

INSTRUCTION MANUAL

SIL 2 Load Cell/Strain Gauge Bridge
Isolating Repeater, DIN-Rail and Power Bus
Model D6263S



Characteristics

General Description:

The single channel DIN Rail Load Cell/Strain Gauge Bridge Isolating Repeater D6263S module is a unit suitable for applications requiring SIL 2 level (according to IEC 61508:2010) in safety related systems for high risk industries.

The unit acts as a transparent galvanic isolated interface installed between a weighing indicator and a load cell (or group of load cells); it appears at the terminals of the indicator as a single load cell equivalent to the one in the field. It provides a fully floating power supply voltage with remote sensing capability to load cell and repeats, while isolating, the mV signal output to drive a load depending on the host system reference voltage. Up to four 350 Ω load cells, or five 450 Ω load cells, or ten 1000 Ω load cells can be connected in parallel.

The Voltage reference (on output side) is set as an external supply.

Function:

1 channel input from strain gauge signals, provides 3 port isolation (input/output/supply) and repeats, as a transparent unit, the bridge signal output.

Signalling LED:

Power supply indication (green).

EMC:

Fully compliant with CE marking applicable requirements.

Technical Data

Supply:

24 Vdc nom (18 to 30 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp.

Current consumption @ 24 V: 85 mA with four 350 Ω load cells connected, typical.

Power dissipation: 1.8 W with 24 V supply and four 350 Ω load cells connected typical.

Isolation (Test Voltage):

In / Out 1.5 KV; In / Supply 1.5 KV; Out / Supply 500 V.

Input:

up to four 350 Ω load cells in parallel or up to five 450 Ω load cells in parallel or up to ten 1000 Ω load cells in parallel.

A/D conversion time: 12.5 ms

Bridge supply voltage: 4.0 Vdc nominal.

Bridge output signal: 1 to 4 mV/V.

Line resistance compensation: ≤ 10 Ω .

Output:

Same as Input signal.

Output impedance: 500 Ω typical.

Excitation voltage: ≥ 4.0 V typical, ≤ 15 V maximum. Externally applied.

Transfer characteristic: linear based on mV input.

Response time: ≤ 100 ms (10 to 90 % step change).

Performance:

Ref. Conditions 24 V supply, 23 ± 1 °C ambient temperature.

Calibration accuracy after system calibration: $\leq \pm 0.003$ % of full scale of input range.

Linearity accuracy: $\leq \pm 0.002$ % of full scale of input range.

Supply voltage influence: $\leq \pm 0.002$ % of full scale for a min to max supply change.

Temperature influence: $\leq \pm 0.002$ % of full scale of input range for a 1 °C change.

Compatibility:

 CE mark compliant, conforms to Directives:
2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:

Operating: temperature limits -40 to $+70$ °C, relative humidity max 95 % non condensing, up to 55 °C.

Storage: temperature limits -45 to $+80$ °C.

Max altitude: 2000 m a.s.l.

Approvals:

SIL 2 conforms to IEC61508:2010 Ed.2.

Mounting:

 EN/IEC60715 TH 35 DIN-Rail, with or without Power Bus.

Weight: about 165 g.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm² (13 AWG).

Protection class: IP 20.

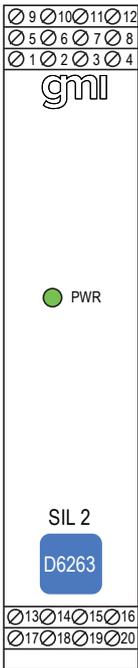
Dimensions: Width 22.5 mm, Depth 123 mm, Height 120 mm.

