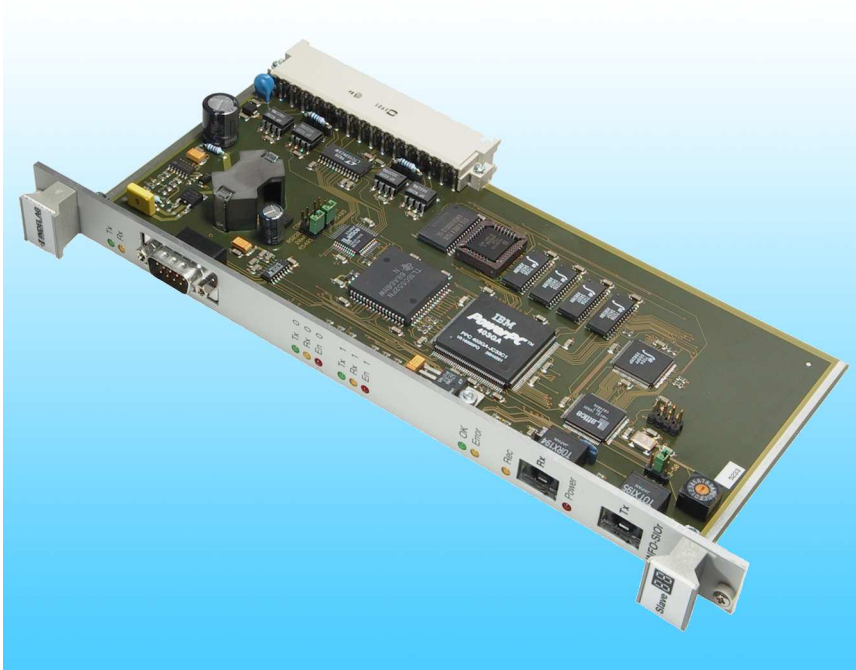


2 Channel Serial Input/Output

INFO-SIOr



Technical Data

2 S-I/O interfaces

- RS232
- RS422/RS485
- Current Loop (20mA)

Baud rate

- up to 115.2 Kbaud freely selectable

32-bit RISC processor

- PowerPC 604GA-33
- 33MHz clock rate
- 2-channel UART 16552

Memory

- 128/512kByte 32-bit cache RAM
- 128/512kByte 8-bit CDRAM
- 128/512kByte flash EPROM
- 4kByte dual port RAM to INFO-Link

Protocols

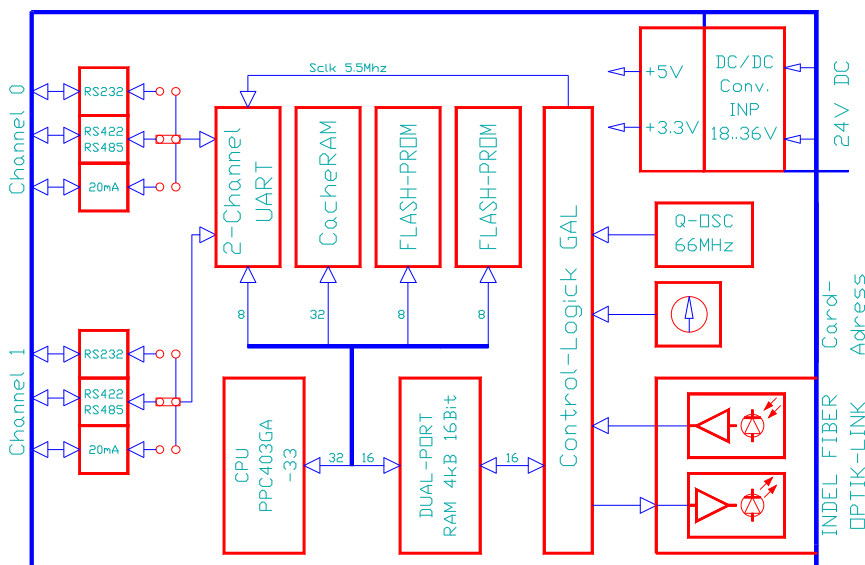
- Software tool for implementing customized communication protocols
- Siemens 3964r protocol for PLC integration
- Printer control (without protocol)

With the INFO-SIOr board, the INFO-Link is given a decentralized, powerful communication interface. Through the serial interface, it is possible to connect printers, operator panels and other external devices. Data exchanges with a PLC or other intelligent system components are also possible via the SIOr. The board has its

own processor system, which relieves the master of complex communication functions.

