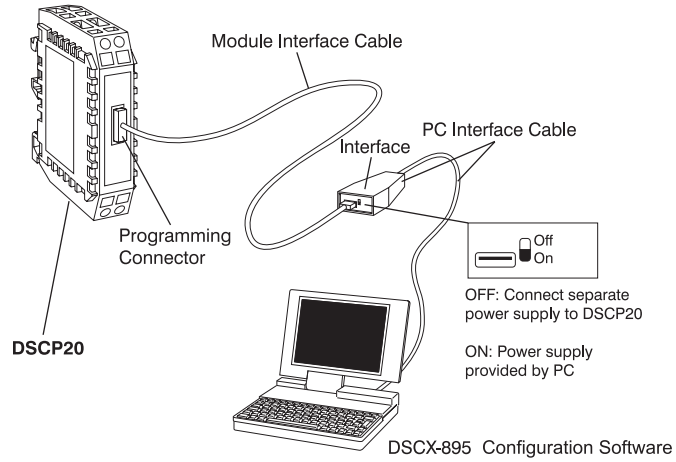
RTD Four-wire connection

RTD Three-wire connection

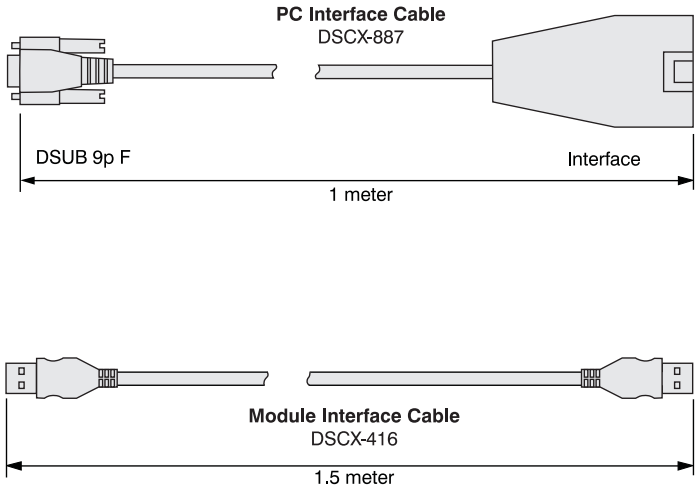
RTD Two-wire connection

I = Input
O = Two-wire output (4-20mA signal)
P = Power supply = 12...30V DC

Accessories and Spare Parts

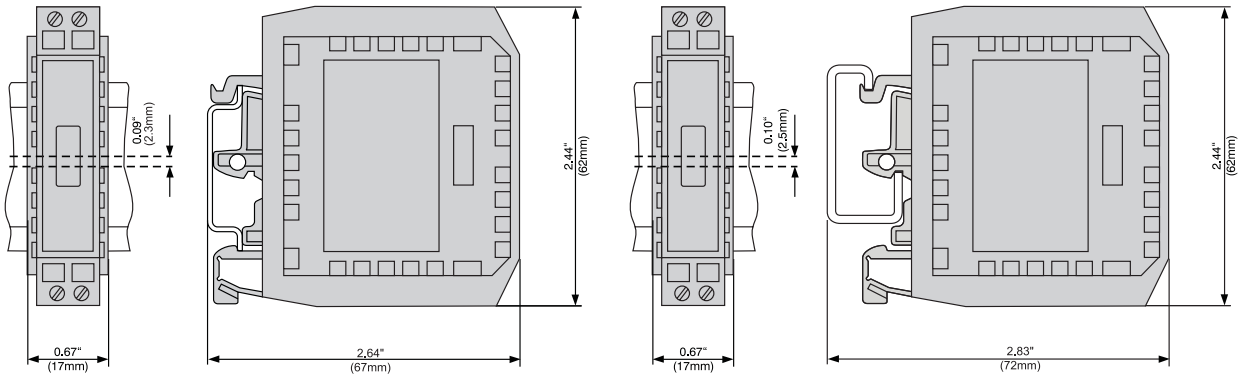


Example of the set-up for programming a DSCP20 without the power supply. For this case, the switch on the interface must be set to "ON". The DSCX-895 configuration software is downloadable from the website.



Dimensions

Dimensions: inches (millimeters)



DSCP20 Clipped onto a Top-hat Rail EN 50-022-35 x 7.5

DSCP20 Clipped onto a Rail "G" EN 50-035-G32

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DSCP55

Pt100, Ni100/Loop-powered Converter

DESCRIPTION

The DSCP55 RTD loop-powered converter provides a single channel of RTD-input which is amplified, linearized, and converted to a high-level 4-20mA or 20-4mA output. Inputs may be connected by 2-, 3-, or 4-wires and measurement range may be configured by dip-switch.



FEATURES

- Input: Pt100 (–200°C to + 650°C) Ni100 (–60°C to + 250°C)
- Output Current: 4-20mA or 20-4mA
- Spring-cage Clamp Connection
- 16-bit Resolution
- Better than ±0.1% Accuracy
- Configuration by Dip-switch
- Compact 6.2mm DIN Housing
- CE Compliant

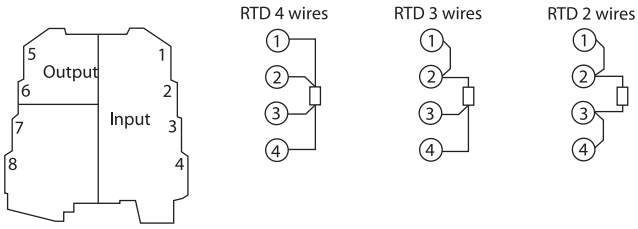
BENEFITS

- No Additional Power Supply Required
- Easy Wiring
- Lower Cost
- Hazardous Area Approvals

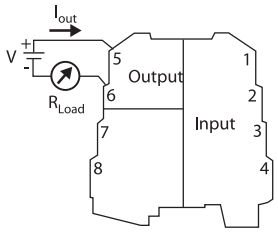
APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems
- Current Repeater
- Resistive Load Drives
- Medical, Industrial, etc. Needing Electrical Isolation for Safety

Input



Output and Power Supply



DSCP55 Electrical Connections

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Power

Module	DSCP55
Input (selectable)	
Pt100 Probe EN 60751	Accepts 2-, 3-, or 4-wire RTDs Sensor Current: 750µA Cable Resistance: 25Ω (max) per Wire Measurement Range: – 200°C to +650°C (settable) Span: 20°C (min)
Ni100 Probe	Accepts 2-, 3-, or 4-wire RTDs Sensor Current: 750µA Cable Resistance: 25Ω (max) per Wire Measurement Range: –60°C to +250°C (settable) Span: 20°C (min)
Accuracy	±0.1% (max)
Thermal Drift	<100ppm/°K
A/D Conversion	16-bit
Response Time, 90% Span (selectable)	<220ms (without filter), <620ms (with filter)
Isolation	No
Dip-switch Configuration	Sets Input and Output Ranges, Sensor Type, Filter and Faults
Status Indicators (LED)	Internal Fault, Configuration Error, Connection Fault
Output (selectable)	
Current	4-20mA or 20-4mA Load resistance: 1200Ω (max)
Current Output Maximum	30mA
Fault Output	102.5% or 105% of Full-scale Value in Case of Over-range
Hot Swapping	Yes
Loop Supply Voltage	5-30VDC
Mechanical Dimensions (w x h x d)	0.24" x 3.67" x 4.04" (6.2mm x 93.1mm x 102.5mm)
Housing	Terminal Housing for Mounting on 35mm DIN 46277
Connections	Spring-cage Clamp
Weight	1.6 ounces (45g)
Environmental	
Operating Temp. Range	–20°C to +65°C
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 90%, Noncondensing
IP Protection	IP20
Emissions	EN61000-6-4
Immunity	EN61000-6-2

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

Ordering Information

Model	Description
DSCP55	Pt100, Ni100 Loop-powered Converter

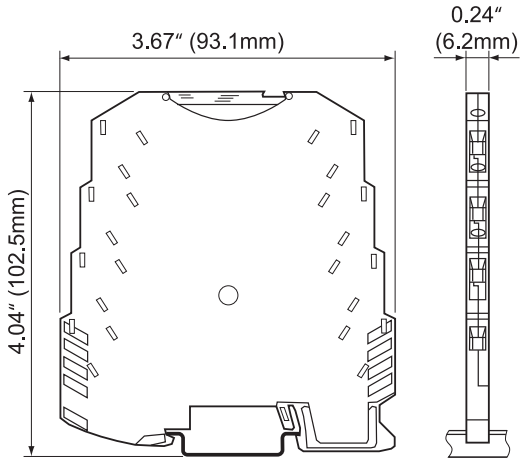


Figure 1: Dimensional Drawing

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DSCP61

Pt100-to-DC Current/Voltage Converter

DESCRIPTION

The DSCP61 RTD Pt100 converter provides a single channel of RTD-input which is amplified, linearized, and converted to a high-level current or voltage output. Inputs may be connected by 2-, 3-, or 4-wires and measurement range may be configured by dip-switch to cover a range of –150°C to +650°C. Power can be applied directly to the converter's terminals or through a DIN-rail mounted bus connector accessory, eliminating the need to wire power to each individual converter.



FEATURES

- Input: Pt100 (2, 3, 4 wires, –150°C to +650°C)
- Output Current: 0-20mA, 4-20mA, 20mA-0, 20-4mA
- Output Voltage: 0-5VDC, 1-5VDC, 0-10VDC, 10-0VDC
- 1500Vrms Galvanic Isolation, 3-way
- 19.2-30VDC Power
- Spring-cage Clamp Connection
- 14-bit Resolution
- Better than ±0.1% Accuracy
- Configuration by Dip-switch
- Compact 6.2mm DIN Housing
- CE Compliant

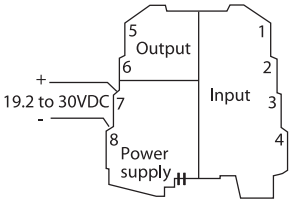
BENEFITS

- Stable Output
- Fast Response
- Small, Slim Packaging Saves Space and Cost
- Flame-retardant Shell

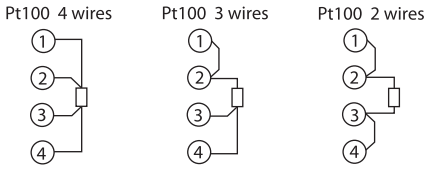
APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems

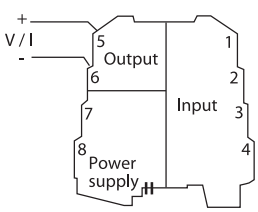
Power Supply



Input



Output



DSCP61 Electrical Connections

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Power

Module	DSCP61
Input (selectable) Pt100 Probe EN 60751	 Accepts 2-, 3-, or 4-wire RTDs Sensor Current: <900µA Cable Resistance: 20Ω per wire (max) Measurement Range: –150°C to +650°C (settable) Span: 50°C (min) Input Voltage: 32VDC (max)
Accuracy Thermal Drift A/D Conversion Processing Response Time, 90% Span (selectable) Isolation Dip-switch Configuration Status Indicators (LED)	±0.1% (max) <100ppm/°K 14-bit Floating Point 32-bit <50ms (without filter), <200ms (with filter) 1500Vrms (1 minute), 3-way Sets Input and Output Ranges, Sensor Type, Filter and Faults Internal Fault, Configuration Error, Connection Fault
Output (selectable) Current Current Output Maximum Fault Output Voltage	 0-20mA, 4-20mA, 20mA-0 or 20-4mA Load Resistance: 500Ω (max) 25mA 102.5% or 105% of Full-scale Value in Case of Over-range 0-5VDC, 1-5VDC, 0-10VDC or 10-0VDC Load Resistance: 2kΩ (min)
Power Supply Power Consumption Hot Swapping	19.2 to 30VDC 500mW (21mA at 24VDC) Yes
Mechanical Dimensions (w x h x d)	0.24" x 3.67" x 4.04" (6.2mm x 93.1mm x 102.5mm)
Housing	Terminal Housing for Mounting on 35mm DIN 46277
Connections	Spring-cage Clamp
Weight	1.8 ounces (50g)
Environmental Operating Temp. Range Storage Temp. Range Relative Humidity IP Protection Emissions Immunity	 –20°C to +65°C –40°C to +85°C 0 to 90%, Noncondensing IP20 EN61000-6-4 EN61000-6-2

Ordering Information

Model	Description
DSCP61	Pt100-to-DC Current/Voltage Converter

Accessories

Model	Description
DSCX-02	DIN-rail Expandable Power-bus Connector
DSCP70	Power Supply Connection Module

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

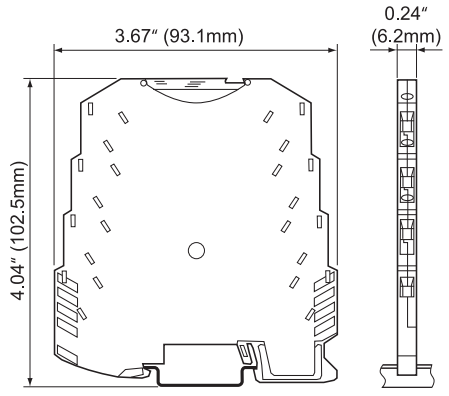
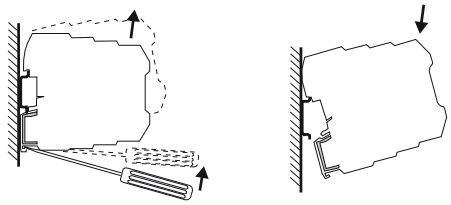
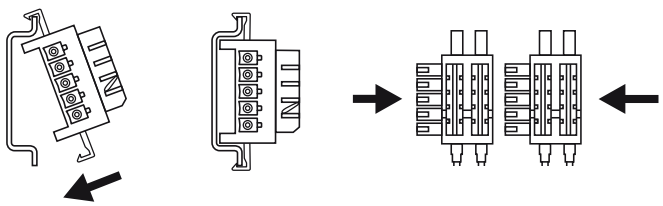


Figure 1: Dimensional Drawing

Inserting/Extracting Module on DIN Guide



Expandable Power-bus Connector



Spring-cage Clamp Connection

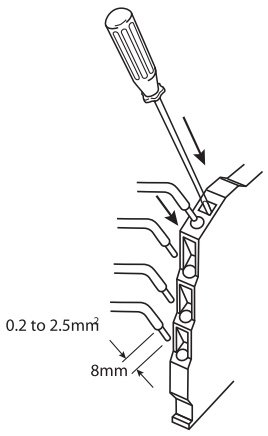


Figure 2: Module Installation

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DSCP62

Thermocouple-to-DC Current/Voltage Converter with Relay Output

DESCRIPTION

The DSCP62 thermocouple converter provides a single channel of thermocouple-input which is amplified, linearized, and converted to a high-level current or voltage output. Thermocouple type, measurement range, filter, output type and range, and fault indication may be configured by dip-switch. An auxiliary relay output is provided to generate an alarm or act as a thermostat. Power can be applied directly to the converter's terminals or through a DIN-rail mounted bus connector accessory, eliminating the need to wire power to each individual converter.



