ComAp
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Inteli DC4/4

Order code: EM1DC44XBDB

Datasheet

Module for DC low voltage measurement and current measurement

Product description

Inteli DC 4/4 module is an extension module, transducer type, equipped with analog inputs and analog outputs. The module can be used with various types of controllers, purposed for applications where we need to measure precisely direct voltage and direct current (DC Voltage, DC Current)

Key features

- Unipolar voltage measurement and bipolar current measurement per channel
- 2 galvanically isolated input measuring channels

Analog Inputs

- 4 channels – 2 for Voltage and 2 for Current measurement
  - Voltage measurement input up to 1500 VDC – direct measurement
  - Current measurement with external shunt up to 3000 ADC (100 mV max voltage input from external shunt resistor)

Analog Outputs

- 4 channels - 2 for Voltage and 2 for Current measurement
  - 4 .. 20 mA current loop output (see the transfer function section)

1 Terminals and dimensions

Terminals

Terminal	Symbol	Description	Note
1	-	Power supply negative terminal	
2		Not connected	Do not connect
3	+	Power supply positive terminal	
4	COM	Analog output common terminal	Reference point for analog outputs, internally connected to Terminal 1.
5	I2	Analog output current, channel two	
6	U2	Analog output voltage, channel two	
7	I1	Analog output current, channel one	
8	U1	Analog output voltage, channel one	
9		Measurement input common, channel two	Current Sense (external shunt) negative terminal, Voltage sense positive terminal.
10		Measurement input current, channel two	Current Sense (external shunt) positive terminal.
11		Not connected	Do not connect
12		Not connected	Do not connect
13		Measurement input voltage, channel two	Voltage Sense negative terminal.
14		Measurement input voltage, channel one	Voltage Sense negative terminal.
15		Not connected	Do not connect
16		Not connected	Do not connect
17		Measurement input current, channel one	Current Sense (external shunt) positive terminal.
18		Measurement input common, channel one	Current Sense (external shunt) negative terminal, Voltage sense positive terminal.

Note: *Measurement category of live electrical circuits of measuring terminals U1, U2, I1, and I2 CAT III / 1000 VAC, 1500 VDC*

