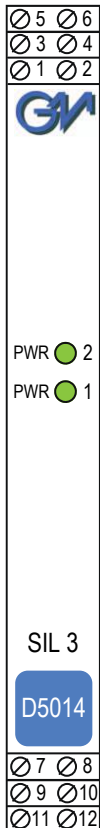


Characteristics:
General Description:

The single and dual channel Repeater Power Supply, D5014S and D5014D module is a high integrity analog input interface suitable for applications requiring SIL 3 level (according to IEC 61508) in safety related systems for high risk industries. Provides a fully floating dc supply for energizing conventional 2/3 wires 0/4-20 mA, active or passive, transmitters located in Hazardous Area, and repeats the current in floating circuit to drive a Safe Area 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, in Safe Area or in Zone 2.

Front Panel and Features:


- SIL 3 according to IEC 61508 for Tproof = 1 / 2 yrs (10 / 20 % of total SIF).
- SIL 2 according to IEC 61508 for Tproof = 10 / 20 yrs (10 / 20 % of total SIF).
- PFDavg (1 year) 9.39 E-05, SFF 93.92 %.
- 2 fully independent channels.
- Input from Zone 0 (Zone 20), installation in Zone 2.
- 0/4-20 mA Input / Output Signal Active-Passive / 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 system.
- In-field programmability by DIP Switch.
- ATEX, IECEx Certifications.
- High Density, two channels per unit.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without Power Bus, or customized Termination Boards.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model:	D5014
1 channel	S
2 channels	D

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

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: 85 mA for 2 channels D5014D, 42.5 mA for 1 channel D5014S with 20 mA output typical.

Power dissipation: 1.25 W for 2 channels D5014D, 0.62 W for 1 channel D5014S 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; I.S. In/I.S. In 500 V; Out/Supply 500 V; Out/Out 500 V.

Input:

0/4 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:

15.0 V typical at 20 mA with max. 20 mVrms ripple on 0.5 to 2.5 KHz frequency band, 14.5 V minimum.

Output:

0/4 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 or 0/1 to 5 V on internal 250 Ω shunt (or 0/2 to 10 V on internal 500 Ω shunt on request).

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

Output ripple: ≤ 20 mVrms on 250 Ω communication load on 0.5 to 2.5 KHz band.

Frequency response: 0.5 to 2.5 KHz bidirectional within 3 dB (Hart protocol).

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 CE mark compliant, conforms to 94/9/EC Atex Directive and to 2004/108/CE EMC Directive.

Environmental conditions:

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

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

Safety Description:


ATEX: II 3(1) G Ex nA [ia Ga] IIC T4 Gc, II (1) D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I

IECEx: Ex nA [ia Ga] IIC T4 Gc, [Ex ia Da] IIIC, [Ex ia Ma] I,

associated apparatus and non-sparking electrical equipment.

Uo/Voc = 25.9 V, Io/Isc = 92 mA, Po/Po = 594 mW at terminals 7-8, 9-10.

Uo/Voc = 1.1 V, Io/Isc = 56 mA, Po/Po = 16 mW at terminals 8-11, 10-12.

Ui/Vmax = 30 V, li/lmax = 128 mA, Ci = 0 nF, Li = 0 nH at terminals 8-11, 10-12.

Um = 250 Vrms, -40 °C \leq Ta \leq 70 °C.

Approvals:

BVS 10 ATEX E 113 X conforms to EN60079-0, EN60079-11, EN60079-15,

EN60079-26, EN61241-11, EN50303,

IECEx BVS 10.0072 X conforms to IEC60079-0, IEC60079-11, IEC60079-15,

IEC60079-26, IEC1241-11.

Russia according to GOST 12.2.007.0-75, R 51330.0-99, R 51330.10-99,

R 51330.14-99 2ExnA[ia]IIC T4 X.

Ukraine according to GOST 12.2.007.0, 22782.0, 22782.3, 22782.5 2Exs[ia]IIC T4 X.

TUV Certificate No. C-IS-204194-01, SIL 2 / SIL 3 conforms to IEC61508.

