

## Characteristics:

### General Description:

The single and dual channel DIN Rail Analog Signal Converter D1052S and D1052D accepts a voltage or current input from externally powered transmitters, located in Hazardous Area, and converts, with isolation, the signal to drive a Safe Area load. Output signal can be direct or reverse.

Duplicator type D1052X provides two independent outputs for the single input.

Adder, subtractor, low/high selector type D1052Y provides two independent outputs representing input A, input B, input A plus input B, input A minus input B, low/high selector.

### Function:

1 or 2 channels I.S. input from separately powered transmitters, provides 3 port isolation (input/output/supply) and current (source mode) or voltage output signal.

Duplicator type D1052X and adder, subtractor, low/high selector type D1052Y.

### Signalling LED:

Power supply indication (green).

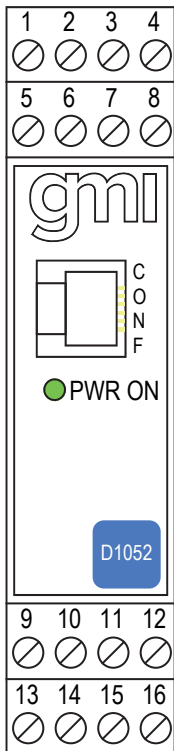
### Configurability:

Totally software configurable, no jumpers or switches, mA or V input/output signal, linear or reverse by GM Pocket Portable Configurator PPC1090, powered by the unit or configured by PC via RS-232 serial line with PPC1092 Adapter and SWC1090 Configurator software. To operate PPC1090 or PPC1092 refer to instruction manual.

### EMC:

Fully compliant with CE marking applicable requirements.

## Front Panel and Features:



- Input from Zone 0 (Zone 20), Division 1, installation in Zone 2, Division 2.
- 0/4-20 mA, 0/1-5 V, 0/2-10 V Input-Output Signal linear or reverse.
- Duplicated output for single input (D1052X).
- Adder, Subtractor, low/high Selector (D1052Y).
- High Accuracy,  $\mu$ P controlled A/D converter.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4.
- Fully programmable operating parameters.
- ATEX, IECEx, UL & C-UL, FM & FM-C, INMETRO, EAC-EX, UKR TR n. 898 Certifications.
- 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:	D1052		
1 channel		S	
2 channels		D	
1 input-2 outputs (duplicator)		X	
2 inputs-2 outputs (A, B, [A+B]/2, A-B)		Y	
Power Bus enclosure			/B

Operating parameters are programmable by the GM Pocket Portable Configurator PPC1090 or via RS-232 serial line with PPC1092 Adapter and SWC1090 Configurator software. If the parameters are provided with the purchasing order the unit will be configured accordingly, otherwise the unit will be supplied with default parameters.

## Technical Data:

**Supply:** 12-24 Vdc nom (10 to 30 Vdc) reverse polarity protected, ripple within voltage limits  $\leq 5$  Vpp.

**Current consumption @ 24 V:** 70 mA for 2 channels D1052D, 45 mA for 1 channel D1052S with 20 mA output typical.

**Current consumption @ 12 V:** 140 mA for 2 channels D1052D, 80 mA for 1 channel D1052S with 20 mA output typical.

**Power dissipation:** 1.5 W for 2 channels D1052D, 1.0 W for 1 channel D1052S with 24 V supply voltage and 20 mA output typical.

**Max. power consumption:** at 30 V supply voltage, overload condition and PPC1090 connected, 2.1 W for 2 channels D1052D, 1.4 W for 1 channel D1052S.

**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/Supply 500 V; Out/Out 500 V.

**Input:** 0/4 to 20 mA (-4 to +24 mA reading) separately powered input, voltage drop  $\leq 0.5$  V or 0/1 to 5 V or 0/2 to 10 V (-2 to +12 V reading) 1 M $\Omega$  impedance.

**Integration time:** 100 ms.

**Resolution:** 1  $\mu$ A on current input, 1 mV on voltage input.

**Visualization:** 1  $\mu$ A on current input, 1 mV on voltage input.

**Input range:** -4 to +24 mA on current input, -2 to +12 V on voltage input.

**Burnout:** enabled or disabled. Analog output can be programmed to detect burnout condition with downscale or highsacle forcing.

