
CNV 1413 Converter RS 232 - RS 485/422

Manual



ERMA

Electronic GmbH

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1. Description

The model **CNV 1413** is designed for converting serial datas of serial interfaces like RS 485 respectively RS 422 to RS 232 and vice versa.

Characteristics

- Easy installation
- Flexible power supply (8 ... 36 VDC)
- Communication distance up to 1000 m
- Data rate max. 120 kBaud.

2. Safety instructions

This converter is produced in accordance with Class II of IEC 348 and VDE 0411. When delivered the converter has been tested to meet all functions described. Before installing the converter please read the mounting and servicing instructions.

We have no liability or responsibility to customer or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by equipment or software sold or furnished by us. Read the installation instruction carefully. No liability will be assumed for any damage caused by improper installation.

Inspect the converter module carton for obvious damage. Be shure there are no shipping and handing damages on the module before processing. Do not apply power to the converter if it has been damaged.

ERMA's warranty does not apply to defects resulting from action of the buyer, such as mishandling, improper interfacing, operation outside of design limits, improper repair or unauthorized modifications.

3. **Explanation of symbols**



Caution



Attention



Instruction



Hint

- Caution:** **Dangerous!**
- Attention:** Will cause **damage**
- Instruction:** If not noticed, **trouble** may occur
- Tip:** Useful hints for **better operation**

4. **General**

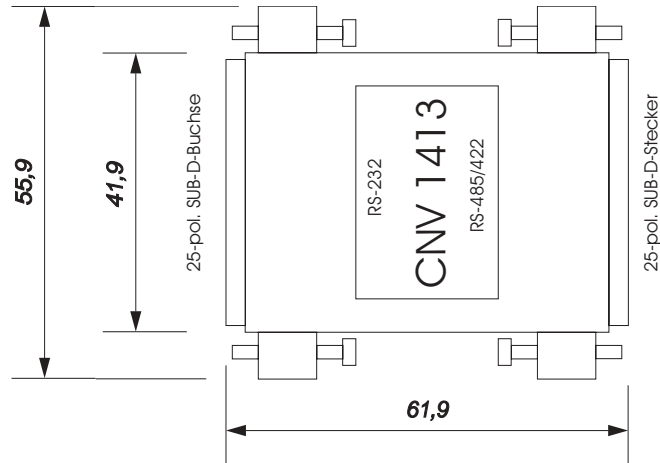
The unit model CNV 1314 is a converter for transferring data between different serial interfaces like RS 485, RS 422 to or from RS 232.

The usage is recommended for transferring data from or to one serial interface of the type RS 232 to several units supplied with a serial interface RS 485/422. One converter can be connected to max. 32 units supplied with serial RS 485 or RS 422. The distance between the converter and the remote units supplied with RS 485/422 interfaces can be 1000 m. Data transfer rates up to 1200 kBaud are possible provided that twisted pair cables are used which are terminated by correct termination networks.

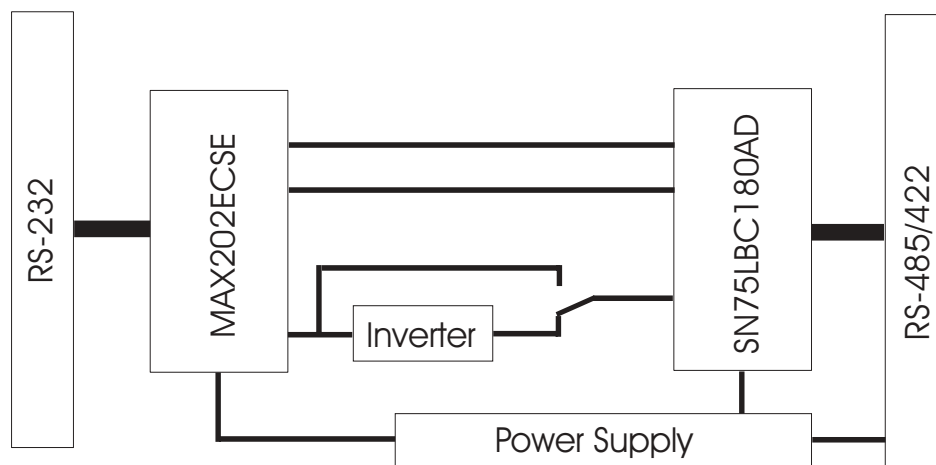
Using RS 485 the converter can be connected to a RS 232 interface and used like a normal interface. The only difference is when switching over from transmitting to receiving. Switching is necessary because the RS 485 interface can only work in the half duplex mode. The switching from transmitting to receiving or reversed can be done by the lines DTR or RTS of the RS 232 interface.