With the aid of a software tool, it is possible for users to implement their own user-specific protocols without much effort.

The SIOr can also be applied as a debugging interface.



Order-No. INFO-SIOr 97252

Function

The INFO-SIOr board is provided with 2 independent serial interfaces, which can be configured with a jumper as required to RS232, RS422 or 20mA (Current Loop).

The standard firmware supports any number of INFO-SIO boards. In case of very busy data traffic, the adequate limit is at 4 INFO-SIO boards or 8 channels. The channels are addressed via the device number 0 ... n. The transmission format is stated in the common INDEL form. An exception is the baud rate, which can be freely selected up to 115.2 kBaud, allowing also devices with exotic baud rates to be addressed.

The PowerPC Master transmits (sends, receives) the SIOr data blocks with a maximum size of 512Byte. These are buffered in the cache of the SIOr. Per channel, 2kByte input and 2kByte output buffer capacity are available. The actual data transmission is done by the processor (PPC403GA-33) on the SIOr so that the master has nothing to do with the processing of the protocol. The SIOr performs all communication activities. It manages the input and output buffers so that simultaneous and loss-free communication is possible on both channels up to 115.2 KBaud.

The INFO-SIOr board is provided with 128/512kByte CRAM. In this RAM, it is possible to accommodate additional input and output buffers. The DMA functionality (Direct Memory Access) of the serial interface allows very large data blocks to be loaded or transmitted with maximum baud rate directly into the CRAM.

Debug interface

The RS232 interface in the front panel can be used for debugging purposes or for "listening" to a channel.

Additional information is given in the software operating instructions in the INFO binder.

Connector Allocations

		d		b		z
Channel 0	2				I	+ 24 V
	4		GND		I	0 V
	6	O	OUT +	O	OUT -	Screen
	8	I	INP +	I	INP -	Screen
	10		GND		GND	Screen
	12	O	TXD(Sout-)	O	DTR(Sout+)	Screen
	14	I	RXD(Sin-)	I	DSR(Sin+)	Screen
	16		GND	O	V +	Screen
	18		GND	O	V +	Screen
	Channel 1	20	I	RXD(Sin-)	I	DSR(Sin+)
22		O	TXD(Sout-)	O	DTR(Sout+)	Screen
24			GND		GND	Screen
26		I	INP +	I	INP -	Screen
28		O	OUT +	O	OUT -	Screen
30			GND		GND	Screen
32						Screen

Connector 1

90° angled
DIN 41612, Type F-48
2.8mm pins

1		NC
2	I	RXD
3	O	TXD
4	O	DTR
5	I	GND
6	I	DSR

Connector 2

9-pin D-SUB

Customized communication protocols

Customized communication protocols are implemented with the aid of a software tool made available by INDEL AG.

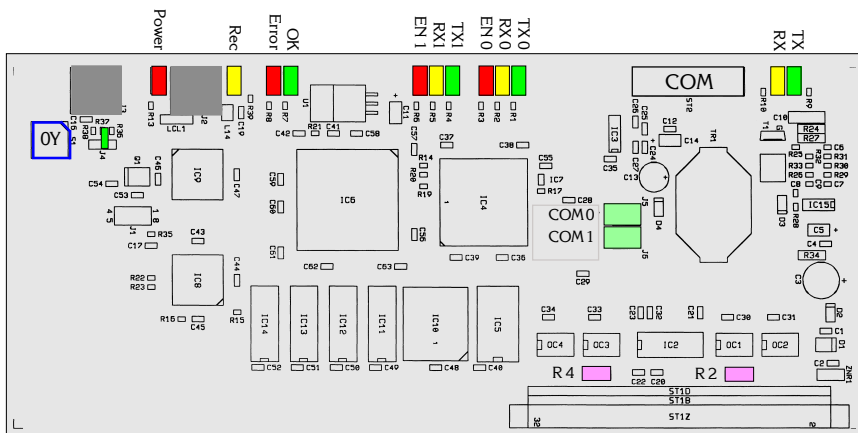
This allows external devices or other networks to be quickly and easily linked to the INFO-Link.

