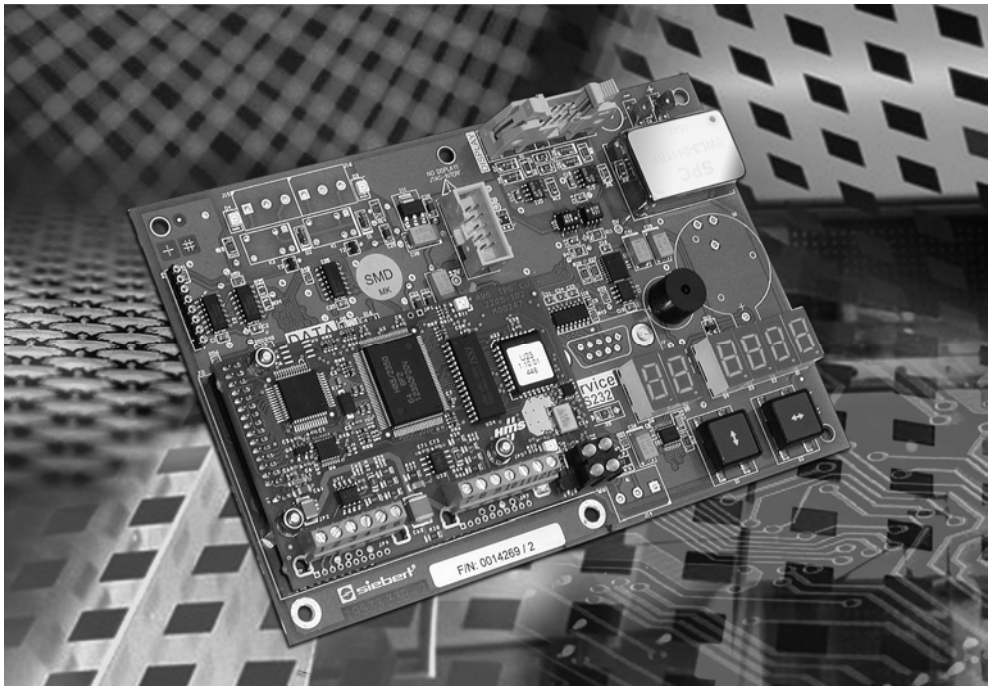

Operating instructions

C9090-YJ
Gateway for Interbus PD

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Chapter 1 Safety precautions

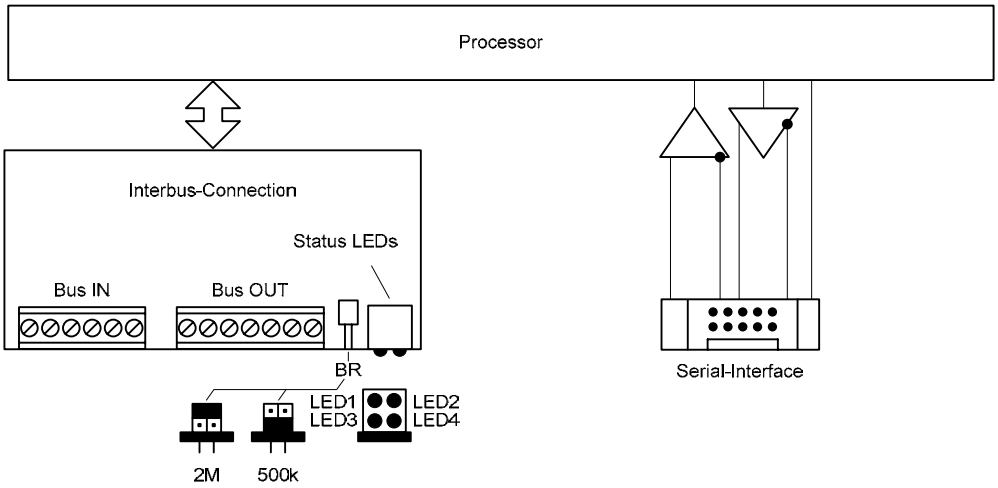
Bus errors may result in personal injury or material damage. erefore it is to observe that activating the menu (see chapter 4) may cause a bus error.

Chapter 2 Unit description

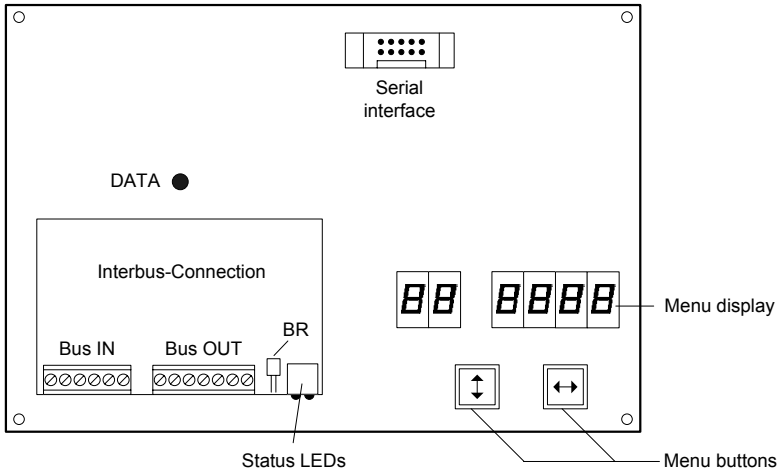
Function

The gateway C9090-YJ serves for activating serial display panels and XT boards by the serial interface via Interbus PD. It has the function of a protocol converter and is built in the units ex factory.