FEATURES

- Input: Thermocouple types J, K, E, N, S, R, B, T
- Output Current: 0-20mA, 4-20mA, 20mA-0, 20-4mA
- Output Voltage: 0-5VDC, 1-5VDC, 0-10VDC, 10-0VDC
- Auxiliary Relay for Alarm or Control
- 1500Vrms Galvanic Isolation, 3-way
- 19.2-30VDC Power
- Spring-cage Clamp Connection
- 14-bit Resolution
- Better than ±0.1% Accuracy
- Configuration by Dip-switch
- Compact 6.2mm DIN Housing
- CE Compliant

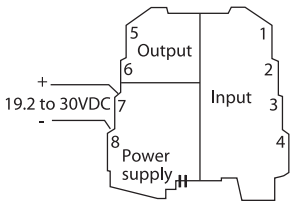
BENEFITS

- Robust Interference-free Signal
- Enables Use of Copper Extension Cable in Place of More Expensive Solutions

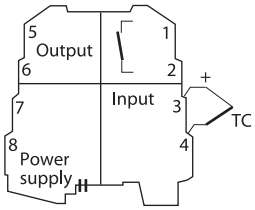
APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems

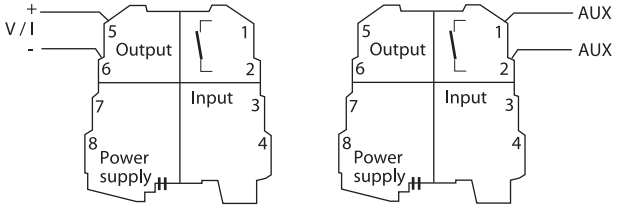
Power Supply



Input



Ouput



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DSCP62 Electrical Connections

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Power

Module	DSCP62
Input (selectable) Thermocouple Type EN 60584-1 Input Impedance	 J, K, E, N, S, R, B, T Measurement Range: Depends on Thermocouple Type and Dip-switch Setting Span: 100°C (min) 10MΩ
Accuracy Cold Junction Error Thermal Drift A/D Conversion Processing Response Time, 90% Span (selectable) CMRR Isolation Dip-switch Configuration Status Indicators (LED)	±0.1% (max) 1.5°C (max) <120ppm/°K 14-bit Floating Point 32-bit <25ms (without filter), <55ms (with filter) >135dB, Referred to Power Supply Side 1500Vrms (1 minute), 3-way Sets Input and Output Ranges, Sensor Type, Filter and Faults Internal Fault, Configuration Error, Connection Fault
Output (selectable) Current Current Output Protection Fault Output Voltage Auxiliary Relay Output	 0-20mA, 4-20mA, 20mA-0 or 20-4mA Load Resistance: 500Ω (max) 25mA (max) 102.5% or 105% of Full-scale Value in Case of Over-range 0-5VDC, 1-5VDC, 0-10VDC or 10-0VDC Load Resistance: 2kΩ (min) Rated 60mA (max) at 24VAC
Power Supply Power Consumption Hot Swapping	19.2-30VDC <600mW (24mA at 24VDC) Yes
Mechanical Dimensions (w x h x d)	0.24" x 3.67" x 4.04" (6.2mm x 93.1mm x 102.5mm)
Housing	Terminal Housing for Mounting on 35mm DIN 46277
Connections	Spring-cage Clamp
Weight	1.6 ounces (46g)
Environmental Operating Temp. Range Storage Temp. Range Relative Humidity IP Protection Emissions Immunity	 –20°C to +65°C –40°C to +85°C 0 to 90%, Noncondensing IP20 EN61000-6-4 EN61000-6-2

Ordering Information

Model	Description
DSCP62	Thermocouple Converter

Accessories

Model	Description
DSCX-02	DIN-rail Expandable Power-bus Connector
DSCP70	Power Supply Connection Module

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

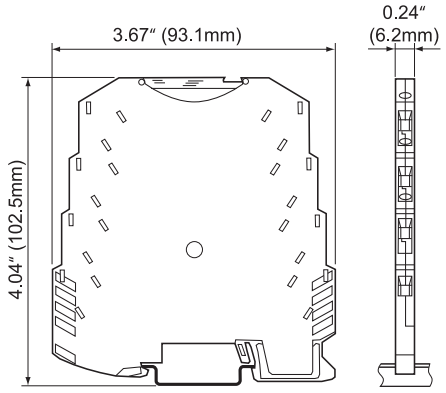
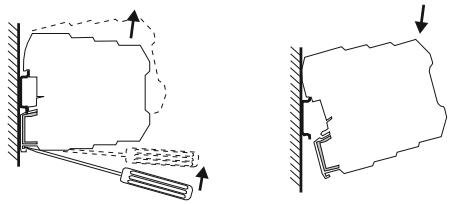
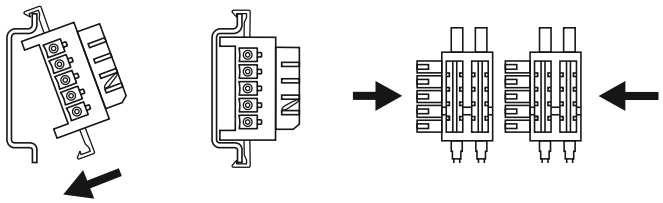


Figure 1: Dimensional Drawing

Inserting/Extracting Module on DIN Guide



Expandable Power-bus Connector



Spring-cage Clamp Connection

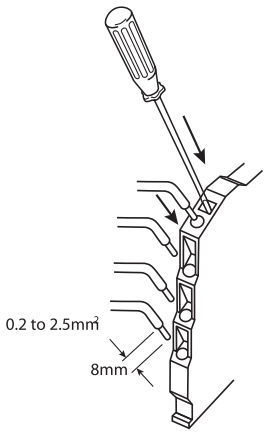


Figure 2: Module Installation

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DSCP63

DC Voltage/Current Converter

DESCRIPTION

The DSCP63 voltage/current converter provides a single channel of voltage or current input which is converted to a voltage or current output. It is designed for industrial standard voltage or current signals. Input/output range, filter, fault indication, square root function, and other functions may be configured by dip-switch. Power can be applied directly to the converter's terminals or through a DIN-rail mounted bus connector accessory, eliminating the need to wire power to each individual converter.



FEATURES

- Input Voltage: 0-5VDC, 0-10VDC, 0-15VDC, 0-30VDC, 1-5VDC, 2-10VDC
- Input Current: 0-20mA, 4-20mA
- Output Voltage: 0-5VDC, 0-10VDC, 1-5VDC, 2-10VDC
- Output Current: 0-20mA, 4-20mA, 20mA-0, 20-4mA
- 1500Vrms Galvanic Isolation, 3-way
- 19.2-30VDC Power
- Spring-cage Clamp Connection
- 14-bit Resolution
- Better than ±0.1% Accuracy
- Configuration by Dip-switch
- Compact 6.2mm DIN Housing
- CE Compliant

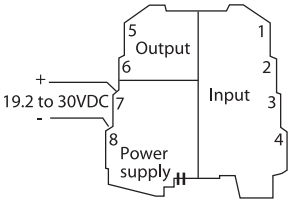
BENEFITS

- High-efficiency Energy Conversion
- Helps to Improve Device Energy Utilization

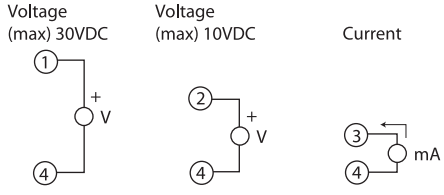
APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems

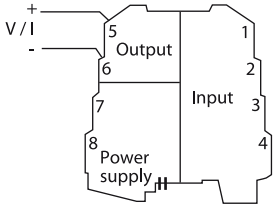
Power Supply



Input



Output



DSCP63 Electrical Connections

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Power

Module	DSCP63
Input (selectable) Voltage (max 50VDC) Voltage (max 30VDC) Current (max 24mA)	 0-15VDC, 0-30VDC (Input R = 325kΩ) 0-5VDC, 1-5VDC, 0-10VDC, 2-10VDC (Input R = 110kΩ) 0-20mA, 4-20mA (Input R = 35Ω)
Accuracy Thermal Drift A/D Conversion Processing Response Time, 90% Span, (selectable) Isolation Dip-switch Configuration Status Indicators (LED)	±0.1% (max) <120ppm/°K 14-bit Floating Point 32-bit <35ms (without filter), <74ms (with filter) 1500Vrms (1 minute), 3-way Sets Input and Output Ranges, Filter and Faults Internal Fault, Configuration Error, Connection Fault
Output (selectable) Current Current Output Maximum Fault Output Voltage	 0-20mA, 4-20mA, 20mA-0 or 20-4mA Load Resistance: 500Ω (max) 25mA 102.5% or 105% of Full-scale Value in Case of Over-range 0-5VDC, 1-5VDC, 0-10VDC or 2-10VDC Load Resistance: 2kΩ (min)
Power Supply Power Consumption Hot Swapping	19.2-30VDC <600mW (22mA at 24VDC) Yes
Mechanical Dimensions (w x h x d)	0.24" x 3.67" x 4.04" (6.2mm x 93.1mm x 102.5mm)
Housing	Terminal Housing for Mounting on 35mm DIN 46277
Connections	Spring-cage Clamp
Weight	1.8 ounces (50g)
Environmental Operating Temp. Range Storage Temp. Range Relative Humidity IP Protection Emissions Immunity	 –20°C to +65°C –40°C to +85°C 0 to 90%, Noncondensing IP20 EN61000-6-4 EN61000-6-2

Ordering Information

Model	Description
DSCP63	DC Voltage/Current Converter

Accessories

Model	Description
DSCX-02	DIN-rail Expandable Power-bus Connector
DSCP70	Power Supply Connection Module

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

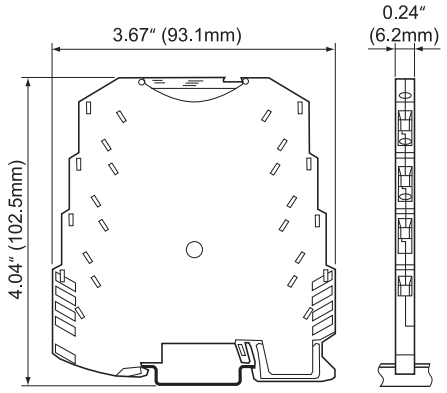
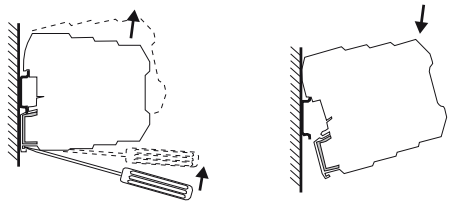
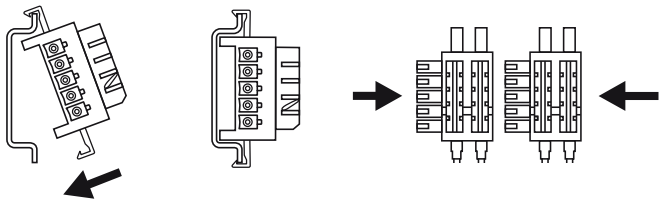


Figure 1: Dimensional Drawing

Inserting/Extracting Module on DIN Guide



Expandable Power-bus Connector



Spring-cage Clamp Connection

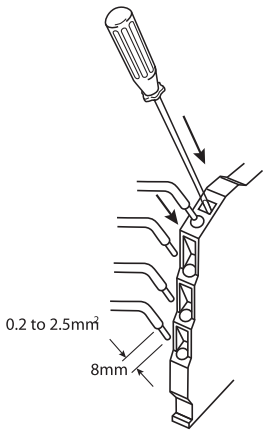


Figure 2: Module Installation

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DSCP64

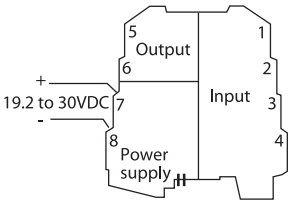
DC Voltage/Current Converter with Transducer Power Supply

DESCRIPTION

The DSCP64 voltage/current converter provides a single channel of voltage or current input which is converted to a current or voltage output. An auxiliary power supply is provided for powering the input transducer/sensor. It is designed for Industry-standard voltage or current signals. Input/output range, filter, fault indication, square root function, and other functions may be configured by dip-switch. Power can be applied directly to the converter's terminals or through a DIN-rail-mounted bus connector accessory, eliminating the need to wire power to each individual converter.