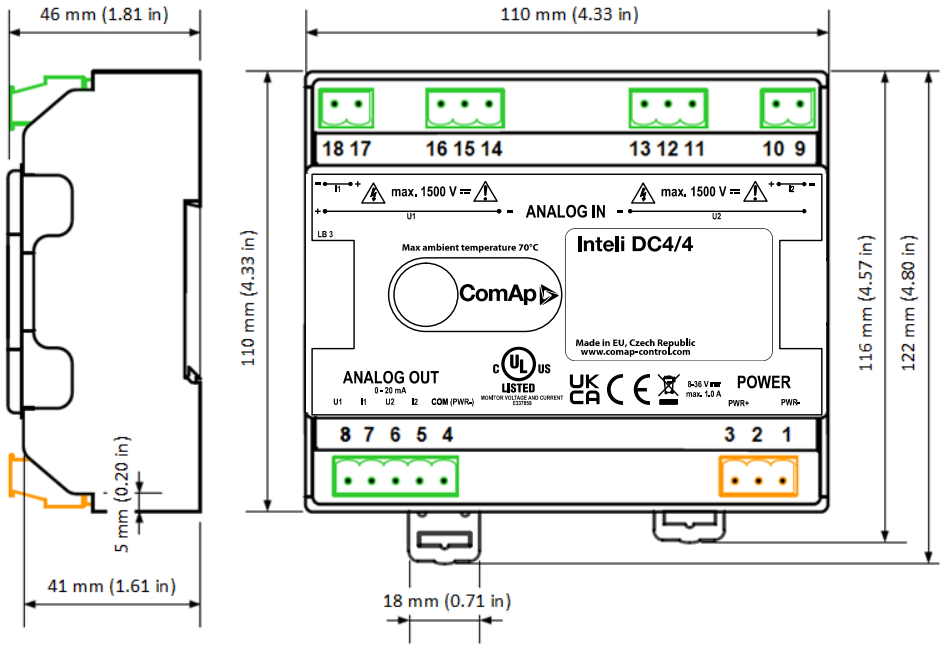

Image 2.1 Dimensions

Terminal rating

Terminals	Rating
1, 3	Nominal voltage between terminals: 36 V Nominal current: 0.5 A
4, 5, 6, 7	Nominal voltage between terminals: 15 V Nominal current: 20 mA
9, 10	Nominal voltage between terminals: 12 V Nominal current: 20 mA
9, 13	Nominal voltage between terminals: 1.5 kV Nominal current: 0.4 mA
10, 13	Nominal voltage between terminals: 1.5 kV Nominal current: 0.4 mA
14, 17	Nominal voltage between terminals: 1.5 kV Nominal current: 0.4 mA
14, 18	Nominal voltage between terminals: 1.5 kV Nominal current: 0.4 mA
17, 18	Nominal voltage between terminals: 12 V Nominal current: 20 mA

2 Technical data

General information

Dimensions	110 × 110 × 46 mm (4.3” × 4.3” × 1.8”)
Weight	250 g
Interface to controller	Analog

Power supply

Nominal power supply	24 V DC
Acceptable power supply range	8 .. 36 V DC
Nominal power consumption	3.8 W 160 mA @ 24 V DC
Max. Heat Dissipation	5 W

Operating conditions

Storage temperature	-40 ˚C .. +80 ˚C
Operating temperature (ambient)	-40 °C .. +70 °C
Operating humidity	max. 95 % non-condensing (EN 60068-2-30)
Protection degree	IP20, suitable for pollution degree 2
Vibration	5 .. 25 Hz, ± 1.6 mm 25 .. 100 Hz, a = 4 g
Shocks	max. 500 m/s^2
Altitude	max. 2000 m

DC Current measurement

Number of channels	2
Measurement type	Bipolar galvanically isolated
Measurement range (sense terminals)	± 100 mV measuring directly via external shunt resistor 4 .. 20 mA measuring via external shunt with external amplifier Max. measurement current depends on the shunt selection (up to ± 3 kA)
Accuracy	2% of the range

DC Voltage measurement

Number of channels	2
Measurement type	Unipolar galvanically isolated
Measurement range	direct measurement up to 1.5 kV DC
Accuracy	1% of the range
Input impedance	3.78 MΩ

Analog outputs

Number of channels	4
Type	Current loop (4 .. 20 mA)
Load	R.load < 500 Ω

Note: *For connecting the product, wires shall have insulation specified for temperatures corresponding to the maximum operating temperature with margin + 15°C.*

3 Wiring

3.1 Measure: HV Bus Voltage and Current (SHUNT)

The module I-DC4/4 allows to measure high bus voltage and current. Wiring for such measurement is shown on **Image 4.1**. Current is measured via an external shunt resistor. Information of a measured values is provide via current loops. Detailed information can be found in Global Guide.

