



1. General Information

CD / EIA-530 converter box allows to connect any equipment with Conditioned Diphase (“Manchester”) interface to any equipment with RS-422/EIA-530 or EIA-530A interface.

CD - RS-422/EIA-530 converter specification.

1. Binary throughput: 16 / 32 / 64 / 128 kbps
2. Generated clock frequencies (signal “114”):
16, 32, 64, 128 kHz ± 25 ppm
3. EIA-530/RS-422 interface:
 - RS-422/V.11/X.27 electrical parameters
 - D-SUB 25 female-type connector
 - DCE (modem) interface conformant to EIA-530 or EIA-530A standard
 - Control signals (DTR, RTS) are ignored by the converter.
4. CD interface
 - Conditioned Diphase “Manchester code”
 - Transmitter output: 2-wire balanced with transformer isolation
 - Transmitter output level: 3Vpp/5Vpp on 600 Ω load,
 - Transmitter output impedance: 600 Ω
 - Receiver input: 2-wire balanced with transformer isolation
 - Receiver sensitivity: < 0.3Vpp
 - Receiver input impedance: 600 Ω
 - Interface socket: MC 1,5/ 4-G-3,81 (man. Phoenix Contact)

5. Power supply (options):

1. DC +12V..+30, < 2W, non-isolated, '-' connected to board's earth and GND line of RS-422 interface, PSU socket 5.5/2.5mm
 2. AC 85...264VAC, 47...63Hz, <5W, IEC60320-C14 socket
6. Dimensions: 105 (130 with mounting flanges) mm • 164mm • 44mm

2. **Front panel layout**

Front panel contains:

- CD interface (MC 1,5/ 4-G-3,81 socket)
- RS-422/EIA-530 (DSUB-25) interface
- 'Power' status indicator (LED)
- ' CD' – received signal status indicator for CD interface (LED)
- Received 'DATA' and 'CLK' signals indicators (LEDs) for RS-422/EIA-530 interfaces

3. **Connectors layout**

1. **CD interface , MC 1,5/ 4-G-3,81**

Pin	Signal Name	Direction
1	Transmit Signal Wire A	Output from converter
2	Transmit Signal Wire B	
3	Receive Signal Wire A	Input to converter
4	Receive Signal Wire B	

Pins are numbered from left to right.

2. Interface EIA-530 connector DSUB-25, female

No	Pin	Code	Cat.	Direction	Name (V.24 ITU circuit)	Type in DCE	U
1	-- 1	Shield	---	---	Connected in DTE, not connected in DCE		
2	A 2 B 14	BA TxD	I	to DCE	TXD, Transmit Data (103)	Receiver	*
3	A 3 B 16	BB RxD	I	from DCE	RXD, Receive Data (104)	Transmitter	*
4	A 4 B 19	CA/CJ RTS	I	to DCE	Request To Send (105)/ Ready For Receiving	Receiver	*
5	A 5 B 13	CB CTS	I	from DCE	Clear to Send (106)	Transmitter ¹	*
6	A 6 B 22 ⁴	CC DSR	I	from DCE	DCE ready DSR(107) Data Set Ready	Transmitter ²	*
7	7	AB GND	---		GND (102)	---	*
8	A 8 B 10	CF RLSD	I	from DCE	Received Line Signal Detector (109)	Transmitter	*
9	A 17 B 9	DD RxCk	I	from DCE	Receive Signal Timing (115)	Transmitter	*
10	A 24 B 11	DA iTxClk	I	to DCE	Transmit Signal Timing (113)	Receiver	*
11	A 15 B 12	DB oTxClk	I	from DCE	Transmit Signal Timing (114)	Transmitter	*
12	A 18	LL	II	from DCE	Local Loopback (141)	Receiver V.10	
13	A 20 B 23 ⁵	CD DTR	I	from DCE	DTE Ready (108) Data Terminal Ready	Receiver	*
14	A 21	RL	II	from DCE	Remote Loopback (142)	Receiver V.10	
16	A 25	TM	II	from DCE	Test Mode	Receiver V.10	

* - used in CD/RS-422 converter

Category (Cat.): I – V.11 / RS-422
II – V.10 / RS-423

Transmitter¹: CTS is connected directly to RTS or it is in constant ON state depending on CTS-A and CTS-B jumpers' state.