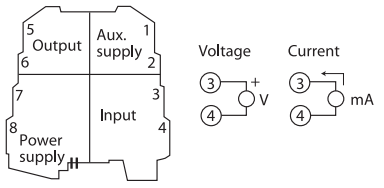


Power Supply

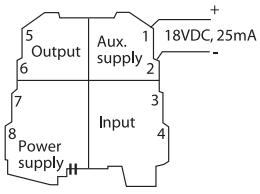


Input

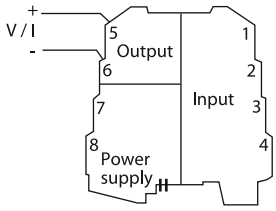
Voltage and Current (passive)



Current (active)



Output



DSCP64 Electrical Connections

FEATURES

- Input Voltage: 0-5VDC, 0-10VDC, 0-15VDC, 0-30VDC, 1-5VDC, 2-10VDC
- Input Current: 0-20mA, 4-20mA
- Output Voltage: 0-5VDC, 0-10VDC, 1-5VDC, 2-10VDC
- Output Current: 0-20mA, 4-20mA, 20mA-0, 20-4mA
- 1500Vrms Galvanic Isolation, 4-way
- 19.2-30VDC Power
- Spring-cage Clamp Connection
- 14-bit Resolution
- Better than ±0.1% Accuracy
- Configuration by Dip-switch
- Compact 6.2mm DIN Housing
- CE Compliant

BENEFITS

- High-efficiency Energy Conversion
- Helps to Improve Device Energy Utilization

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Power

Module	DSCP64
Input (selectable) Voltage Current	 0-5VDC, 1-5VDC, 0-10VDC, 2-10VDC (Input R = 110kΩ) 0-20mA, 4-20mA (Input R = 35Ω)
Accuracy Thermal Drift A/D Conversion Processing Response Time, 90% Span, (selectable) Isolation Dip-switch Configuration Status Indicators (LED)	±0.1% (max) <120ppm/°K 14-bit Floating Point 32-bit <35ms (without filter), <74ms (with filter) 1500Vrms (1 minute), 3-way Sets Input and Output Ranges, Filter and Faults Internal Fault, Configuration Error, Connection Fault
Output (selectable) Current Current Output Maximum Fault Output Voltage Auxiliary Power Supply	 0-20mA, 4-20mA, 20mA-0 or 20-4mA Load Resistance: 500Ω (max) 25mA 102.5% or 105% of Full-scale Value in Case of Over-range 0-5VDC, 1-5VDC, 0-10VDC or 2-10VDC Load Resistance: 2kΩ (min) 17VDC-21VDC, 0 to 25mA
Power Supply Power Consumption Hot Swapping	19.2-30VDC 23mA (max) at 24VDC with Output at 20mA and Auxiliary Supply Not Used 45mA (max) at 24VDC with Output at 21mA and Auxiliary Supply at 21mA Yes
Mechanical Dimensions (w x h x d)	0.24" x 3.67" x 4.04" (6.2mm x 93.1mm x 102.5mm)
Housing	Terminal Housing for Mounting on 35mm DIN 46277
Connections	Spring-cage Clamp
Weight	1.6 ounces (46g)
Environmental Operating Temp. Range Storage Temp. Range Relative Humidity IP Protection Emissions Immunity	 –20°C to +65°C –40°C to +85°C 0 to 90%, Noncondensing IP20 EN61000-6-4 EN61000-6-2

Ordering Information

Model	Description
DSCP64	DC Voltage/Current Converter

Accessories

Model	Description
DSCX-02	DIN-rail Expandable Power-bus Connector
DSCP70	Power Supply Connection Module

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

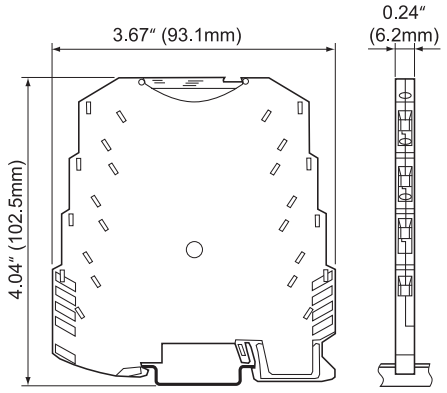
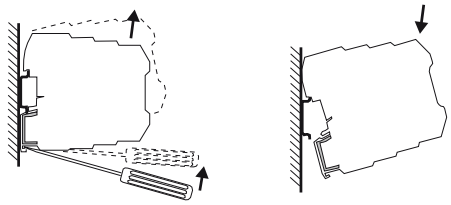
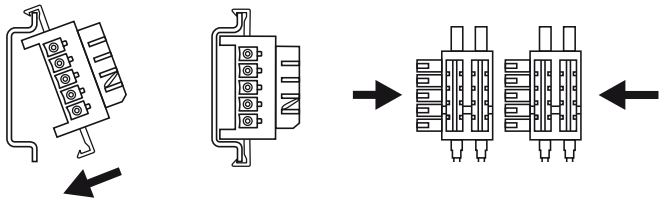


Figure 1: Dimensional Drawing

Inserting/Extracting Module on DIN Guide



Expandable Power-bus Connector



Spring-cage Clamp Connection

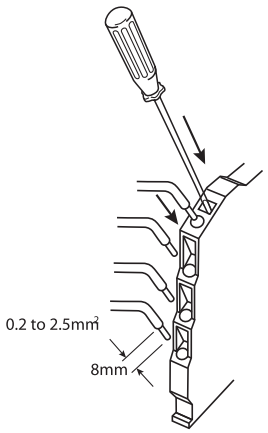


Figure 2: Module Installation

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DSCP65

DC Low Voltage Converter

DESCRIPTION

The DSCP65 low voltage converter provides a single channel of low-voltage input which is converted to a current or voltage output. It is designed for industrial-standard voltage or current signals. Input/output range, filter, fault indication, and other functions may be configured by dip-switch. Power can be applied directly to the converter's terminals or through a DIN-rail-mounted bus connector accessory, eliminating the need to wire power to each individual converter.



FEATURES

- Input Voltage: 25mV to 2VDC in 15 Settable Steps
- Output Voltage: 0-5VDC, 0-10VDC, 1-5VDC, 2-10VDC
- Output Current: 0-20mA, 4-20mA, 20mA-0, 20-4mA
- 1500Vrms Galvanic Isolation, 3-way
- 19.2-30VDC Power
- Spring-cage Clamp Connection
- 14-bit Resolution
- Better than ±0.1% Accuracy
- Configuration by Dip-switch
- Compact 6.2mm DIN Housing
- CE Compliant

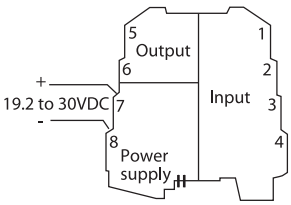
BENEFITS

- High Efficiency and Performance
- Reduced Power Loss During Conversion

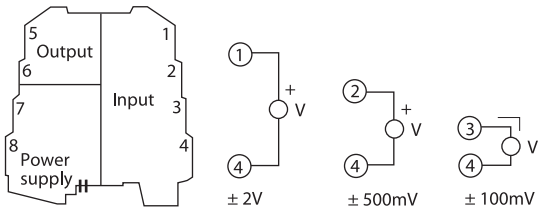
APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems

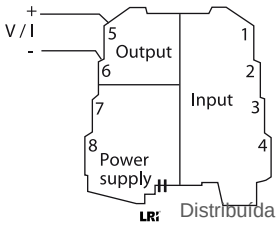
Power Supply



Input



Output



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DSCP65 Electrical Connections

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Power

Module	DSCP65
Input (selectable)	
Voltage (Terminals 3 and 4)	25, 50, 60, 75, 80, or 100mV (Input R = 50kΩ)
Voltage (Terminals 2 and 4)	120, 150, 200, 250, 300, 400, or 500mV (Input R = 250kΩ)
Voltage (Terminals 1 and 4)	1000 or 2000mV (Input R = 1MΩ)
Maximum Input Voltage	±50VDC
Accuracy	±0.1% (max)
Thermal Drift	<120ppm/°K
A/D Conversion	14-bit
Processing	Floating Point 32-bit
Response Time, 90% Span (selectable)	<23ms (without filter), <51ms (with filter)
CMRR	>160dB
Isolation	1500Vrms (1 minute), 3-way
Dip-switch Configuration	Sets Input and Output Ranges, Filter and Faults
Status Indicators (LED)	Internal Fault, Configuration Error, Connection Fault
Output (selectable)	
Current	0-20mA, 4-20mA, 20mA-0 or 20-4mA Load Resistance: 500Ω (max)
Current Output Maximum	25mA
Fault Output	102.5% or 105% of Full-scale Value in Case of Over-range
Voltage	0-5VDC, 1-5VDC, 0-10VDC or 2-10VDC Load Resistance: 2kΩ (min)
Voltage Output Maximum	12.5VDC
Power Supply	19.2-30VDC
Power Consumption	<600mW (22mA at 24VDC)
Hot Swapping	Yes
Mechanical Dimensions (w x h x d)	0.24" x 3.67" x 4.04" (6.2mm x 93.1mm x 102.5mm)
Housing	Terminal Housing for Mounting on 35mm DIN 46277
Connections	Spring-cage Clamp
Weight	1.6 ounces (46g)
Environmental	
Operating Temp. Range	–20°C to +65°C
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 90%, Noncondensing
IP Protection	IP20
Emissions	EN61000-6-4
Immunity	EN61000-6-2

Ordering Information

Model	Description
DSCP65	DC Low Voltage Converter

Accessories

Model	Description
DSCX-02	DIN-rail Expandable Power-bus Connector
DSCP70	Power Supply Connection Module

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

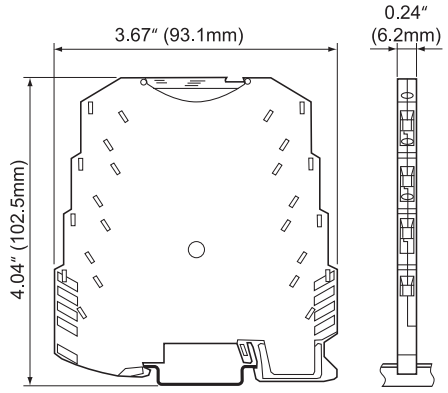
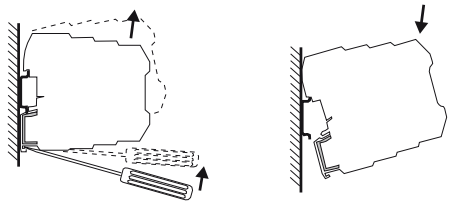
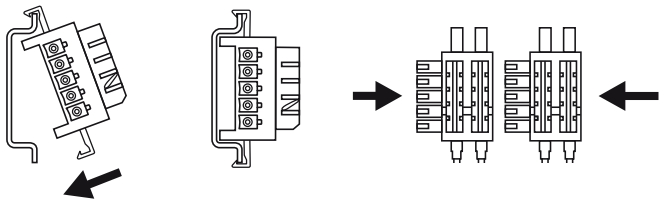


Figure 1: Dimensional Drawing

Inserting/Extracting Module on DIN Guide



Expandable Power-bus Connector



Spring-cage Clamp Connection

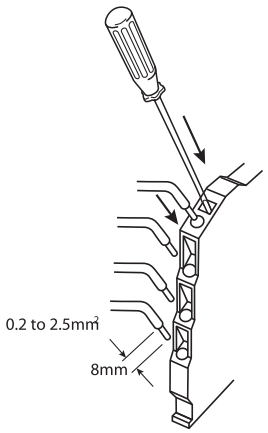


Figure 2: Module Installation

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DSCP70

Power Supply Connection Module for DIN-rail Power Bus

DESCRIPTION

The DSCP70 power supply connection module permits the delivery of power to DSCP6x modules through DIN-rail-mounted power-bus connectors. An external power supply, or supplies for redundant operation, are connected to the terminals of the DSCP70. The DSCP70 then routes the power to the DIN-rail power-bus, provides protection against power supply reversal, provides LED status indication of correct power, inverted power connection and presence of AC, and provides over-voltage protection.



