

**INDUSTRIAL SERIAL INTERFACE CONVERTER**

**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 (i.e. after 1 ms at 19200 bit /s). It's possible to set, without removing the 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.

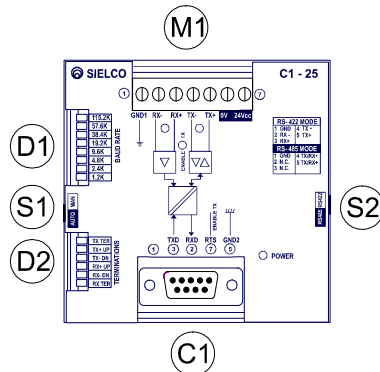


Fig 1 - C1-25- P1 layout

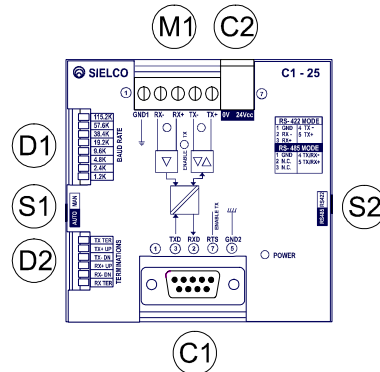


Fig 2 - C1-25-P2 layout

**C1-25 DESCRIPTION**

- C1** Female 9 contacts D connector (RS232).
- C2** Power jack connector for wall adaptor ( $9V < V_{cc} < 18V$ ).
- M1** Screws for line connection (RS422/485) and power connection ( $18 < V_{cc} < 36V$ ).
- D1** Dipswitch baud rate selector (from 1.2 to 115Kbit/sec).
- D2** Dipswitch to set line termination resistances (see table 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 Power** Lights when power is on.
- Led TX** Lights during bit transmission (1 states).
- Led RX** Lights during bit receiving (1 states).
- Led TX enable** Lights while line is keeping hold (RS485).

**POWER**

Verify the used device version:  
**C1-25-P1:** 24Vdc model for rear mounting ( $18V < V_{cc} < 36V$ ). Connect power supply to M1 screws 6 (0V), and 7 (24V).  
**C1-25-P2:** 12Vdc model (desk version) ( $9V < V_{cc} < 18V$ ). Connect plug in jack of power cable in C2 connector.  
 For the P2 version the power cable with the wall adapter can be delivered if ordered (part number: AC/DC23012).  
 Device consumption about 2W.

**SIGNALS**

- **PC to C1-25 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	C1-25	PC COM	C1-25
Con. 9 Poli	Con. C1	Con. 25 Poli	Con. C1
2 RXD	RXD	2 TXD	TXD
3 TXD	TXD	3 RXD	RXD
5 GND	GND	4 RTS	RTS
7 RTS	RTS	7 GND	GND

Tab 1 - RS232-C1-25 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

RS422 wiring		RS485 wiring	
C1-25	Device	C1-25	Device
Screws M1		Screws M1	
1 GND	GND	1 GND	GND
2 RX-	TX-	1 n.c.	n.c.
3 RX+	TX+	3 n.c.	n.c.
4 TX-	RX-	4 TX- / RX-	TX- / RX-
5 TX+	RX+	5 TX+ / RX+	TX+ / RX+

Tab 2 - C1-25-devices wiring (RS422 and RS485)

Cable wiring according to table 2  
 Max number of parallel devices (with both terminated ends): 32

The cable shield can be connected to C1-25 ground (screw n°1) and, through a 100 ohm, to field ground to avoid ground loops as specified in fig. 3.

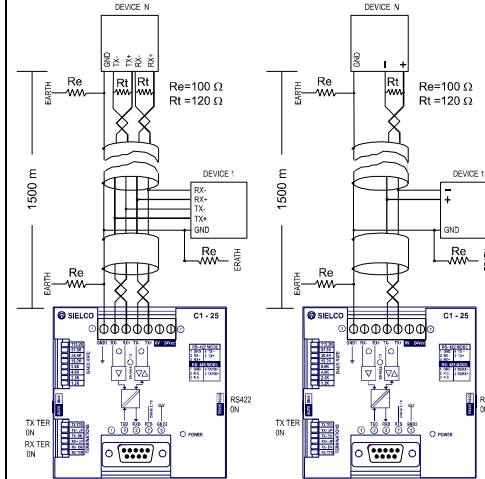


Fig 3 - RS422 and RS485 wiring example

**APPLICATIONS**

The C1-25 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 3 and 2 of M1). 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 25 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.

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

Tab 3 - Configuration modes

- 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).

**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	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.