

RS232-RS422/RS485 CONVERTER (90-270 VAC, DIN RAIL)

INTRODUCTION

The device converts electric signals from RS232 standard into the RS422/485 one. The two line sections (RS232 and RS422/485) are optically and galvanically isolated from each other and from power supply as well. The device automatically handles bidirectional data flow in 485 line (switch S1 in auto position) and after each transmitted message, assures 2 bytes guard time after last bit transmitted before line releasing. This operation is compatible with Mod bus RTU protocol devices and with all devices whose response messages occur after the two bytes guard specified time (ie. after 1 ms at 19200 bit/s).

It's possible to set, opening the frontal cover:

- type of line (RS 422-RS 485);
- Auto / Man functioning;
- baud rate used;
- termination resistances.

It's particularly necessary with 422 line to set S1 in Auto position and D1 dipswitch in off position, without selecting any baud rates. All the devices are subjected to 1 year warranty period except in all those cases of bad handling and uncorrect wiring.

C1-23 DESCRIPTION

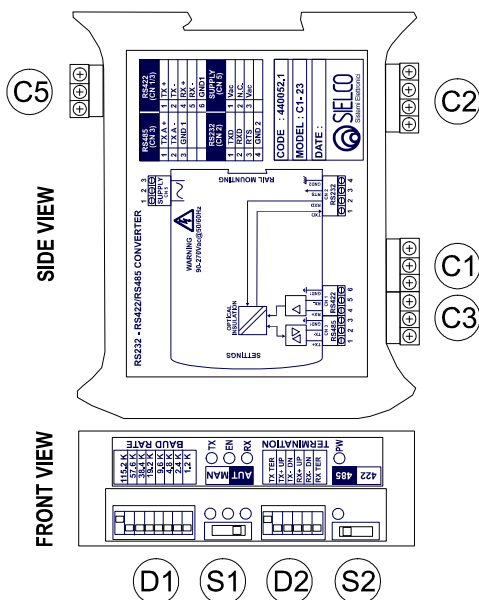


Fig 1 - C1-23 layout

- C1, C3** Connectors for RS422/485 line connection
- C2** Connectors for RS232 line connection
- C5** 90-270 Vac supply connector.
- D1** Dipswitch baud rate selector (from 1.2 to 115Kbit/sec).
- D2** Dipswitch to set line termination resistances (tab. 4).

- S1** Auto/Man selector: in manual position output line is hold/released according to RTS (driver controlled) signal. In auto position line is hold at the first bit transmitted and the release occurs after two bytes guard time from the last bit transmitted. In RS485 line a baud rate must be selected (dipswitch D1) when S1 is set in auto position (see table 3).
- S2** line selector (RS422/RS485). Set the switch according to the type of physical line used.

- Led PW** Lights when power is on.
- Led TX** Lights during bit transmission (1 states).
- Led RX** Lights during bit receiving (1 states).
- Led EN** Lights while line is keeping hold (RS485).

POWER

C1-23 is a rear mounting device (DIN rail) with a 90-270Vac supply. Connect power supply to C5 screws 1, and 3 .

Device consumption about 5VA.

SIGNALS

- PC to C1-23 connection

If your PC COM port is provided with a 9 contacts D type male connector use a four wire cable according to table 1 (non inverting cable).

If your PC COM port is provided with a 25 contacts D type male connector use a four wire cable according to table 1 (inverting cable).

PC COM		C1-23		PC COM		C1-23	
n°	Con. 9 Poli	Con. C2	n°	n°	Con. 25 Poli	Con. C2	n°
2	RXD	TXD	1	2	TXD	RXD	2
3	TXD	RXD	2	3	RXD	TXD	1
5	GND	GND	4	4	RTS	RTS	3
7	RTS	RTS	3	7	GND	GND	4

Tab 1 - RS232-C1-23 wiring (9 Poles and 25 Poles)

- RS422 /485 cable

Use a shielded cable with 1 (RS 485) or 2 (RS 422) twisted pairs according to EIA RS-422 and EIA RS-485.

