

INSTRUCTION MANUAL

SIL 2 Repeater Power Supply Hart,
DIN-Rail and Termination Board
Models D6015SS, D6015SK



General Description:

The single channel Repeater Power Supply, D6015SS and D6015SK modules, is a high integrity analog input interface suitable for applications requiring SIL 2 level (according to IEC 61508:2010 Ed.2) in safety related systems for high risk industries.

Provides a fully floating dc supply for energizing conventional 2 wires passive 4-20 mA or 4 wires (active) transmitters and repeats the current in floating circuit to drive a load.

The circuit allows bi-directional communication signals, for HART® transmitters.

Mounting on standard DIN-Rail, with or without Power Bus, or on customized Termination Boards.

D6015SS: Single channel, source output.

D6015SK: Single channel, sink output.

Functional Safety Management Certification:

G.M. International is certified by TUV to conform to IEC61508:2010 part 1 clauses 5-6 for safety related systems up to and included SIL 3.



Technical Data

Supply:

24 Vdc nom (18 to 30 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp, 2 A time lag fuse internally protected.

Current consumption @ 24 V: 50 mA with 20 mA output typical.

Power dissipation: 0.90 W with 24 V supply voltage and 20 mA output typical.

Isolation (Test Voltage):

I.S. In/Out 2.5 KV; I.S. In/Supply 2.5 KV; Out/Supply 500 V.

Input:

4 to 20 mA (separately powered input, voltage drop ≤ 0.5 V) or

4 to 20 mA (2 wires Tx current limited at ≈ 25 mA), reading range 0 to 24 mA.

Transmitter line voltage:

16.0 V typical at 20 mA with max.

Output:

4 to 20 mA, on max. 550 Ω load in source mode (typical 12 V compliance);

V min. 8 V at 0 Ω load V max. 30 V in sink mode, current limited at ≈ 25 mA.

Response time: 5 ms (0 to 100 % step change).

Performance:

Ref. Conditions 24 V supply, 250 Ω load, 23 ± 1 °C ambient temperature.

Calibration accuracy: $\leq \pm 0.1$ % of full scale.

Linearity error: $\leq \pm 0.05$ % of full scale.

Supply voltage influence: $\leq \pm 0.02$ % of full scale for a min to max supply change.

Load influence: $\leq \pm 0.02$ % of full scale for a 0 to 100 % load resistance change.

Temperature influence: $\leq \pm 0.01$ % of full scale on zero and span 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 95 %, up to 55 °C.

Storage: temperature limits – 45 to + 80 °C.

Approvals:



TUV Certificate No. C-IS-272994-01 SIL 2 conforms to IEC61508:2010 Ed. 2.

TUV Certificate No. C-IS-236198-09, SIL 3 Functional Safety Certificate conforms to IEC61508:2010 Ed.2, for Management of Functional Safety.

Mounting:

EN/IEC60715 TH 35 DIN-Rail, with or without Power Bus or on customized Termination Board.

Weight: about 130 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 12.5 mm, Depth 123 mm, Height 120 mm.