Principle circuit diagram



Unit construction



Parameterization

The parameterization of the unit is done by means of a menu in the menu display (see chapter 4).

⚠ Bus errors may result in personal injury or material damage. Therefore it is to observe that activating the menu may cause a bus error.

Interbus interface

The interbus interface (RS422) is located on the screw terminal strip of the interbus coupling. It has the following assignment:

Bus IN (incoming bus)

Termin. 1	/DO1	Inverted data output
Termin.2	DO1	Non inverted data output
Termin.3	/DI1	Inverted data input
Termin.4	DI1	Non inverted data input
Termin.5	GND	Signal ground
Termin.6	PE	Protective Earth

Bus OUT (outgoing bus)

Termin.7	PE	Protective Earth
Termin.8	/DO2	Inverted data output
Termin.9	DO2	Non inverted data output
Termin.10	/DI2	Inverted data input
Termin.11	DI2	Non inverted data input
Termin.12	GND	Signal ground
Termin.13	NC	–

The units are interbus slaves according to IEC 61158. On the bus, the units will use the ID code 03 (DIO).

The number of the assigned data words depends on the number of digits of the unit and on the data format selected in menu 1 (see chapter 3).

The incoming and outgoing bus are galvanically separated from each other.

Baud rate

The baud rate is defined by means of the jumper BR of the Interbus coupling (see block diagram):

Upper jumper 2 Mb/s
Lower jumper 500 kb/s

Serial interface

The serial interface is located on a flat cable connector. It is connected with the control computer of the display panel ex factory.

The serial interface has the RS485 4-wire format. The interface parameters are set in a menu (see chapter 4).

⚠ The settings ex factory are to be found in the delivered documentation and so can be restored in case of a possible lost..

Menu display

The parameterization of the gateway is done by means of a menu in the menu display (see chapter 4).

In normal operation, the following status messages appear in the menu display::

ᴏɴ ʟɪɴᴇ The gateway is parameterized on the bus and recognized as participant.

-- ---- The gateway is not ready for communicating with the master.

Status displays

The status displays (LED) of the control computer and the Interbus coupling have the following meaning:

LED1	CC/RC	Connection is OK, master is not in RESET
LED2	BA	Bus is active
LED3	RD	Routing bus is disconnected
LED4	TR	No meaning
DATA	Data reception	

Data transmission

The data transmission is done by sending cyclic process data (PD channel), which are written in the output data area. The number of output data bytes (2…20) is set in menu item 10 (see chapter 4).

The first byte in the input data area is needed for the handshake. The other data in the input data area are at random and without any meaning.

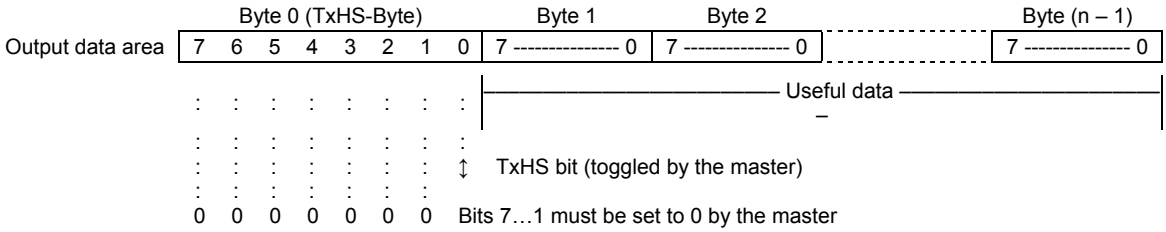
The data transmission via the PCP channel is not supported.

Handshake

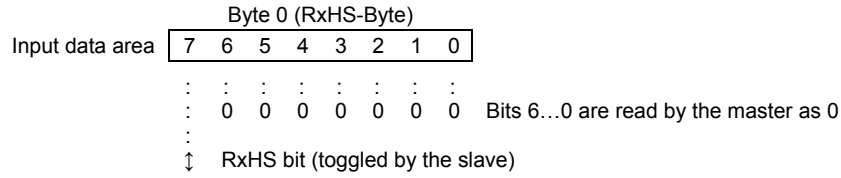
The system requires the data transmission in the Interbus to take place cyclically. Data located in the input and output areas of the master are exchanged cyclically between master and slave. This is why new data must be marked by the handshake as 'new'. The new data are applied once, whereas their cyclic repetition is ignored.

The handshake marks new data for the display (send handshake) and checks the receiving readiness of the display (busy check).