**Burnout range:** low and high separated trip point value programmable between -5 to +25 mA on current input and -3 to +13 V on voltage input.

**Output:** 0/4 to 20 mA, on max. 600  $\Omega$  load source mode, current limited at 22 mA or 0/1 to 5 V or 0/2 to 10 V signal, limited at 11 V.

**Resolution:** 2  $\mu$ A current output or 1 mV voltage output.

**Transfer characteristic:** linear or reverse.

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

**Output ripple:**  $\leq 20$  mVrms on 250  $\Omega$  load.

**Performance:** Ref. Conditions 24 V supply, 250  $\Omega$  load, 23  $\pm 1$   $^{\circ}$ C ambient temperature.

**Input:**

**Calibration and linearity accuracy:**  $\leq \pm 20$   $\mu$ A on current input or  $\leq \pm 10$  mV on voltage input.

**Temperature influence:**  $\leq \pm 2$   $\mu$ A, 1 mV of input for a 1  $^{\circ}$ C change.

**Analog Output:**

**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  $^{\circ}$ 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  $^{\circ}$ C,

relative humidity max 90 % non condensing, up to 35  $^{\circ}$ C.

**Storage:** temperature limits -45 to +80  $^{\circ}$ 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 ec IIC T4 Gc

**IECEx:** [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I; Ex ec IIC T4 Gc

**INMETRO:** [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I

Uo/Voc = 10.8 V, Io/Isc = 4 mA, Po/Po = 11 mW at terminals 14-15-16, 10-11-12.

Ui/Vmax = 30 V, Ci = 4.5 nF, Li = 0 nH at terminals 14-15-16, 10-11-12.

Um = 250 Vrms, -20  $^{\circ}$ C  $\leq$  Ta  $\leq$  60 $^{\circ}$ C.

### Approvals:

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

IECEx BVS 07.0027X conforms to IEC60079-0, IEC60079-11.

IMQ 09 ATEX 013 X conforms to EN60079-0, EN60079-7.

IECEx IMQ 13.0011X conforms to IEC60079-0, IEC60079-7.

INMETRO DNV 13.0108 X conforms to ABNT NBR IEC60079-0, ABNT NBR IEC60079-11.

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 and

C22.2 No.142, C22.2 No.157, C22.2 No.213, E60079-0, E60079-11, E60079-15,

EA3C RU C-IT.HA67.B.00113/20 conforms to GOST 31610.0, GOST 31610.11,

GOST 31610.15.

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

DNV No. TAA00002BM and KR No.MIL20769-EL001 Cert. for maritime applications.

### Mounting:

EN/IEC60715 TH 35 DIN-Rail.

**Weight:** about 170 g D1052D, 140 g D1052S.

**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.

**Parameters Table:**

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (μF)	Lo/La (mH)	Lo/Ro (μH/Ω)
Terminals 14-15-16, 10-11-12				
Uo/Voc = 10.8 V	IIC	2.135	2541	3520
Io/Isc = 4 mA	IIB	14.995	10167	14090
Po/Po = 11 mW	IIA	65.995	20335	28180

