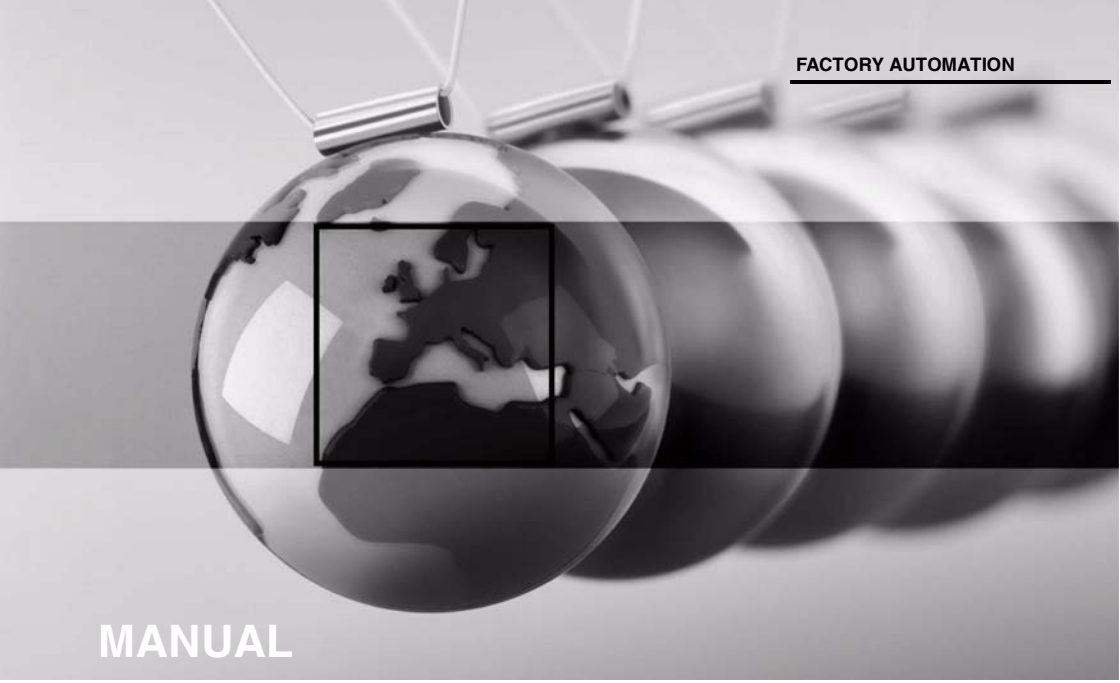

MANUAL

VBP-HH1-V3.0-V1

AS-Interface handheld

PEPPERL+FUCHS
SENSING YOUR NEEDS

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"

2012-07

1 Declaration of 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.

The product manufacturer, Pepperl+Fuchs GmbH, D-68307 Mannheim, has a certified quality assurance system that conforms to ISO 9001.

ISO**9001**

2 Safety

2.1 Used Symbols

Safety-relevant Symbols

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

In case of ignoring the consequences may range from personal injury to death.

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

In case of ignoring the consequences may cause personal injury or heaviest property damage.

Caution!
This symbol indicates a warning about a possible fault.

In case of ignoring the devices and any connected facilities or systems may be interrupted or fail completely.

Informative Symbols

Note!
This symbol brings important information to your attention.

Action

This symbol indicates a paragraph with instructions.

2.2 General safety instructions

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

This device is approved for use in environments with controlled electromagnetic compatibility (EMC) according to IEC 61326-1. Jammers, such as mobile phones can not be operated in close proximity.

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended purpose.

Only use recommended original accessories.

User modification and or repair 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, return the device to your local Pepperl+Fuchs representative or sales office.

When packing the device for storage or transport, use materials that will protect the device from bumps and impacts and protect against moisture. The original packaging provides the best protection. Also take into account the permitted ambient conditions.

3 Notes on disposal

Electronic waste is hazardous waste. When disposing of the equipment, observe the current statutory requirements in the respective country of use, as well as local regulations.

Do not dispose of storage batteries with the household refuse.

Consumers are obliged by law to dispose of used storage batteries in accordance with regulations. You can hand in your used batteries at public collection points in your area or sales points where batteries of that particular kind are sold. You can also send your used batteries directly to us for disposal. Please remember that this service is only available within the scope of normal use. If you wish to send back your used batteries, please affix sufficient postage stamps and send to our address. There are no extra charges for disposal.

4 Product Description

4.1 What is AS-Interface?

The actuator-sensor interface (AS-Interface) replaces conventional wiring technology on the sensor-actuator level.

AS-Interface provides a secure data transfer, which is resistant to EMC influences, while minimizing the time and costs of installation and incorporating a diagnostic function. AS-Interface detects short-circuits, reduces incidental maintenance costs, and enables a simple decentralization of control processes. Your plant takes on greater transparency, making maintenance and tooling straightforward and more flexible.