Transmitter²: DSR is connected directly to DTR or it is in constant ON state depending on DSR-A and DSR-B jumpers' state.

Pin 22⁴ (CC/DSR – B) is used in EIA-530A as CE/RI (ring indicator).

Pin 23⁵ (CD/DTR – B) is used in EIA-530A as GND.

3. Power

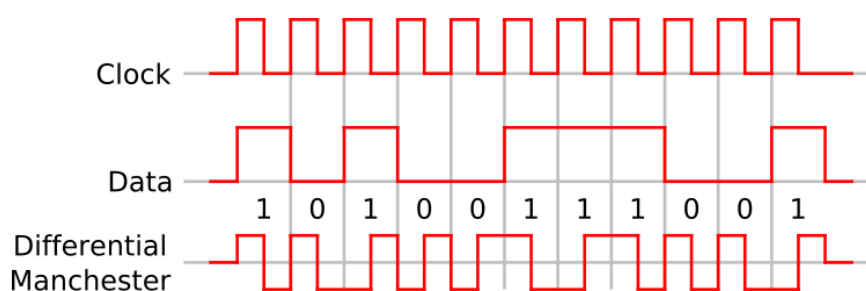
1. DC option

Converter box is powered by +9...+30VDC. The equipment is resistant to incorrect power connection, if the voltage is below 35V.