FEATURES

- Delivers Power to DSCP6x Modules via DIN-rail
- Two Independent Inputs Allow Redundant Power
- LED Indication of Power Supply Presence
- LED Indication of Reversed Power Connection
- 19.2-30VDC Power
- Spring-cage Clamp Connection
- Compact 6.2mm DIN Housing
- CE Compliant

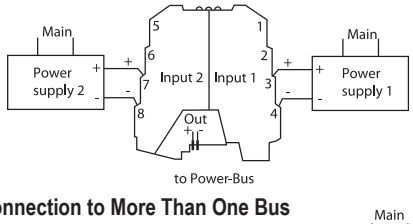
BENEFITS

- Protection Against Power Reversals
- DIN-rail Flexibility

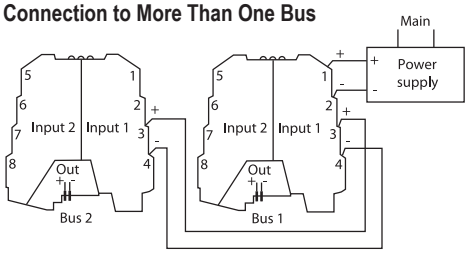
APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems

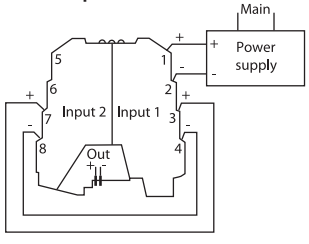
Example of Connection with Redundant Power Supply



Example of Connection to More Than One Bus



Example of Connection with Inputs Connected in Parallel: 2A Output



DSCP70 Electrical Connections

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Power

Module	DSCP70
Input Voltage Current Capacity Protection	 19.2-30VDC 4A Maximum per Terminal Each Positive Input Must Have an External Fuse
Output Internal Voltage Drop Current Capacity Filter Power Consumption	 300mV One Input = 1.6A Parallel Inputs 1 and 2 = 2A Differential Mode: 4.7mH and two 470nF per Input 5mA per Input (max)
Mechanical Dimensions (w x h x d)	0.24" x 3.67" x 4.04" (6.2mm x 93.1mm x 102.5mm)
Housing	Terminal Housing for Mounting on 35mm DIN 46277
Connections	Spring-cage Clamp
Weight	1.6 ounces (46g)
Environmental Operating Temp. Range Storage Temp. Range Relative Humidity IP Protection Emissions Immunity	 –20°C to +65°C –40°C to +85°C 0 to 90%, Noncondensing IP20 EN61000-6-4 EN61000-6-2

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

Ordering Information

Model	Description
DSCP70	Power Supply Connection Module

Accessories

Model	Description
DSCX-02	DIN-rail Expandable Power-bus Connector

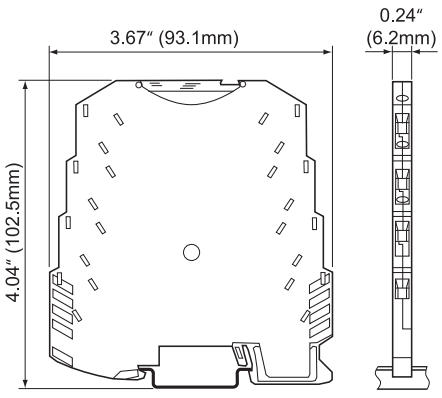
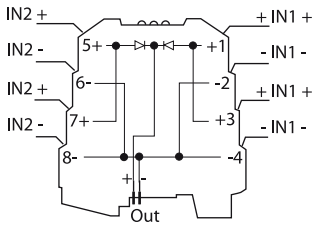
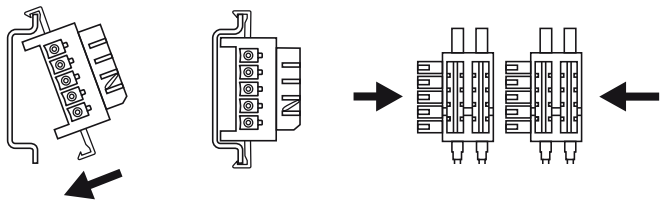


Figure 1: Dimensional Drawing

Internal Wiring



Expandable Power-bus Connector



Spring-cage Clamp Connection

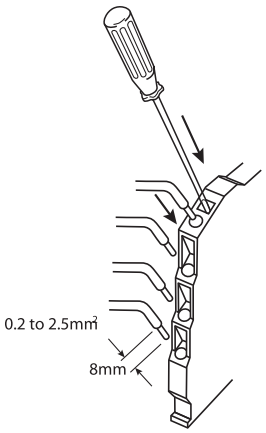


Figure 2: Module Installation

SECTION 7 - DSCL-DSCP-DSCT

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DSCP81

Configurable Voltage/Current Input Signal Conditioners, DIN-mount

DESCRIPTION

The isolated DSCP81 signal conditioner is designed for measuring voltages up to ±1000VDC and currents up to ±100mA. The input type, measurement range, and other features are software configurable. A PC with RS-232C serial port, the DSCX-787 and DSCX-587 interface cables, and the DSCX-557 configuration software are required to program the DSCP81.

The DSCP81 can interface to either a current or voltage input and provide a current or voltage output (Figure 1). The input filter characteristics, input and output ranges, input signal linearization, signal inversion, and optional alarm relay output are all software configurable by the user. The input signal may be linearized using up to 50 points of interpolation. Optionally, the user may specify all configurable parameters.

Two models are available offering wide-range power supply connection: 24 to 60VDC/AC, and 85 to 230VDC/AC. The DSCX-557 configuration software allows query, print-out and saving of configuration settings, display of input measurement value, and display of interpolation table points.

FEATURES

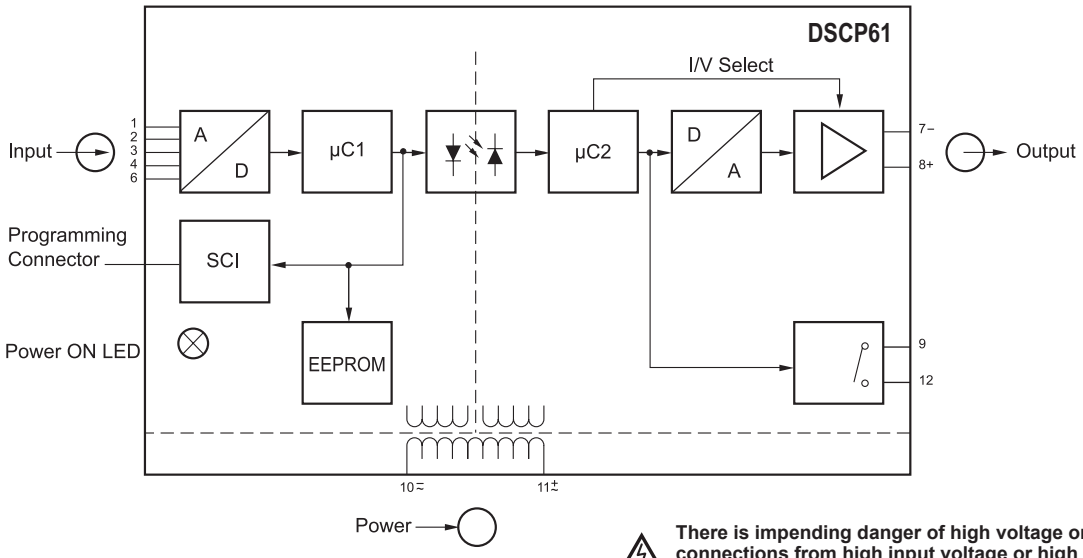
- Interfaces to Voltages up to ±1000VDC and Currents up to ±100mA
- Software Configurable Input Type and Range
- Software Configurable Filter
- 3700Vrms Transformer Isolation
- Supply Voltage of 24-60VDC/AC or 85-230VDC/AC
- Alarm Relay Output
- Mounts on Standard DIN-rail
- –25ºC to +55ºC Operating Temperature
- CE Compliant

BENEFITS

- Provides Isolation Between Inputs and Outputs
- Reduces Noise
- Prevents Ground Loops
- High Degree of Accuracy

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



DSCP81 Block Diagram

There is impending danger of high voltage on any DSCP81 connections from high input voltage or high power supply voltage.

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Specifications Typical* at T_A = +25°C and 24VDC or 230VAC ±10% Supply Voltage

Module	DSCP81
Input Range, Voltage	–1000VDC to +1000VDC (max) Configurable
Input Resistance	1MΩ (V_{IN}≤±1.7V), 540kΩ (V_{IN}>±1.7V to ≤±100V), 5.5MΩ (V_{IN}>±100V to ±1000V)
Input Range, Current	–100mA to +100mA (max) Configurable
Input Resistance	1kΩ (I_{IN} = –1.5mA to +1.5mA), 15.4Ω (I_{IN} = –100mA to +100mA)
Output Range, Voltage	–10V to +10V (max) Configurable
V Limit Under Overload	Approx. ±11V
Short Circuit Current	≤60mA
External Resistance	R_{EXT} (min) (kΩ)≥V_{EV}/10mA Note: V_{EV} = Output Voltage End Value
Output Range, Current	–20mA to +20mA (max) Configurable
Output Load Voltage	12V
Current Limit Under Overload	Approx. ±22mA
Open-Circuit Voltage	<16V
External Resistance	R_{EXT} (max) (kΩ) = 12V/I_{ev} Note: I_{EV} = Output Current End Value
Output Ripple (Voltage or Current)	<0.5% p-p
CMV, Input to Output & Relay	3700Vrms, 1 minute
CMV, Power Supply to Input & Output	3700Vrms, 1 minute
CMV, Power Supply to Relay	2300Vrms, 1 minute
CMV, Output to Relay	2300Vrms, 1 minute
Mains Ripple Suppression	Configurable to 50 or 60Hz
Input Filter	Configurable, see Table 1
Accuracy(1)	±0.1% Span (typ), ±0.2% Span (max)
Output Stability	100ppm/°C
Linearization	Configurable; Linear, Custom, $x^{1/2}$, $x^{3/2}$, $x^{5/2}$
Alarm Relay	SPST Isolated Contact
Material	Gold Flashed Silver Alloy
Contact Rating	AC: ≤2A at 250V (500VA), DC:≤2A at 125V (60W)
Mode of Action	Configurable; Alarm and Power Loss (see Table 2 Feature 6)
Trip Point Type	Configurable; Inactive, Low, High (see Table 2 Feature 7)
Trip Point Setting	Configurable, –10 to 110% Input Span (see Table 2 Feature 7)
Trip Point Hysteresis	Configurable, 0 to 100% Input Span (see Table 2 Feature 7)
Energize/De-energize Delay	Configurable, 0.01 to 1000s (see Table 2 Feature 8)
Visible Alarm	Front Panel Green LED flashes "ON"
Power Supply	
Voltage	24-60VDC/AC or 85-230VDC/AC; 45 to 400Hz AC
Tolerance	DC –15% to +33%, AC ±15%
Power Consumption	DC ≤1.2W, AC ≤2.5VA
Mechanical Dimensions (h)(w)(d)	2.72" x 0.69" x 4.49" (69.2mm x 17.5mm x 114mm)
Housing Material	Lexan 940, Flammability Class V-0 According to UL 94
Mounting	DIN EN 50022 -35x7.5 or -35x15
Environmental	
Operating Temperature Range	–25°C to +55°C
Storage Temperature Range	–40°C to +70°C
Relative Humidity	0 to 75% Noncondensing
Emissions	EN50081-2 (Radiated, Conducted)
Immunity	EN50082-2 (ESD, RF, EFT)

Table 1: Configurable Input Filter Settings

Response Time (63%) [s] 50Hz	Response Time (63%) [s] 60Hz	Response Time(4) (99%) [s] 50Hz	Response Time(4) (99%) [s] 60Hz
0.04	0.03	0.08	0.07
0.06	0.05	0.17	0.14
0.10	0.08	0.36	0.30
0.18	0.15	0.72	0.60
0.34	0.28	1.5	1.2
0.66	0.55	3.0	2.5
1.3	1.1	6.0	5.0
2.6	2.2	12	10
5.1	4.3	24	20
10.3	8.6	48	40
20.5	17	94	80
41	34	190	160
82	68	380	315
160	140	750	630
330	270	1500	1260

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes linearity and repeatability errors at reference conditions.
(2) Shipped as 4-20mA input, 4-20mA output, linearization = linear, input filter = 80ms, ripple suppression = 60Hz, alarm function = inactive.
(3) Downloadable from website.
(4) Configuration software allows selection of the (99%) values.

