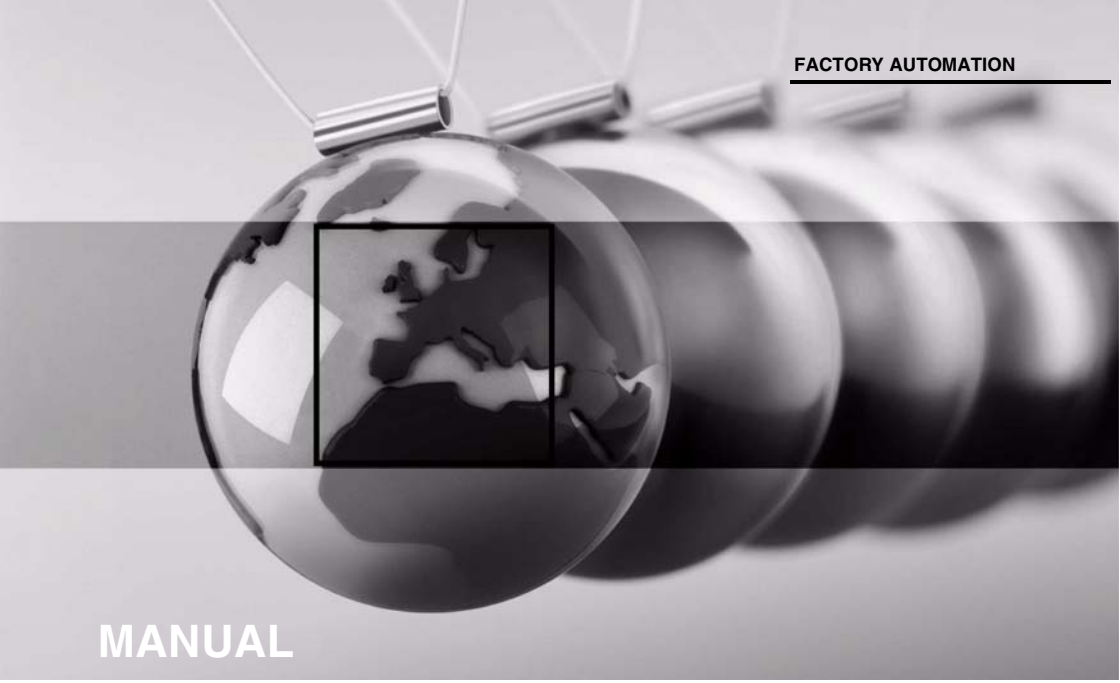

MANUAL

WCS-IG110

WCS INTERBUS-S INTERFACE MODULE

CE

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With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

1 Introduction

Congratulations

You have chosen a device manufactured by Pepperl+Fuchs. Pepperl+Fuchs develops, produces and distributes electronic sensors and interface modules for the market of automation technology on a worldwide scale.

Symbols used

The following symbols are used in this manual:

Note!

This symbol draws your attention to important information.

Handling instructions

You will find handling instructions beside this symbol

Contact

If you have any questions about the device, its functions, or accessories, please contact us at:

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2 Declaration of conformity

2.1 CE conformity

This product was developed and manufactured under observance of the applicable European standards and guidelines.

Note!

A declaration of conformity can be requested from the manufacturer.

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3 Safety

3.1 Symbols relevant to safety

Danger!
This symbol indicates a warning about a possible danger.

In the event the warning is ignored, the consequences may range from personal injury to death.

Warning!
This symbol indicates a warning about a possible fault or danger.

In the event the warning is ignored, the consequences may course personal injury or heaviest property damage.

Caution!
This symbol warns of a possible fault.

Failure to observe the instructions given in this warning may result in the devices and any connected facilities or systems develop a fault or fail completely.

3.2 Intended use

This manual describes the intended use of the device. The unit must be installed and used in accordance with the information in the manual.

The WCS-IG110 interface module serves as an interface between the WCS read head and the controller.

3.3 General safety instructions

The operator of the system is responsible in terms of planning, mounting, commissioning, operating and maintenance.

Installation and commissioning of all devices must be performed by a trained professional only.

Independent interventions and separate modifications are dangerous and will void the warranty and exclude the manufacturer from any liability. If serious faults occur, stop using the device. Secure the device against inadvertent operation. In the event of repairs, send the device to Pepperl+Fuchs.