Ordering Information

Model: D6263S

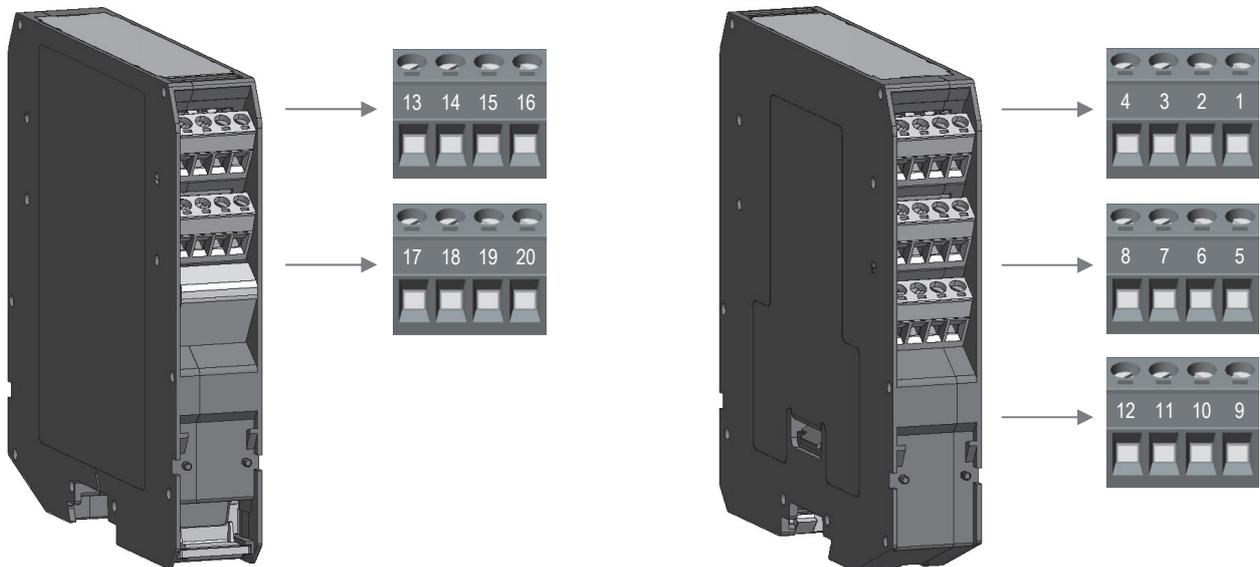
Power Bus and DIN-Rail accessories:
 Connector JDFT050
 Cover and fix MCHP196
 Terminal block male MOR017
 Terminal block female MOR022

Front Panel and Features



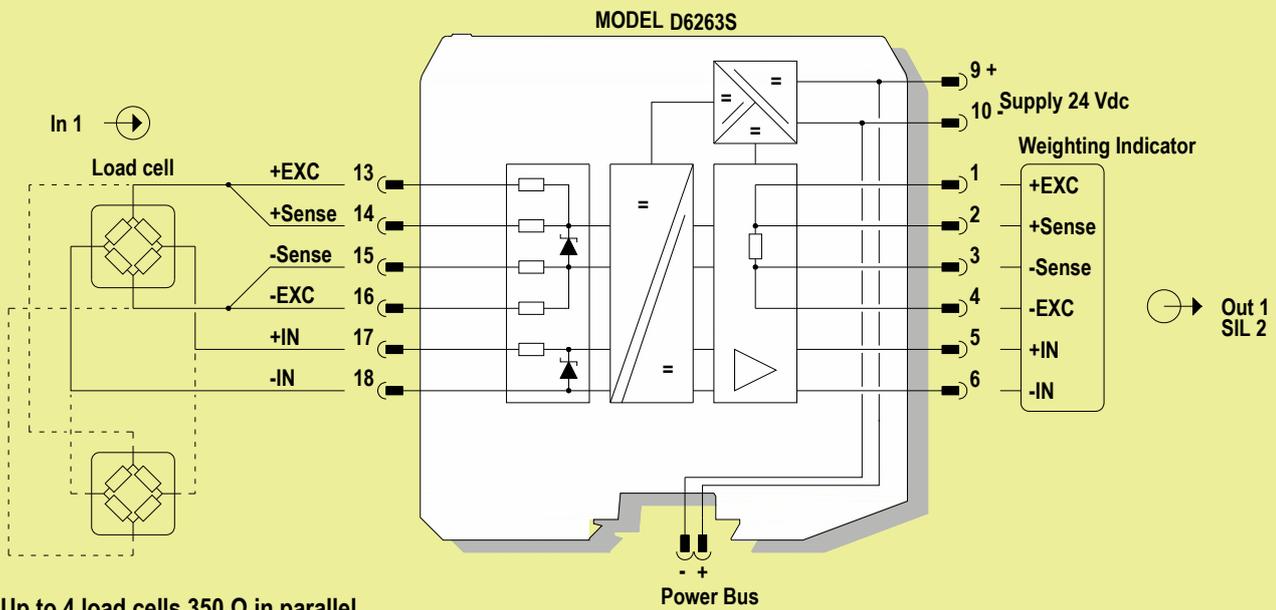
- Strain Gauge Bridge Transparent Repeater.
- Up to four 350 Ω load cells in parallel or up to five 450 Ω load cells in parallel or up to ten 1000 Ω load cells in parallel.
- High Accuracy.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety system.
- High Reliability, SMD components.
- Simplified installation using standard DIN Rail and plug-in terminal blocks, with or without Power Bus.