Ordering Information

Model	Input Range/Description	Output Range
DSCP81-01 (Standard Configuration(2))	User Configurable V or I Input, 24 to 60VDC/AC Power	User Configurable V or I Output
DSCP81-02 (Standard Configuration(2))	User Configurable V or I Input, 85 to 230VDC/AC Power	User Configurable V or I Output

Accessories

Model	Description
DSCX-787	PC-interface Cable
DSCX-587	Module-interface Cable
DSCX-557(3)	Configuration Software

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Figure 1: Switching Function by Trip Point Type

Alarm Relay Features[1]	
Trip Point Type	Configurable as Low or High or Inactive
Trip Point Adjustment	Configurable Between –10 and 110%[2]
Hysteresis	Configurable Between >0 and 100%[2]
Energize/De-energize Delays	Configurable Between 0 and 1000s
Relay Contact Position	Configurable
Front Panel Display	Green Led "On" Flashes When the Limit Value is Exceeded

NOTES:
(1) Refer to Table 2 for connections
(2) In relation to the analog input span

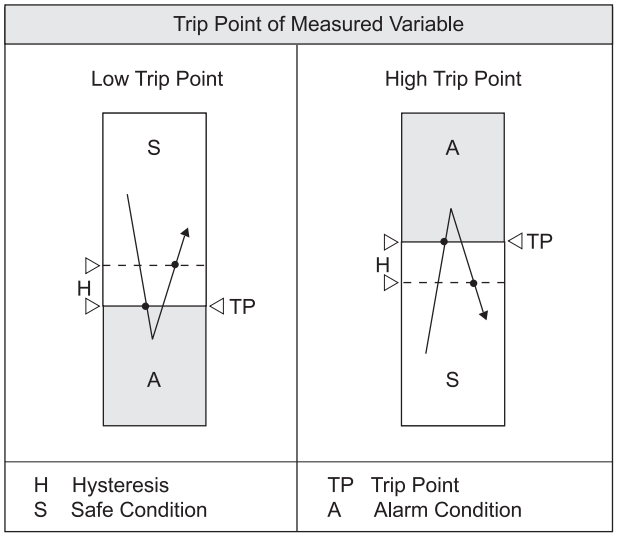


Table 2: Input Range and Associated Connection Diagram

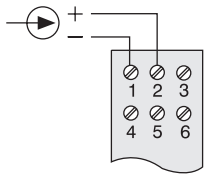
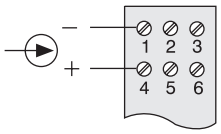
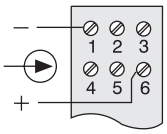
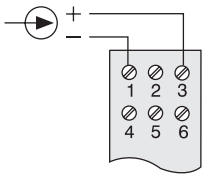
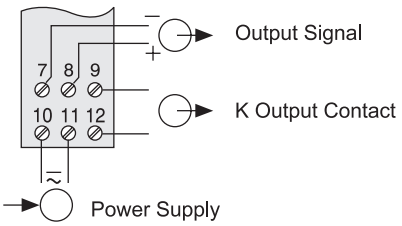
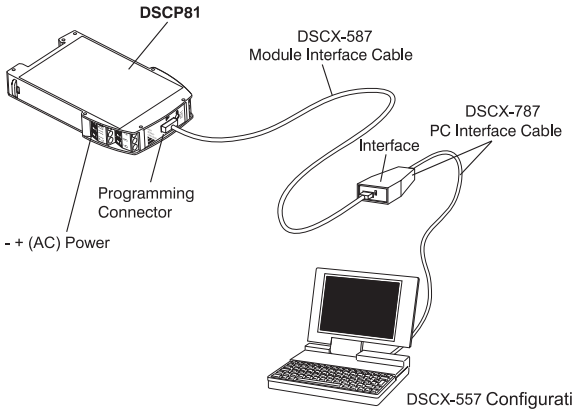
Measuring Mode/Application	DC Voltage			DC Current
Measuring Range Limits	≤ ± 1.7V	> ± 1.7 to ≤ ± 100V	> ± 100 to ± 1000V	≤ ± 100 mA
= Input Signal				
= Output Signal K = Output Contact = Power Supply				

Figure 2: Configuring the DSCP81



A PC, DSCX-787 PC interface cable, DSCX-587 module interface cable, and DSCX-557 configuration software are required to program the DSCP81. Power must be connected to the DSCP81 for configuration. The DSCX-557 configuration software is downloadable from the website.

IMPORTANT!

1. DO NOT connect the DSCX-587 module interface cable to the DSCP81 programming connector when >253V is applied to the DSCP81 input.

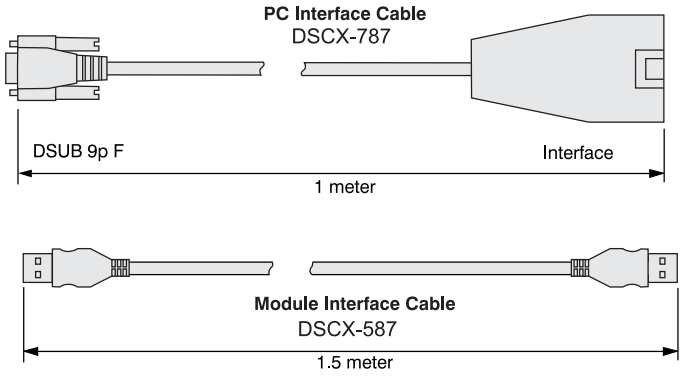
2. The DSCX-587 module interface cable must first be connected to the DSCX-787 cable before it is connected to the DSCP81.

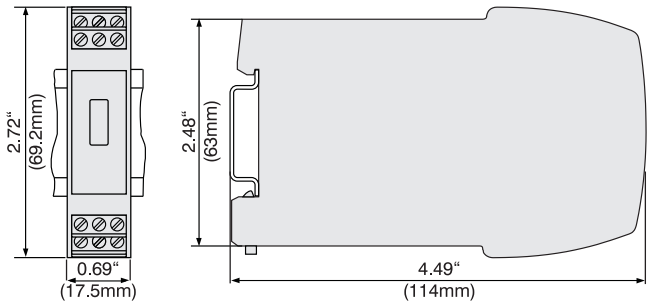
3. The programming connector on the DSCP81 is DC connected to the DSCP81 input circuit. **DO NOT** touch any metal parts of the plug or socket if an input voltage >24V is connected to the DSCP81.

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Figure 3: Product Dimensions





DSCP81 Clipped onto a Top-Hat Rail (35 x 15mm or 35 x 17mm, acc. to EN 50022).

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DSCT

Isolated DIN-rail Mount 2-wire Transmitters



Instrument Class® Performance

"Best In Class" accuracy, linearity, stability, and noise specifications. Outstanding protection and isolation performance for input, output and power connections. Capable of operating on the widest of loop supply power and over the broadest operating temperature range!

DESCRIPTION

Dataforth's DSCT series of loop-powered 2-wire transmitters consists of seven family groups with a total of 48 transmitter models that interface to a wide variety of voltage, current, temperature and position measuring devices. As one of Dataforth's *Instrument Class* products, the DSCT family provides superior specifications such as ±0.03% accuracy, 5-pole filtering, 1500Vrms continuous isolation, low output noise, and much more.

The DSCT 2-wire transmitter conditions and sends 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 DSCT accepts a wide range of inputs, including millivolt, volt, milliamp, thermocouple, RTD, potentiometer, and slide wire. It operates on power from a 2-wire signal loop and modulates the supply current to represent the input signal within a 4-20mA range.

Two-wire transmission loops are a very economical method for connecting sensors to distant control rooms. Since the DSCT operates from the signal loop current, no additional expensive power and wiring are required. Only low-cost, twisted-pair wiring is needed.

FEATURES

- ±0.03% Accuracy (typ)
- ±0.01% Linearity
- 1500Vrms Transformer Isolation and 240Vrms Field-side Protection
- ANSI/IEEE C37.90.1 Transient Protection
- Wide Loop Supply Voltage, 10.8V to 60V
- 5-pole Low-pass Filtering
- Up to 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- Protected Against Reverse Connection of Loop Voltage
- –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

BENEFITS

- Easy to Use
- Low-cost Solution
- Does Not Require External Power
- High Reliability in Hazardous Area
- Simple Field Wiring

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems

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DSCT Selection Guide

ANALOG VOLTAGE INPUT TRANSMITTERS

MODEL	INPUT RANGE	MODEL	INPUT RANGE
DSCT30-01	±10mV	DSCT31-01	±1V
DSCT30-02	±50mV	DSCT31-02	±5V
DSCT30-03	±100mV	DSCT31-03	±10V
DSCT30-04	0 - 10mV	DSCT31-04	0 - 1V
DSCT30-05	0 - 50mV	DSCT31-05	0 - 5V
DSCT30-06	0 - 100mV	DSCT31-06	0 - 10V
		DSCT31-07	±20V
		DSCT31-08	0 - 20V

ANALOG CURRENT INPUT TRANSMITTERS

MODEL	INPUT RANGE
DSCT32-01	4-20mA
DSCT32-02	0-20mA

LINEARIZED 2- OR 3-WIRE RTD-INPUT TRANSMITTERS

MODEL	TYPE**	INPUT RANGE
DSCT34-01	100ΩPt	–100°C to +100°C (–148°F to +212°F)
DSCT34-02	100ΩPt	0°C to +100°C (+32°F to +212°F)
DSCT34-03	100ΩPt	0°C to +200°C (+32°F to +392°F)
DSCT34-04	100ΩPt	0°C to +600°C (+32°F to +1112°F)
DSCT34-05	100ΩPt	0°C to +400°C (+32°F to +752°F)
DSCT34N-01	120ΩNi	0°C to +300°C (+32°F to +572°F)

POTENTIOMETER-INPUT TRANSMITTERS

MODEL	INPUT RANGE
DSCT36-01	0 to 100Ω
DSCT36-02	0 to 500Ω
DSCT36-03	0 to 1kΩ
DSCT36-04	0 to 10kΩ

THERMOCOUPLE-INPUT TRANSMITTERS

MODEL	TYPE‡	INPUT RANGE
DSCT37J-01	J	–100°C to +760°C (–148°F to +1400°F)
DSCT37K-02	K	–100°C to +1350°C (–148°F to +2462°F)
DSCT37T-03	T	–100°C to +400°C (–148°F to +752°F)
DSCT37E-04	E	0°C to +900°C (+32°F to +1652°F)
DSCT37R-05	R	0°C to +1750°C (+32°F to +3182°F)
DSCT37S-06	S	0°C to +1750°C (+32°F to +3182°F)
DSCT37B-07	B	0°C to +1800°C (+32°F to +3272°F)
DSCT37N-08	N	–100°C to +1300°C (–148°F to +2372°F)

LINEARIZED THERMOCOUPLE-INPUT TRANSMITTERS

MODEL	TYPE‡	INPUT RANGE
DSCT47J-01	J	0°C to +760°C (+32°F to +1400°F)
DSCT47J-02	J	–100°C to +300°C (–148°F to +572°F)
DSCT47J-03	J	0°C to +500°C (+32°F to +932°F)
DSCT47K-04	K	0°C to +1000°C (+32°F to +1832°F)
DSCT47K-05	K	0°C to +500°C (+32°F to +932°F)
DSCT47K-13	K	–100°C to +1350°C (–148°F to +2462°F)
DSCT47K-14	K	0°C to +1200°C (+32°F to +2192°F)
DSCT47T-06	T	–100°C to +400°C (–148°F to +752°F)
DSCT47T-07	T	0°C to +200°C (+32°F to +392°F)
DSCT47E-08	E	0°C to +1000°C (+32°F to +1832°F)
DSCT47R-09	R	+500°C to +1750°C (+932°F to +3182°F)
DSCT47S-10	S	+500°C to +1750°C (+932°F to +3182°F)
DSCT47B-11	B	+500°C to +1800°C (+932°F to +3272°F)
DSCT47N-15	N	–100°C to +1300°C (–148°F to +2372°F)

ACCESSORIES

MODEL	DESCRIPTION
SCMXRAIL1-XX	DIN EN50022-35x7.5 (Slotted Steel), Length -XX Meters
SCMXRAIL3-XX	DIN EN50022-35x15 (Slotted Steel), Length -XX Meters

POWER SUPPLIES

PWR-PS5R7W	Power Supply, 24V, 0.3A, 100-240VAC Input
PWR-PS5R15W	Power Supply, 24V, 0.65A, 100-240VAC Input

‡THERMOCOUPLE ALLOY COMBINATIONS

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
100Ω Pt 120Ω Ni	0.00385 0.00672	DIN 43760	JIS C 1604-1989

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DSCT30/31

Analog Voltage-input Transmitters

DESCRIPTION

Each DSCT30 and DSCT31 voltage-input transmitter provides a single channel of analog input which is filtered, isolated, amplified, and converted to a process current output (Figure below). Signal filtering is accomplished with a five-pole filter, which provides 85dB of normal-mode rejection at 60Hz and 80dB at 50Hz. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four are on the process loop side. After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common-mode spikes or surges.

Special input and output circuits on the DSCT30 and DSCT31 transmitters provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Signal and loop power lines are secured to the module using screw terminals, which are in pluggable terminal blocks for ease of system assembly and reconfiguration.

The modules have excellent stability over time and do not require recalibration; however, zero and span settings are adjustable up to ±10% to accommodate situations where fine-tuning is desired. The adjustments are made using potentiometers located under the front panel label and are non-interactive for ease of use.