Ordering Information

Model:	D6015
1 channel source output	SS
1 channel sink output	SK

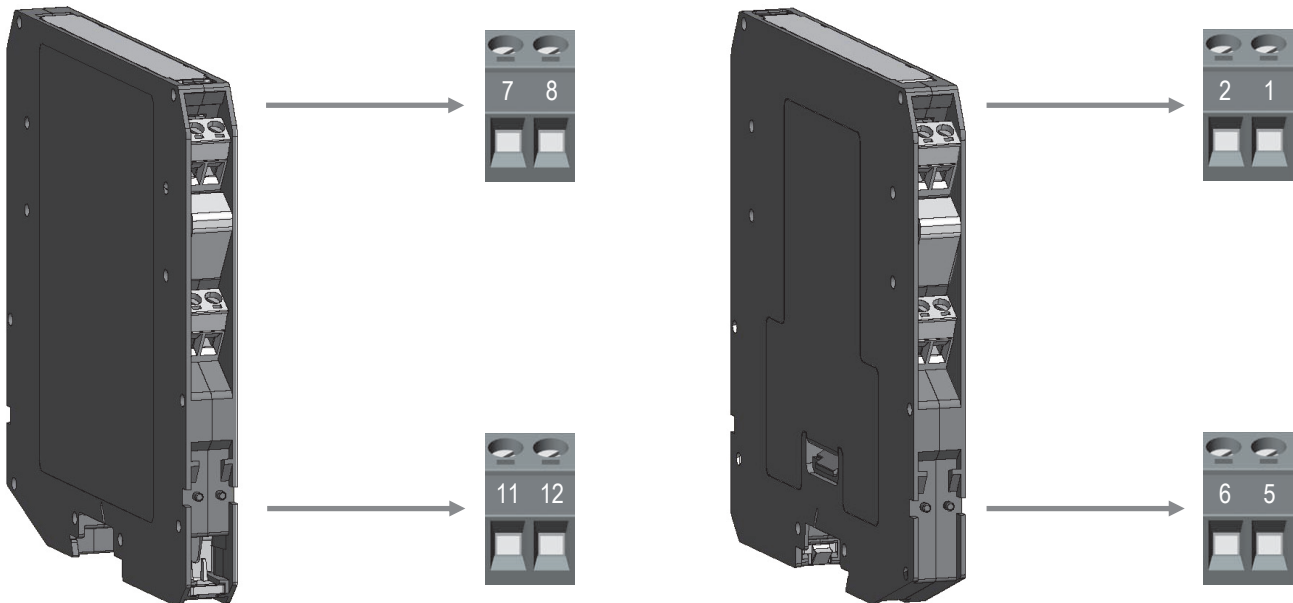
Power Bus and DIN-Rail accessories:
 Connector JDFT049 Cover and fix MCHP196
 Terminal block male MOR017 Terminal block female MOR022

Front Panel and Features

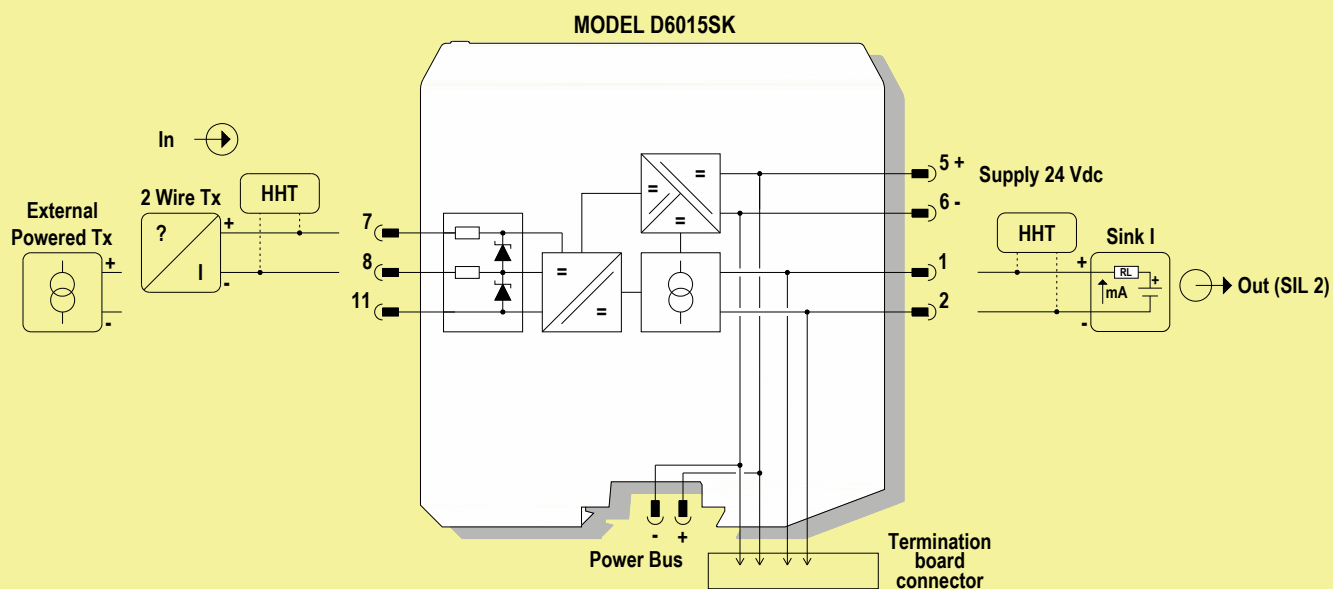
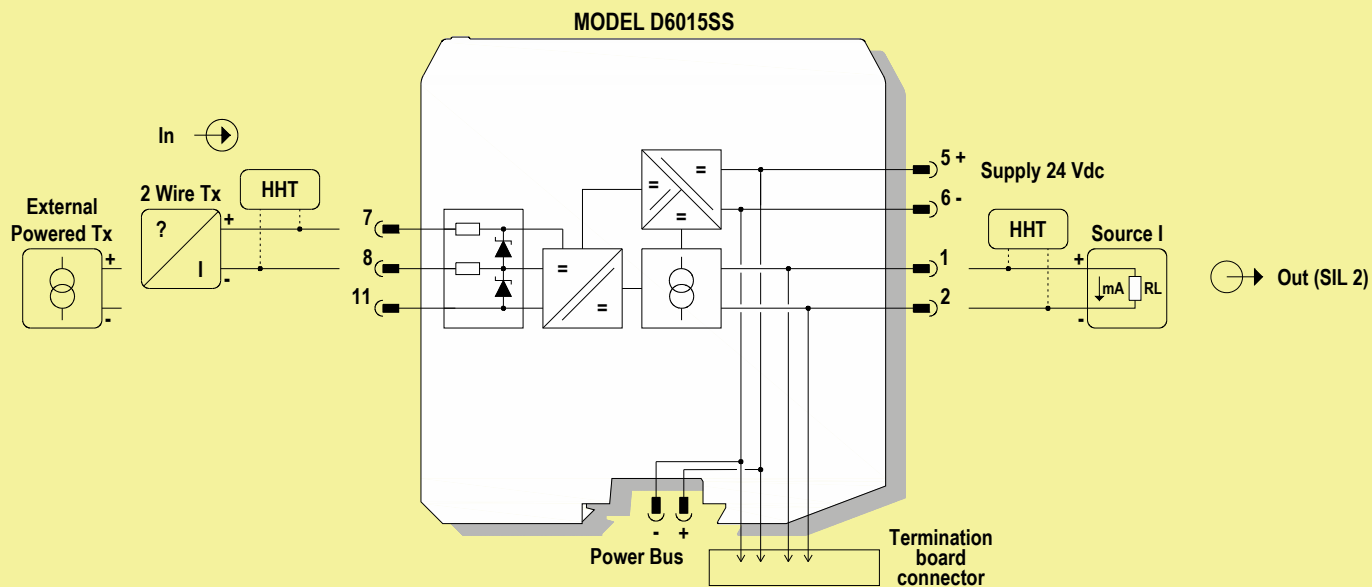


