Analog Module D1-15

User Manual

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Sielco Elettronica Srl
Edison Street 209 20019 Settimo Milanese (MI) - Italy
http://www.sielcoelettronica.com
info @ sielcoelettronica. com

Table of Contents

A List of ports

1 Installation

1. 1 Check the Box

Before installing, verify that the contents of the package conforms to your requirement. Inside the package are:

- No. 1 D1-15
- n ° 1 instruction manual

Check that the model number corresponds to the number ordered and the manual edition corresponding to the year of purchase.

The models are:

D1-15I2 6 analog voltage 0-10V type. 3 3-wire PT100 inputs (with compensation of cable resistance).

D1-15I2 6 analog inputs type current 0-20 mA or 4-20 mA, 3 3-wire PT100 inputs (with compensation of cable resistance).

The analog inputs have the following characteristics:

- Accuracy: ± 0.05% full scale
- Resolution: 15 bits
- Input impedance (0-20 or 4-20 mA): 249 ohms

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The inputs for PT100 probes have the following characteristics:

-Temperature range: -199.9 to 500.0 ° C to +
- Accuracy: ± 0.05% full scale
- Resolution: 15 bits
- max resistance connection cables: 20 ohm

The D1 series modules are covered by a one year warranty except for damages caused by tampering or wrong wiring

For the purchase date The label on the back of the modules.

1. 2 Dimensions

The dimensions of the modules D1-15 are shown in figure 1 .1.

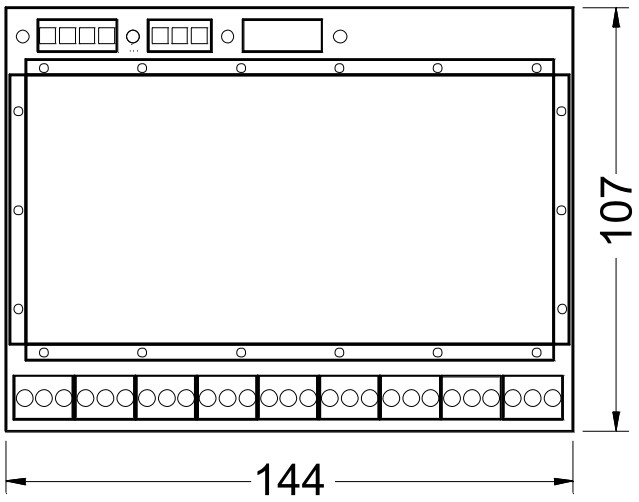


Figure 1. 1 - Size of D1-15P

1. 3 Method of attachment

All products in the D1 series are equipped with a plastic holder for fixing on rail DIN EN normalized by a shielding screen-printed.

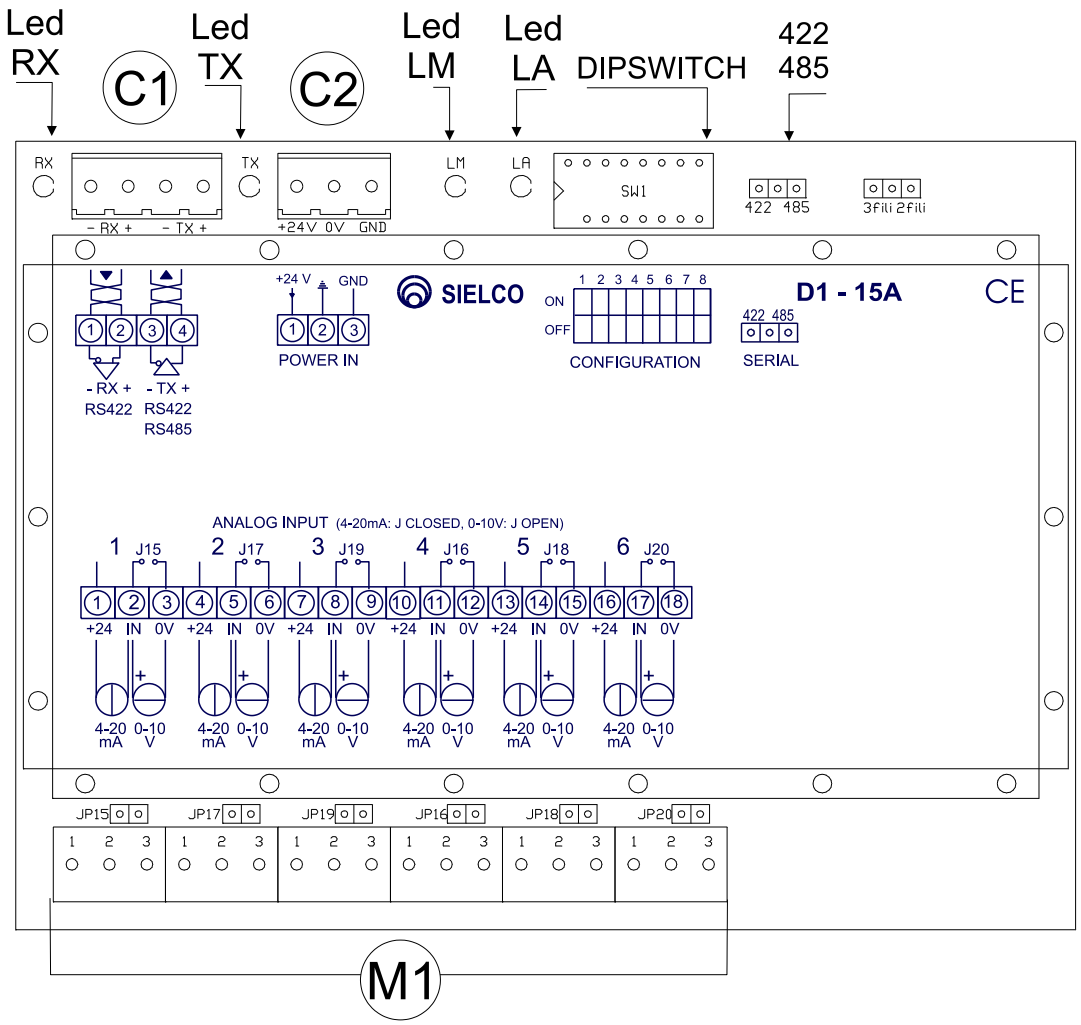
On the cover there are schematic mounting indications; gray areas are shown in the interface circuits inside the module, in yellow the sensors and actuators used to be connected externally.