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4 Product description

4.1 Use and application

The WCS-IG110 interface module serves as an interface between the WCS read head and the Interbus-S. Data is transferred between the read head and the interface module via an RS 485 interface. The data from the interface module to the controller is transferred via the Interbus-S protocol.

The WCS-IG110 interface module transmits the data in binary code or gray code. The data is transferred to the Interbus-S at a rate of 500 kbaud or 2 Mbaud.

You can connect one or two WCS read heads Type LS221 (and/or LS121) to a WCS-IG110 interface module. If you connect two read heads, they must have different addresses. The number of connected read heads is set using a rotary switch. If you wish to connect up to four read heads to the interface module, please contact Pepperl+Fuchs.

You can replace type WCS-IS2xx interface modules with interface module WCS-IG110.

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5 Installation

5.1 Installation

The dimensions of the WCS-IG110 interface module are:
90 x 127 x 55 mm (W x H x D).

The WCS-IG110 interface module is attached to a 35 mm wide DIN mounting rail (EN 50022-35) with a snap attachment.

The device is grounded via the DIN mounting rail.

Note!

Grounding of the mounting rail

The mounting rail must be grounded to the switch cabinet. The connection wire must have a cross section of at least 10 mm^2.

5.2 Electrical connection

The interface module is fitted with two cable lugs for making the ground connection. Use cables with a minimum core cross-section of 1.5 mm^2 to make the connection to ground.

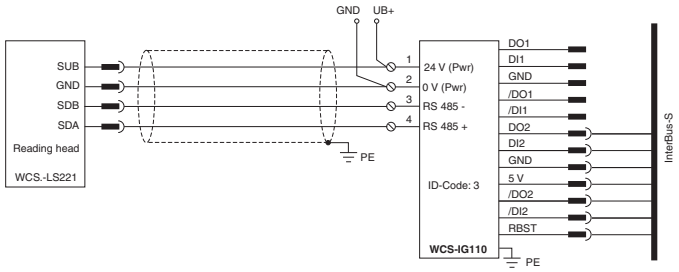

Figure 5.1: Electrical connection

Terminal		Description
1	24 V (Pwr)	Operating voltage interface module/operating voltage read head
2	0 V (Pwr)	Ground interface module/ground read head
3	RS 485-	Data line RS 485- to read head
4	RS 485+	Data line RS 485+ to read head
5		Not occupied

Table 5.1: Terminal WCS-IG110 interface module

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Caution!
The device can be damaged or malfunction if AC voltage is used.

Device malfunction or damage to the device.

Connect interface module to direct current (DC).

Connect interface module to voltage

Connect the operating voltage (24 V ±DC 20%) to terminals 1 and 2 of the 5-pin connector on the interface module.

The "Power" LED lights up green.

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6 Commissioning

6.1 Cable routing in the RS 485 bus

The data cable must always form an in-line connection between the first and the last node. This in-line connection must end with a fieldbus terminator.

The RS 485 connection resistors are integrated in the WCS read heads and can be switched on and off with the interface module.

If only **one read head** is connected, one device is connected at the beginning and one device is connected at the end of the data line.

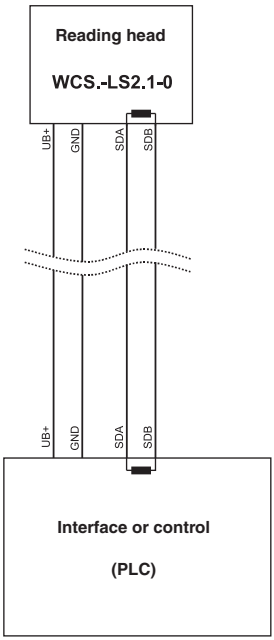

Figure 6.1: Connection of **one** read head

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If **two read heads** are attached to one interface module, there are two wiring versions:

- **Version A:**

  One read head is located at the beginning and one read head at the end of the data line. With two read heads, the RS 485 fieldbus terminator is activated. The interface module is located in between the read heads and does not contain an RS 485 fieldbus terminator. Each read head is connected to the interface module with a separate data cable.

