

Product Datasheet - Technical Specifications



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DSCA42



2-Wire Transmitter Interface Signal Conditioners with Loop Power

Description

Each DSCA42 2-wire transmitter interface module provides a single channel of 4 to 20mA process current input which is filtered, isolated, amplified, and converted to a high-level voltage output (Figure 1). An isolated 24V power supply is provided to power the 2-wire transmitter. Signal filtering is accomplished with a five-pole filter which is optimized for step response. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four poles are on the system 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.

Module output is either voltage or current. For current output models a dedicated loop supply is provided at terminal 3 (+OUT) with loop return located at terminal 4 (-OUT). The system-side load may be either floating or grounded.

Special input circuits provide protection against accidental connection of powerline voltages up to 240VAC and against transient events as defined by ANSI/ IEEE C37.90.1. Protection circuits are also present on the signal output and power input terminals to guard against transient events and power reversal. Signal and 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 ±5% 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 Process Loop Signals
- Industry Standard Output of 0 to +10V, 2 to +10V, 0 to 20mA, or 4 to 20mA
- Provides Isolated Loop Excitation
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- True 3-Way Isolation
- Wide Range of Supply Voltage
- 105dB CMR
- 5 Poles of Filtering
- ±0.03% Accuracy
- ±0.01% Linearity
- Easily Mounts on Standard DIN Rail
- C-UL-US Listed
- CE and ATEX Compliant