FEATURES

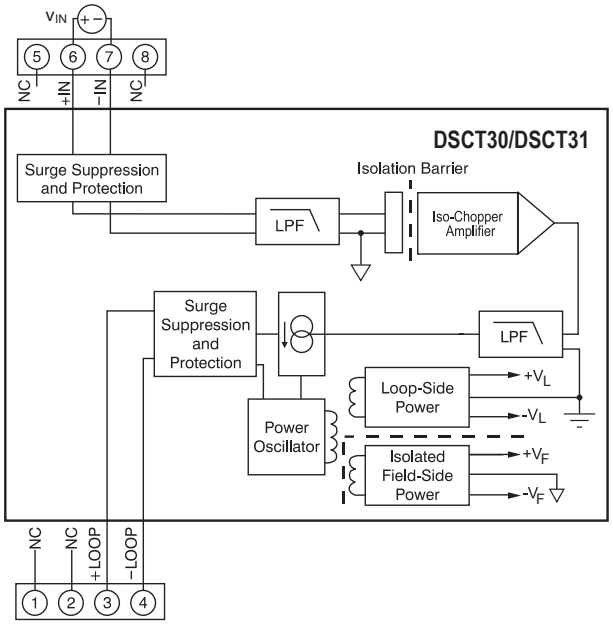
- Accepts Millivolt and Voltage Level Signals
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- ±0.03% Accuracy
- ±0.01% Linearity
- Easily Mounts on Standard DIN-rail
- CSA C/US Certified
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- High-density Signals Provide Improved Accuracy
- Protects Against Accidental Connection of Power Line Voltages
- Screw Terminal Provide Secure Connections
- More Accurate Representation of Change in Physical Phenomena

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



DSCT30/31 Block Diagram - For Module Dimensions and Pinouts, See Page 7-47

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Voltage

Module	DSCT30	DSCT31
Input Range	±10mV to ±100mV	±1V to ±20V
Input Bias Current	±0.5nA	±0.05nA
Input Resistance		
Normal	50MΩ	2MΩ
Power Off	66kΩ	2MΩ
Overload	66kΩ	2MΩ
Input Protection		
Continuous	240Vrms (max)	240Vrms (max)
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMV, Input to Output		
Continuous	1500Vrms (max)	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	160dB	160dB
NMR	85dB at 60Hz, 80dB at 50Hz	85dB at 60Hz, 80dB at 50Hz
Adjustability	±10% Zero and Span	±10% Zero and Span
Accuracy(1)	±0.03%	±0.03%
Conformity	±0.01%	±0.01%
Stability		
Offset	±20ppm/°C	±20ppm/°C
Gain	±80ppm/°C	±80ppm/°C
Noise		
Output, 100kHz	3µArms	3µArms
Bandwidth, –3dB	3Hz	3Hz
Response Time, 90% Span	165ms	165ms
Output Range	4-20mA	4-20mA
Output Limits		
Under-range	2.8mA	2.8mA
Over-range	29mA	29mA
Output Protection		
Reverse Polarity	Continuous	Continuous
Over-voltage	240Vrms Continuous	240Vrms Continuous
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Loop Supply Voltage	10.8V to 60V	10.8V to 60V
Loop Supply Sensitivity	±0.0005%/V	±0.0005%/V
Turn-on Delay	400ms	400ms
Mechanical Dimensions (h)(w)(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)
Mounting	DIN EN 50022 -35x7.5 or -35x15 Rail	DIN EN 50022 -35x7.5 or -35x15 Rail
Environmental		
Operating Temperature	–40°C to +80°C	–40°C to +80°C
Storage Temperature	–40°C to +80°C	–40°C to +80°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
DSCT30-01	–10mV to +10mV
DSCT30-02	–50mV to +50mV
DSCT30-03	–100mV to +100mV
DSCT30-04	0mV to +10mV
DSCT30-05	0mV to +50mV
DSCT30-06	0mV to +100mV
DSCT31-01	–1V to +1V
DSCT31-02	–5V to +5V
DSCT31-03	–10V to +10V
DSCT31-04	0V to +1V
DSCT31-05	0V to +5V
DSCT31-06	0V to +10V
DSCT31-07	–20V to +20V
DSCT31-08	0V to +20V

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DSCT32

Analog Current-input Transmitters

DESCRIPTION

Each DSCT32 current-input transmitter provides a single channel of analog input which is filtered, isolated, amplified, and converted to a process current output (Figure below). Signal filtering is accomplished with a five-pole filter, which provides 80dB per decade of normal-mode rejection above 100Hz. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four are on the process loop side. After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common-mode spikes or surges.

Special input and output circuits on the DSCT32 transmitters provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Signal and loop power lines are secured to the module using screw terminals, which are in pluggable terminal blocks for ease of system assembly and reconfiguration.

The modules have excellent stability over time and do not require recalibration; however, zero and span settings are adjustable up to ±10% to accommodate situations where fine-tuning is desired. The adjustments are made using potentiometers located under the front panel label and are non-interactive for ease of use.

FEATURES

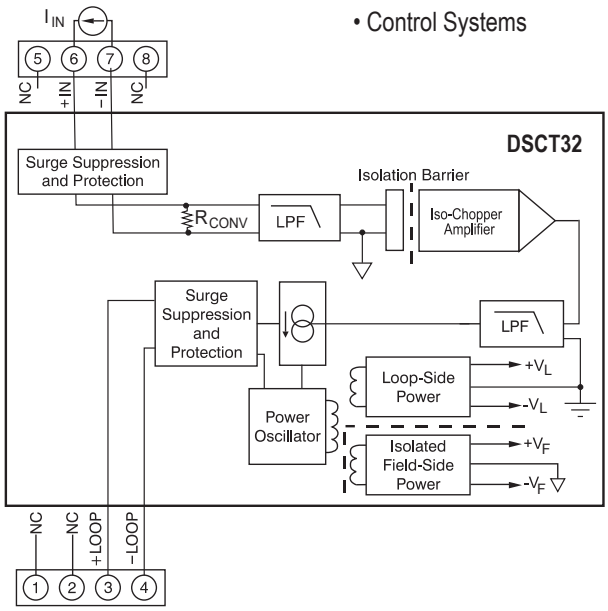
- Accepts Milliamp Level Signals
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 105dB CMR
- ±0.03% Accuracy
- ±0.01% Linearity
- Easily Mounts on Standard DIN-rail
- CSA C/US Certified
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Simple-to-Use and Configure
- Uses Less Wiring and Fewer Connectors
- Best Choice for Long-Distance Transmission
- No Calibration Needed
- Zero and Span Settings Adjustable
- Protects Against Accidental Connection of Power Line Voltages
- Screw Terminal Provide Secure Connections

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



DSCT32 Block Diagram - For Module Dimensions and Pinouts, See Page 7-47

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

Module	DSCT32
Input Range	0-20mA or 4-20mA
Current Conversion Resistor	50.00Ω
Input Protection	
Continuous	240Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	105dB
NMR (–3dB at 100Hz)	80dB/decade Above 100Hz
Adjustability	±10% Zero and Span
Accuracy(1)	±0.03%
Conformity	±0.01%
Stability	
Offset	±30ppm/°C
Gain	±90ppm/°C
Noise	
Output, 100kHz	3µArms
Bandwidth, –3dB	100Hz
Response Time, 90% Span	5ms
Output Range	4-20mA
Output Limits	
Under-range	2.8mA
Over-range	29mA
Output Protection	
Reverse Polarity	Continuous
Over-voltage	240Vrms Continuous
Transient	ANSI/IEEE C37.90.1
Loop Supply Voltage	10.8V to 60V
Loop Supply Sensitivity	±0.0005%/V
Turn-on Delay	400ms
Mechanical Dimensions (h)(w)(d)	2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm)
Mounting	DIN EN 50022 -35x7.5 or -35x15 rail
Environmental	
Operating Temperature	–40°C to +80°C
Storage Temperature	–40°C to +80°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
DSCT32-01	4-20mA
DSCT32-02	0-20mA

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DSCT34

Linearized 2- or 3-wire RTD-input Transmitters

DESCRIPTION

Each DSCT34 RTD-input transmitter provides a single channel of RTD-input which is filtered, isolated, amplified, linearized, and converted to a process current output (Figure below). Signal filtering is accomplished with a five-pole filter, which provides 85dB of normal-mode rejection at 60Hz and 80dB at 50Hz. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four are on the process loop side. After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common-mode spikes or surges.

RTD excitation is provided from the transmitter using a precision current source. The excitation currents are very small (0.26mA max for 100Ω Pt and 120Ω Ni) which minimizes self-heating of the RTD. Linearization is achieved by creating a non-linear transfer function through the module itself. This non-linear transfer function is configured at the factory and is designed to be equal and opposite to the specific RTD non-linearity. Lead compensation is achieved by matching two current paths thus canceling the effects of lead resistance.

The specifications listed are for a 3-wire connection. A 2-wire connection of the RTD to the module is also possible and is achieved by adding a jumper between pin 5 (+EXC) and pin 6 (+IN) on the terminal block and connecting the RTD leads between pin 6 (+IN) and pin 7 (–IN). The 2-wire connection nullifies the lead resistance compensation feature of the module.

Special input and output circuits on the DSCT34 transmitters provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Signal and loop power lines are secured to the module using screw terminals, which are in pluggable terminal blocks for ease of system assembly and reconfiguration.

The modules have excellent stability over time and do not require recalibration; however, zero and span settings are adjustable up to ±3% to accommodate situations where fine-tuning is desired. The adjustments are made using potentiometers located under the front panel label and are non-interactive for ease of use.

FEATURES

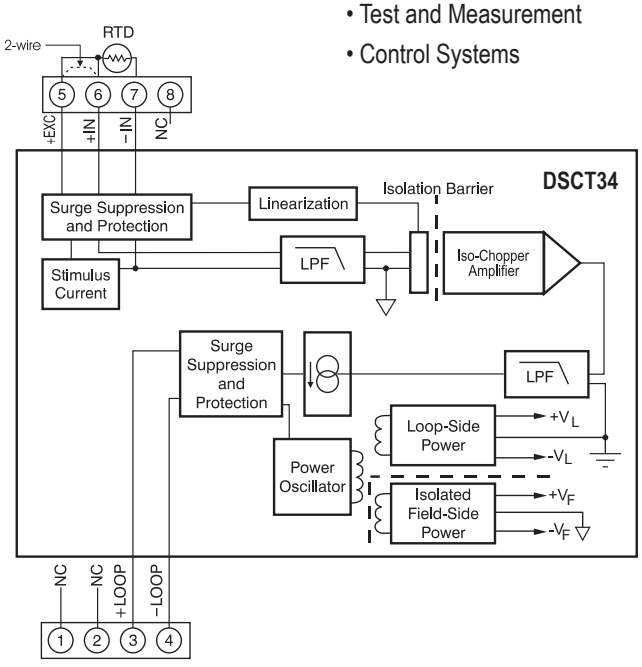
- Interfaces to 100Ω Platinum or 120Ω Nickel RTDs
- Linearizes RTD Signal
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- ±0.1% Accuracy
- ±0.025% Conformity
- Easily Mounts on Standard DIN-rail
- CSA C/US Certified
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Highly Accurate
- Stable Outputs
- High Repeatability

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



DSCT34 Block Diagram - For Module Dimensions and Pinouts, See Page 7-47

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Voltage

Module	DSCT34
Input Range	–200°C to +850°C (100Ω Pt) –80°C to +320°C (120Ω Ni)
Input Resistance	
Normal	50MΩ
Power Off	66kΩ
Overload	66kΩ
Input Protection	
Continuous	240Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	160dB
NMR	85dB at 60Hz, 80dB at 50Hz
Adjustability	±3% Zero and Span
Accuracy	See Ordering Information
Conformity	±0.025%
Stability	
Offset	±50ppm/°C
Gain	±100ppm/°C
Sensor Excitation Current	0.260mA
Lead Resistance Effect	±0.02°C/Ω
Noise	
Output, 100kHz	3µArms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	165ms
Output Range	4-20mA
Output Limits	
Under-range	3mA
Over-range	29mA
Output Protection	
Reverse Polarity	Continuous
Over-voltage	240Vrms Continuous
Transient	ANSI/IEEE C37.90.1
Loop Supply Voltage	10.8V to 60V
Loop Supply Sensitivity	±0.0005%/V
Turn-on Delay	400ms
Mechanical Dimensions (h)(w)(d)	2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm)
Mounting	DIN EN 50022 -35x7.5 or -35x15 rail
Environmental	
Operating Temperature	–40°C to +80°C
Storage Temperature	–40°C to +80°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 conformity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Accuracy(1)	
100Ω Pt **			
DSCT34-01	–100°C to +100°C (–148°F to +212°F)	±0.1%	±0.2°C
DSCT34-02	0°C to +100°C (+32°F to +212°F)	±0.1%	±0.1°C
DSCT34-03	0°C to +200°C (+32°F to +392°F)	±0.1%	±0.2°C
DSCT34-04	0°C to +600°C (+32°F to +1112°F)	±0.1%	±0.6°C
DSCT34-05	0°C to +400°C (+32°F to +752°F)	±0.1%	±0.4°C
120Ω Ni **			
DSCT34N-01	0°C to +300°C (+32°F to +572°F)	±0.1%	±0.3°C

**RTD Standards

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

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DSCT36

Potentiometer-input Transmitters

DESCRIPTION

Each DSCT36 potentiometer-input transmitter provides a single channel of potentiometer-input which is filtered, isolated, amplified, and converted to a process current output (Figure below). Signal filtering is accomplished with a five-pole filter, which provides 85dB of normal-mode rejection at 60Hz and 80dB at 50Hz. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four are on the process loop side. After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common-mode spikes or surges.

Potentiometer excitation is provided from the transmitter using a precision current source. The excitation current is small (less than 0.26mA) which minimizes self-heating of the potentiometer. Lead compensation is achieved by matching two current paths which cancels the effects of lead resistance.

Special input and output circuits on the DSCT36 transmitters provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Signal and loop power lines are secured to the module using screw terminals, which are in pluggable terminal blocks for ease of system assembly and reconfiguration.

