

Model D1

Programmable Sensor Signal Conditioners



Description

Model D1 is a programmable sensor signal conditioner (SSC), which is developed to work with a wide range of resistive sensors in which the sensing elements are configured to a Wheatstone bridge circuit. On one hand the D1 SSC provides either constant excitation voltage or excitation current to the sensor, and on the other hand the D1 SSC amplifies and conditions the sensor output signals to the signal which meets the customer's needs for his application. For instance, the output of the D1 SSC can be either an analogue or a digital signal which can be directly used by a PLC (programmable logic controller) or by any computer-based data acquisition system.

In fact the D1 SSC can process any input signal from sensors of output sensitivity ranging from 1.25mV/V to 20mV/V, and provide the sensors with either a constant excitation voltage of 4Vdc or a constant excitation current. The excitation current is adjustable from 50µA to 750µA by means of a computer or a specific device.

The output signals from the D1 SSC can be configured with various options, from analogue signals of 4~20mA, 0~5V or 0~10V, through ratiometric 10%~90%Vs, to digital signals of RS485, I²C or SPI, so as to meet the needs of different systems.

The Zero output and Span of the D1 SSC can be adjusted at any time, either via the computer at a laboratory or by the specific device on site when the D1 is operated in the field.

Thanks to the advanced technology of electronics, the D1 SSC delivers its programmable features for application. Therefore, the mechanical knobs have been eliminated from the previous version of D1. As a result, the current version of the D1 SSC can meet environment protection up to IP67.



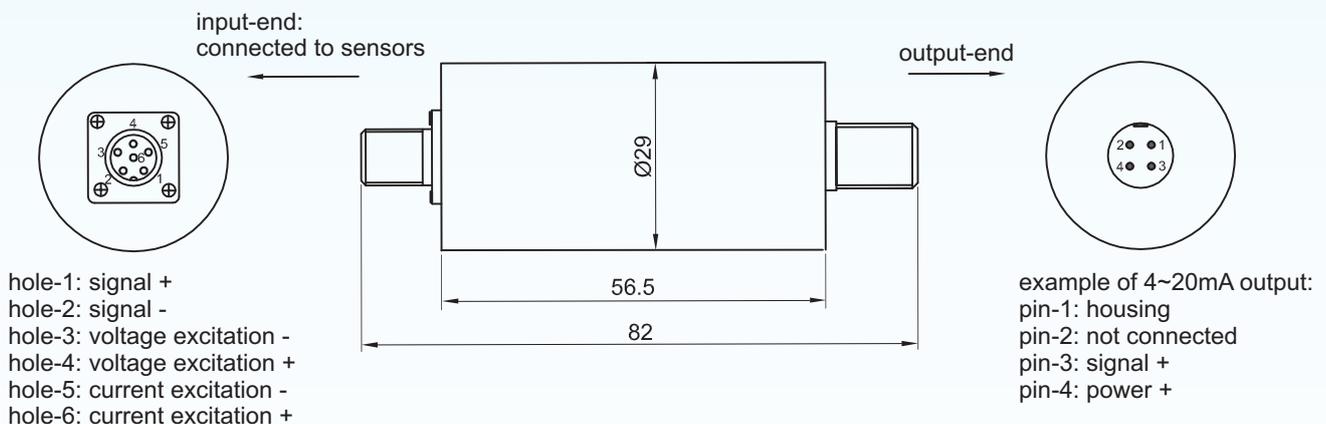
Features

- working with resistive sensors based on Wheatstone bridge circuit
- input sensitivity: 1.25mV/V, ..., 100mV/V
- output signal available:
 - analogue signal: 4~20mA, 0~5Vdc, 0~10Vdc or 10%~90%Vs;
 - digital signal: RS485, I²C or SPI.
- constant excitation current selectable from 50µA to 750µA
- Zero and Span adjustment via an external device or a computer
- environment protection up to IP67

Applications

- amplifying and conditioning sensor signals of resistive sensors

Dimensions



Note: All dimensions are in mm.