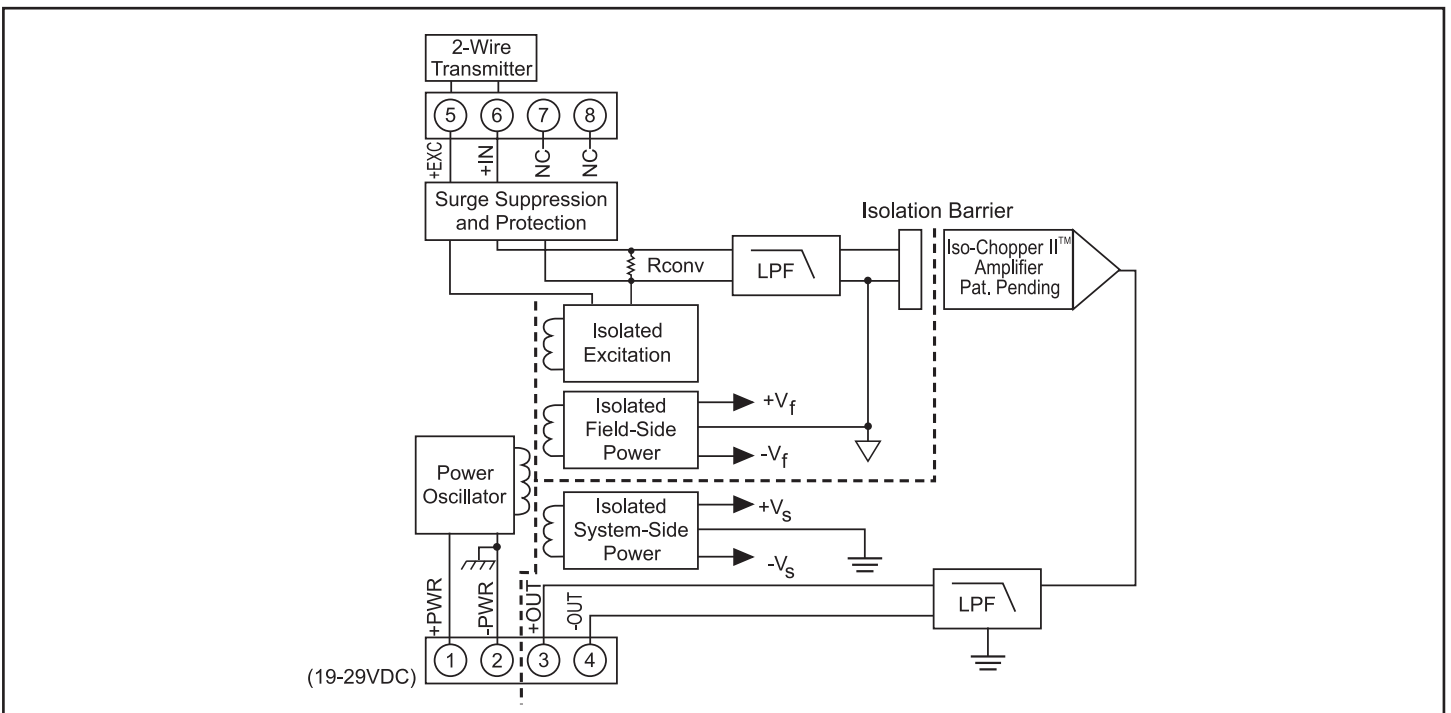


Figure 1: DSCA42 Block Diagram

Specifications Typical* at $T_A = +25^\circ\text{C}$ and +24VDC supply voltage

| Module | DSCA42 |
|--------------------------------------|---|
| Input Range | 4-20mA |
| Input Resistance | |
| Normal | <100 Ω |
| Power Off | <100 Ω |
| Overload | 65k Ω |
| Input Protection | |
| Continuous | 240Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| Loop Supply Voltage | +20VDC |
| Isolated Excitation Protection | |
| Continuous | 240Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| Output Range | See Ordering Information |
| Load Resistance (I_{OUT}) | 600 Ω max |
| Current Limit | 8mA (V_{OUT}), 30mA (I_{OUT}) |
| Output Protection | |
| Short to Ground | Continuous |
| Transient | ANSI/IEEE C37.90.1 |
| CMV, Input to Output, Input to Power | |
| Continuous | 1500Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| CMV, Output to Power | |
| Continuous | 50VDC max |
| CMR (50Hz or 60Hz) | 105dB |
| Accuracy ⁽¹⁾ | $\pm 0.03\%$ Span |
| Linearity | $\pm 0.01\%$ Span |
| Adjustability | $\pm 5\%$ Zero and Span |
| Stability | |
| Offset | $\pm 6\text{ppm}/^\circ\text{C}$ (V_{OUT}), $\pm 20\text{ppm}/^\circ\text{C}$ (I_{OUT}) |
| Gain | $\pm 40\text{ppm}/^\circ\text{C}$ |
| Output Noise, 100kHz Bandwidth | 300 μVrms (V_{OUT}), 1.5 μArms (I_{OUT}) |
| Bandwidth, -3dB | 100Hz |
| NMR (-3dB at 100Hz) | 100dB per Decade above 100Hz |
| Response Time, 90% Span | 5ms |
| Power Supply | |
| Voltage | 19 to 29VDC |
| Current | 60mA (V_{OUT}), 80mA (I_{OUT}) |
| Sensitivity | $\pm 0.0002\%$ % |
| Protection | |
| Reverse Polarity | Continuous |
| Transient | ANSI/IEEE C37.90.1 |
| 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 Range | -40 $^\circ\text{C}$ to +80 $^\circ\text{C}$ |
| Storage Temperature Range | -40 $^\circ\text{C}$ to +80 $^\circ\text{C}$ |
| 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 $\pm 0.5\%$ Span Error |
| ESD, EFT | Performance B |

NOTES:

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

(1) Includes linearity, hysteresis and repeatability.

Ordering Information

| Model | Input Range | Output Range |
|------------|-------------|--------------|
| DSCA42-01 | 4mA to 20mA | 0V to +10V |
| DSCA42-02 | 4mA to 20mA | 2V to +10V |
| DSCA42-01C | 4mA to 20mA | 4 to 20mA |
| DSCA42-01E | 4mA to 20mA | 0 to 20mA |

Installation Notes:

- 1.) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B, C, D, or Non-Hazardous Locations Only.
- 2.) WARNING - Explosion Hazard - Substitution of Components May Impair Suitability for Class I, Division 2.
- 3.) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or The Area is Known to be Non-Hazardous.
- 4.) The Power to These Devices Shall Be Limited By an Over-Current Protection Device, UL Certified Fuse (JDYX/JDYX2) Rated 6A Max.