# DSCP63 Configuration Guide

## DC Voltage/Current Converter

### Description

Each 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.

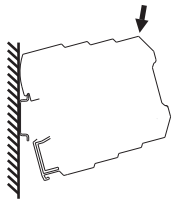
### Specifications Typical at $T_A$=+25°C and +24VDC power

| Module | DSCP63 |
|---|---|
| Input (selectable) | |
| Voltage (maximum 50VDC) | 0 to 15, 0 to 30VDC (input R = 325kΩ) |
| Voltage (maximum 30VDC) | 0 to 5, 1 to 5, 0 to 10, 2 to 10VDC (input R = 110kΩ) |
| Current (maximum 24mA) | 0 to 20, 4 to 20mA (input R = 35Ω) |
| Accuracy | ±0.1% (max) |
| Thermal Drift | <120ppm/°K |
| A/D Conversion | 14-bit |
| Processing | Floating point 32-bit |
| Response Time, 90% Span (selectable) | <35ms (without filter), <74ms (with filter) |
| 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 to 20, 4 to 20, 20 to 0 or 20 to 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 to 5, 1 to 5, 0 to 10 or 2 to 10VDC Load resistance: 2kΩ (min) |
| Power Supply | 19.2 to 30VDC |
| Power Consumption | <600mW (22mA at 24VDC) |
| Hot Swapping | Yes |
| 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 |
| 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) |

### Installation rules

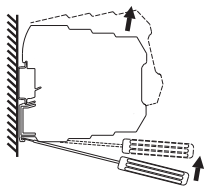
This module is designed for assembly on a DIN 46277 rail. Assembly in a vertical position is recommended to increase the module's ventilation. Be sure that no raceways or other objects that compromise aeration are positioned in the vicinity, and do not position the module above equipment that generates heat. We recommend positioning the module in the lower part of the control panel or container compartment. We also recommend rail-type assembly using the Power Bus connector, which eliminates the need to connect the power supply to each module.

**Inserting module in DIN rail**



1. Attach module in upper part of rail.
2. Press module downward.

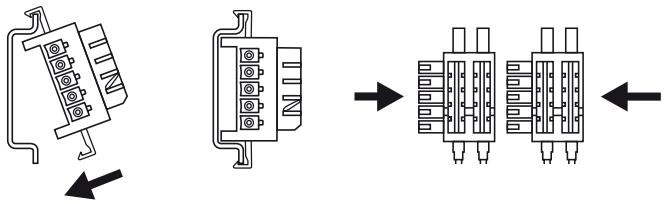
**Extracting module from DIN rail**



1. Apply leverage using a screwdriver (as shown in figure).
2. Rotate module upward.

### Using the Power-Bus connector

Each expandable Power-Bus connector allows insertion of two modules. Insert Power-Bus connectors into the DIN rail by attaching to upper side of rail and rotating downward.



**NOTE:**
The Power-Bus must be inserted with protruding terminals on the left (as shown in figure above); otherwise the modules are turned upside down.

**Never connect power supply directly to the bus connector on the DIN rail. Never tap power from the bus connector either directly or by using module terminals.**

### Factory dip-switch settings

The module leaves the factory with all dip-switches in the OFF position. The default configuration is as follows:

| | |
|---|---|
| Input signal | 0 to 20mA |
| 50/60Hz line rejection | 50Hz |
| Input filter | Not enabled |
| Inversion | Not enabled |
| Linearization | None |
| Output signal | 0 to 20mA |
| Input over-range | Output signal is limited to +2.5% of max (or –2.5% of min) with input over-ranged |

This configuration is valid only with all dip-switches in the OFF position. If even one dip-switch is not in the OFF position, all parameters must be set as indicated in the following tables.

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**NOTE:**
**The indication ● means the dip-switch is set in the ON position.**
**No indication means the dip-switch is set in the OFF position.**

| Input signal | | | | |
|---|---|---|---|---|
| SW1 | 1 | 2 | 3 | |
| | | | | 0 to 20mA |
| | ● | | | 4 to 20mA |
| | | ● | | 0 to 10VDC |
| | ● | ● | | 2 to 10VDC |
| | | | ● | 1 to 5VDC |
| | ● | | ● | 0 to 5VDC |
| | | ● | ● | 0 to 30VDC |
| | ● | ● | ● | 0 to 15VDC |

| 50/60Hz line rejection | | |
|---|---|---|
| SW1 | 4 | |
| | ● | 60Hz |
| | | 50Hz |

| Input filter | | | | |
|---|---|---|---|---|
| SW1 | 5 | | 10-90% response, 50Hz | 10-90% response, 60Hz |
| | ● | Enabled | max 88ms | max 74ms |
| | | Not enabled | max 41ms | max 35ms |

| Inversion | | |
|---|---|---|
| SW1 | 6 | |
| | ● | Enabled |
| | | Not enabled |

| Linearization function | | | |
|---|---|---|---|
| SW1 | 7 | 8 | |
| | | | Default |
| | ● | | None |
| | | ● | SQRT |
| | ● | ● | Tank |