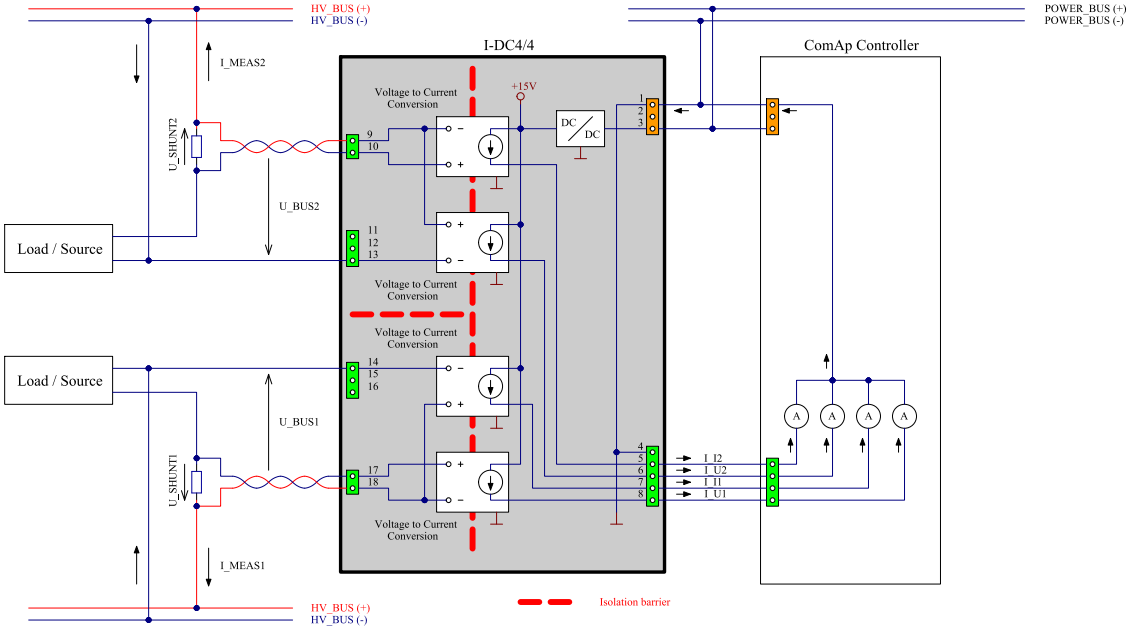

Image 4.1 SHUNT wiring scheme

The shunt resistor for current measurement should be connected in the positive pole of a HV bus. On the **Image 4.2** configuration is illustrated for current measurement via the external shunt resistor in the negative pole of the HV bus.

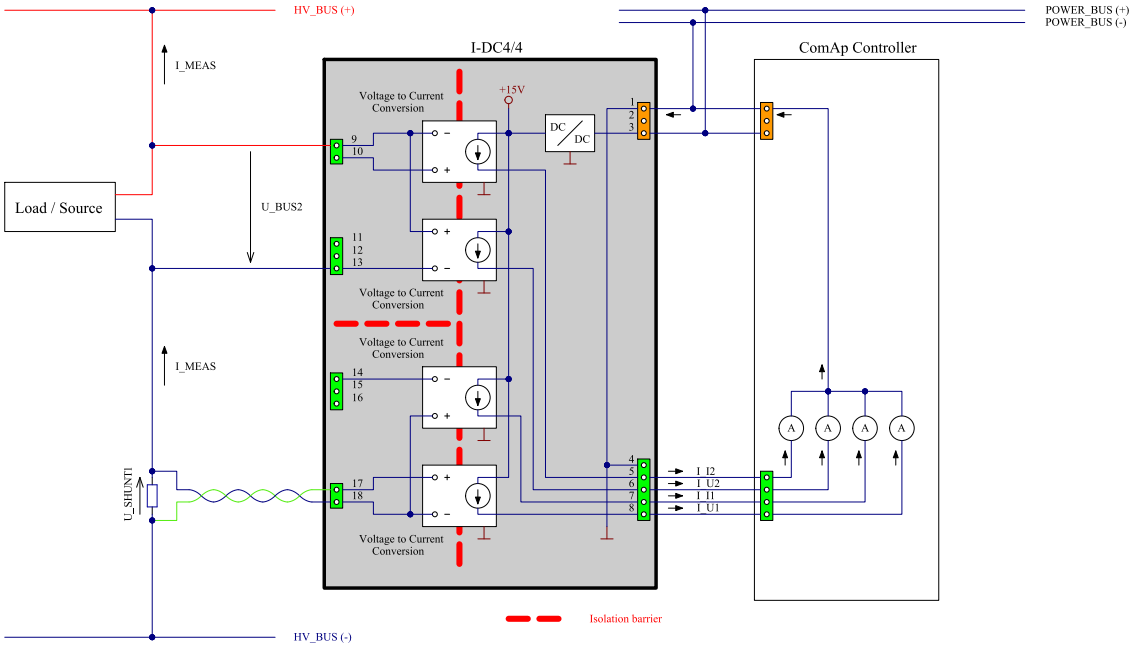

Image 4.2 SHUNT in negative branch

When current loops are read by a ComAp controller the negative power supply terminals of both the modul I-DC4/4 and the controller should be interconnected. This allows the return current to flow back to the module (closed current loop).