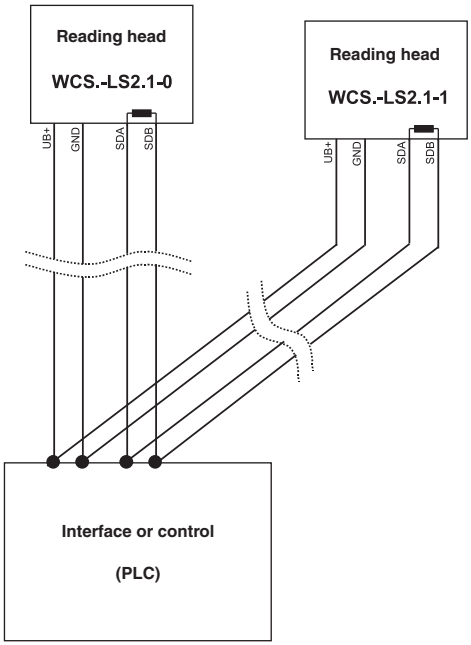

Figure 6.2: Connection of **two** read heads, Version A

- **Version B:**

  The interface module is located at the beginning of the data line; one read head is located at the end of the data line. Both need the RS 485 fieldbus terminator. The second read head is connected to the line connection between the interface module and the first read head through a short spur (length < 1 m). Use bus terminal BT111 to connect the spur.

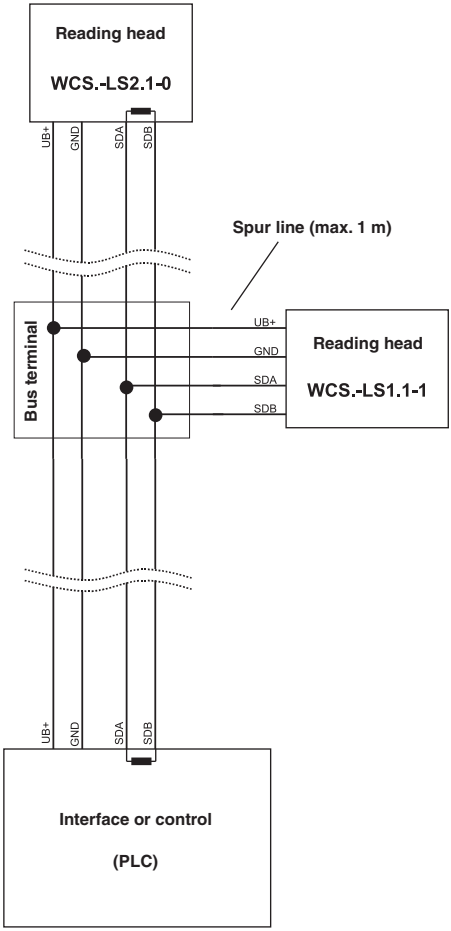

Figure 6.3: Connection of **two** read heads, Version B

The wiring version used depends on which is best suited for the application If **three** or **four read heads** are used on the same interface module, you must connect this with spurs as shown in version B.

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6.2 Connection of the read head(s)

If you install several WCS read heads together on one bus (maximum of 4 read heads), the read heads must have different addresses. In this way, the controller can assign each one individually. If you connect only one WCS read head to the interface module, this read head always receives the address 0. You can connect one or two WCS read heads via an RS 485 line on the interface module. The address of the read heads is contained in the type designation, e.g. LS221-0: read head with the address 0, LS221-1: read head with the address 1. If no address has been noted, the WCS read head has the address 0.

Use rotary switch S4 to select the number of connected read heads. Regardless of the number of read heads, 1 byte is reserved for activating the read head(s) in the master. For the response data, 4 bytes are reserved per read head. The WCS-IG110 interface module sends the read head data to the master. The data is transferred without a delay because the interface module continuously queries the read heads independently of the Interbus-S.

Terminal pin read head		Terminal interface module
WCS2B	WCS3B	
2	1	1
4	2	4
1	4	3
3	3	2

Table 6.1: Connection of WCS read heads

Connect read head

1. Connect the power supply for the read head to terminals 1 and 2 of the 5-pin connector on the interface module.
2. Connect the RS 485 data line to the read head to terminals 3 and 4 of the 5-pin connector on the interface module.
3. Always set the rotary switch "Interface" to position "485".

If you operate the WCS-IG110 interface module at the beginning or end of the RS 485 bus, you must activate the RS 485 terminator.

Activate RS 485 terminator

1. To activate the RS 485 terminator, switch the "RS 485 Termination" sliding switch to "On".
2. To deactivate the RS 485 terminator, switch the "RS 485 Termination" sliding switch to "Off".
3. If only one read head is connected, you must always activate the RS 485 terminator. To do so, switch the "RS 485 Termination" sliding switch to "On".