For the send handshake, bit 0 (TxHS bit) has been reserved in the first byte of the output data area (TxHS byte. Bits 7...1 must be set to 0 by the master.

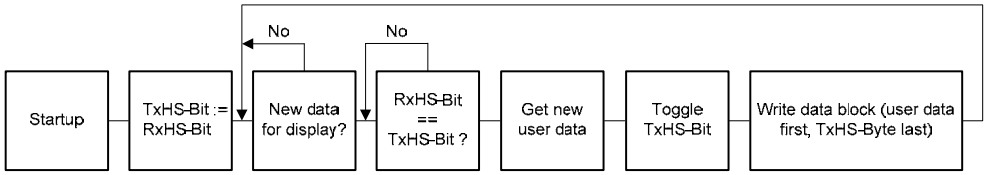


For the busy check, bit 7 (RxHS bit) has been reserved in the only byte of the input data area (RxHS byte). Bits 6…0 are read by the master as 0.



Flow chart

During the start, the master must set the TxHS bit to the value of the RxHS bit.



The display is ready to receive as soon as the RxHS bit has the same value as the TxHS bit sent last. Now the master can send new data to the display. The master marks new data by inverting the TxHS bit (toggle). After a short time, the display signals again readiness to receive by setting the RxHS bit equal to the TxHS bit received last.

Data segmentation

The system requires the number of output bytes to be limited. This may require the division of a new data telegram into several segments. In accordance with the handshake method described above, each individual segment contains a send handshake byte (TxHS byte), and the maximum number of bytes it can contain is that configured in the output data area.

The segments are sent in succession to the display in accordance with the handshake. The display evaluates the data after receipt of a message termination.

Caution! If fewer data are sent to the display than configured in the output data area, excess output data bytes must be filled with 0x00, irrespective of whether data is segmented or not. Data bytes containing 0x00 are ignored.

Test mode

In order to test the correct connection of the display panel, the gateway contains a test function. For activation of the test mode press the menu key [*] for approx. 5 s.

In test mode the gateway displays alternating character strings in form of **1111111111<CR><LF>** every second and indicates them on the menu screen. The figures are run from 0 to 9. The output is effected with the interface parameters set in the menu.

The test mode is terminated by switching the gateway off and on.

The display panel cannot be activated in test mode.

Chapter 4 Parameterization

Bus errors may result in personal injury or material damage. Therefore it is to observe that activating the menu may cause a bus error.

Menu

The parameterization of the gateway is carried out in a menu of the menu display. In normal operation, the status messages appear in the menu display (see chapter 1).

Menu operation

To reach the menu, press both menu buttons simultaneously (approx. 1 sec.) until an audible signal is heard and menu item 01 appears in the menu display. Now, you can navigate in the menu as follows:

Next menu item:	Shortly press key [↕]
Page menu items forward:	Press key [↕] long
Previous menu item:	Double click on key [↕]
Page menu items backward:	Double click on [↕] and keep it pressed
Next setting	Shortly press key [↔]
Page settings forward:	Press key [↔] long
Previous setting	Double click on key [↔]
Page setting backward:	Double click on [↔] and keep it pressed

The menu ends in menu item 99 with the button [↕]. The settings made are either saved (set), not saved (escape) or the factory settings are reset, depending on the setting selected in menu item 99.

Canceling the menu without saving the settings made is possible by pressing both menu buttons longer (approx. 1 sec.) or will occur automatically if 60 seconds pass without a menu button being pressed.

Once the menu is closed, the gateway behaves in the same manner as when the operating voltage was applied.

In menu operation an activation of serial end units connected in series is not possible.

Menu table

The menu items are displayed in the following menu table. The factory settings are marked with an *. Individual menu items or settings can be suppressed in another menu item, depending on the unit version or setting.

Menu item		Settings	Menu display
01	Baud rate	1200	01 1200
		2400	01 2400
		4800	01 4800
		9600*	01 9600
		19200	01 192
		38400	01 384
		57600	01 576
		115200	01 1152
02	Data format	7 bit	02 7bit
		8 bit*	02 8bit
03	Parity	No parity*	03 nonE
		odd parity	03 odd
		even parity	03 EvEn
04	Handshake (serial interface)	No Handshake*	04 noHS
		XON/XOFF-Handshake	04 onoF
10	Number of output data bytes	2	10 2
		4	10 4
		6	10 6
		↓	↓
		20	10 20
99	Saving	Saving parameters* (Set)	99 SEt
		Not saving parameters (Escape)	99 ESC
		Resetting to the default settings (Default)	99 dEF

Power supply	C9090-YJ-01	3,3 V DC
	C9090-YJ-02	5 V DC
	C9090-YJ-03	12…24 V ±15% DC
Power consumption max.	4 VA	
Ambient conditions	Operating temperature:	0…50 °C
	Storage temperature:	-30…85 °C
	Relative humidity:	95 % (non-condensing)
Dimensions	108,9 x 108 mm (B x H)	
Weight approx.	125 g	