

Manual

PC Cards for ISA Bus Systems



Type	13001, 13401
	13601, 13801, 13802
Release	1.2

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Manual

W&T PC cards

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Function

The W&T PC card 13801 equip your PC with two independent RS232 serial interfaces.

Both serial ports are equipped with type 16C550 FIFO UARTs; this makes them functionally compatible with standard RS232 interfaces, so that the cards can easily be used with your available software. Following a reset, the type 16550 elements are in standard UART operating mode, so that there is no need to worry about existing software. The FIFO mode has to be activated explicitly by the software.

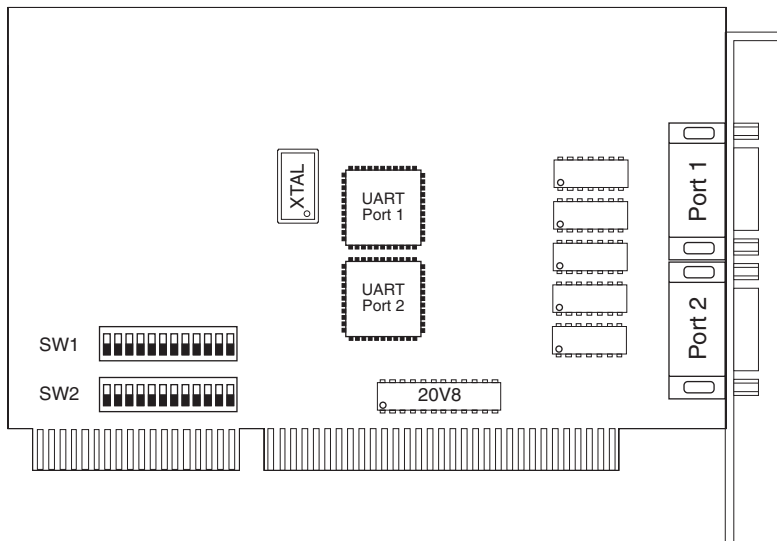
DMA operation of the 16550 UARTs is not supported by the hardware of the W&T PC card 13801.

ESD protection

All interface signal lines of the PC card 13801 are protected against electrostatic discharge of up to 15 kV according to IEC 801-2, level 4.

Configuring the card

The base address and the required interrupt line can be set by DIP switches at the lower edge of the card.



Base addresses

The I/O base addresses of the two ports can be set independently by DIP switches to 03F8H, 02F8H, 03E8H or 02E8H. Serial ports at these base addresses are recognized by almost all modern BIOS versions upon startup of the PC, and are written to the BIOS RAM of the computer. Some older BIOS versions recognize only two serial ports at the base addresses for COM1 and COM2. In these rare cases, a separate program is needed to search the computer for installed serial ports and write the COM3 and COM4 ports to BIOS RAM. The necessary software can be obtained from W&T on request. Setting both ports to the same base address should be strictly avoided. Please see the following tables for an explanation of the address DIP switch settings:

Port 1		SW 1.9	SW 1.10	SW 1.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 1.12 has no function

Port 2		SW 2.9	SW 2.10	SW 2.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 2.12 has no function

Since the address is decoded by means of GALs, customizing of the I/O address is no problem. This option makes it possible to employ more than 4 serial ports on a computer, if the software permits the use of additional I/O addresses.

Interrupt settings

The W&T serial PC Cards permit use of the standard interrupts IRQ3 and IRQ4 for the serial ports COM1 and COM2, and interrupts IRQ5 and IRQ7 for the parallel ports LPT1 and LPT2 if the system has no parallel ports or if the built-in parallel ports do not operate in interrupt mode. Since it is a long card, the PC Card 16201 also supports interrupts IRQ9..IRQ12 of the second interrupt controller. Please see the following tables for an explanation of the IRQ DIP switch setting:

IRQ	SW 1.1	SW 1.2	SW 1.3	SW 1.4	SW 1.5	SW 1.6	SW 1.7	SW 1.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 1

IRQ	SW 2.1	SW 2.2	SW 2.3	SW 2.4	SW 2.5	SW 2.6	SW 2.7	SW 2.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 2

Connectors and pin assignment

The two ports of the W&T RS232 PC card 13801 use DB9 male connectors with identical pin configuration. The connector pin assignments are shown in the table below:

pin assignment RS232 interface	
pin#	function
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Technical data

base addresses: 03F8H, 02F8H, 03E8H, 02E8H
interrupts: IRQ3, IRQ4, IRQ5, IRQ7
IRQ9, IRQ10, IRQ11, IRQ12
Baudrate: 50..115200 Baud
data format: any data format
insulation: no insulation
ESD protection: up to 15 kV according to IEC 801-2, level 4
supply current: approx. 200mA @5V, 30mA @12V, 30mA @-12V
RS232 interface: DB 9 male connector
dimensions: 165 x 106 mm
weight: approx. 150 g
packing list: 1 x RS232 PC card, type 13801

Function

The W&T PC card 13802 equip your PC with two independent RS232 serial interfaces with an insulation of up to 1000 Volts.

Both serial ports are equipped with type 16C550 FIFO UARTs; this makes them functionally compatible with standard RS232 interfaces, so that the cards can easily be used with your available software. Following a reset, the type 16550 elements are in standard UART operating mode, so that there is no need to worry about existing software. The FIFO mode has to be activated explicitly by the software.

DMA operation of the 16550 UARTs is not supported by the hardware of the W&T port cards.

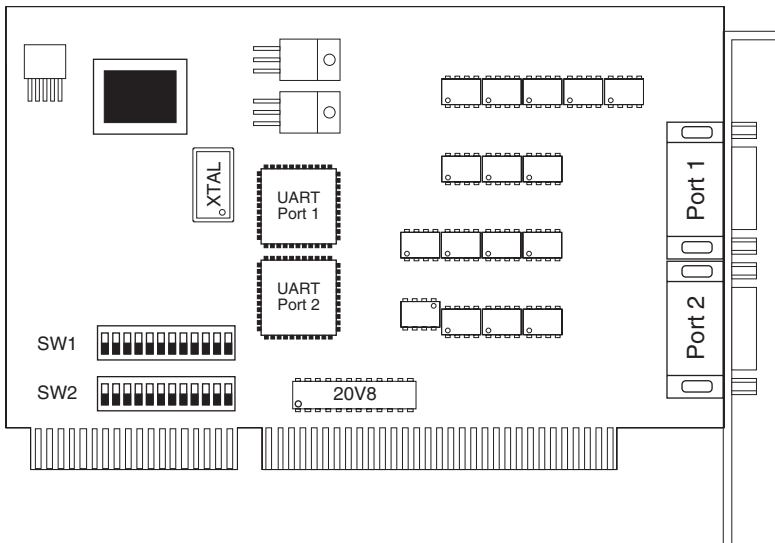
Insulation and ESD protection

The two ports of the W&T serial PC card 13802 are insulated both from each other and from the PC with a dielectric strength of 1000 volts. The signals are isolated 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 back panel.

All interface signal lines of the PC card 13802 are protected against electrostatic discharge of up to 15 kV according to IEC 801-2, level 4.

Configuring the card

The base address and the required interrupt line can be set by DIP switches at the lower edge of the card.



Base addresses

The I/O base addresses of the two ports can be set independently by DIP switches to 03F8H, 02F8H, 03E8H or 02E8H. Serial ports at these base addresses are recognized by almost all modern BIOS versions upon startup of the PC, and are written to the BIOS RAM of the computer. Some older BIOS versions recognize only two serial ports at the base addresses for COM1 and COM2. In these rare cases, a separate program is needed to search the computer for installed serial ports and write the COM3 and COM4 ports to BIOS RAM. The necessary software can be obtained from W&T on request. Setting both ports to the same base address should be strictly avoided. Please see the following tables for an explanation of the address DIP switch settings:

Port 1		SW 1.9	SW 1.10	SW 1.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 1.12 has
no function

Port 2		SW 2.9	SW 2.10	SW 2.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 2.12 has
no function

Since the address is decoded by means of GALs, customizing of the I/O address is no problem. This option makes it possible to employ more than 4 serial ports on a computer, if the software permits the use of additional I/O addresses.