2. AC option

Converter box is powered by 85...264VAC, 47...440Hz, connector IEC60320-C14

4. Signal definition – Conditioned Diphas (Manchester)



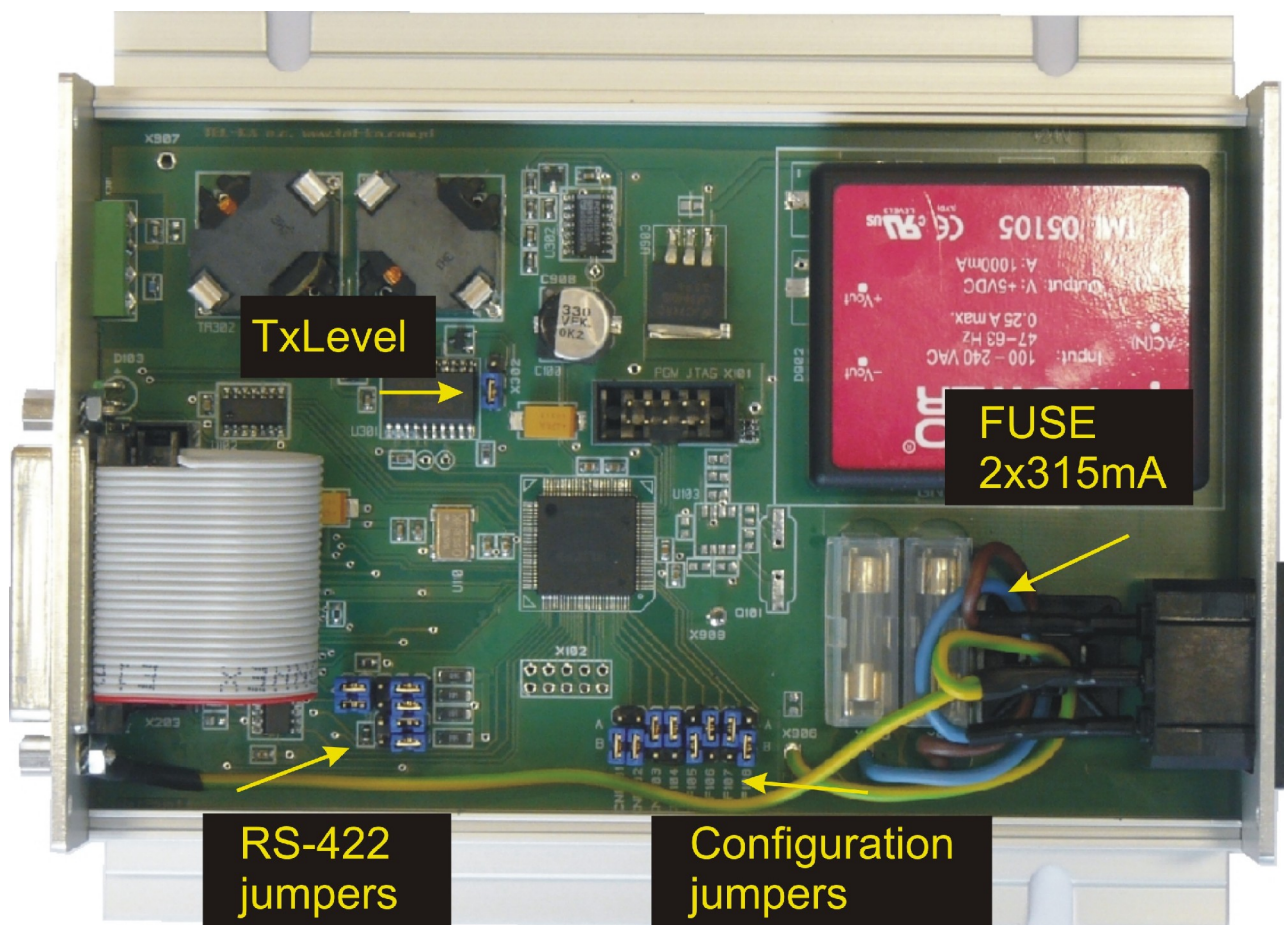
5. Signal definition – RS-422/EIA-530

Voltage $V_a - V_b$	Data bit	Control state
$> + 0.3 \text{ V}$	0	ON
$< - 0.3 \text{ V}$	1	OFF

Clock signal definition: *The condition of this circuit shall be ON and OFF for nominally equal periods of time and a transition from ON to OFF condition shall nominally indicate the centre of each signal element on data circuit.*

