

**Characteristics:**
**General Description:**

The single and dual channel DIN Rail Isolating Driver, D1020S and D1020D, isolates and transfers a 4-20, 0-20 mA signal from a controller located in Safe Area to a load of up to 750 Ω in Hazardous Area. It has a high output capacity of 15 V at 20 mA combined with a low drop across its input terminals.

The circuit allows bi-directional communication signals, for Smart I/P.

In the 4-20 mA input range, a field open circuit reflects a high impedance to the control device output circuit.

**Function:**

1 or 2 channels I.S. mA analog output for 2 wire I/P Smart converters or valve positioners, provides 3 port isolation (input/output/supply).

**Signalling LED:**

Power supply indication (green).

**Smart Communication Frequency Band:**

0.5 to 40 KHz within 3 dB (Hart and higher frequency protocols).

**EMC:**

Fully compliant with CE marking applicable requirements.

**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 SIL3.


**Technical Data:**
**Supply:**

24 Vdc nom (20 to 30 Vdc) reverse polarity protected, ripple within voltage limits  $\leq 5$  Vpp.

**Current consumption @ 24 V:** 95 mA for 2 channels D1020D, 50 mA for 1 channel D1020S with 20 mA output typical.

**Power dissipation:** 1.9 W for 2 channels D1020D, 1.0 W for 1 channel D1020S with 24 V supply voltage and 20 mA output typical.

**Max. power consumption:** at 30 V supply voltage and overload condition, 2.7 W for 2 channels D1020D, 1.4 W for 1 channel D1020S.

**Isolation (Test Voltage):**

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

**Input:**

0/4 to 20 mA with  $\leq 2.0$  V voltage drop, reverse polarity protected.

**Output:**

0/4 to 20 mA, on max. 750 Ω load, current limited at  $\approx 23$  mA.

**Response time:** 50 ms (10 to 90 % step change).

**Output ripple:**  $\leq 20$  mVrms on 250 Ω communication load on 0.5 to 40 KHz band.

**Frequency response:** 0.5 to 40 KHz bidirectional within 3 dB (Hart and higher frequency protocols).

**Performance:**

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

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

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

**Supply voltage influence:**  $\leq \pm 0.05$  % of full scale for a min to max supply 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 mark compliant, conforms to Directive:

2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

**Environmental conditions:**

**Operating:** temperature limits -20 to +60 °C, relative humidity max 95 %.

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

**Safety Description:**


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

**IECEX / INMETRO:** [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I; Ex nA IIC T4 Gc

**UL:** NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, AEx nC [ia] IIC

**C-UL:** NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, Ex nC [ia] IIC

**FM:** NI / I / 2 / ABCD / T4, NI / I / 2 / IIC / T4, AIS / I, II, III / 1 / ABCDEFG, AEx [ia] IIC

**FM-C:** NI / I / 2 / ABCD / T4, NI / I / 2 / IIC / T4, AIS / I, II, III / 1 / ABCDEFG, Ex [ia] IIC

**EAC-EX:** 2Ex nA [ia Ga] IIC T4 Gc X, [Ex ia Da] IIIC X, [Ex ia Ma] I X

**UKR TR n. 898:** 2ExnAIICT4 X, Exial X

associated apparatus and non-sparking electrical equipment.

Uo/Voc = 25.2 V, Io/Isc = 87 mA, Po/Po = 548 mW at terminals 14-15, 10-11.

Um = 250 Vrms, -20 °C  $\leq$  Ta  $\leq$  60 °C.

**Approvals:**

DMT 01 ATEX E 042 X conforms to EN60079-0, EN60079-11, EN60079-26.

IECEX BVS 07.0027X conforms to IEC60079-0, IEC60079-11, IEC60079-26.

IMQ 09 ATEX 013 X conforms to EN60079-0, EN60079-11, IEC60079-26.

IECEX IMQ 13.0011X conforms to IEC60079-0, IEC60079-15.

INMETRO DNV 13.0108 X conforms to ABNT NBR IEC60079-0, ABNT NBR IEC60079-11, ABNT NBR IEC60079-15, ABNT NBR IEC60079-26, ABNT NBR IEC 61241-11.

UL & C-UL E222308 conforms to UL913, UL 60079-0, UL60079-11, UL60079-15,

ANSI/ISA 12.12.01 for UL and CSA-C22.2 No.157-92, CSA-E60079-0, CSA-E60079-11,

CSA-C22.2 No. 213 and CSA-E60079-15 for C-UL.