- SIL 2 (low demand mode of operation) according to IEC 61508:2010 Ed.2 with Tproof = 13 / 20 yrs ($\leq 10 / >10$ % of total SIF).
- SC3: Systematic capability SIL 3.
- 4-20 mA Input Signal Active-Passive.
- 4-20 mA Output Signal Source-Sink.
- HART® compatible.
- Input and Output short circuit proof.
- High Accuracy.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety systems.
- TÜV Certification.
- TÜV Functional Safety Certification.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without Power Bus, or customized Termination Boards.

Terminal block connections



7	+ Input Ch 1 for 2 wires Transmitters	1	+ Output Ch 1
8	- Input Ch 1 for 2 wires Transmitters or + Input Ch 1 for External Powered Transmitters	2	- Output Ch 1
9	-	3	-
10	-	4	-
11	- Input Ch 1 for External Powered Transmitters	5	+ Power Supply 24 Vdc
12	-	6	- Power Supply 24 Vdc



Warning

D6015 series must be installed, operated and maintained only by qualified personnel, in accordance to 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

D6015 provides fully floating DC supply for energizing 2 wires 4-20 mA transmitters, or separately powered 4 wires, 4-20 mA transmitters and repeats the current to a 4-20 mA floating output signal to drive a load.

The circuit allows bi-directional communication signal for smart transmitters, a "POWER ON" green led for each channel lits when input power is present.

Installation

D6015 series are Repeater power supply HART® compatible housed in a plastic enclosure suitable for installation on EN/IEC60715 TH 35 DIN-Rail, with or without Power Bus or on customized Termination Board. D6015 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.

The enclosure provides, according to EN60529, an IP20 minimum degree of protection (or similar to NEMA Standard 250 type 1). The unit shall be installed in an area of no more than pollution degree 2 according to EN/IEC60664-1. 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.

D6015 series must be connected to SELV or PELV supplies.

All circuits connected to D6015 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.

Turn on power, the "power on" green LED must be lit, for 2 wires transmitter connection output signal should be corresponding to the input from the transmitter. If possible change the transmitter output and check the corresponding output.