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

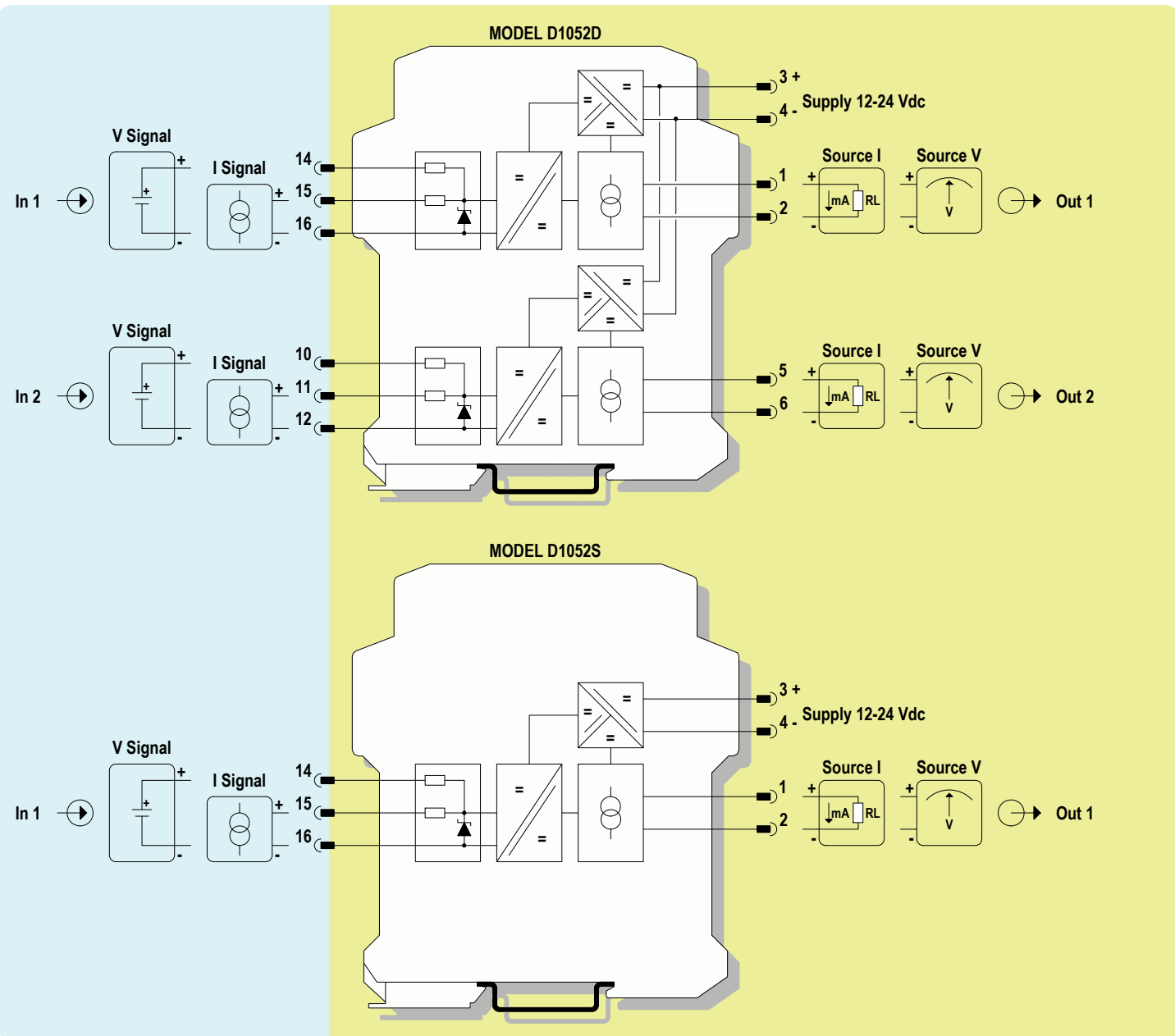
**Image:**



**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

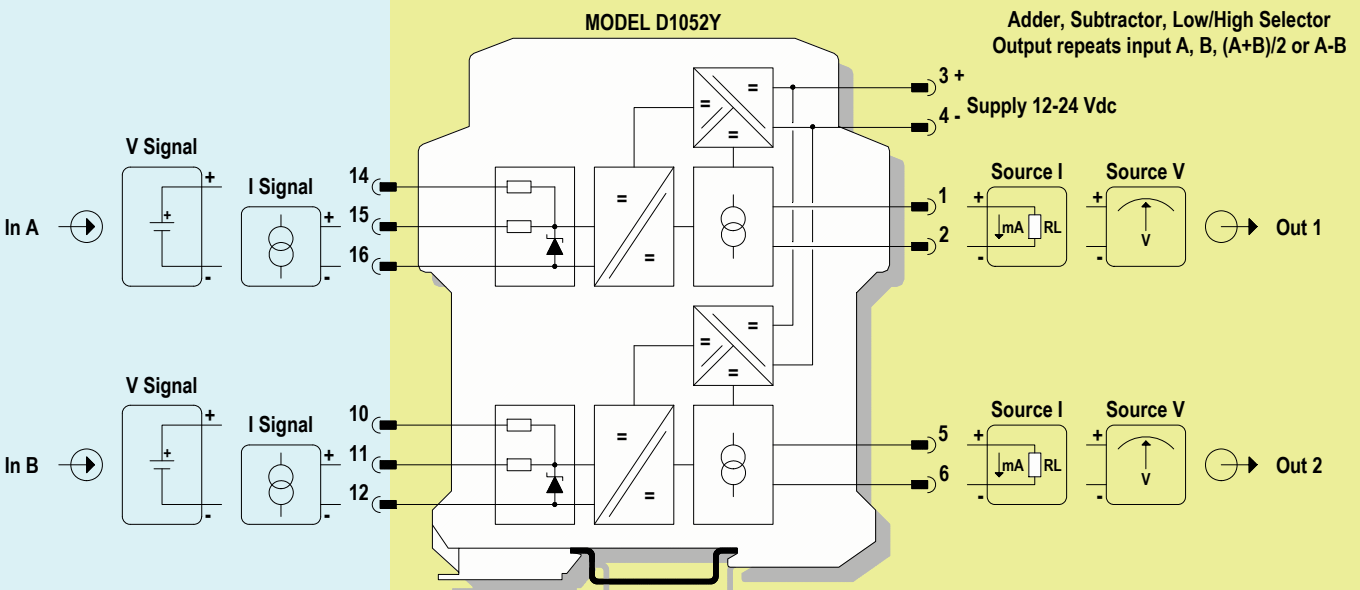