The cover serigraph provides only a general wiring diagram and can not show all the possible connection cases, it is therefore necessary, before activating the module, carefully read this manual.

Do not exert excessive pressure on the cover and remove the module from the rail. Also remember to do these operations with power off.

1. 4 Physical module description

Figure 1. 2 - Diagram D1-15



	Description
[C1]	Connector for connecting serial RS422/485
[C2]	+24 Vdc power connector
[M1]	Terminal analog inputs 0-10 V or 4-20 but

M2	Input terminal PT100
DIPSW	Selection dipswitch and device address of the communication protocol
Led LA	Supply led
Led LM	Led by self-
Led TX	Led data transmitted over the serial
RX LED	Led Received data

[C1] - Connector for connecting serial RS422/485

	RS422		**RS485**
1	RX-	1	NC
2	RX +	2	NC
3	TX-	3	TX-/RX-
4	TX +	4	TX + / RX +

[C2] - Connector for power supply 24 VDC

	ALIM
1	+24 VDC
2	FIELD GND
3	MECH. GND

1. 5 Power Supply

The module must be supplied with a DC power supply 24 V DC (18V <Vcc <36V) via the [C2] and absorb a maximum current Icc = 70 mA at 24 Vdc.

The negative power supply must be connected to pin 2 of [C2].

After supplying the power, check that the LA led is lit.

1. 6 Inputs

1. 6 .1 Analog inputs for a linear transducers

For the D1-15A Series modules can be connected sensors 0-10 V or 0-20mA/4-20mA. The inputs can be configured for voltage or current using independently jumper from J15 to J20 (closed in case of current input).

For a connection with transducers with 0-10 V output, connect the positive terminal of the sensor to pin named IN and the negative to the named 0V, as shown in Figure 1 .3.

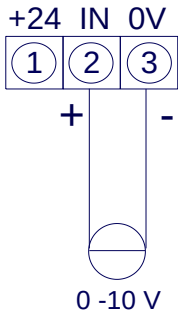


Figure 1. 3 - Connection with sensors linearized 0-10V

For connecting current transducers is necessary to distinguish two cases:

A) sensors powered by D1-15A, power to the sensor via pin +24 V terminal and connect the signal to the IN pin (fig. 1 .4 A);

B) sensors externally powered : power the sensor via an external power supply and connect its negative to pin the terminal marked 0V. Connect the signal to the IN pin (fig. 1 .4 B).

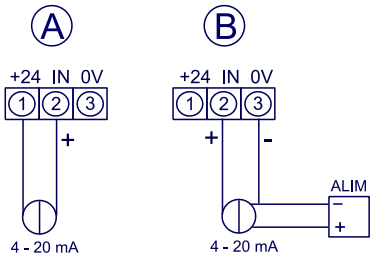


Figure 1. 4 - Connection with sensors linearized 0-20 mA / 4-20mA powered from the module D1-15A (case A) or from an external power supply (case B)

In case of complaints, it may be a good idea to use shielded cable and connect the shield to pin terminal called 0V.

1. 7 Serial communication

1. 7. 1 Serial connection

To connect to D1 modules, you must use the serial interface RS422/485 that usually are not standard equipment in personal computers. As an alternative to serial cards internal converters can be used for external serial interface.

SIELCO ELECTRONIC produces C1-25 model, a serial interface converter RS232-RS422/485 with triple optical isolation. To use it you simply connect it by cable to the RS232 serial port of the PC (COM) and connect it to the [C1] D1-15 according to Table 1 .1.

In the case of PCs without COM port but with a USB port, the module can be connected to the model C2-65: USB-RS485/422 converter.