Suggested cable type: Belden 9841 (RS485), 9842 (RS422)

Maximum line attenuation: 6 dB

Maximum line capacitance: 100 nF

Cable wiring according to table 2

RS422 wiring		RS485 wiring	
C1-25	Device	C1-23	Device
Con C3, C1		Con C3	
1 TX+	RX+	1 TX+ / RX+	TX+ / RX+
2 TX-	RX-	2 TX- / RX-	TX- / RX-
4 RX+	TX+	3 GND	GND
5 RX-	TX-		
6 GND	GND		

Tab 2 - C1-23-devices wiring (RS422 and RS485)

Max number of parallel devices (with both terminated ends): 32
The cable shield can be connected to C1-23 ground (screw n°3 of C3 and screw n°6 of C1) and, through a 100 ohm, to field ground to avoid ground loops as specified in fig. 3.

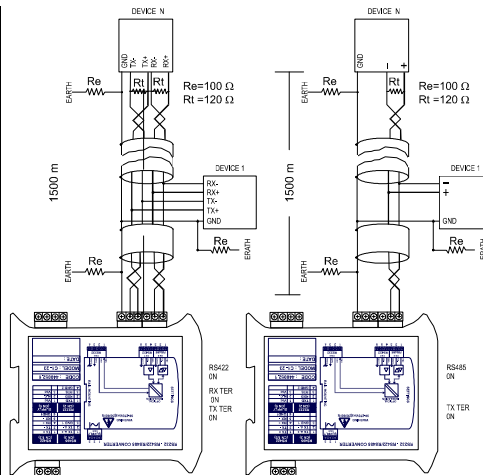


Fig 3 - RS422 and RS485 wiring example

APPLICATIONS

The C1-23 converter can be employed in the following configurations:

- 1) in RS232 point to point connection, to increase the distance and quality of transmission.
- 2) in RS232-RS422/485 multipoint connections with a single RS 232 master device (PC or PLC)
- 3) in parallel connection in a RS485 (RS422) line to make possible the message tracing, (both way from the bidirectional line) without introducing disturbances.
- 4) for networking RS232 units, where one RS232 master unit must be connected with a plurality of RS232 slave units. A proper working requires that the device number initialization be done for individual slave unit by slave software together with filtering of unwanted messages.

SETTINGS

- Case 1) and 2))
Use table 3 for setting the device in application cases 1) and 2). In particular with 422 lines let the baud rate dipswitches disconnected. The dipswitches must be used only in 485 line with S1 in auto position.
- Case 3)
When the connection is parallel, set switch S2 always in 422 mode independently of the type of physical line.

- 485 line - You must connect the 2 wires to RX+ e RX- (screw 4 and 5 of C1). Both way line message of half duplex transmission can be received from the same input RS232 port.
- 422 line - You can realize a complete message monitor using 2 C1 23 devices, each one monitoring one way of transmission. Two input RS232 ports must be used in this case.

- Case 4)
- Set switch S1 in Auto position.
- Set switch S2 in RS485 mode (physical line must be conform to RS485 standard).
- Set D1 according to the used baud rate (the baud rate must be the same for all devices).
- Be sure that the used protocol is conform to the guard time specified.
- Termination resistances can be set only in master and far end slave device according to table 4.

N.B. Keep the RS485 derivative connections as short as possible (max. 1.5 m).

	Switch S2	Switch S1	Dipswitch D1
A	RS422	AUTO	UNSELECT
B	RS485	MAN	UNSELECT
C	RS485	AUTO	SELECT BAUD RATE

Tab 3 - Configuration modes

LINE TERMINATIONS

It's possible to set line terminations independently for both way of transmission without removing the cover.

- Set dipswitches D2 (RX+ UP, RX-DN, TX+ UP, TX-DN) for biasing of 422/485 line in case 1, 2 and 4 (limited to master and far end slave device). Don't use D2 in parallel monitor applications (case 3).
- Set line terminations by dipswitch D2 (TX TER, RX TER) (120 ohm in parallel between the line wires) according to the following table

Baud rate	Distance(m)	
	0 50 100 200 300 600 1100 1400 1500	
1.2 Kbit/s	[Termination bars]	
2.4 Kbit/s	[Termination bars]	
4.8 Kbit/s	[Termination bars]	
9.6 Kbit/s	OFF	ON
19.2 Kbit/s	[Termination bars]	
38.4 Kbit/s	[Termination bars]	
57.6 Kbit/s	[Termination bars]	
115.2 Kbit/s	[Termination bars]	

Tab 4 - Line terminations

Be sure that symmetrically termination resistances have been set also at the corresponding far end.