BCM SENSOR TECHNOLOGIES BVBA

Model D1

Programmable Sensor Signal Conditioners



Technical Data

Parameters		Units	Specifications	Notes
number of channels			1	
input sensitivity (S)		mV/V	1.25, ..., 100	1
output signal	analogue		4~20mA (standard), 0~5V, 0~10V, 10%~90%Vs	
	digital		RS485, I ² C, SPI	
accuracy		%fs	0.1, if output = 4~20mA, 0~5V, 0~10V, 10%~90%Vs, or RS485	
			0.3, if output = I ² C, or SPI	
supply voltage (Vs)		Vdc	8, ..., 30, if output = 4~20mA, 0~5V, or RS485	
			12, ..., 30, if output = 0~10V	
			≥ 3, if output = 10%~90%Vs	
			5, if output = I ² C, or SPI	
power consumption		mW	≤ 480, at 24Vdc, 20mA output	
input resistance of connected sensors (R _{in})		kΩ	≥ 1.6	2
output resistance of connected sensors		kΩ	no requirement	
load resistance (R _L)	4~20mA	Ω	≤ (Vs - 10) / 0.02 - R ₀ , R ₀ refer to cable resistance, R _L can be 0Ω.	
	voltage output	Ω	≥ Vout / 0.005, R _L the larger the better.	
	RS485		according to standard ANSI/TIA/EIA-485-A-1998	
load capacitance	I ² C, SPI	pF	≤ 400 as total capacitance of load.	
excitation voltage to connected sensors		Vdc	4	
excitation current to connected sensors		μA	50, ..., 750	3
operating temperature range		°C	-40 ~ +85	
electrical interface	input-end		6-pin connector, attached with its matting connector	
	output-end		4-pin connector or 6-pin connector (if output = SPI), attached with its matting connector of cable	
housing material			anodized aluminum	
EMC compliance			EN 61000-6-2: 2005, EN61000-6-4: 2007	
environment protection			IP66 (standard), IP67	
net weight		gram	~100	

Notes:

1. The listed values of S is based on R_{in} ≥ 1.6kΩ. In case R_{in} < 1.6kΩ, one can use the following formula to check whether the D1 SSC is suitable in the application:

$$S \times R_{in} / 1.6k\Omega \times 4V \geq 5mV$$

2. In case R_{in} cannot meet the required resistance, one can add an additional resistor in series to R_{in} so that total equivalent resistance is not less than 1.6kΩ.

3. The bridge excitation current is pre-set according to specified S in the ordering code.

If necessary, this parameter can be adjusted with a step of 50μA via the adjustment device or computer.

BCM SENSOR TECHNOLOGIES BVBA

Model D1

Programmable Sensor Signal Conditioners



Ordering Information

position (pos.) 1: model						
D1						
pos. 2: input sensitivity						
1.25mV/V, ..., 100mV/V Specify this parameter according to the sensor which will work with the D1, e.g., 2mV/V.						
pos. 3: output signal						
4/20mA (standard)						
0/5V		0/10V		10%/90%Vs		
RS485		I2C		SPI		
pos. 4: accuracy						
0.1%fs, if output = 4~20mA, 0~5V, 0~10V, 10%~90%Vs or RS485						
0.3%fs, if output = I ² C or SPI						
pos. 5: electrical interface of output-end						
Specify the length in meter of the cable attached with the matting connector, e.g, 1m. "0m" = no cable attached to the matting connector.						
pos. 6: environment protection						
IP66 (standard)				IP67		
pos. 7: customized specifications						
"(*)" is necessary only if any customized parameter is required, otherwise it is neglectable.						
pos.1	pos. 2	pos. 3	pos. 4	pos. 5	pos. 6	pos. 7

Examples of Ordering Code

- standard SSC:

D1-2mV/V-4/20mA-0.1%fs-0m-IP66

- customized SSC:

D1-2mV/V-4/20mA-0.1%fs-1m-IP67-(*)

(*): Customized environment protection = IP67.

The listed dimensions, specifications, and data are subject to change without prior notice.

BCM SENSOR TECHNOLOGIES BVBA