Mounting:

T35 DIN-Rail according to EN50022, with or without Power Bus or on customized Termination Board.

Weight: about 145 g D5014D, 120 g D5014S.

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

Location: Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4 installation.

Protection class: IP 20.

Dimensions: Width 12.5 mm, Depth 123 mm, Height 120 mm.

Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (µF)	Lo/La (mH)	Lo/Ro (µH/Ω)
Terminals 7-8, 9-10	IIC	0.10	4.2	59.9
Uo/Voc = 25.9 V	IIB	0.77	16.8	239.7
Io/Isc = 92 mA	IIA	2.63	33.7	479.4
Po/Po = 594 mW	I	4.02	55.2	786.6
	iaD	0.77	16.8	239.7
Terminals 8-11, 10-12	IIC	100	11.5	2327.2
Uo/Voc = 1.1 V	IIB	1000	46.0	9309.0
Io/Isc = 56 mA	IIA	1000	92.1	18618.1
Po/Po = 16 mW	I	1000	151.1	30545.4
Ui/Vmax = 30 V, li/lmax = 128 mA	iaD	1000	46.0	9309.0
Ci = 0 nF, Li = 0 nH				

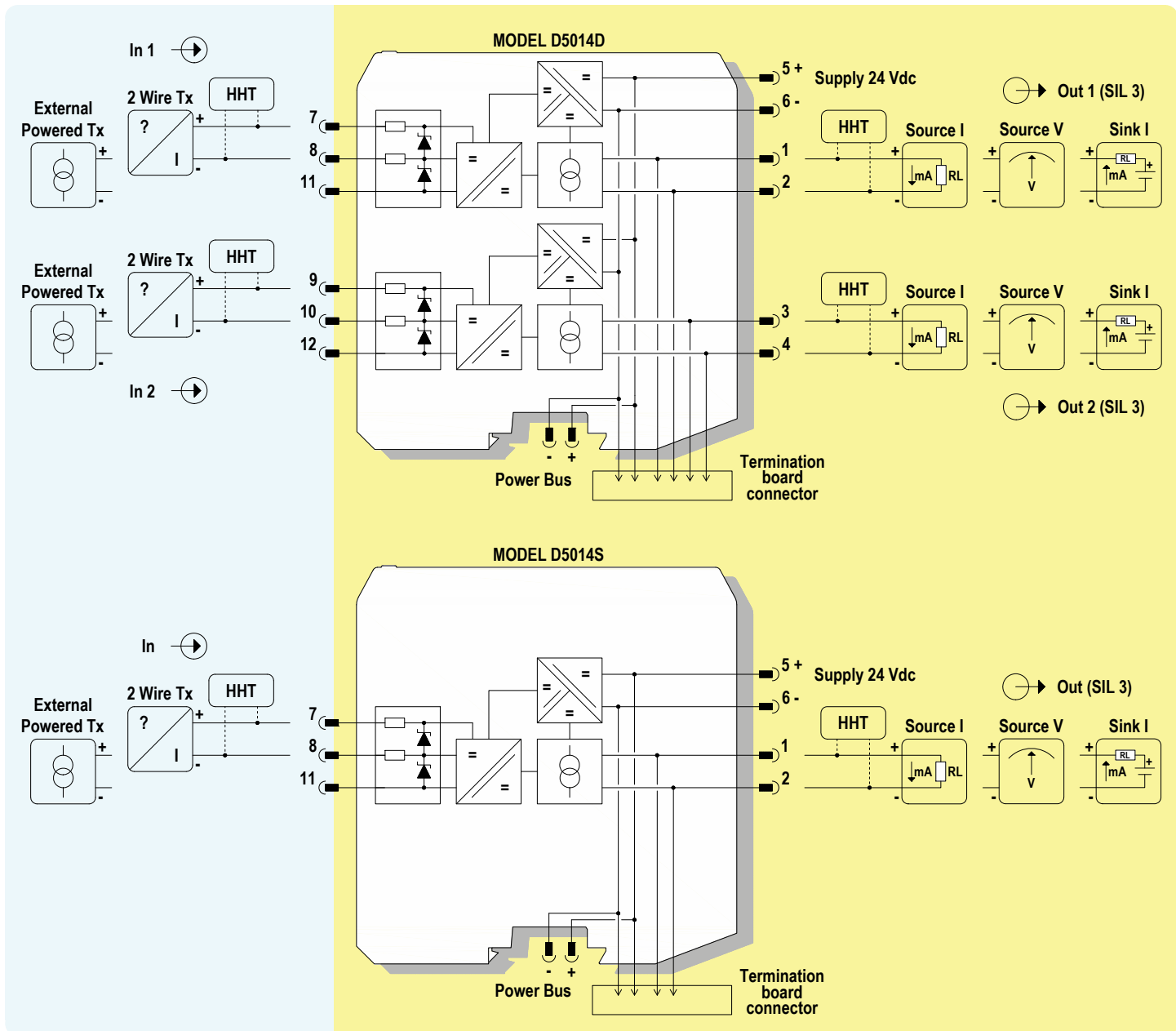
Image:



Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4



Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4

Safety Description

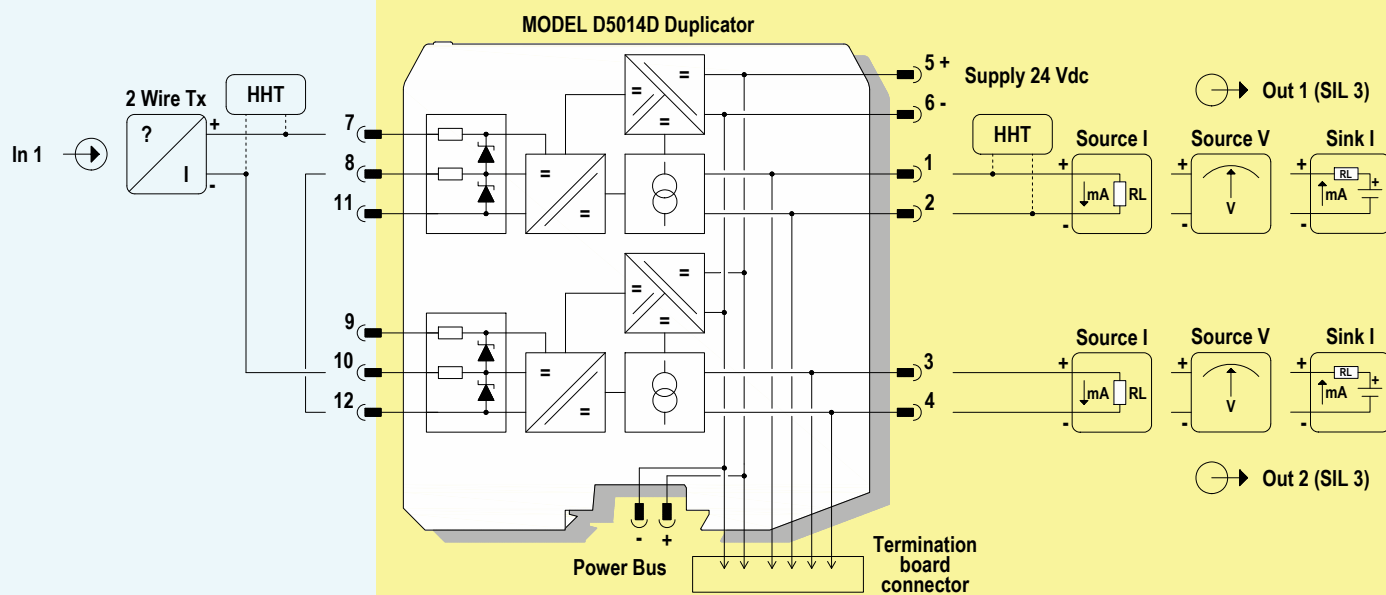
Terminals 7-10

$U_o/V_{oc} = 27\text{ V}$

$I_o/I_{sc} = 93\text{ mA}$

$P_o/P_o = 623\text{ mW}$

Group	Co/Ca (μF)	Lo/La (mH)	Lo/Ro ($\mu\text{H}/\Omega$)
Cenelec			
IIC	0.090	4.1	57.0
IIB	0.705	16.6	228.3
IIA	2.330	33.2	456.6
I	3.750	54.5	749.1
iaD	0.705	16.6	228.3



