

SIL 3 Repeater Power Supply Hart Compatible DIN-Rail Models D1014S, D1014D

Characteristics:

General Description:

The single and dual single channel DIN Rail Repeater Power Supply, D1014S and D1014D is a high integrity analog input interface suitable for application requiring SIL 2 level (according to EN61508) in safety related system for high risk industries. Provides a fully floating dc supply for energizing conventional 2-wire 4-20 mA Transmitter 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.

Function:

1 or 2 independent channels I.S. analog input for 2 wire loop powered Hart Transmitters, provides 3 port isolation (input/output/supply) and current (source or sink) or voltage output signal.

Signalling LED:

Power supply indication (green).

Field Configurability:

mA (source or sink) or V output signal.

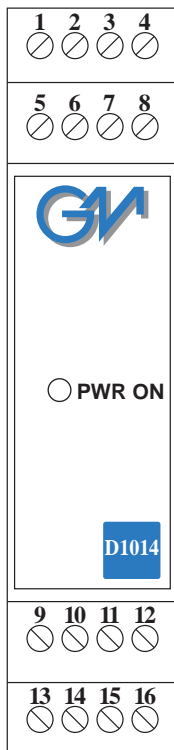
Hart Communication Frequency Band:

0.5 to 2.5 KHz within 3 dB.

EMC:

Fully compliant with CE marking applicable requirements.

Front Panel and Features:



- 2 fully independent channels.
- SIL 2 according to IEC 61508, IEC 61511 for $T_{proof} = 10$ years.
- SIL 3 according to IEC 61508, IEC 61511 for $T_{proof} = 1$ year.
- 4-20 mA Input, Output Signal.
- 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.
- Field programmability by DIP Switch.
- ATEX, UL & C-UL, FM & FM-C, Russia and Ukraine Certifications.
- High Reliability, SMD components.
- High Density, two channels per unit.
- Simplified installation using standard DIN Rail plug-in terminal blocks.
- 250 Vrms (U_m) max. voltage applied to the instruments associated with barrier.

Ordering Information:

Model:	D1014		
1 channel		S	
2 channels		D	
Power Bus enclosure			/B

Technical Data:

Supply: 12-24 Vdc nom (10 to 30 Vdc) reverse polarity protected ripple within voltage limits ≤ 5 Vpp.

Current consumption @ 24 V: 110 mA for 2 channels D1014D, 55 mA for 1 channel D1014S with 20 mA output typical.

Current consumption @ 12 V: 240 mA for 2 channels D1014D, 120 mA for 1 channel D1014S with 20 mA output typical.

Max. power consumption: 3.30 W for 2 channels D1014D, 1.80 W for 1 channel D1014S with 30 V supply voltage and short circuit condition.

Isolation (Test Voltage): I.S. In/Out 1.5 KV; I.S. In/Supply 1.5 KV; I.S. In/I.S. In 500 V; Out/Out 500 V; Out/Supply 500 V.

Input: 4 to 20 mA (2 wire Tx current limited at ≈ 25 mA).

Transmitter line voltage: ≥ 15.0 V at 20 mA with max. 20 mVrms ripple on 0.5 to 2.5 KHz frequency band.

Output: 4 to 20 mA, on max. 600 Ω load in source mode; V min. 5 V at 0 Ω load V max. 30 V in sink mode, current limited at ≈ 25 mA or 1 to 5 V on internal 250 Ω shunt (or 2 to 10 V on internal 500 Ω shunt on request).

Response time: 20 ms (10 to 90 % 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 temp.

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

Linearity error: $\leq \pm 0.1$ % of full scale.

Supply voltage influence: $\leq \pm 0.05$ % of full scale for a min to max supply voltage change.

Load influence: $\leq \pm 0.05$ % of full scale for a 0 to 100 % load resistance change.

Temperature influence: $\leq \pm 0.01$ % on zero and span for a 1 °C change.

Compatibility:

CE CE mark compliant, conforms to 94/9/EC Atex Directive and to 89/336/CEE EMC Directive.

Environmental conditions: Operating: Temperature limits -20 to + 60 °C, relative humidity max 90 % non condensing, up to 35 °C.

Storage: Temperature limits - 40 to + 80 °C.

Safety Description:

Ex II (1) G D [EEx ia] IIC, I M2 [EEx ia] I, II 3 G EEx nA IIC T4 associated electrical apparatus.

$U_0/V_{oc} = 25.2$ V, $I_0/I_{sc} = 93$ mA, $P_0/P_o = 585$ mW at terminals 14-15, 10-11.

$U_m = 250$ Vrms, -20 °C $\leq T_a \leq 60$ °C.

Approvals: DMT 01 ATEX E 042 X conforms to EN50014, EN50020.

UL & C-UL E222308 conforms to UL913 (Div.1), UL 60079-0 (General, All Zones), UL60079-11 (Intrinsic Safety "i" Zones 0 & 1) for UL and CSA-C22.2 No.157-92 (Div.1), CSA-E60079-0 (General, All Zones),

CSA-E60079-11 (Intrinsic Safety "i" Zones 0 & 1) for C-UL,

FM & FM-C No. 3024643, 3024643C, conforms to Class 3600, 3610, 3611, 3810 and C22.2 No.142, C22.2 No.157, C22.2 No.213, E60079-0, E60079-11, E60079-15,

TCCEExEE (Russia) Nr.665 according to GOST R 51330.0-99, 51330.10-99 [Exia] IIC X,

TCCEExEE (Ukraine) Nr.665 according to GOST 12.2.007.0, 22782.0, 22782.5 Exia IIC X,

Gosgortekhnadzor of Russia Permit Nr. PPC 04-11284.

EXIDA Report No. GM03/07-24 R001, SIL 2 / SIL 3 according to IEC 61508,

IEC 61511. Please refer to Functional Safety Manual for SIL applications.

Mounting: T35 DIN Rail according to EN50022.

Weight: about 160 g D1014D, 125 g D1014S.

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, Class I, Division 2, Groups A, B, C, D Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA T4 installation.

Protection class: IP 20.

Dimensions: Width 22.5 mm, Depth 99 mm, Height 114.5 mm.

Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (μF)	Lo/La (mH)	Lo/Ro (μH/Ω)
Terminals 14-15, 10-11				
Uo/Voc = 25.2 V	II C	0.102	4.2	60.7
Io/Isc = 93 mA	II B	0.820	15.0	242.9
Po/Po = 585 mW	II A	2.900	33.0	485.8

NOTE for USA and Canada:

II C equal to Gas Groups A, B, C, D, E, F and G.
 II B equal to Gas Groups C, D, E, F and G.
 II A equal to Gas Groups D, E, F and G.



Function Diagram:

