

Manual

CompactPCI Cards



Type	13421
	13621
Release	1.0

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Since the mid-1990's the PCI bus has become the standard bus for PCs. With the development of the CompactPCI standard, which integrates the electrical properties of the PCI bus with the mechanics of the traditional 19" world, this proven bus system has become usable in industrial environments as well.

W&T has converted all serial standard PCI cards into the CompactPCI format so that when the user switches between the PC worlds he notices no differences when using the cards. Regardless of which PC bus is used (ISA, PCI or CompactPCI), all W&T PC card families have the same design with division into the bus-specific elements and modular interface electronics. This ensures that for all bus systems the peripherals are connected using the same cables and without the necessity of exotic adapters or adjustments.

This CompactPCI family is described on the following pages along with the relevant technical data and wiring examples.

Up-to-date information on new developments as well as the newest driver releases can be found in the Internet at <http://www.wut.de> or in the e-mail short infos available through the W&T Interface Club. You can register for the Interface Club on the W&T homepage.

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PC cards for CompactPCI Bus Systems

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Common Properties

Function

All the W&T serial interface cards for CompactPCI bus systems provide the PC with two additional serial ports. The serial ports on all W&T interface cards are galvanically isolated from each other and with respect to the PC for an isolation voltage of 1kV.

The signals are insulated by means of high-speed opto-couplers; energy is supplied to the driver and receiver elements by means of an isolated DC/DC converter. Please note that the shielding of the port connectors is directly connected to the case of the PC by the metallic front panel.

All interface signal lines of the cPCI-based serial PC cards are protected against electrostatic discharge of up to 15kV according to IEC 801-2, level 4.

Drivers and software installation

The serial interface cards for cPCI bus systems can be accessed under the various operating systems only by using special drivers. These drivers are being constantly revised with respect to their technical features as well as the enumber and type of compatible operating systems.

Therefore W&T offers the most current driver versions and software installation guides available in the Internet under <http://www.wut.de>.

Important notes

The serial W&T cPCI cards are only compatible with interface modules from series 18x1x (e.g. 18811, 18813, 18611, 18411, etc.) having a supply voltage of 5V DC.

Use of 3.3V modules from series 18x3x (e.g. 18831, 18833, 18631, etc.) will cause permanent damage to the interface modules and/or the cPCI card.



cPCI Card 2x 20mA, #13421**Function**

The W&T cPCI card 13421 provides two mutually independent serial 20mA interfaces with 1kV of galvanic isolation for CompactPCI systems.

Wiring configuration

The 20mA terminals on the PC card are configured as a DB9 plug. The pin configuration is shown in the table below:

pin#	function
1	Data Out 20 mA
2	Data Out +
3	Data Out -
4	Data Out GND
5	Halfduplex control
6	Data In 20 mA
7	Data In +
8	Data In -
9	Data In GND

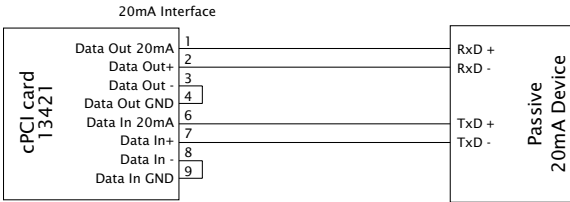
Wiring examples

A jumper from Pin 4 to Pin 5 on the SUB-D connector can convert the 20mA interface into a half-duplex mode in which echo suppression is performed for the sent signals.

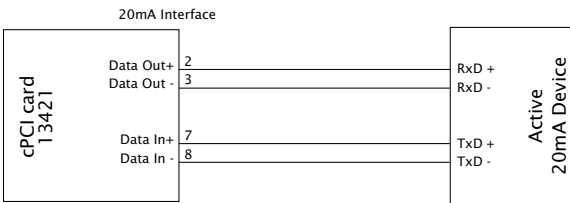
The 20mA cPCI card can be used both as an active and passive component. In active mode the card provides the loop current for the respective 20mA loop, whereas in passive mode the connected device must provide the loop current.