3.2 Isolated floating current loop measurement

When the current loops are measured by an isolated (floating) external unit the return current cannot flow back to the module via the negative power supply terminal. In such case the external unit must be connected to the terminal 4 (COM) so the current loops are properly closed, see **Image 4.3**.

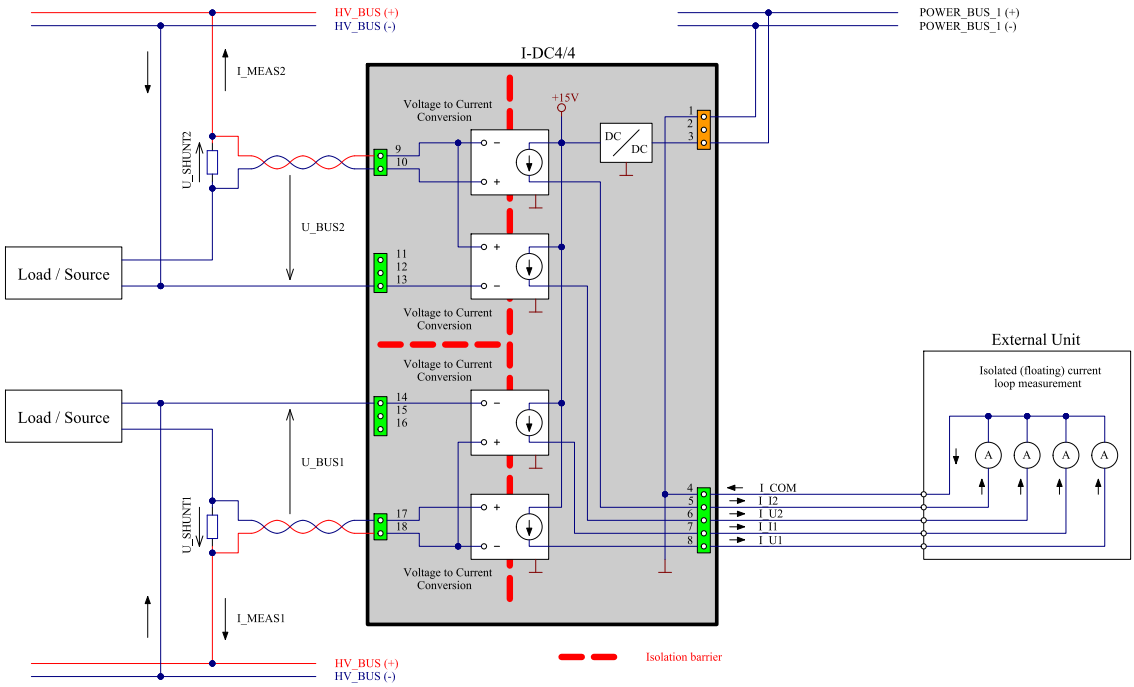

Image 4.3 Isolated floating current loop

4 Related informations

Certifications and standards

EN 61000-6-2 EN 61000-6-4 EN 61010-1 EN 60529	EN 60068-2-1 (-40 °C/16 h) EN 60068-2-2 (70 °C/16 h) EN 60068-2-6 (2÷25 Hz / ±1,6 mm; 25÷100 Hz / 4.0 g) EN 60068-2-27 (a=500 m/s2; T=6 ms) EN 60068-2-30:2005 25/55°C, RH 95%, 48hours	UKCA	CE UKCA

Document history

Revision number	Related sw. version	Date	Note	Author
3	1.0.0	25.03.2024		ComAp
2	1.0.0	29.02.2024	Product sticker changed (UL)	ComAp
1	1.0.0	1.08.2023		ComAp

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