The board is provided with a 128kByte flash EPROM, enabling a firmware update via the INFO-Link whenever the need arises.

2 Channel Serial Input/Output

INFO-SIOr

Assembly



Addressing (blue)

S1 (0Y) communication channel	
0	0
...	
n	n

LEDs

The front panel is provided with LEDs which signal the following functions:

TX, TX0, TX1	:	green	=	Transmit data
RX, RX0, RX1	:	yellow	=	Receive data
EN0, EN1	:	red	=	Channel active
Ok	:	green	=	Processor OK
Error	:	red	=	Customer-specific

LEDs on receiver module

LED-red	=	+5V supply
LED-yellow	=	INFO-Link receiver signal OK

Interface type (light green)

The interface type is set with the aid of jumper bridges. The jumper fields are designated by J1, J2 (see assembly diagram).

Com1, Com2

1		RS422/RS485
		20mA
		RS232

Transmitting power jumpers (green)

The jumpers influence the light intensity of the emitting LED and thereby the segment length of the fiber cable to the next board.

Segment length	Jumper position
0 ... 10m	no jumper
8 ... 30m	> 10
20 ... 50m	> 30

Specifications

Power supply

+18 ... 36V, 250mA max.

Climatic conditions

- Ambient temperature:
 - Storage: -20...+80°C
 - Operation: 0 ... +45°C
- Board temperature:
 - Operation: 0...+70 °C
- Relative air humidity
 - No condensation: 95%

32-bit RISC processor

- PowerPC 403GA-33
- 33MHz clockrate

Memory

- 128/512kByte 32-bit cache RAM, 15ns
- Optional: 128/512kByte 8-bit CRAM, 60ns
- 128/512kByte flash EPROM
- 4kByte dualport RAM to INFO-Link

S-I/O interfaces

- 2 independent interfaces
- 2-channel UART 16C552
- 2kByte FIFO buffer memory
- RS232, RS422/RS485, 20mA
- Transmission max. 115.2 kBaud

RS232

- Baud rate max. 115,2 kBaud
- DSR, DTR
- XON/XOFF mode
- Line length max. 3m

20mA Current Loop

- Baud rate max. 20 kBaud
- Line length max. 400m

RS422 / RS485

- Baud rate max. 115,2 kBaud
- Line length max. 1200m
- Series resistor violet (see p. 6)

Mounting

- Connector DIN41612, Type F-48
- Mounting in 19" chassis
- Dimensions: 234 x 20 x 100 mm (LxWxD)

Wiring

Board power supply

For the board power supply, a 3-phase rectifier without electrolytic capacitor will suffice. But to prevent interference, a electrolytic capacitor of 4,700 ... 10,000µF is recommended.

The 24V supply must pass through a line filter.

Screened lines

The RS232 interfaces must always be operated through screened cables. The screening must contact the metallic connector casing on both sides inside the connector. (Do not ground via screen pin!)

The Current Loop and the RS422 interface can be operated with twisted pairs. For short distances, a non-screened cable will suffice. For connecting the RS422 over long distances (> 100m), it is advisable to use a screened twisted pair line.

Power supply V+

This power supply (+14V) is used for setting the unused control lines for minimum connection establishment (software handshake).