The modules have excellent stability over time and do not require recalibration; however, zero and span settings are adjustable up to ±10% to accommodate situations where fine-tuning is desired. The adjustments are made using potentiometers located under the front panel label and are non-interactive for ease of use.

FEATURES

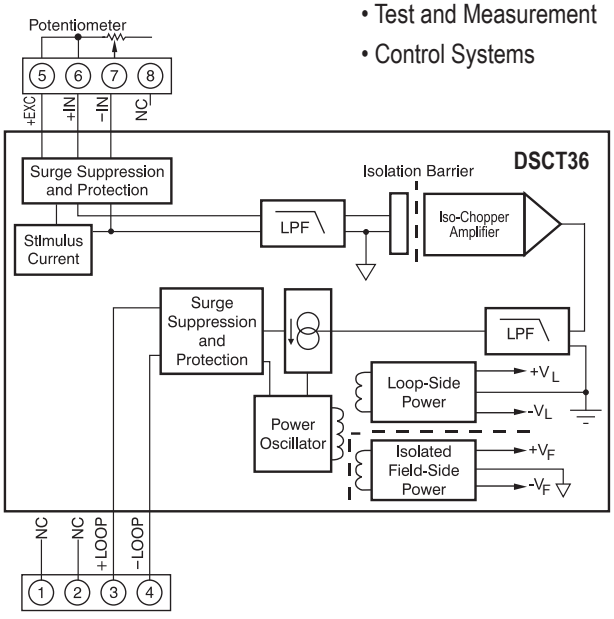
- Interfaces to Potentiometers up to 10kΩ
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- ±0.03% Accuracy
- ±0.01% Linearity
- Easily Mounts on Standard DIN-rail
- CSA C/US Certified
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Easily Integrated into a Variety of Applications
- Provide Continuous Analog Control
- Allows for Precise Adjustments

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



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DSCT36 Block Diagram - For Module Dimensions and Pinouts, See Page 7-47

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Voltage

Module	DSCT36
Input Range	0Ω to 10kΩ
Input Resistance	
Normal	50MΩ
Power Off	66kΩ
Overload	66kΩ
Input Protection	
Continuous	240Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	160dB
NMR	85dB at 60Hz, 80dB at 50Hz
Adjustability	±10% Zero and Span
Accuracy(1)	±0.03%
Conformity	±0.01%
Stability	
Offset	±50ppm/°C
Gain	±100ppm/°C
Sensor Excitation Current	0.26mA; 100Ω, 500Ω Sensor 0.13mA; 1kΩ Sensor 0.065mA; 10kΩ Sensor
Lead Resistance Effect	±0.01Ω/Ω; 100Ω, 500Ω, 1kΩ Sensor ±0.02Ω/Ω; 10kΩ Sensor
Noise	
Output, 100kHz	3µArms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	165ms
Output Range	4-20mA
Output Limits	
Under-range	3mA
Over-range	29mA
Output Protection	
Reverse Polarity	Continuous
Over-voltage	240Vrms Continuous
Transient	ANSI/IEEE C37.90.1
Loop Supply Voltage	10.8V to 60V
Loop Supply Sensitivity	±0.0005%/V
Turn-on Delay	400ms
Mechanical Dimensions (h)(w)(d)	2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm)
Mounting	DIN EN 50022 -35x7.5 or -35x15 rail
Environmental	
Operating Temperature	–40°C to +80°C
Storage Temperature	–40°C to +80°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
DSCT36-01	0 to 100Ω
DSCT36-02	0 to 500Ω
DSCT36-03	0 to 1kΩ
DSCT36-04	0 to 10kΩ

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DSCT37

Non-linearized Thermocouple-input Transmitters

DESCRIPTION

Each DSCT37 non-linearized thermocouple-input transmitter provides a single channel of Thermocouple-input which is filtered, isolated, amplified, and converted to a process current output (Figure below). Signal filtering is accomplished with a five-pole filter, which provides 85dB of normal-mode rejection at 60Hz and 80dB at 50Hz. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four are on the process loop side. After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common mode spikes or surges.

The DSCT37 can interface to eight industry-standard thermocouple types: J, K, T, E, R, S, B and N. Each transmitter is cold-junction compensated to correct for parasitic thermocouples formed by the thermocouple wire and screw terminals on the transmitter. Upscale open thermocouple detection is provided by circuitry. Downscale indication can be implemented by installing a 47MΩ, ±20% resistor between screw terminals 6 (+IN) and 8 (–EXC) on the input terminal block.

Special input and output circuits on the DSCT37 transmitters provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Loop power lines are secured to the module using screw terminals, which are in pluggable terminal blocks for ease of system assembly and reconfiguration. Transmitter zero and span settings are adjustable up to ±10%. The adjustments are made using potentiometers located under the front panel label and are non-interactive for ease of use.

FEATURES

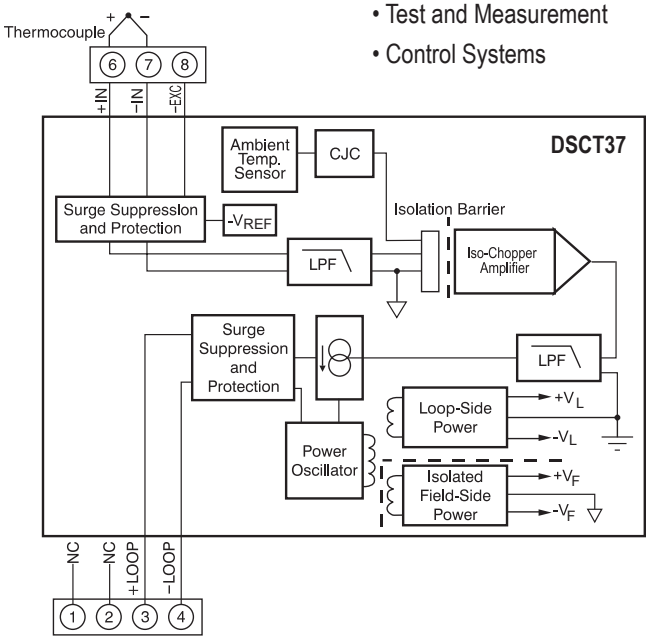
- Interfaces to Types J, K, T, E, R, S, B, and N Thermocouples
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- ±0.05% Accuracy
- ±0.01% Linearity
- Easily Mounts on Standard DIN-rail
- CSA C/US Certified
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Enables Advanced Diagnostics
- Greater Noise Resistance Over Long Distances
- Output Signals Can Be Utilized by Many Standard Devices

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



DSCT37 Block Diagram - For Module Dimensions and Pinouts, See Page 7-47

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Voltage

Module	DSCT37
Input Range	Standard Thermocouple Temperature Limits as per Nist Monograph 175, ITS-90
Input Bias Current	–25nA
Input Resistance	
Normal	50MΩ
Power Off	66kΩ
Overload	66kΩ
Input Protection	
Continuous	240Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	160dB
NMR	85dB at 60Hz, 80dB at 50Hz
Adjustability	±10% Zero and Span
Accuracy	See Ordering Information
Stability	
Offset	±40ppm/°C
Gain	±60ppm/°C
Cold Junction Compensation	
Accuracy, +25°C	±0.25°C
Accuracy, 0°C to +50°C	±0.50°C
Accuracy, –40°C to +80°C	±1.25°C
Open Input Response	Upscale
Open Input Detection Time	<5s
Noise	
Output, 100kHz	3µArms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	165ms
Output Range	4-20mA
Output Limits	
Under-range	2.8mA
Over-range	29mA
Output Protection	
Reverse Polarity	Continuous
Over-voltage	240Vrms Continuous
Transient	ANSI/IEEE C37.90.1
Loop Supply Voltage	10.8V to 60V
Loop Supply Sensitivity	±0.0005%/V
Turn-on Delay	400ms
Mechanical Dimensions (h)(w)(d)	2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm)
Mounting	DIN EN 50022 -35x7.5 or -35x15 Rail
Environmental	
Operating Temperature	–40°C to +80°C
Storage Temperature	–40°C to +80°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 conformity, hysteresis, repeatability, and CJC error.

Ordering Information

Model	TC Type‡	Input Range	Accuracy(1)	
DSCT37J-01	J	–100°C to +760°C (–148°F to +1400°F)	±0.05%	±0.43°C
DSCT37K-02	K	–100°C to +1350°C (–148°F to +2462°F)	±0.05%	±0.73°C
DSCT37T-03	T	–100°C to +400°C (–148°F to +752°F)	±0.05%	±0.25°C
DSCT37E-04	E	0°C to +900°C (+32°F to +1652°F)	±0.05%	±0.45°C
DSCT37R-05	R	0°C to +1750°C (+32°F to +3182°F)	±0.05%	±0.88°C
DSCT37S-06	S	0°C to +1750°C (+32°F to +3182°F)	±0.05%	±0.88°C
DSCT37B-07	B	0°C to +1800°C (+32°F to +3272°F)	±0.05%	±0.90°C
DSCT37N-08	N	–100°C to +1300°C (–148°F to +2372°F)	±0.05%	±0.70°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
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
N	Nickel-14.2% Chromium-1.4% Silicon vs. Nickel-4.4% Silicon- 0.1% Magnesium

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DSCT47

Linearized Thermocouple-input Transmitters

DESCRIPTION

Each DSCT47 thermocouple-input transmitter provides a single channel of Thermocouple-input which is filtered, isolated, amplified, linearized, and converted to a process current output (Figure below). Signal filtering is accomplished with a five-pole filter, which provides 85dB of normal-mode rejection at 60Hz and 80dB at 50Hz. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four are on the process loop side. After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common-mode spikes or surges.

Linearization is achieved by creating a non-linear transfer function through the module itself. This non-linear transfer function is configured at the factory and is designed to be equal and opposite to the thermocouple non-linearity.

The DSCT47 can interface to eight industry-standard thermocouple types: J, K, T, E, R, S, B and N. Each transmitter is cold-junction compensated to correct for parasitic thermocouples formed by the thermocouple wire and screw terminals on the transmitter. Upscale open thermocouple detection is provided by circuitry. Downscale indication can be implemented by installing a 47MΩ, ±20% resistor between screw terminals 6 (+IN) and 8 (–EXC) on the input terminal block.

Special input and output circuits on the DSCT47 transmitters provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Loop power lines are secured to the module using screw terminals, which are in pluggable terminal blocks for ease of system assembly and reconfiguration. Transmitter zero and span settings are adjustable up to ±3%. The adjustments are made using potentiometers located under the front panel label and are non-interactive for ease of use.

FEATURES

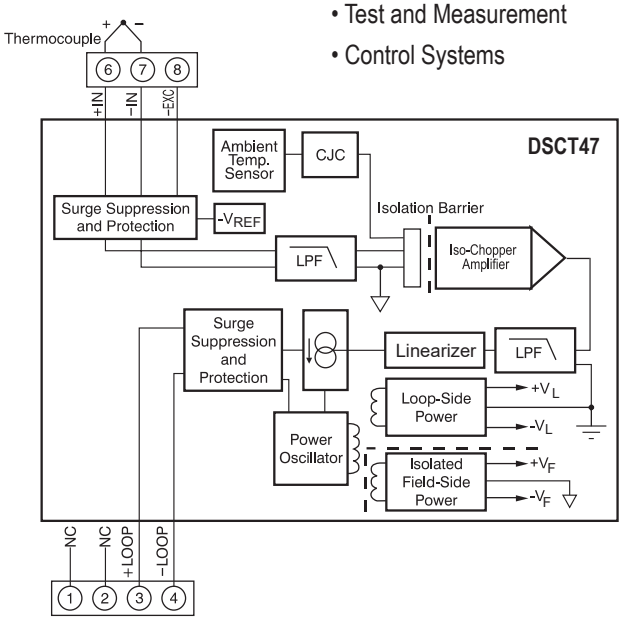
- Interfaces to Types J, K, T, E, R, S, B, and N Thermocouples
- Linearizes Thermocouple Signal
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- ±0.10% Accuracy
- Easily Mounts on Standard DIN-rail
- CSA C/US Certified
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Enables Advanced Diagnostics
- Greater Noise Resistance over Long Distances
- Output Signals Can Be Utilized by Many Standard Devices

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



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DSCT47 Block Diagram - For Module Dimensions and Pinouts, See Page 7-47

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Voltage

Module	DSCT47
Input Range	Standard Thermocouple Temperature Limits as per Nist Monograph 175, ITS-90
Input Bias Current	–25nA
Input Resistance	
Normal	50MΩ
Power Off	66kΩ
Overload	66kΩ
Input Protection	
Continuous	240Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	
Continuous	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	160dB
NMR	85dB at 60Hz, 80dB at 50Hz
Adjustability	±3% Zero and Span
Accuracy	See Ordering Information
Stability	
Offset	±60ppm/°C
Gain	±80ppm/°C
Cold Junction Compensation	
Accuracy, +25°C	±0.25°C
Accuracy, 0°C to +50°C	±0.50°C
Accuracy, –40°C to +80°C	±1.25°C
Open Input Response	Upscale
Open Input Detection Time	<5s
Noise	
Output, 100kHz	3µArms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	165ms
Output Range	4-20mA
Output Limits	
Under-range	2.8mA
Over-range	29mA
Output Protection	
Reverse Polarity	Continuous
Over-voltage	240Vrms Continuous
Transient	ANSI/IEEE C37.90.1
Loop Supply Voltage	10.8V to 60V
Loop Supply Sensitivity	±0.0005%/V
Turn-on Delay	400ms
Mechanical Dimensions (h)(w)(d)	2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm)
Mounting	DIN EN 50022 -35x7.5 or -35x15 Rail
Environmental	
Operating Temperature	–40°C to +80°C
Storage Temperature	–40°C to +80°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 conformity, hysteresis, repeatability, and CJC error.

Ordering Information

Model	TC Type‡	Input Range	Accuracy(1)	
DSCT47J-01	J	0°C to +760°C (+32°F to +1400°F)	±0.1% span	±0.76°C
DSCT47J-02	J	–100°C to +300°C (–148°F to +572°F)	±0.1% span	±0.40°C
DSCT47J-03	J	0°C to +500°C (+32°F to +932°F)	±0.1% span	±0.50°C
DSCT47K-04	K	0°C to +1000°C (+32°F to +1832°F)	±0.1% span	±1.00°C
DSCT47K-05	K	0°C to +500°C (+32°F to +932°F)	±0.1% span	±0.50°C
DSCT47K-13	K	–100°C to +1350°C (–148°F to +2462°F)	±0.1% span	±1.45°C
DSCT47K-14	K	0°C to +1200°C (32°F to +2192°F)	±0.1% span	±1.20°C
DSCT47T-06	T	–100°C to +400°C (–148°F to +752°F)	±0.1% span	±0.50°C
DSCT47T-07	T	0°C to +200°C (+32°F to +392°F)	±0.1% span	±0.20°C
DSCT47E-08	E	0°C to +1000°C (+32°F to +1832°F)	±0.1% span	±1.00°C
DSCT47R-09	R	+500°C to +1750°C (+932°F to +3182°F)	±0.1% span	±1.25°C
DSCT47S-10	S	+500°C to +1750°C (+932°F to +3182°F)	±0.1% span	±1.25°C
DSCT47B-11	B	+500°C to +1800°C (+932°F to +3272°F)	±0.1% span	±1.30°C
DSCT47N-15	N	–100°C to +1300°C (–148°F to +2372°F)	±0.1% span	±1.40°C

‡Thermocouple Alloy Combinations

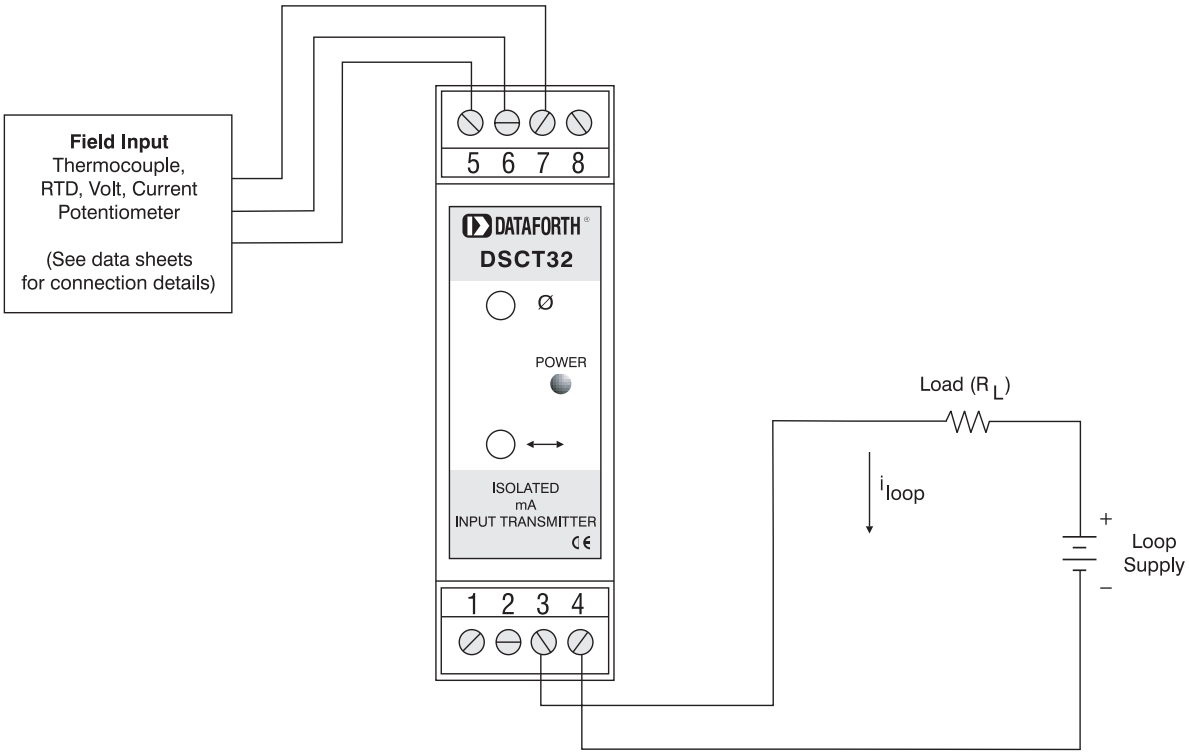
Standards: DIN IEC 584, ANSI MC96-1-82, JIS C 1602-1981

Type	Material
J	Iron vs. Copper-Nickel
K	Nickel-Chromium vs. Nickel-Aluminum
T	Copper vs. Copper-Nickel
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
N	Nickel-14.2% Chromium-1.4% Silicon vs. Nickel-4.4% Silicon- 0.1% Magnesium

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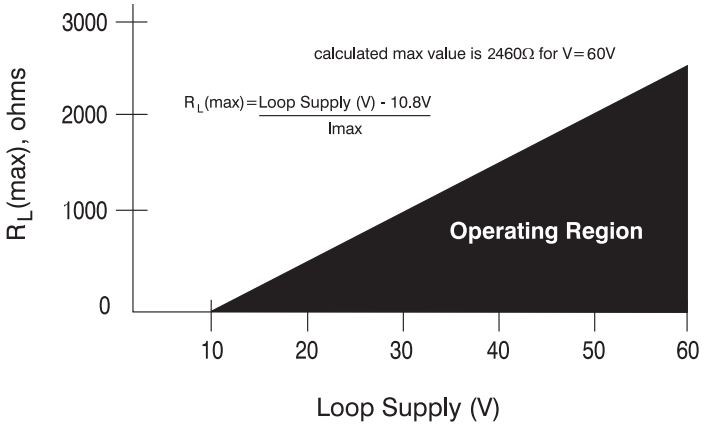
DSCT Wiring Diagram



DSCT Loop Drive Capability

The DSCT transmitter's wide range of loop supply voltage (10.8V-60V) makes it a versatile device which can be used in most any current loop. The maximum loop resistance is determined by subtracting the transmitter's minimum loop supply voltage from the total loop supply voltage and dividing the result by the maximum loop current (see graph).

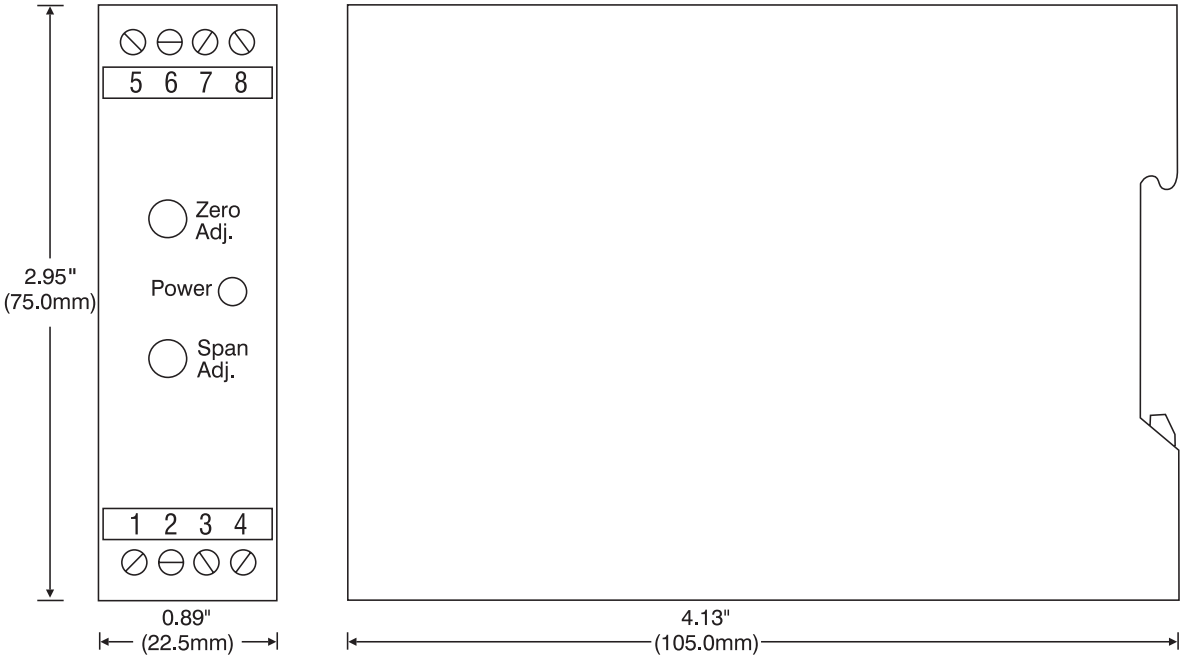
The low loop supply voltage of 10.8V allows the DSCT to be used in applications with low output power supplies, and the high loop supply voltage of 60V allows use in applications with long-distance current loops.



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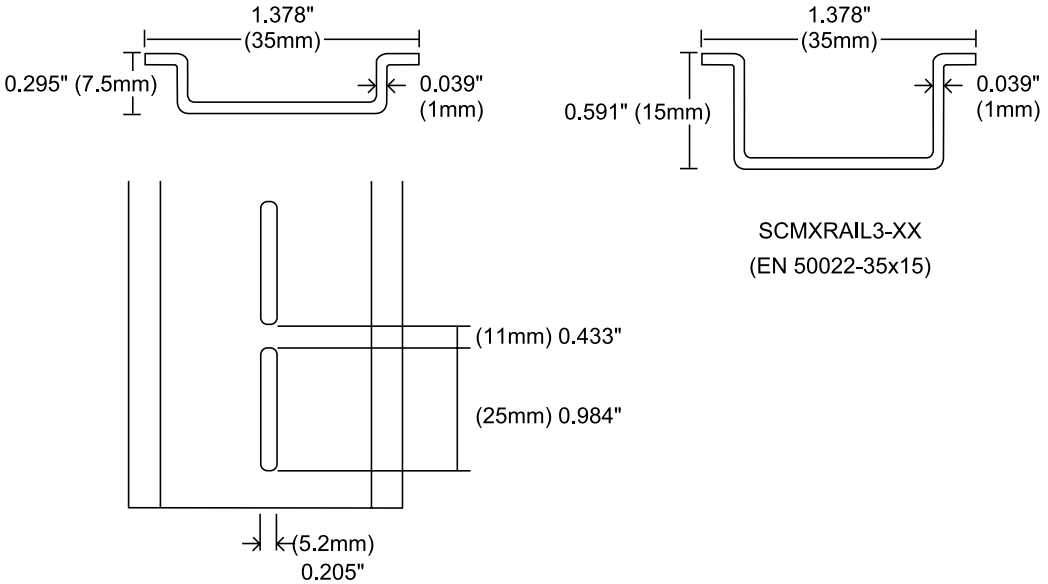
DSCT Module Dimensions



NOTES:

1) Pluggable terminal blocks accept wire sizes AWG 22-12. Strip wire insulation 0.27 in. (7mm) prior to insertion in terminal block.
2) DSCA modules can be mounted to DIN rails shown in Accessories section.

Accessories for DSCT Analog Modules



SCMXRAIL3-XX
(EN 50022-35x15)

SCMXRAIL1-XX
(EN 50022-35x7.5)

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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)

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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
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- ISO9001
- Hazardous Locations in the European Union - ATEX Directive
- Hazardous Locations in North America
- Certifications
- Why Should Sensors Be Isolated
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- 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
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- Measuring True RMS
- 2-wire, 4-20mA Applications
- System Accessories
- Why True RMS?
- Analog-to-Serial
- Transient Protection
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- Common-Mode Voltage
- Thermocouples
- 5B or 7B
- DIN or 5B/7B Option
- Signal Conditioning Tutorial
- Programmable Signal Conditioning
- When Good Grounds Go Bad
- Input Resistance
- Drift Specs
- Failure Rates
- Industrial Date Acquisition
- Single Phase Revisited
- 3-phase AC Calculations Revisited
- Using Ethernet for Data Acquisition
- Linearity and Conformity
- Reproducibility - Repeatability
- Surge Withstand Capability
- Easy Recalibration Procedure
- System Throughput
- 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

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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

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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

The information provided herein is believed to be reliable; however, DATAFORTH assumes no responsibility for inaccuracies or omissions. DATAFORTH assumes no responsibility for the use of this information, and all use of such information shall be entirely at the user's own risk. Application information is intended as suggestions for possible use of the products and not as explicit performance in a specific application. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. DATAFORTH does not authorize or warrant any DATAFORTH product for use in life-support devices and/or systems.

WORLD HEADQUARTERS

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

The Dataforth Quality Management System is ISO9001:2015 Registered



dataforth.com

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