5. Construction

The converter CNV 1413 is housed in a metallized plastic case (see figure 1)



For connecting the converter CNV 1413 to a RS 232 interface there is a 25-pol SUB-D connector (female) provided. The pin assignment fits to the pin assignment of the RS 232 interface connector of a PC. The connector for the RS 485/422 interface and the power supply is on the opposite side of the converter. The block diagramm of the converter can be seen in figure 2. The electronic circuit consists of a transmitter/receiver circuit for the RS 232 interface. The internal signals of the transmitter/receiver circuit are connected to the RS 485/422 converter circuit. The signals of the RS 485/422 converter are fed to the second connector. There are two 120 Ω built-in resistors. These resistors can be used as termination network.



Block Diagramm

Additionally there is a built-in inverter. This inverter can be used for controlling the transmitter/receiver mode. By this way the function of the external signals DTR or RTS for switching between transmitting and receiving can be inverted.

For the power supply there is an integrated regulating switching DC/ DC converter. The DC/DC converter has a wide voltage input range. By this way it is possible to use supply voltages from 8 VDC to 32 VDC. Because of the high efficiency of the converter the mode “continuous transmitting” is allowed. The supply voltage must be connected to the pins 24/25(GND) and 12/13(+).

6. Configuration

It is possible to configure the functions of the converter according to customer requirements. Normally the configuration is done before delivering. The standard configuration is described below.

Mode	RS 485
Controlling input	DTR
Controlling function	High activ
Receiver controlling	Continuous receiving
Pin configuration	DCE

Another configuration is:

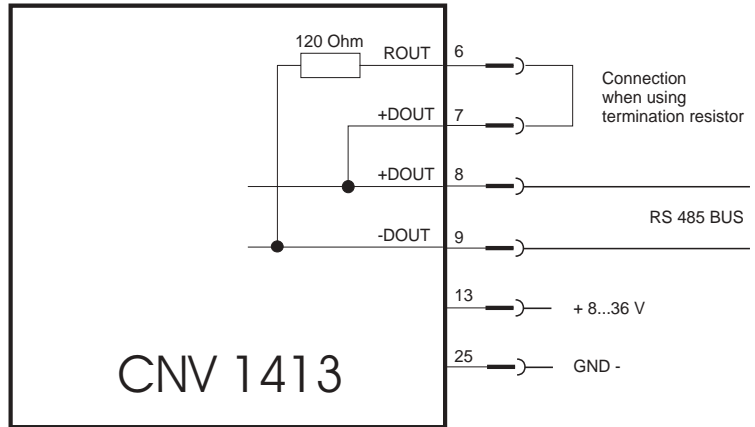
Mode	RS 422
Controlling input	RTS
Controlling function	Low activ
Receiver controlling	Controlled
Pin configuration	DTE

7. RS 232 - RS 485 Converter

This configuration uses only one twisted pair cable. The transmitter channel and the receiver channel are connected together by the internal solder bridges LP6 and LP 7 (see Figure 3). All lines

of the remote units (up to 32) are connected in parallel. Only one of the parallel connected converters is allowed to be in the transmitting mode.