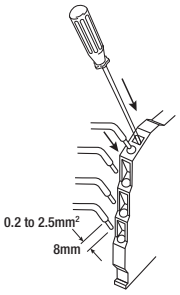
| Output signal | | | | |
|---|---|---|---|---|
| SW2 | 1 | 2 | 3 | |
| | | | | 0 to 20mA |
| | ● | | | 4 to 20mA |
| | | ● | | 20 to 0mA * |
| | ● | ● | | 20 to 4mA * |
| | | | ● | 0 to 10VDC |
| | ● | | ● | 0 to 5VDC |
| | | ● | ● | 1 to 5VDC |
| | ● | ● | ● | 2 to 10VDC |

* These are inverse output ranges that are useful whenever the linearization applied is incompatible with inversion of the input.

| Over-range / Under-range Options (See table below for corresponding values) | | |
|---|---|---|
| SW2 | 4 | |
| | ● | ON: Output signal is limited to ±5% of full-scale setting with input over- / under-ranged |
| | | OFF: Output signal is limited to ±2.5% of full-scale setting with input over- / under-ranged |

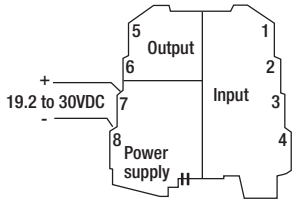
| Nominal output value | Over- / Under-range limited to ±2.5% of full-scale setting | Over- / Under-range limited to ±5% of full-scale setting |
|---|---|---|
| 20mA | 20.5mA | 21mA |
| 4mA | 3.5mA | 3mA |
| 0mA | 0mA | 0mA |
| 30VDC | 30.75VDC | 31.5VDC |
| 15VDC | 15.375VDC | 15.75VDC |
| 10VDC | 10.25VDC | 10.5VDC |
| 5VDC | 5.125VDC | 5.25VDC |
| 1VDC | 0.875VDC | 0.75VDC |
| 2VDC | 1.75VDC | 1.5VDC |
| 0VDC | 0VDC | 0VDC |

## Electrical connections




The module is designed for spring cage clamp electrical connections.
1. Strip cables by 0.8mm.
2. Insert screwdriver in the square hole and press until the cable lock spring opens.
3. Insert cable in the round hole.
4. Remove screwdriver and ensure cable is tightly fastened in the terminal.

## Power supply




There are three ways to power the DSCP6x series of signal converters.

1. Connect the 24VDC power supply directly to terminals 7 (+) and 8 (-) of each module.

2. Connect power to one signal converter and use the expandable Power-Bus connector to distribute power to a maximum of 16 adjacent modules. The bus can be supplied from any of the modules, but the total current consumption of the bus must be less than 400mA. Higher consumption values can damage the module. An appropriately sized fuse must be connected in series with the power supply.

3. Use the DSCP70 Power Supply Connection Module and the expandable Power-Bus connector to distribute power to a maximum of 75 modules. The DSCP70 is designed to protect the modules connected via bus against overvoltage loads. The bus connector can be provided with power using the DSCP70 module if the total consumption of the bus is less than 1.5A. Higher consumption values can damage both the module and the bus. An appropriately sized fuse must be connected in series with the power supply.

## Input

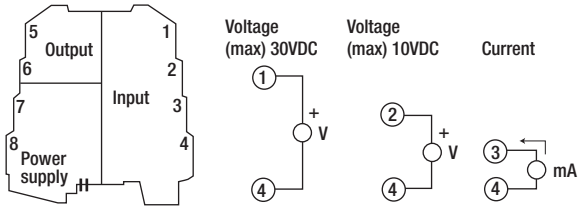
The module accepts a current or voltage input signal.
The use of shielded cables is recommended for the electronic connections.

## Voltage input

Terminal 1: Voltage input up to 30VDC
Terminal 2: Voltage input up to 10VDC
Terminal 4: Return

## Current input

Terminal 3: Current input
Terminal 4: Return

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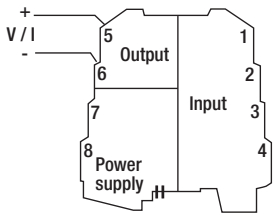
### Output: Voltage / Current connections

The use of shielded cables is recommended for the electronic connections.




**NOTE:** To reduce power dissipation, load must be ≥250Ω for current output option.

### LED indications on front of module

| LED (red) | Meaning |
|---|---|
| Flashing | Internal fault |
| Steady light | Input or output out-of-range limiter device triggered or input saturation |

**NOTE:** In case of internal fault, the output will stay at zero value.

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