Interrupt settings

The W&T serial PC Cards permit use of the standard interrupts IRQ3 and IRQ4 for the serial ports COM1 and COM2, and interrupts IRQ5 and IRQ7 for the parallel ports LPT1 and LPT2 if the system has no parallel ports or if the built-in parallel ports do not operate in interrupt mode. Since it is a long card, the PC Card 16201 also supports interrupts IRQ9..IRQ12 of the second interrupt controller. Please see the following tables for an explanation of the IRQ DIP switch setting:

IRQ	SW 1.1	SW 1.2	SW 1.3	SW 1.4	SW 1.5	SW 1.6	SW 1.7	SW 1.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 1

IRQ	SW 2.1	SW 2.2	SW 2.3	SW 2.4	SW 2.5	SW 2.6	SW 2.7	SW 2.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 2

Connectors and pin assignment

The two ports of the W&T RS232 PC card 13802 use DB9 male connectors with identical pin configuration. The connector pin assignments are shown in the table below:

pin assignment RS232 interface	
pin#	function
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Technical data

base addresses: 03F8H, 02F8H, 03E8H, 02E8H
 interrupts: IRQ3, IRQ4, IRQ5, IRQ7
 IRQ9, IRQ10, IRQ11, IRQ12
 Baudrate: 50..115200 Baud
 data format: any data format
 insulation: min. 1000 volts
 ESD protection: up to 15 kV according to IEC 801-2, level 4
 supply current: approx. 200mA @5V, 80mA @12V
 RS232 interface: DB 9 male connector
 dimensions: 165 x 106 mm
 weight: approx. 200 g
 packing list: 1 x RS232 PC card, type 13802

Function

The W&T PC card 13401 equip your PC with two independent 20mA serial interfaces with an insulation of up to 1000 Volts.

Both serial ports are equipped with type 16C550 FIFO UARTs; this makes them functionally compatible with standard RS232 interfaces, so that the cards can easily be used with your available software. Following a reset, the type 16550 elements are in standard UART operating mode, so that there is no need to worry about existing software. The FIFO mode has to be activated explicitly by the software.

DMA operation of the 16550 UARTs is not supported by the hardware of the W&T port cards.

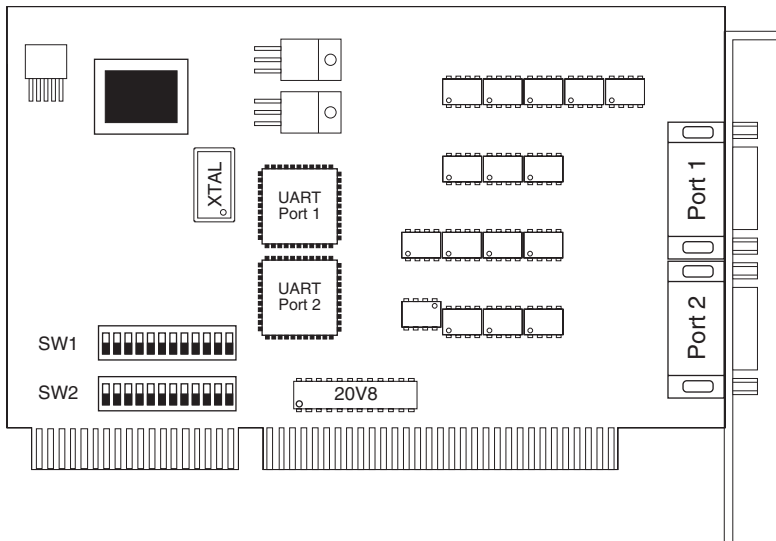
Insulation and ESD protection

The two ports of the W&T serial PC card 13401 are insulated both from each other and from the PC with a dielectric strength of 1000 volts. The signals are isolated 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 back panel.

All interface signal lines of the PC card 13401 are protected against electrostatic discharge of up to 15 kV according to IEC 801-2, level 4.

Configuring the card

The base address and the required interrupt line can be set by DIP switches at the lower edge of the card.



Base addresses

The I/O base addresses of the two ports can be set independently by DIP switches to 03F8H, 02F8H, 03E8H or 02E8H. Serial ports at these base addresses are recognized by almost all modern BIOS versions upon startup of the PC, and are written to the BIOS RAM of the computer. Some older BIOS versions recognize only two serial ports at the base addresses for COM1 and COM2. In these rare cases, a separate program is needed to search the computer for installed serial ports and write the COM3 and COM4 ports to BIOS RAM. The necessary software can be obtained from W&T on request. Setting both ports to the same base address should be strictly avoided. Please see the following tables for an explanation of the address DIP switch settings:

Port 1		SW 1.9	SW 1.10	SW 1.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 1.12 has no function

Port 2		SW 2.9	SW 2.10	SW 2.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 2.12 has no function

Since the address is decoded by means of GALs, customizing of the I/O address is no problem. This option makes it possible to employ more than 4 serial ports on a computer, if the software permits the use of additional I/O addresses.

Interrupt settings

The W&T serial PC Cards permit use of the standard interrupts IRQ3 and IRQ4 for the serial ports COM1 and COM2, and interrupts IRQ5 and IRQ7 for the parallel ports LPT1 and LPT2 if the system has no parallel ports or if the built-in parallel ports do not operate in interrupt mode. Since it is a long card, the PC Card 16201 also supports interrupts IRQ9..IRQ12 of the second interrupt controller. Please see the following tables for an explanation of the IRQ DIP switch setting:

IRQ	SW 1.1	SW 1.2	SW 1.3	SW 1.4	SW 1.5	SW 1.6	SW 1.7	SW 1.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 1

IRQ	SW 2.1	SW 2.2	SW 2.3	SW 2.4	SW 2.5	SW 2.6	SW 2.7	SW 2.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 2

Connectors and pin assignment

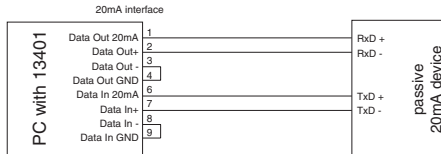
The two ports of the W&T 20 mA PC card 13401 use DB9 male connectors with identical pin configuration. The connector pin assignments are shown in the table below:

pin assignment 20mA interface	
pin#	function
1	Data Out 20 mA
2	Data Out +
3	Data Out -
4	Data Out GND
5	n.c.
6	Data In 20 mA
7	Data In +
8	Data In -
9	Data In GND

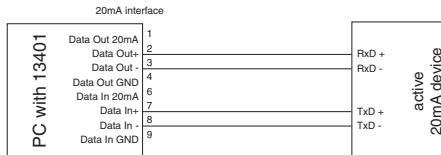
Applications

The PC card 13401 can be used as an active or passive 20mA component. In the active mode, the card supplies the current required by the respective 20mA loop, while in the passive mode the loop current must be supplied by the connected device. The operating mode can be selected for both loops separately. Examples of card-switching into active/passive mode are shown in the following drawings:

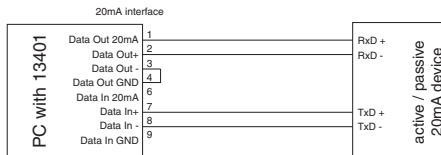
Active Tx and active Rx current loop application



Passive Tx and passive Rx current loop application



Active Tx and passive Rx current loop application



Technical data

base addresses: 03F8H, 02F8H, 03E8H, 02E8H
interrupts: IRQ3, IRQ4, IRQ5, IRQ7
 IRQ9, IRQ10, IRQ11, IRQ12
baudrate: 50..57600 Baud
data format: any data format
operation modes: 20mA active mode / 20mA passive mode
 independently selectable for Tx and Rx current loop
insulation: min. 1000 volts
ESD protection: up to 15 kV according to IEC 801-2, level 4
supply current: approx. 200mA @5V, 60mA @12V
20mA interface: DB9 male connector
dimensions: 165 x 106 mm
weight: approx. 200 g
packing list: 1 x 20mA PC card, type 13401

Function

The W&T PC card 13601 equip your PC with two independent RS422/RS485 serial interfaces with an insulation of up to 1000 Volts.

Both serial ports are equipped with type 16C550 FIFO UARTs; this makes them functionally compatible with standard RS232 interfaces, so that the cards can easily be used with your available software. Following a reset, the type 16550 elements are in standard UART operating mode, so that there is no need to worry about existing software. The FIFO mode has to be activated explicitly by the software.

DMA operation of the 16550 UARTs is not supported by the hardware of the W&T port cards.

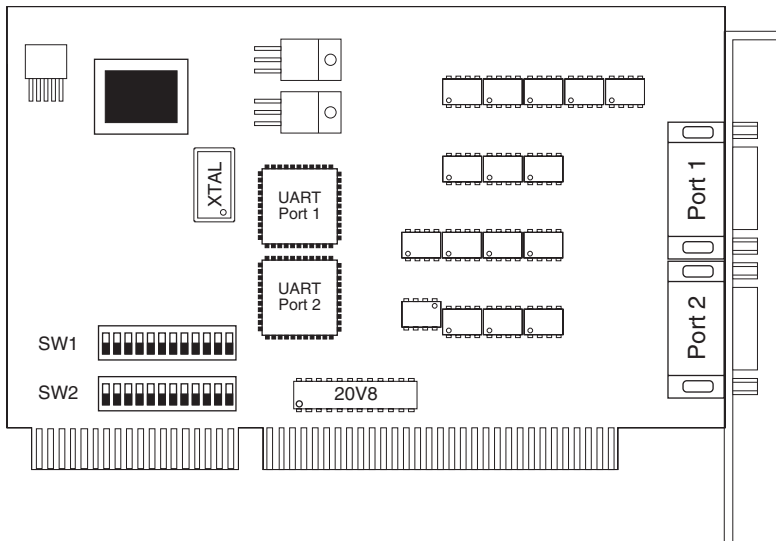
Insulation and ESD protection

The two ports of the W&T serial PC card 13601 are insulated both from each other and from the PC with a dielectric strength of 1000 volts. The signals are isolated 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 back panel.

All interface signal lines of the PC card 13601 are protected against electrostatic discharge of up to 15 kV according to IEC 801-2, level 4.

Configuring the card

The base address and the required interrupt line can be set by DIP switches at the lower edge of the card.



Base addresses

The I/O base addresses of the two ports can be set independently by DIP switches to 03F8H, 02F8H, 03E8H or 02E8H. Serial ports at these base addresses are recognized by almost all modern BIOS versions upon startup of the PC, and are written to the BIOS RAM of the computer. Some older BIOS versions recognize only two serial ports at the base addresses for COM1 and COM2. In these rare cases, a separate program is needed to search the computer for installed serial ports and write the COM3 and COM4 ports to BIOS RAM. The necessary software can be obtained from W&T on request. Setting both ports to the same base address should be strictly avoided. Please see the following tables for an explanation of the address DIP switch settings:

Port 1		SW 1.9	SW 1.10	SW 1.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 1.12 has no function

Port 2		SW 2.9	SW 2.10	SW 2.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 2.12 has no function

Since the address is decoded by means of GALs, customizing of the I/O address is no problem. This option makes it possible to employ more than 4 serial ports on a computer, if the software permits the use of additional I/O addresses.

Interrupt settings

The W&T serial PC Cards permit use of the standard interrupts IRQ3 and IRQ4 for the serial ports COM1 and COM2, and interrupts IRQ5 and IRQ7 for the parallel ports LPT1 and LPT2 if the system has no parallel ports or if the built-in parallel ports do not operate in interrupt mode. Since it is a long card, the PC Card 16201 also supports interrupts IRQ9..IRQ12 of the second interrupt controller. Please see the following tables for an explanation of the IRQ DIP switch setting:

IRQ	SW 1.1	SW 1.2	SW 1.3	SW 1.4	SW 1.5	SW 1.6	SW 1.7	SW 1.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 1

IRQ	SW 2.1	SW 2.2	SW 2.3	SW 2.4	SW 2.5	SW 2.6	SW 2.7	SW 2.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 2

Connectors and pin assignment

The two ports of the W&T RS422/RS485 PC card 13601 use DB9 male connectors with identical pin configuration. The connector pin assignments are shown in the table below:

pin assignment RS422/RS485 interface	
pin#	function
1	data out A (-)
2	data in A (-)
3	handshake out A (-)
4	handshake in A (-)
5	signal GND
6	data out B (+)
7	data in B (+)
8	handshake out B (+)
9	handshake in B (+)

Operating mode

The RS422/RS485 interface of the W&T PC card 13601 can be set for five different operating modes by DIP switch setting. The selectable operating modes are briefly described here:

RS422, RS485 4 wire bus master application

One data channel and one handshake channel in each direction are available. The RS422/RS485 receivers and transmitters are always active in this operating mode.

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

One data channel in each direction is available. The RS485 output driver is switched on with DTR or RTS = "ON", while DTR or RTS = "OFF" forces the driver to high impedance state. The RS485 receiving channel is always active in this operating mode.

RS485, 2 wire application without echo, handshake control

One data channel in each direction is available. The RS485 output driver is switched on with DTR or RTS = "ON", while DTR or RTS = "OFF" forces the driver to high impedance state. The RS485 receiving channel is deactivated when the driver is on, but is switched on when the driver is in the high impedance state.

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

One data channel in each direction is available. The RS485 output driver is activated automatically with each transmission of data, and goes to the high impedance state again after the end of transmission. The RS485 receiving channel is always active in this operating mode.

RS485, 2 wire application without echo, automatic control

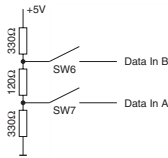
One data channel in each direction is available. The RS485 output driver is activated automatically with each transmission of data, and goes to the high impedance state again after the end of transmission. The RS485 receiving channel is deactivated when the driver is on, but is switched on when the driver is in the high impedance state.

Please see the following table for an explanation of the operating mode DIP switch:

operating mode	SW1	SW2	SW3	SW4	SW5
RS422, RS485, 4 wire bus master, DTR handshake	OFF	OFF	OFF	ON	OFF
RS422, RS485, 4 wire bus master, RTS handshake	OFF	OFF	OFF	OFF	ON
RS485, 4 wire / 2-wire with echo, DTR control	OFF	OFF	ON	ON	OFF
RS485, 2-wire without echo, DTR control	ON	OFF	ON	ON	OFF
RS485, 4 wire / 2-wire with echo, RTS control	OFF	OFF	ON	OFF	ON
RS485, 2-wire without echo, RTS control	ON	OFF	ON	OFF	ON
RS485, 4 wire / 2-wire with echo, automatic control	OFF	ON	OFF	ON	OFF
RS485, 2-wire without echo, automatic control	ON	ON	OFF	ON	OFF

Termination

For all RS485 operating modes it is essential that the bus system be terminated with a termination network which assures a defined rest state in the high-impedance phases of bus operation. The bus system can be connected to a termination network by closing switches #6 and #7:

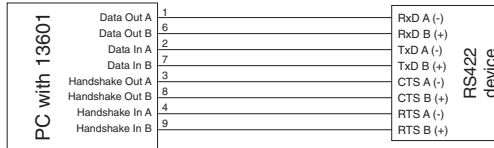


SW8 has no function

Applications

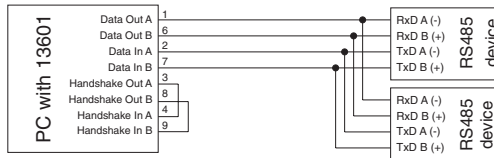
RS422 hardware handshake application

RS422/485 interface



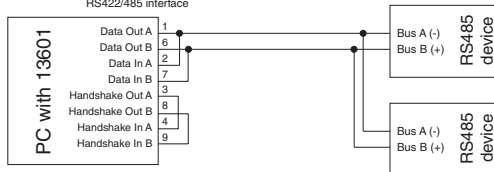
RS485 4 wire bus master application

RS422/485 interface



RS485 2 wire application

RS422/485 interface



Technical data

base addresses: 03F8H, 02F8H, 03E8H, 02E8H
interrupts: IRQ3, IRQ4, IRQ5, IRQ7
IRQ9, IRQ10, IRQ11, IRQ12
baudrate: 50..115200 Baud
data format: any data format
operation mode: RS422
RS485, 2 wire and 4 wire applications
automatic and handshake control
insulation: min. 1000 volts
ESD protection: up to 15 kV according to IEC 801-2, level 4
termination: switchable termination network
for RS485 modes (330 Ohms / 120 Ohms / 300 Ohms)
supply current: approx. 200mA @5V, 150mA @12V
RS422/485 interface: DB9 male connector
dimensions: 165 x 106 mm
weight: approx. 200 g
packing list: 1 x RS422/RS485 PC card, type 13601

Function

The W&T serial module mainboard equip your PC with two independent serial interfaces with an insulation of up to 1000 Volts. The integration of interface specific components in the form of exchangeable interface modules offer the possibility of an optional card equipment with various types of interfaces. This makes it possible to concentrate the connections of a RS232-COM1: for a mouse and a 20mA-COM2: for a control device on one card.

Both serial ports are equipped with type 16C550 FIFO UARTs; this makes them functionally compatible with standard RS232 interfaces, so that the cards can easily be used with your available software. Following a reset, the type 16550 elements are in standard UART operating mode, so that there is no need to worry about existing software. The FIFO mode has to be activated explicitly by the software.

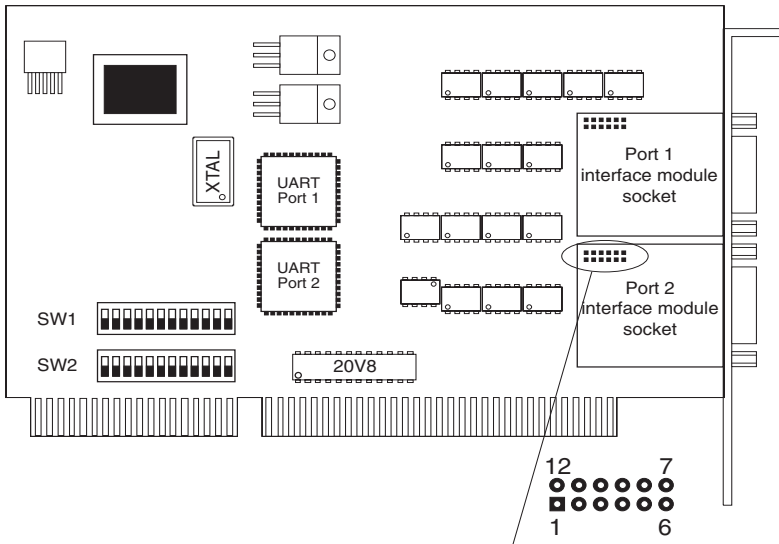
DMA operation of the 16550 UARTs is not supported by the hardware of the W&T port cards.

Insulation

The two ports of the W&T serial module mainboard are insulated both from each other and from the PC with a dielectric strength of 1000 volts. The signals are isolated 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 back panel.

Configuring the card

The base address and the required interrupt line can be set by DIP switches at the lower edge of the card.



Base addresses

The I/O base addresses of the two ports can be set independently by DIP switches to 03F8H, 02F8H, 03E8H or 02E8H. Serial ports at these base addresses are recognized by almost all modern BIOS versions upon startup of the PC, and are written to the BIOS RAM of the computer. Some older BIOS versions recognize only two serial ports at the base addresses for COM1 and COM2. In these rare cases, a separate program is needed to search the computer for installed serial ports and write the COM3 and COM4 ports to BIOS RAM. The necessary software can be obtained from W&T on request. Setting both ports to the same base address should be strictly avoided. Please see the following tables for an explanation of the address DIP switch settings:

Port 1		SW 1.9	SW 1.10	SW 1.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 1.12 has no function

Port 2		SW 2.9	SW 2.10	SW 2.11
Disabled		X	X	OFF
COM1	03F8H	OFF	OFF	ON
COM2	02F8H	ON	OFF	ON
COM3	03E8H	OFF	ON	ON
COM4	02E8H	ON	ON	ON

SW 2.12 has no function

Since the address is decoded by means of GALs, customizing of the I/O address is no problem. This option makes it possible to employ more than 4 serial ports on a computer, if the software permits the use of additional I/O addresses.

Interrupt settings

The W&T serial PC Cards permit use of the standard interrupts IRQ3 and IRQ4 for the serial ports COM1 and COM2, and interrupts IRQ5 and IRQ7 for the parallel ports LPT1 and LPT2 if the system has no parallel ports or if the built-in parallel ports do not operate in interrupt mode. Since it is a long card, the PC Card 16201 also supports interrupts IRQ9..IRQ12 of the second interrupt controller. Please see the following tables for an explanation of the IRQ DIP switch setting:

IRQ	SW 1.1	SW 1.2	SW 1.3	SW 1.4	SW 1.5	SW 1.6	SW 1.7	SW 1.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 1

IRQ	SW 2.1	SW 2.2	SW 2.3	SW 2.4	SW 2.5	SW 2.6	SW 2.7	SW 2.8
-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
10	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Interrupt setting port 2

Connectors and pin assignment

The serial TTL interfaces of the W&T serial module mainboard use pin header connectors with identical pin configuration. The connector pin assignments are shown in the table below:

TTL interface		
pin#	signal	function
1	5V	power supply
2	RI	input
3	RxD	input
4	TxD	output
5	n.c.	n.c.
6	CTS	input
7	DTR	output
8	DSR	input
9	RTS	output
10	DCD	input
11	12V	power supply
12	GND	signal ground

Pin 1 of the pin head connector has a square pad while the other pins have round pads.

Technical data

base addresses: 03F8H, 02F8H, 03E8H, 02E8H
 interrupts: IRQ3, IRQ4, IRQ5, IRQ7
 IRQ9, IRQ10, IRQ11, IRQ12
 baudrate: 50..115200 Baud
 data format: any data format
 insulation: min. 1000 volts
 TTL interface: 2mm pin header connector
 dimensions: 165 x 106 mm
 weight: approx. 200 g
 packing list: PC card, type 13001