Terminal block connections



13	+ Input Ch 1 EXC (Load cell)
14	+ Input Ch 1 Sense (Load cell)
15	- Input Ch 1 Sense (Load cell)
16	- Input Ch 1 EXC (Load cell)
17	+ Input Ch 1 IN (Load cell)
18	- Input Ch 1 IN (Load cell)
19	Not used
20	Not used

1	+ Output Ch 1 EXC (Weighing Indicator)
2	+ Output Ch 1 Sense (Weighing Indicator)
3	- Output Ch 1 Sense (Weighing Indicator)
4	- Output Ch 1 EXC (Weighing Indicator)
5	+ Output Ch 1 IN (Weighing Indicator)
6	- Output Ch 1 IN (Weighing Indicator)
7	Not used
8	Not used
9	+ Power Supply 24 Vdc
10	- Power Supply 24 Vdc
11	Not used
12	Not used



Up to 4 load cells 350 Ω in parallel
 Up to 5 load cells 450 Ω in parallel
 Up to 10 load cells 1000 Ω in parallel

Warning

D6263 series must be installed, operated and maintained only by qualified personnel, in accordance with the relevant national/international installation standards. Failure to properly installation or use of the equipment may risk to damage the unit or severe personal injury. The unit cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided.

Operation

The D6263 series strain gauge bridge isolating repeater acts as transparent galvanic isolated interface between weighing indicator and a load cell (or group of n load cells). It provides a fully floating power supply voltage with remote sensing capability to strain gauge bridge and repeats the corresponding output signal. Remote sensing wires (terminals "14" +Sense and "15" –Sense) must be always connected to force lines (terminals "13" +Exc and "16" –Exc) for proper operation of the unit, in case of 4 wires cell connect the sensing lines near to the cell connections to minimize the power supply voltage compensation error. The mV input signal is isolated and repeated to drive a weighing indicator. The unit appears at the terminals of the indicator as a single load cell equivalent to the one installed in the field area. The mV output signal is proportional to the reference voltage of the host system. A "POWER ON" green led lits when input power is present.

Installation

D6263 series is a Load Cell/Strain Gauge Bridge Isolating Repeater housed in a plastic enclosure suitable for installation on EN/IEC60715 TH 35 DIN-Rail, with or without Power Bus. D6263 series can be mounted with any orientation over the entire ambient temperature range. Electrical connections are accommodated by polarized plug-in removable screw terminal blocks which can be plugged in/out into a powered unit without suffering or causing any damage. Connect only one individual conductor per each clamping point, use conductors up to 2.5 mm² (13 AWG) and a torque value of 0.5-0.6 Nm. Use only cables that are suitable for a temperature of at least 85°C. The wiring cables have to be proportionate in base to the current and the length of the cable. On the section "Function Diagram" and enclosure side a block diagram identifies all connections. Identify the function and location of each connection terminal using the wiring diagram in the corresponding section, for example: Connect a 24 Vdc power supply voltage between terminals "9" (positive pole) and "10" (negative pole). Connect positive output at terminal "5" and negative output at "6". Connect host reference voltage at terminal "1" positive and terminal "4" negative. If host system has remote voltage sensing capability, connect sensing wire at terminal "2" positive and terminal "3" negative. Connect strain gauge bridge voltage supply at terminal "13" positive and terminal "16" negative. Connect strain gauge bridge voltage sensing supply at terminal "14" positive and terminal "15" negative. If strain gauge bridge has no internal voltage sensing capability always connect terminal "14" to terminal "13" and terminal "16" to terminal "15"; for better performance connect the wire at the end of the line near the load cells. Connect strain gauge bridge output signal at terminal "17" positive and terminal "18" negative.

The enclosure provides, according to EN60529, an IP20 minimum degree of protection (or similar to NEMA Standard 250 type 1). The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1. The end user is responsible to ensure that the operating temperature of the module is not exceeded in the end use application. Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water. Any penetration of cleaning liquid must be avoided to prevent damage to the unit. Any unauthorized modification must be avoided. D6263 series must be connected to SELV or PELV supplies. All circuits connected to D6263 series must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

Start-up

Before powering the unit check that all wires are properly connected, particularly supply conductors and their polarity, input and output wires. Check conductors for exposed wires that could touch each other causing dangerous unwanted shorts. **Before turning power on, field load cell must be connected to the module.** Then, turn power on, the "power on" green led must be lit, the unit repeats the load cell condition, check with the weighing indicator the proper value reading.