The operating mode can be set separately for both loops via the external card configuration. Examples for configuring the PC card in active and passive mode can be seen in the following illustrations:

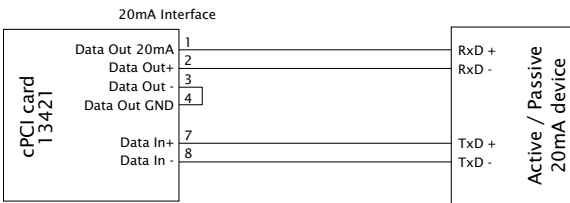
Active Tx and active Rx current loop application



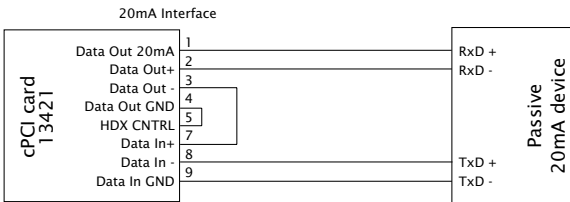
Passive Tx and passive Rx current loop application



Active Tx and passive Rx current loop application



cPCI card active, halfduplex mode application



Technical Data

System bus:	32-bit bus / 33MHz PCI signal voltage: 5V
Interfaces:	Two 20mA interfaces
Galvanic isolation:	min. 1kV isolation voltage
Modes:	Active and passive Full- and half-duplex
Signals:	RxD+, RxD-, TxD+, TxD-
Maximum permissible voltage drop in the current loop:	8 Volts
Baud rate:	50..57.600 baud
Data format:	any
UART:	16950 with 128-byte FIFO
Base addresses:	Automatic configuration
Interrupts:	Automatic configuration
Connections:	2x 9-pin SUB-D plug
Supply voltage:	+5V 0.1A, +12V 0.1A
Format:	Eurocard 100 mm x 160 mm
Front panel:	3 HE / 4 TE
Weight:	approx. 175 g
Scope of delivery:	cPCI card 2x 20mA Driver-CD

cPCI Card 2x RS232/RS422/RS485, #13621

Function

The W&T cPCI-Karte 13621 provides two mutually independent, switchable RS232/RS422/RS485 interfaces with 1 kV of galvanic isolation for CompactPCI systems.

Wiring configuration

The serial connections on the PC card are configured as DB9 plugs. The pin configuration can be seen in the following table:

RS232 mode

pin#	signal	function
1	DCD	input
2	RxD	input
3	TxD	output
4	DTR	output
5	GND	GND
6	DSR	input
7	RTS	output
8	CTS	input
9	RI	input

RS422/RS485 mode

pin#	signal	function
1	TXD A	output
2	RxD A	input
3	DTR A	output
4	CTS A	input
5	GND	GND
6	TXD B	output
7	RxD B	input
8	DTR B	output
9	CTS B	input

Operating modes

The combined RS232/RS422/485 interface of the cPCI card can be set to various operating modes using the DIL switches located near the serial port. These modes are described below:

RS232 mode

This mode provides one data channel each (RxD and TxD) in both directions, as well as six handshake channels (RTS, CTS, DSR, DCD, DTR and RI).

RS422 mode

The cPCI card supports one data and one handshake channel each (selectable DTR or RTS handshake output) in each direction. The RS422 sender and receiver chips are always active.

RS485 mode

In all RS485 modes there is always one data channel available in each direction. The operating modes differ only in how the RS485 driver and receiver chips are controlled.

RS485 4-wire bus master

In this mode the Master uses a pair of wires to send requests to the slaves, which in turn use an additional common wire pair to send their replies to the master. In this mode, in which the master can always send and is always listening for the slaves, the RS485 drivers and receivers always remain active.

RS485 4-wire mode / RS485 2-wire mode with echo, handshake control

One data channel is available in each direction. The RS485 driver chip is turned on with RTS or DTR = „ON“, whereas RTS or DTR = „OFF“ places the driver in high-impedance state. The receiver channel is always active in this mode.

RS485 2-wire mode with no echo, handshake control

One data channel in each direction is available. The RS485 line driver is turned on with RTS or DTR = „ON“, whereas RTS or DTR = „OFF“ puts the driver in high-impedance state. The receiver channel is deactivated when the driver is turned on, and turned on when the driver is at high-impedance.

RS485 4-wire mode / RS485 2-wire mode with echo, automatic control

One data channel is available in each direction. The RS485 line driver is automatically activated whenever data is output and returned to high-impedance state at the end of data output. The receiver channel is always active in this mode.

RS485 2-wire mode without echo, automatic control

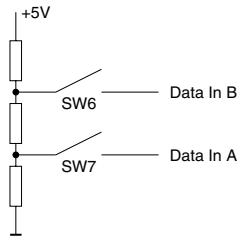
One data channel is available in each direction. The RS485 line driver is automatically activated whenever data is output and returned to high-impedance state at the end of data output. The receiver channel is deactivated when the driver is turned on, and turned on when the driver is at high-impedance.