FM & FM-C No. 3024643, 3029921C, conforms to Class 3600, 3610, 3611, 3810,

ANSI/ISA 12.12.02, ANSI/ISA 60079-0, ANSI/ISA 60079-11, C22.2 No.142,

C22.2 No.157, C22.2 No.213, E60079-0, E60079-11, E60079-15.

C-IT.MH04.B.00306 conforms to GOST R IEC 60079-0, GOST R IEC 60079-11,

GOST R IEC 60079-15.

CL 16.0034 X conforms to DCTY 7113, GOCT 22782.5-78, DCTY IEC 60079-15.

TUV Certificate No. C-IS-236198-03, 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.

DNV No.A-13778 and KR No.MIL20769-EL001 Certificates for maritime applications.

**Mounting:**

T35 DIN Rail according to EN50022.

**Weight:** about 180 g D1020D, 120 g D1020S.

**Connection:** by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.

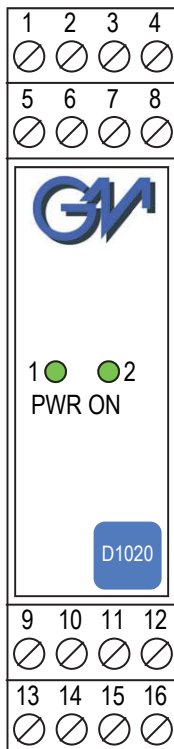
**Location:** Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4,

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.

**Front Panel and Features:**


- SIL 2 according to IEC 61508:2010 Ed.2 for Tproof = 3 / 10 years ( $\leq 10\%$  /  $> 10\%$  of total SIF).
- PFDavg (1 year) 2.60 E-04, SFF 62.04 %.
- SIL 3 Systematic capability.
- 2 fully independent channels.
- Output to Zone 0 (Zone 20), Division 1, installation in Zone 2, Division 2.
- 4-20 or 0-20 mA Input, Output Signal.
- Wide Band Smart Communication, Hart compatible.
- Field open circuit detection.
- High Accuracy.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1.
- ATEX, IECEX, UL & C-UL, FM & FM-C, INMETRO, EAC-EX, UKR TR n. 898, TÜV Certifications.
- TÜV Functional Safety Certification.
- Type Approval Certificate DNV and KR for maritime applications.
- High Reliability, SMD components.
- High Density, two channels per unit.
- Simplified installation using standard DIN Rail and plug-in terminal blocks.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

**Ordering Information:**

|                                     |       |                              |    |
|-------------------------------------|-------|------------------------------|----|
| Model:                              | D1020 |                              |    |
| 1 channel                           |       | S                            |    |
| 2 channels                          |       | D                            |    |
| Power Bus enclosure                 |       |                              | /B |
| Power Bus and DIN-Rail accessories: |       |                              |    |
| DIN rail anchor MCHP065             |       | DIN rail stopper MOR016      |    |
| Terminal block male MOR017          |       | Terminal block female MOR022 |    |

**Parameters Table:**

| Safety Description            | Maximum External Parameters |                            |               |                                   |
|-------------------------------|-----------------------------|----------------------------|---------------|-----------------------------------|
|                               | Group<br>Cenelec            | Co/Ca<br>( $\mu\text{F}$ ) | Lo/La<br>(mH) | Lo/Ro<br>( $\mu\text{H}/\Omega$ ) |
| Terminals 14-15, 10-11        |                             |                            |               |                                   |
| $U_o/V_{oc} = 25.2 \text{ V}$ | IIC                         | 0.105                      | 4.6           | 64.9                              |
| $I_o/I_{sc} = 87 \text{ mA}$  | IIB                         | 0.819                      | 18.7          | 259.6                             |
| $P_o/P_o = 548 \text{ mW}$    | IIA                         | 2.899                      | 37.5          | 519.3                             |
|                               | I                           | 4.15                       | 61.5          | 851.9                             |
|                               | IIIC                        | 0.819                      | 18.7          | 259.6                             |

NOTE for USA and Canada:

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

IIB equal to Gas Groups C, D, E, F and G

IIA equal to Gas Groups D, E, F and G

**Image:**



**Function Diagram:**

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC,  
HAZARDOUS LOCATIONS CLASS I, DIVISION 1, GROUPS A, B, C, D,  
CLASS II, DIVISION 1, GROUPS E, F, G, CLASS III, DIVISION 1,  
CLASS I, ZONE 0, GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4,  
NON HAZARDOUS LOCATIONS, CLASS I, DIVISION 2,  
GROUPS A, B, C, D T-Code T4, CLASS I, ZONE 2, GROUP IIC T4