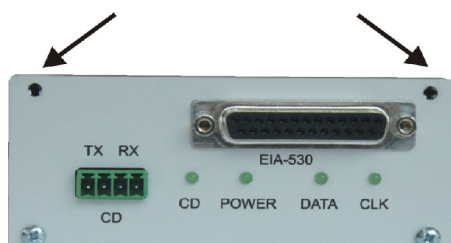
4. Configuration

1. Board layout



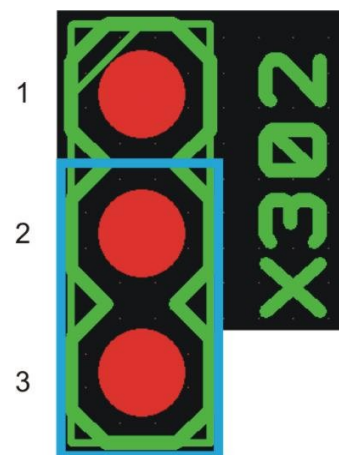
2. Opening the housing

1. Plug off power supply cable
2. Unscrew four upper screw holding top and rear panel
3. Pull out the top shell

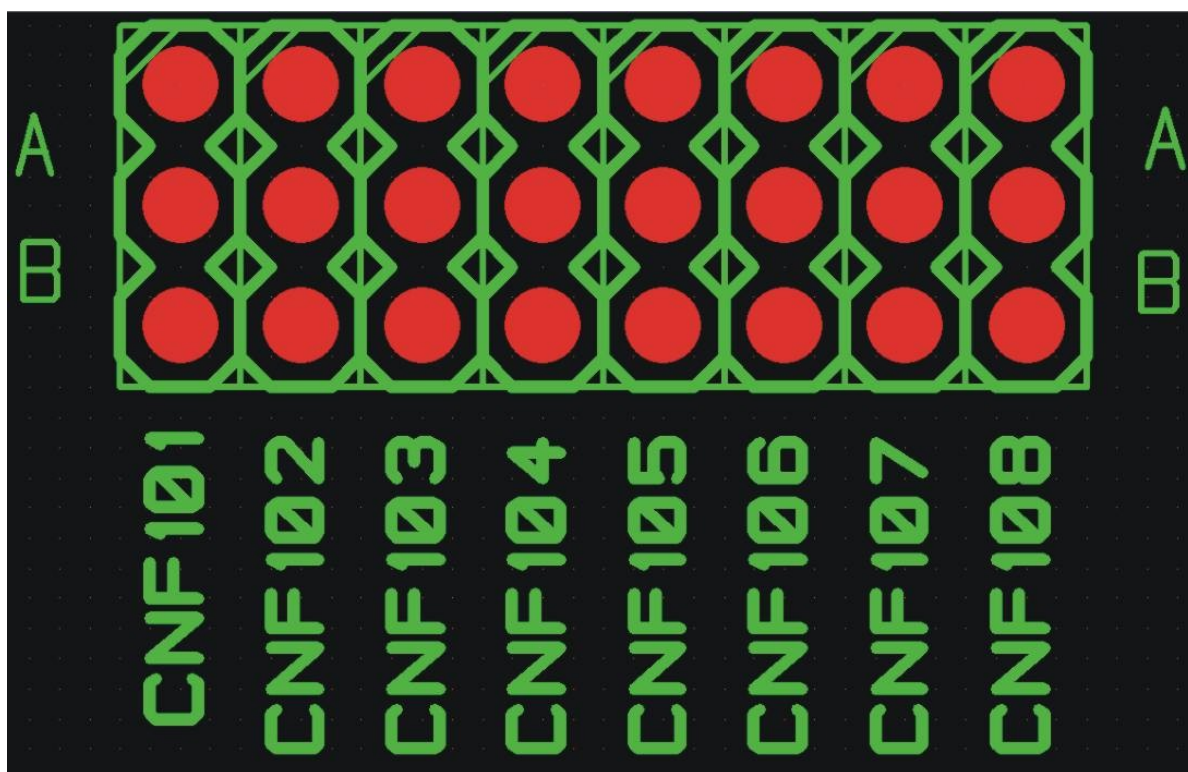


3. Setting the transmitter output level

X302	Output level
1-2	5Vpp
2-3	3Vpp



4. Configuration



1. CNF 101 – data signals' polarity on RS-422 interface

CNF 101	Polarity of data signals on RS-422
A (vcc)	Inverse of data
B (gnd)	Normal polarity

2. CNF 102 – clock signals' polarity on RS-422 interface

CNF 102	Polarity of clock signals on RS-422
A (vcc)	Inverse of clock
B (gnd)	Normal polarity

3. CNF 104 – source of transmitter's clock

CNF 104	Source of transmitter's clock
A (vcc)	External "113" (EIA-530 pins 24,11)
B (gnd)	Internal "114" (EIA-530 pins 15,12)

4. CNF 103, CNF 106 – PLL options

CNF 103	CNF 106	Description
B (gnd)	any	PLL is disabled
A (vcc)	A (vcc)	The bandwidth of PLL is wide
A (vcc)	B (gnd)	The bandwidth of PLL is narrow

Remarks:

1. PLL's occurs in both directions
2. If PLL is disabled, correct CD signal cannot be transmitted without a proper input clock.
3. If PLL is enabled and bandwidth is set to '*wide*', time required to reach steady state is few seconds (eg. 15s by frequency jump of 10Hz)
4. If PLL is enabled and bandwidth is set to '*narrow*' time required to reach steady state is a several tens of second (eg. 50s by frequency jump of 10Hz)