Connections for Duplication of 2 wires Transmitter Input

Restriction on specifications for 2 wires Transmitter Input:

Bidirectional communication for Smart Transmitter is provided only on channel 1

The minimum supply voltage available for Transmitter (V_{tx}) is 14 V at 20 mA input

The safety parameters must be changed in: $U_o/V_{oc} = 27\text{ V}$, $I_o/I_{sc} = 93\text{ mA}$, $P_o/P_o = 623\text{ mW}$

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4

Safety Description

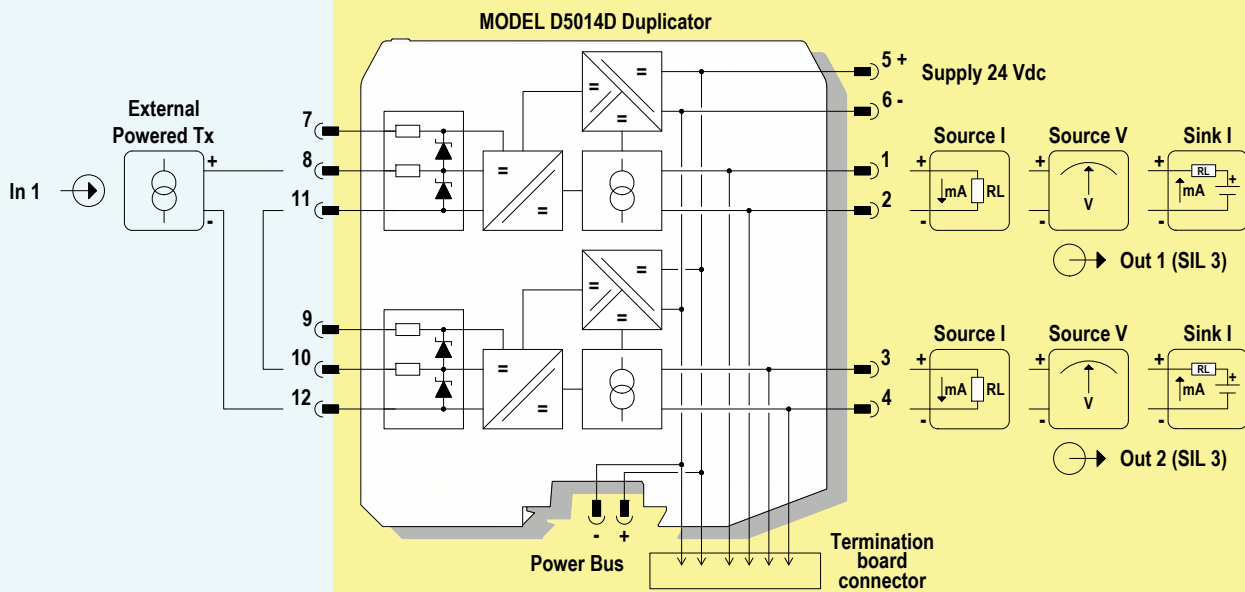
Terminals 8-12

$U_0/V_{oc} = 2.2 \text{ V}$

$I_0/I_{sc} = 56 \text{ mA}$

$P_0/P_o = 31 \text{ mW}$

Group	Co/Ca (μF)	Lo/La (mH)	Lo/Ro ($\mu\text{H}/\Omega$)
Cenelec			
IIC	100	11.5	1163.6
IIB	1000	46.0	4654.5
IIA	1000	92.1	9309.0
I	1000	151.1	15272.7
iaD	1000	46.0	4654.5



Connections for Duplication of Active Input Signals

Restriction on specifications for external powered Transmitter:

Voltage drop $\leq 1.0 \text{ V}$

The safety parameters must be changed in: $U_0/V_{oc} = 2.2 \text{ V}$, $I_0/I_{sc} = 56 \text{ mA}$, $P_0/P_o = 31 \text{ mW}$