DSCP64 Configuration Guide

DC Voltage/Current Converter with Transducer Power Supply

Description

Each 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 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

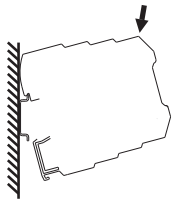
Typical at T_A=+25°C and +24VDC power

Module	DSCP64
Input (selectable)	
Voltage	0 to 5, 1 to 5, 0 to 10, 2 to 10VDC (input R = 110kΩ)
Current	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)
Auxiliary Power Supply	17 to 21VDC, 0 to 25mA
Power Supply	19.2 to 30VDC
Power Consumption	23mA (max) at 24VDC with output at 20mA and auxiliary supply not used 45mA (max) at 24VDC with output at 21mA and auxilliary supply at 21mA
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	1.6 ounces (46g)

Installation rules

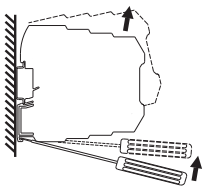
This module is designed for assembly on a DIN 46277 rail. Assembly in a vertical position is recommended to increase the module's ventilation. Be sure that no raceways or other objects that compromise aeration are positioned in the vicinity, and do not position the module above equipment that generates 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.

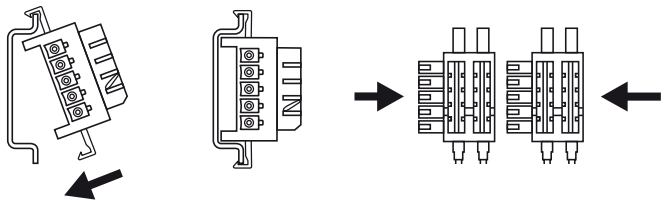
Extracting module from DIN rail



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
		•	•	Not allowed
	•	•	•	Not allowed

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

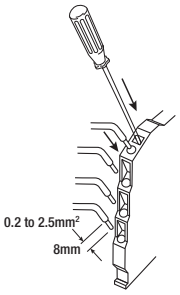
Output signal				
SW2	1	2	3	
				0 to 20mA
	•			4 to 20mA
		•		20 to 0mA *
	•	•		20 to 4mA *
			•	0 to 10VDC
	•		•	0 to 5VDC
		•	•	1 to 5VDC
	•	•	•	2 to 10VDC

* 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

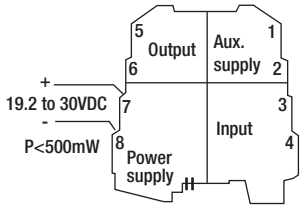
Nominal output value	Over- / Under-range limited to ±2.5% of full-scale setting	Over- / Under-range limited to ±5% of full-scale setting
20mA	20.5mA	21mA
4mA	3.5mA	3mA
0mA	0mA	0mA
10VDC	10.25VDC	10.5VDC
5VDC	5.125VDC	5.25VDC
1VDC	0.875VDC	0.75VDC
2VDC	1.75VDC	1.5VDC
0VDC	0VDC	0VDC

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 and auxiliary power supply

Input

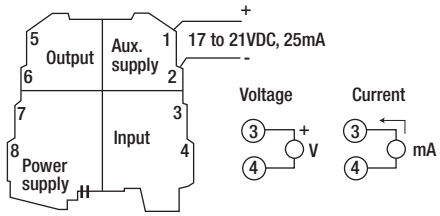
The module accepts a current or voltage input signal.
The use of shielded cables is recommended for the electronic connections.

Voltage input
Terminal 3: Voltage input
Terminal 4: Return (GND)

Current input
Terminal 3: Current input
Terminal 4: Return (GND)

Auxiliary power supply

The value of the provided voltage is independent from the power supply connected to terminals 7 and 8.



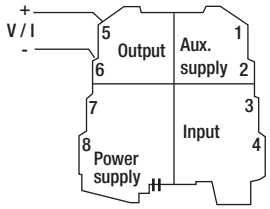
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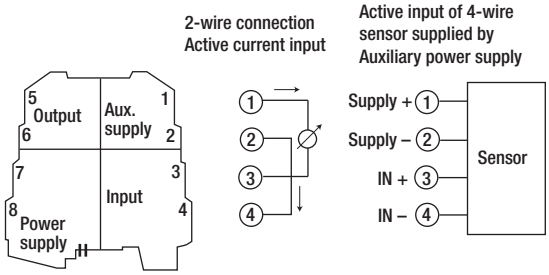
Output: Voltage / Current connections

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



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

Examples of active input connections



LED indications on front of module

LED (red)	Meaning
Fast flashing	Internal fault
Slow flashing	Dip-switch setting not allowed
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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