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S4 position	Code	Description
0	Gray code	1 read head connected, 4 bytes in the Interbus-S
1	Gray code	2 read heads connected, 8 bytes in the Interbus-S
2	Binary code	1 read head connected, 4 bytes in the Interbus-S
3	Binary code	2 read heads connected, 8 bytes in the Interbus-S
4	-	Reserved
5	-	Reserved
6	-	Reserved
7	-	Reserved
8...F	-	Reserved for substitute mode

Table 6.2: Adjustment options on rotary switch S4

Selecting the number of connected read heads and codes

1. Use rotary switch S4 to set the number of connected read heads and the code. The positions for S4 can be found in the table.
2. Rotary switch S5 is not used. Set rotary switch S5 to position "0".

6.3 Connection to the controller

There are two 9-pin Sub-D connectors on the front of the WCS-IG110 interface module for connecting the Interbus-S cable. The 9-pin socket and the 9-pin mating connector for attaching the 9-pin connectors are not included in the delivery package.

Terminal	Description
1	DO1
2	DI1
3	GNDI
6	/ DO2
7	/ DI1

Table 6.3: Terminal assignment of the 9-pin Sub-D mating connector for an incoming Interbus-S cable (IBS-IN)

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Terminal	Description
1	DO2
2	DI2
3	GND
5	5 V
6	/ DO2
7	/ DI2
9	RBST

Table 6.4: Terminal assignment of the 9-pin Sub-D socket for intermediate Interbus-S cable (IBS-OUT)

Connect interface module to controller

1. Plug the socket on the incoming Interbus-S cable to the 9-pin Sub-D mating connector.
2. Plug the connector on the intermediate Interbus-S cable into the 9-pin Sub-D socket.
3. If you are operating other devices downstream of the interface module via the Interbus-S, solder a bridge between terminal 5 (5 V) and terminal 9 (RBST) on the intermediate cable connector.

6.4 LED meaning

Power:

The "Power" LED lights up green: The WCS-IG110 interface module is correctly connected with the power supply.

State:

The "State" LED lights up green: Data exchange takes place with the read heads. Using the four “Error No/Select ID” LEDs, the number of the currently polled read head is displayed.

ErrorNo/Select ID				read head address
8	4	2	1	
0	0	0	1	0
0	0	1	0	1

The "State" LED lights up red: The interface module has recognized an error or a warning. The interface module displays the binary coded error and/or warning number via the “Error No/Select ID” LEDs. For a description of the error codes see chapter 7.

Error (No. 1...7):	Switch the interface module off and back on. If the error occurs again, the module must be replaced.
Warning (No. 8...15):	The warning provides information. The interface module displays the warning for one minute and then resets automatically.

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Bus state:

The "Bus state" LED lights up green:	Data exchange in the Interbus-S active
The "Bus state" LED flashes red and green:	No data exchange in the Interbus-S for more than 0.5 s
The "Bus state" LED lights up red:	Interbus-S reset

UL, RC/CC, RD, BA:

The four LEDs allow a diagnosis of the interface module.

The "UL" LED lights up green:	Interbus-S connected with the power supply
The "RC/CC" LED lights up green:	Incoming cable connection is in order, Interbus-S master not resetting (remote bus check)
The "RD" LED lights up red:	Intermediate Interbus-S interface deactivated
The "BA" LED lights up green:	Data exchange in the Interbus-S active

6.5 Data exchange between the WCS-IG110 interface module and master

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word n	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Word n+1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 6.5: Activation of the interface module by the master

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word n	0	0	0	DB	ERR	OUT	A1	A0	P7	P6	P5	P4	P3	P2	P1	P0
Word n+1	P15	P14	P13	P12	P11	P10	P9	P8	0	0	0	0	0	P18	P17	P16

Table 6.6: Response from the interface module

To see what the data bit means see chapter 7.

If the code you selected was gray code, the position value and error code (ERR=1) are included in the gray code.

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7 Appendix

7.1 Error codes

ErrorNo/Select ID				Error number	Designation
8	4	2	1		
0	1	1	1	7	Communication read head, send buffer overflow
1	0	0	0	8	Communication read head, receive buffer overflow
1	0	0	1	9	Communication read head, timeout
1	0	1	0	10	General fieldbus error
1	0	1	1	11	Parity or frame check error
1	1	0	1	13	Fieldbus error (configuration error, no connection ...)
1	1	1	1	14	Fieldbus data buffer overflow

Table 7.1: error code meaning

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