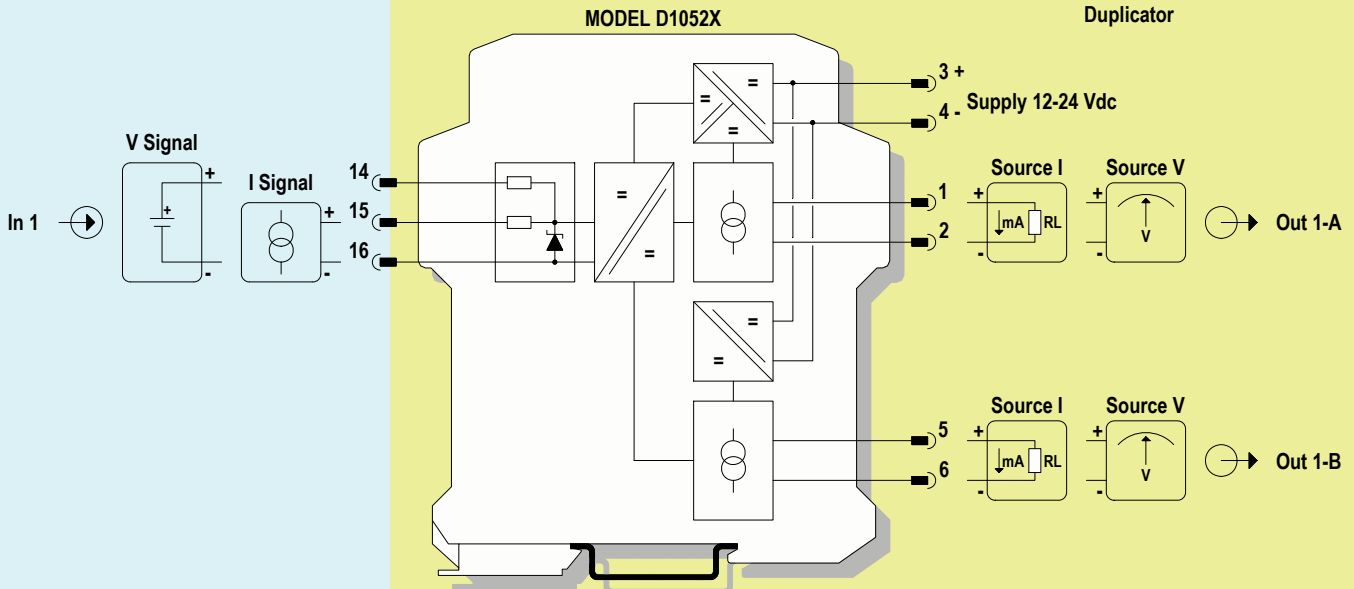
SAFE AREA, ZONE 2 GROUP IIC T4,  
NON HAZARDOUS LOCATIONS, CLASS I, DIVISION 2,  
GROUPS A, B, C, D T-Code T4, CLASS I, ZONE 2, GROUP IIC T4