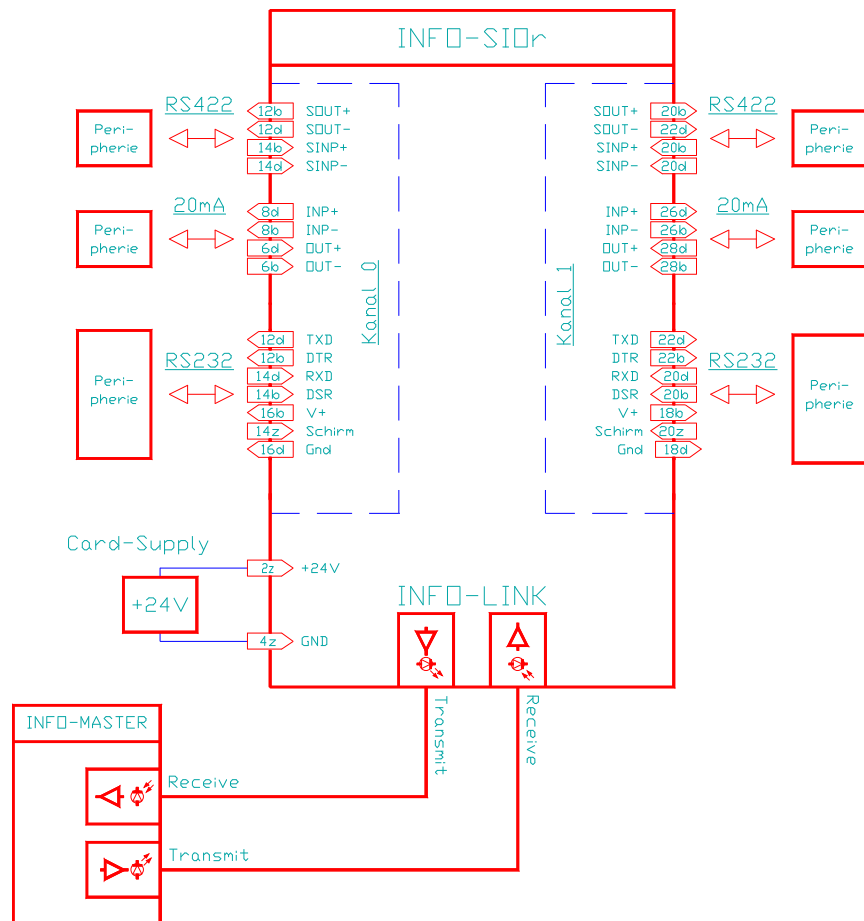
The supply must only be wired to the connector 1 of the SIO_r.

Grounding

The INFO-SIO_r is grounded on the front panel. Take care to ensure that the rack housing is connected with the control cabinet in a conductive manner. This is best achieved using chromated mounting bars.

See also INDEL wiring guidelines and INDEL design guidelines.

Connection example



Do not connect or disconnect the card or any connector while the INFO-SIO_r board is powered on! Otherwise the board will be damaged.

Caution: Laptop users

The following sequence must be observed when connecting a laptop computer to the SIO_r:

1. Disconnect the power supply from the laptop so that it is only supplied with power from the accumulator.
2. Connect the SIO_r and laptop using the appropriate serial cable.
3. Reconnect the power supply.

Reason: As a result of the electrical isolation of the transformer, the laptop supply is increased to a potential of 110V (when the laptop is supplied from the mains). Because there is no guarantee with conventional SUB-D connectors that the screen will contact before the signal lines, there is a risk that the potential will be equalized via the signal ground line. This would cause the destruction of the relevant SIO_r channel.

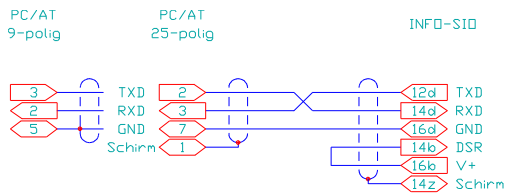
2 Channel Serial Input/Output

INFO-SIOr

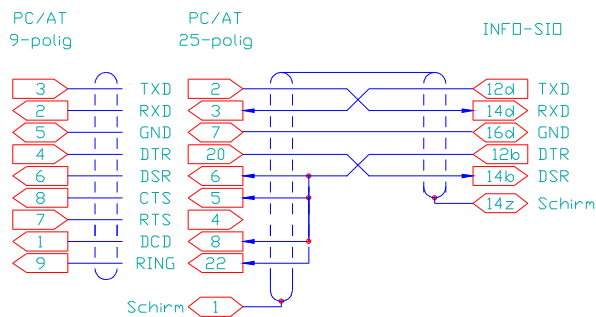
Interfaces

Description

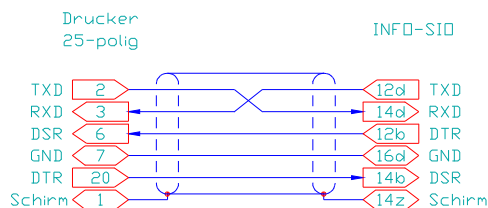
Minimum connection



Maximum connection



Printer connection



Pin description

TxD	Transmitted Data	DTR	Data Terminal Ready
RxD	Received Data	DSR	Data Set Ready
RTS	Request to Send	DCD	Data Carrier Detect (CD)
CTS	Clear to Send	RI	Ring Indicator

RS232 interface

In practice, handling of the RS232 interface frequently poses difficulties as a result of the different possibilities of data transmission and the not-so-simple allocations of the cable connections. In order to ensure trouble-free and reliable operation between the INFO-SIOr and the connected periphery, wiring recommendations are given opposite. The sketched cable connections are based on the connector allocation of channel 0 of the INFO-SIOr board. The connector allocations of the peripheral devices (modem, printer, etc.) are standardized.

Minimum

This connection (PC - INFO-SIOr) is mainly used for debugging, data transmission and operating data collection. It is often also designated as the minimum connection with software handshake.

Maximum

This connection type must be supported by the PC software. This variant uses a handshake line pair: Data Terminal Ready → Data Set Ready.

Printer

Standard printer cable for serial interface 25 pins. The DSR input serves for paper end detection.

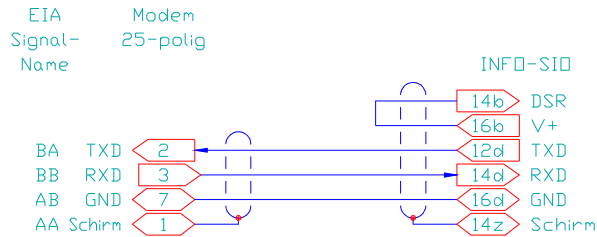
Description

Interfaces

Modem minimum

The most simple type of data transmission is by INFO-SIO modem. This connection does not need any control/record circuits.

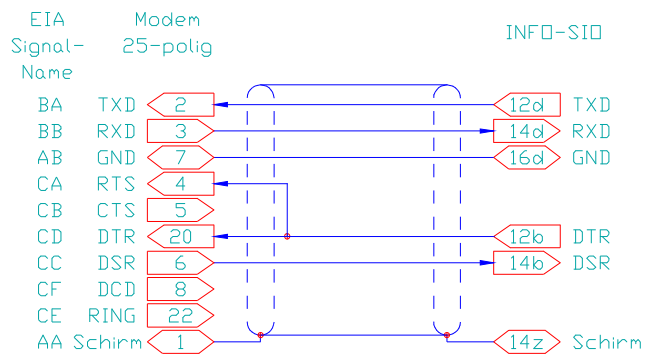
Modem minimum



Modem maximum

But if a connection with all data, control and record circuits is needed (Full Handshake), this connection cable must be used.

Modem maximum



Jumper resistor allocation

In order to match the Current Loop and the RS422 interfaces to the existing conditions, it is possible to apply a series and a termination resistor on a user-specific basis.