The ends of the twisted pair cable must be terminated by a 120 Ω resistance. This can be done by connecting pin 6 to pin 7 (see figure 4).

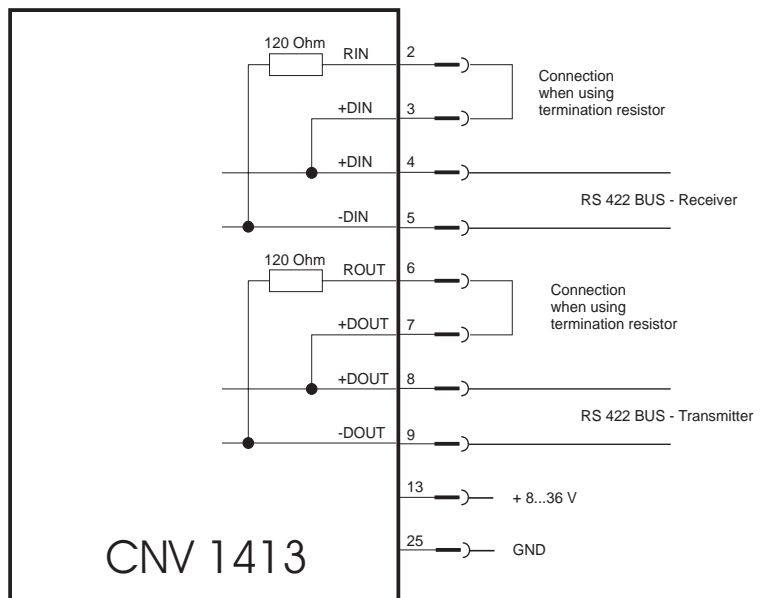


8. RS 232 - ES 422 Converter

This configuration uses two twisted pair cables, one pair for transmitting and one pair for receiving data by a master converter. The master converter is usually the converter connected to the PC. The other converters (up to 32) are working as slaves.

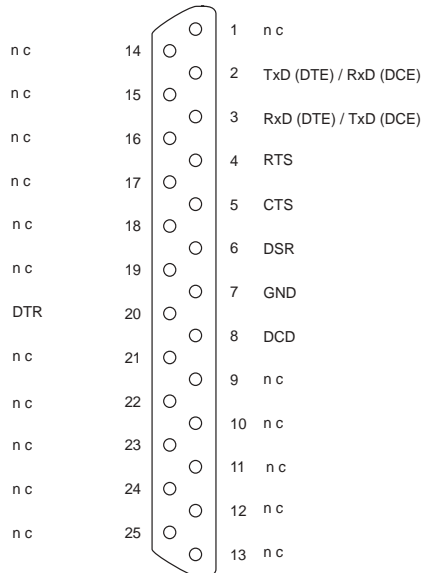
The transmitter channel of the master is connected to the receiver channels of all slave units. The transmitter channels of the slave units are connected to the receiver channel of the master converter. When running, only one channel of the slave units is allowed to be in the transmitting mode.

Both twisted pair cables must be supplied with termination networks at the two ends of the cables.

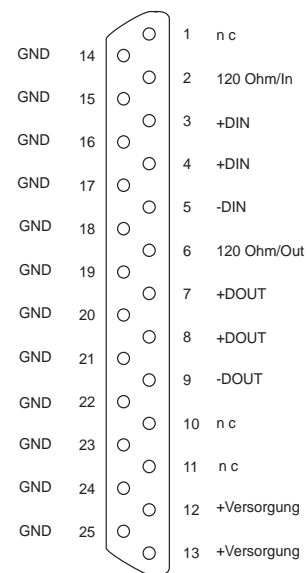


9. Pin Assignment

Connector RS 232 (female)