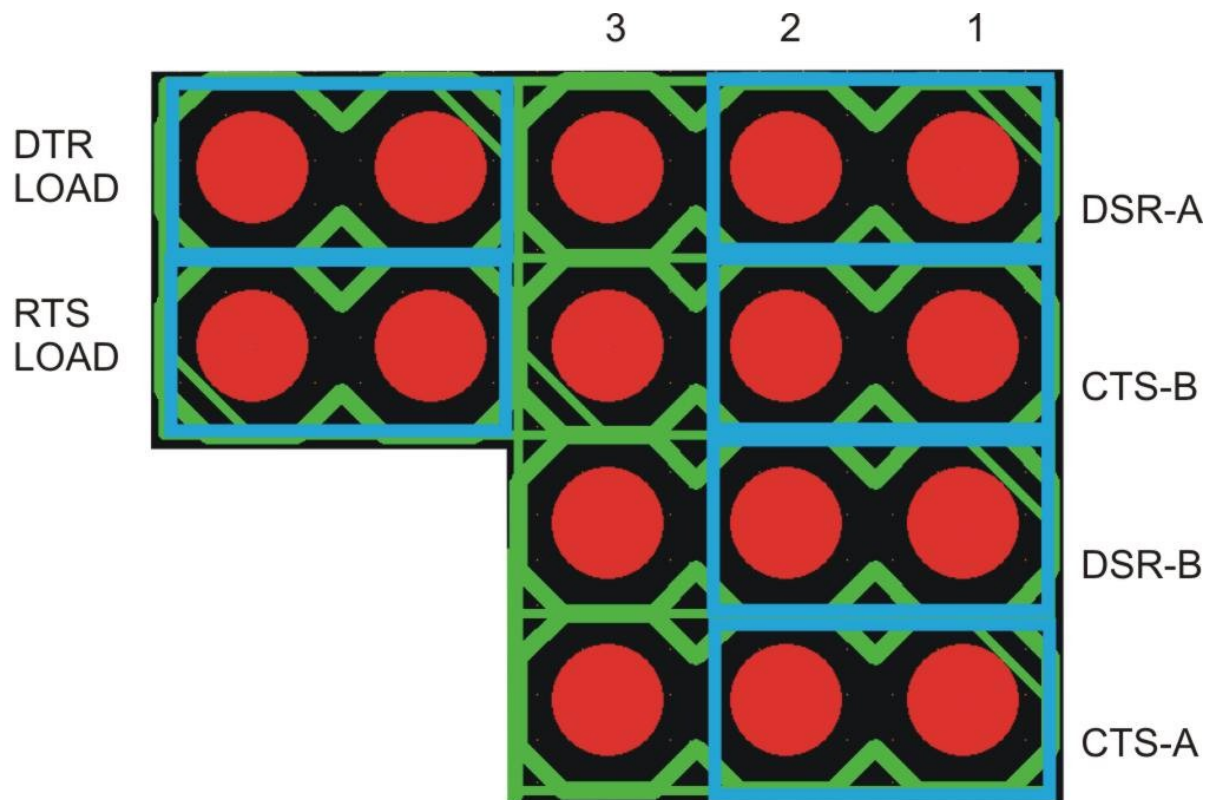
5. CNF 105 - loops

CNF 105	Loop
A (vcc)	Data stream from RS-422 is returned to RS-422 interface and data stream received from CD interface is returned to CD interface transmitter
B (gnd)	Normal operation

6. CNF 107, CNF 108 – throughput selection

CNF 108	CNF 107	Throughput
B (gnd)	B (gnd)	16 kbps
B (gnd)	A (vcc)	32 kbps
A (vcc)	B (gnd)	64 kbps
A (vcc)	A (vcc)	128 kbps

5. RS-422 jumpers layout and default configuration



6. RTS load configuration

RTS LOAD jumper	RTS load
short	resistive 100Ω
open	without load

7. CTS source configuration (X3/X4)

CTS-A/B jumpers	CTS source
1 – 2	Always ON
2 – 3	RTS

8. DTR load configuration (EIA-530)

DTR LOAD jumper	DTR load
short	resistive 100Ω
open	without load

9. DSR source configuration (EIA-530)

DSR-A/B jumpers	DSR source
1 – 2	Always ON
2 – 3	DTR

Fixed settings for the EIA-530A interface:

DSR-B – **always 1-2**
DTR LOAD – **always open**