The DIL mode switch settings can be seen in the following table:

Operating mode	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
RS232	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
RS422, RS485, 4-wire bus master DTR handshake	OFF	OFF	OFF	ON	OFF	*	*	OFF
RS422, RS485, 4-wire bus master RTS handshake	OFF	OFF	OFF	OFF	ON	*	*	OFF
RS485, 4-wire / 2-wire with echo DTR control	OFF	OFF	ON	ON	OFF	*	*	OFF
RS485, 2-wire without echo DTR control	ON	OFF	ON	ON	OFF	*	*	OFF
RS485, 4-wire / 2-wire with echo RTS control	OFF	OFF	ON	OFF	ON	*	*	OFF
RS485, 2-Draht without echo RTS control	ON	OFF	ON	OFF	ON	*	*	OFF
RS485, 4-wire / 2-wire with echo automatic control	OFF	ON	OFF	ON	OFF	*	*	OFF
RS485, 2-wire without echo automatic control	ON	ON	OFF	ON	OFF	*	*	OFF

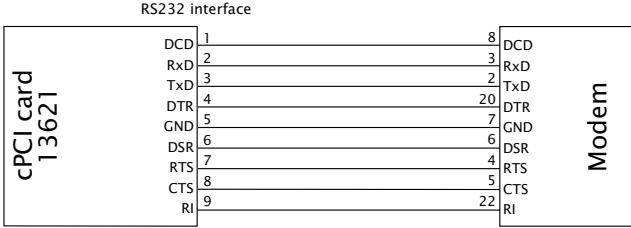
Termination

All RS485 modes require terminating the bus system with a termination network which ensures a defined rest state in the high-impedance phases of bus operation. The connection between the bus system and a termination network can be made on the cPCI card by closing DIL switches 6 and 7:

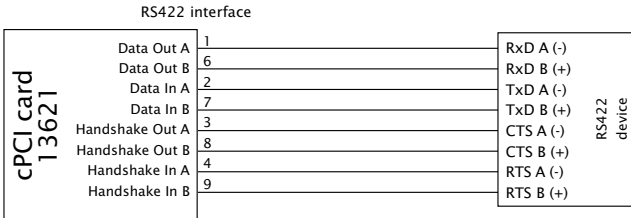


Wiring examples

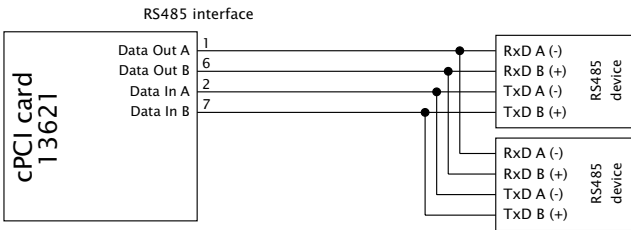
RS232 application with hardware handshake



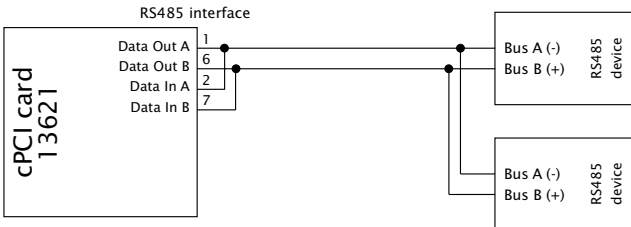
RS422 application with hardware handshake



RS485 4-wire bus master application



RS485 2-wire application



Technical Data

System bus:	32-bit bus / 33MHz PCI signal voltage: 5V
Interfaces:	Two switchable RS232-/RS422-/RS485 interfaces
Galvanic isolation:	min. 1kV isolation voltage
Operating modes:	RS232 RS422 RS485 handshake control RS485 Automatic control
Signals:	RS232 mode: RxD, TxD, RTS, CTS, DSR, DTR, DCD, RI RS422/RS485 mode: RxD A/B, TxD A/B, CTS A/B, DTR A/B
Baud rate:	RS232 mode: 50..230.400 baud RS422/RS485 mode: 50..460.800 baud
Data format:	any
UART:	16950 with 128 Byte FIFO
Base addresses:	Automatic configuration
Interrupts:	Automatic configuration
Connections:	2x 9-pin SUB-D plug
Supply voltage:	+5V 0.1A, +12V 0.1A
Format:	Eurocard100 mm x 160 mm
Front panel:	3 HE / 4 TE
Weight:	approx. 175 g
Scope of delivery:	cPCI Card 2x RS232/RS422/RS485 Driver-CD