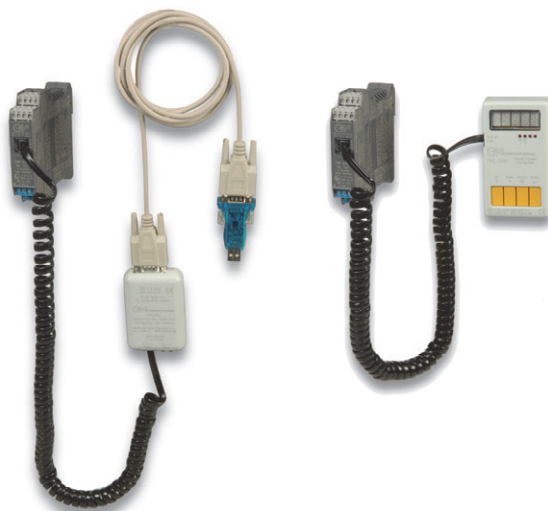
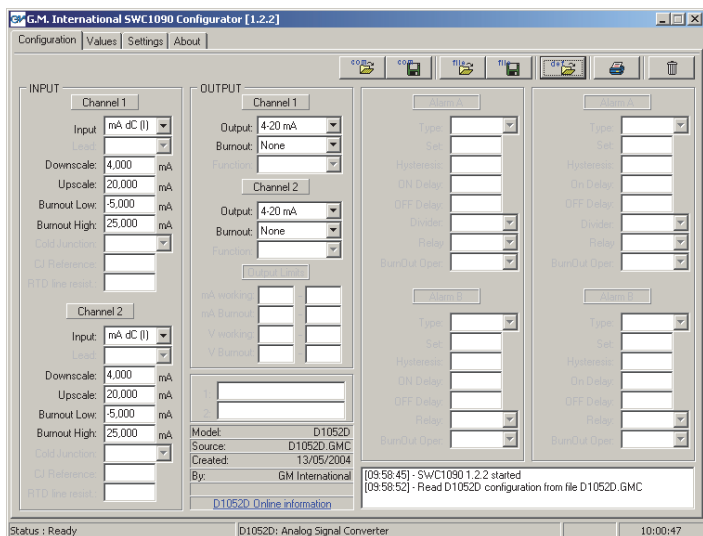


**Function Diagram:**

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





## Configuration Parameters:

### INPUT SECTION:

**Input:** input sensor type

- mA dc (I) current input, range from -4 to +24 mA
- V dc (E) voltage input, range from -2 to +12 V

**Downscale:** input value of measuring range corresponding to defined low output value.

**Upscale:** input value of measuring range corresponding to defined high output value.

**Burnout Low:** low burnout condition trip point value;

below this value a burnout fault condition is activated and the analog output is driven to the configured state (see Burnout in Output Section).

Setting this value outside the measuring range will disable this function.

**Burnout High:** high burnout condition trip point value;

above this value a burnout fault condition is activated and the analog output is driven to the configured state (see Burnout in Output Section).

Setting this value outside the measuring range will disable this function.

Each channel has independent configurations.

### OUTPUT SECTION:

**Output:** analog output type

- 4-20 mA current output range from 4 to 20 mA
- 0-20 mA current output range from 0 to 20 mA
- 1-5 V voltage output range from 1 to 5 V
- 0-5 V voltage output range from 0 to 5 V
- 2-10 V voltage output range from 2 to 10 V
- 0-10 V voltage output range from 0 to 10 V

**Burnout:** analog output burnout state

- None burnout function is disabled; analog output represents the input measure as configured
- Downscale analog output is forced at zero
- Upscale analog output is forced to 22 mA for current output or 11 V for voltage output

**Function:** analog output function (D1052Y module only)

- Ch. A analog output represents input of first channel
- Ch. B analog output represents input of second channel
- Add analog output represents the sum of the two input channels: (A+B)/2
- Sub analog output represents the difference of the two input channels: A-B
- High Ch analog output represents the higher of the two input channels
- Low Ch analog output represents the lower of the two input channels

Each channel has independent configurations.