	C1-25		***D1-15A***		
N°	**RS-422**		**RS-422**	**N°**	
1	GND	→ — ←	GND	2	C2
2	RX-	→ — ←	TX-	3	C1
3	RX +	→ — ←	TX +	4	C1
4	TX-	→ — ←	RX-	1	C1
5	TX +	→ — ←	RX +	2	C1
6	0 V				
7	+24 V				

	C1-25		***D1-15A***		
N°	**RS-485**		**RS-485**	**N°**	
1	GND	→ — ←	GND	2	C2
2	nc		nc	1	C1
3	nc		nc	2	C1

4	TX-/RX-	→ — ←	TX-/RX-	3	C1
5	TX + / RX +	→ — ←	TX + / RX +	4	C1
6	0 V				
7	+24 V				

Table 1. 1 - Connecting C1-25 - D1-15 (RS 422/485)

The modules D1-15 are provided with configurable serial interface RS422/485, normally configured as RS485. To change the configuration, simply remove the hood and move the jumper on the upper left to move the jumper on the card 422/485 in the top left corner on the card.

1. 7. 2 Communication Protocol

The communication protocol software is realized according to Modbus ASCII or RTU: protocol selection is via the selector of dipswitch n ° 2 (RTU = ON, OFF = ASCII).

The baud rate selection is made by the # 1 selector dip switch (ON = 19200, 9600 = OFF).

ASCII protocol

Baud rate 9600/19200
Data bits 7
Parity bit even
Stop bit 1

RTU protocol features

Baud rate 9600/19200
Data bits 8
Parity bit none
Stop bit 1

NOTE
Power on, the module waits for about 4 seconds to communicate.

1. 7. 3 Identification

The device may be assigned an identification address between 1 and 63, specified, according to the binary notation, using selector from 3 to 8 of dipswitch (Table 1 .2).

		ADDRESS					
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

	BAUD	PROT.	2^5	2^4	2^3	2^2	2^1	2^0
ON	19200	RTU						
OFF	9600	ASCII						

Table 1. 2 - configuration using dipswitch

NOTES
The address 0 is reserved.

1. 7. 4 connection cable

Use a shielded cable with one (RS-485) or two (RS-422) twisted pair in compliance with EIA RS-485, EIA RS-422, using the shield for ground.

Cable Type: *Belden 9841 (RS-485), 9842 (RS-422)*
Maximum attenuation of line: *6 dB*
Maximum capacity of line: *100 nf*
Maximum length: *1200 m*
Line Impedance: *between 100 and 120 ohms*

1. 8 Earth wiring and shielding

1. 8. 1 Grounding

For correct operation it is advisable to make the following ground:

- the mechanical ground (pin # 3 of connector [C2]) goes directly to the ground;

- the negative power supply (pin # 2 of connector [C2]) must be connected to a local earth.

It 'important that the masses are brought to the ground in an independent manner and in any case is to avoid the sharing of traits grounding with power devices.

1. 8. 2 Connecting Pt100 probes

The temperature reading is entrusted to the detection of signals from Pt100, of low intensity. Eddy currents on the shields can induce disturbances that sensor reading.

Follow these shielding rules particularly in disturbed environments by power devices (driver for dc motors, power contact, etc.)..

- use shielded and twisted cables for connection with Pt100;

- always keep the connection cables as short as possible;

- it is preferable to carry out a separate channel between Pt100 signals and signal conductors power;

- connect all cable metal shields connection with Pt100 upon arrival on the form, leaving disconnected departing on Pt100;

- Connect all shields to pin # 3 of connector [C2].

2 Operation

2. 1 Application

The D1-15 is equipped with 9-channel input for detecting temperatures of 3 PT100 and 6 analog channels.

The temperatures are measured by Pt100 2 or 3-wire with automatic compensation of the resistance of the connecting cable, the temperature values are recorded in tenths of a degree on a scale of -1990 to +5000, eg., The value 275 indicates a temperature of 27.5 ° C. The recorded values are made available through the gates numeric reading TA, TB, TC.

The ports of error signal the presence of an alarm in the reading of the input signals and in case of error Pt100 proceed disconnecting the Pt100 and verifying that there is not some short to ground.

A List of ports

A. 1 Numeric gates (Holding Registers)

Functional doors

Address	Description	ID	Byte	Limits	R / W
00	Restart number	Rs	1	0: 255	R / W
01	A Pt100 temperature	T1	2	-800: +3000	R
02	Pt100 temperature B	T2	2	-800: +3000	R
03	Pt100 temperature C	T2	2	-800: +3000	R
04	Analog input J1	J1	2	0-10000	R
05	Analog input J2	J1	2	0-10000	R
06	Analog input J3	J1	2	0-10000	R
07	Analog input J4	J1	2	0-10000	R
08	Analog input J5	J1	2	0-10000	R
09	Analog input J6	J1	2	0-10000	R
10	Errors PT100	eT	1	00h : FFh	R
11	Errors Analog Inputs	eJ	1	00h: FFh	R

Errors analog inputs J and J-	
Bit 0	Error analog reference
Bit 1	Analog error J1
Bit 2	Analog error J2
Bit 3	Analog error J3
Bit 4	Analog error J4
Bit 5	Analog error J5
Bit 6	Analog error J6