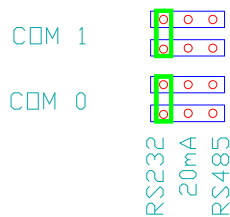
The termination resistors of the RS422 interface (typically: $R_{1,3} = 120\Omega$) must be connected at the terminal.

R_2 and R_4 are the series resistors of the channels 0 and 1 of the Current Loop interface. Typical: $R_{2,3} = 1k\Omega$, with 24V.

Jumper resistor allocation

Jumpers 1,2 determine the interface type:

- Pin 1, 6: RS422
- Pin 2, 5: 20mA
- Pin 3, 4: RS232

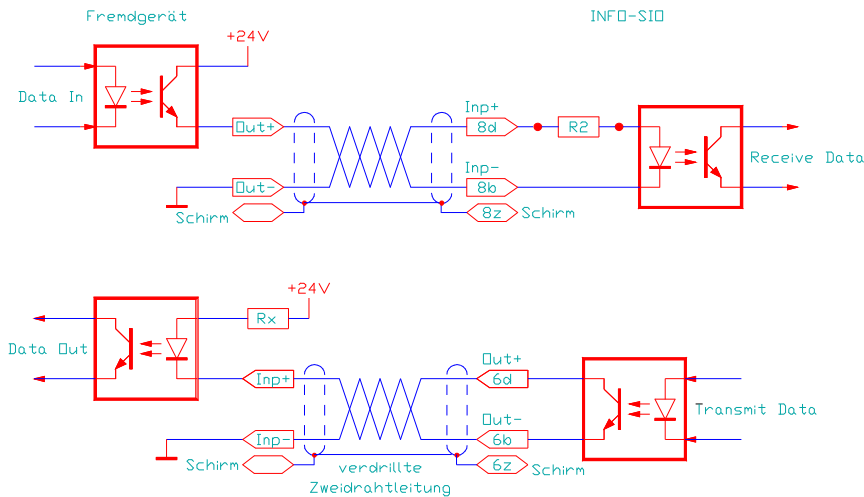


Interface type: RS232

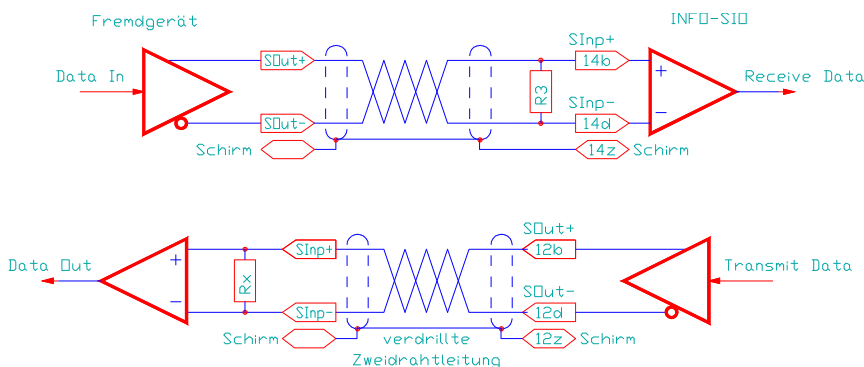
Interfaces

Description

20mA Current Loop



RS422 interface



20mA Current Loop

The 20mA or Current Loop interface transmits the data by activating and deactivating a 20mA current in a conductor loop at the frequency of the data bits. In the resting state or during the transmission of "1" bits, a constant current of 20mA flows. "0" bits are marked by an interrupted current flow. Inside each current loop, only one connected device is allowed to supply the required loop current of 20mA. This device is designated as active, the others as passive. The 20mA interface of the INFO-SIOr board is configured as passive.

RS422 interface

RS422 and RS485 interfaces have been developed for serial data transmission across long distances and are increasingly being used in industrial applications. The serial data is transmitted as a voltage difference between two corresponding lines. The receiver only utilizes the difference between the two lines. It is possible to transmit data across distances as large as 1200m.

Note

The DSR control line is processed also with the 20mA, RS422 and XON/XOFF mode.