Connector RS 485/422



10. Hints against noisy environment

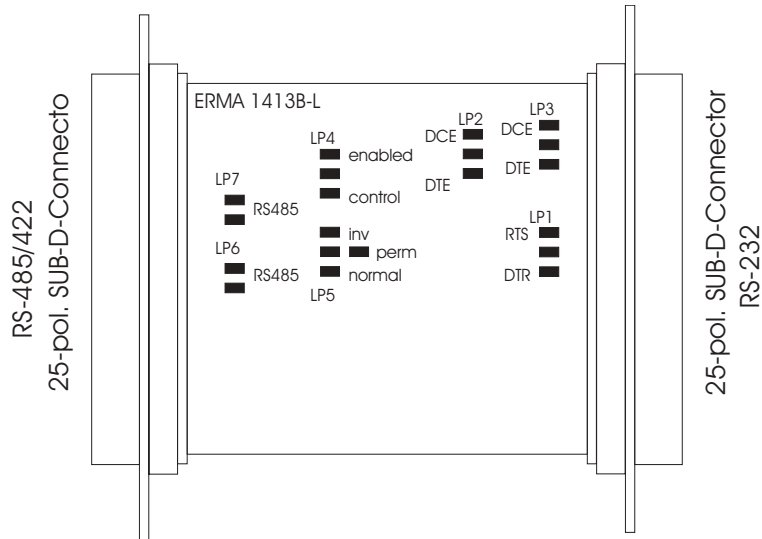
All inputs and outputs are protected against noisy environment and high voltage spikes. Nevertheless the location should be selected to ensure that no capacitive or inductive interference can have an effect on the converter or the connection lines.

It is advisable:

- To use shielded cables.
- The wiring of shields and ground (0V) should be star-shaped.
- The distance to interference sources should be as long as possible. If necessary, protective screen or metal enclosures must be provided.
- Coils of relays must be supplied with filters.
- Parallel wiring of input signals and AC power lines should be avoided.

11. Configuration Hints

If necessary the configuration of the unit CNV 1413 can be changed by the customer. The configuration is done by solder bridges at the soldering side of the board (see figure 5).



Solder Bridges - Overview

Configuration Table:

Function	oSolder Bridge	Solder Bridge
Mode RS 422	oLP6: open	LP7: open
Mode RS 485	dLP6: closed	LP7: closed
Controlling by DTR	LP1: Middle-DTR	
Controlling by RTS	LP1: Middle-RTS	
Controlling Permanent	LP5: Middle-perm	
Controlling High activ	LP5: Middle-Normal closed	
Controlling Low activ	LP5: Middle-INV closed	
Receiving Permanent	LP4: Middle-Enabled	
Controlled Receiving	LP4: Middle-Control	
MODE DCE	LP2: Middle-DCE	LP3: Middle-DCE
MODE DTE	LP2: Middle-DTE	LP3: Middle-DTE

12. Technical Specifications

Data Transfer Rate	: max. 120 kBaud
RS-232 Interface	:
Used Signals	: TxD, RxD, DTR/RTS, GND
Bridged Signals	: RTS + CTS ; DTR + DSR + DCD
RS-485/422	:
Controlling	: by DTR/RTS of the RS 232 interface
Termination Network	: 2 x 120 Ω
Power supply	:
Voltage	: 8 to 32 V DC
Current	: max. 70 mA (8 VDC) : max. 20 mA (32 VDC)
EMV	: in conform with 89/336/EWG
Operating Temperature	: 0 to 50 °C
Storage Temperature	: -25 to +85 °C
Dimensions	: 62 x 55 x 18 mm
Weight	: 50 g

13. Ordering Information

CNV 1413-							
						Pin Assignment	
						0	DCE
						1	DTE
						Controlled Receiving	
						0	Permanent Receiving
						1	Controlled Receiving (receives, when controller off)
						Controlling	
						0	Highaktiv
						1	Lowaktiv
						2	Permanent Transmitting
						Controlling	
						0	DTR
						1	RTS
						Operation	
						0	RS485
						1	RS422

Standard: CNV 1413-00000

14. Notes

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