AS-Interface is not a proprietary system, but an open standard accessible to manufacturers in a wide range of products.

AS-Interface is optimally suited for the safe transfer of small quantities of data under harsh industrial conditions. It has also established and proven itself as an economical standard for networking sensors and actuators in many applications.

Conventional wiring typically requires two wires for power supply and an additional wire for the signal or control line for each sensor and actuator. This results in high costs in terms of connection/distributor technology, requires time-intensive installation, and necessitates costly and complex documentation.

By comparison, AS-Interface offers the following advantages:

- Two-wire cable for the data and energy transmission of all slaves/modules.
- Connection using insulation piercing technology saves time, since stripping cables and fitting connector sleeves are avoided.

4.2 AS-Interface Specification 3.0

In 2004, the AS-Interface Association defined the AS-Interface Specification 3.0 as a backwards-compatible extension, while retaining the protocol and physical structure. AS-Interface Specification 3.0 gives the user important advantages:

- The number of possible network slaves is increased to 62. This is accomblished by enabling 31 **A** addresses and 31**B** addresses of which each is able to support up to 4 output databits.

  In the master message of Specification 3 the **I3** output bit has been replaced by the **SEL** select bit. This select bit enables, in addition to the address bits A0 to A4, differentiation in the address areas **A** and **B**. Through this differentiation, any address can be distributed in both A and B, e.g. the address 15A and 15B.

  In Specification 2.1 3 output bits are available per AS-Interface slave. In Specification 3.0, through the definition of the multiplex bit in place of the I2 bit, 4 output bits are available per slave(communication of 4 output bits in succession via the data bits I1 and I0), i.e. a total of 4*62=248 output bits. The slave message remains unaffected by this change, i.e. there are still 4*62=248 input bits available. In practice, this means an increase of the cycle time to a max. 20 ms, since in the 1st cycle the data of the AS-Interface slaves in the address area A, and in the 2nd cycle, the data of the respective AS-Interface slaves in the address area B are written and read. Additionally, the output bits are transferred one after the other.

  Due to the backwards compatibility of Specification 3.0 you can continue to use standard AS-Interface slaves. However, two of the 62 possible addresses are occupied by a standard AS-Interface slave.

Structure of the master message

SB	CB	A4	A3	A2	A1	A0	I4	SEL	MUX	I1	I0	PB	EB

Note!

You have the option of reducing the cycle time by reducing the number of AS-Interface slaves or by addressing the A/B-Slaves in the standard mode.

- Extended diagnostic function

  In addition to communication faults (e.g. messages with errors), the AS-Interface master also detects hardware faults that are present on the AS-Interface slave. You have the option of utilizing these peripheral error messages to provide a defined system shutdown in the event of a fault, since sensor signals are no longer guaranteed to be available. In addition, a statistical evaluation of the data is conceivable in order to assess the safety of the system. Also, because of the extended diagnostics, it is possible to locate sporadically occurring faults with regard to configuration and communication and to evaluate them via the AS-I Control Tools.

- Extension of the ID-Codes of the AS-Interface slaves.

  Specification 2.1 AS-Interface slaves (A/B slaves) have the hexadecimal value **A** as the ID-Code and have 2 more identification codes (ID1 and ID2) that describe the functionality of the slave. You have the option of describing the ID1-Code.

  The ID-Code for standard AS-Interface slaves differs from the ID-Code of the A/B slaves. With standard AS-Interface slaves, no further identification codes are included.

2012-07

Note!

If you have changed the ID1-Code and want to automatically program the address, check **before** the installation of the new AS-Interface slave that the ID1-Code has been correctly stored in the AS-Interface slave.

4.3 Use and application of the handheld

AS-Interface slaves are usually addressed with a handheld. As a rule, a number of steps are necessary to address the slaves and in the future you will be able to execute this procedure faster using the handheld:

- Unique addressing of the AS-Interface slaves
- Power supply to the AS-Interface slaves via the handheld
- Function checks – even without programmable logic controller (PLC)

4.4 Scope of delivery:

The delivery package contains:

- Addressing device
- Charger
- V1-G-0.3M-PVC-V1-G connection cable
- VAZ-PK-1.5M-V1-G connection cable

4.5 Displays and controls

1 M12 plug to connect an external power supply (only VBP-HH1-V3.0-V1).
2 AS-Interface connection adapter
3 LC Display
4 **up** arrow button
5 **down** arrow button
6 **PRG** button
7 **ADR** button
8 Charger connector
9 **Mode** button

2012-07

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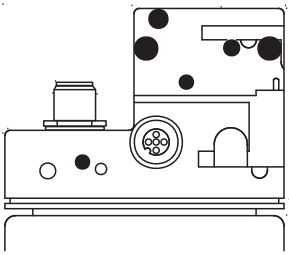
4.5.1 AS-Interface connection adapter



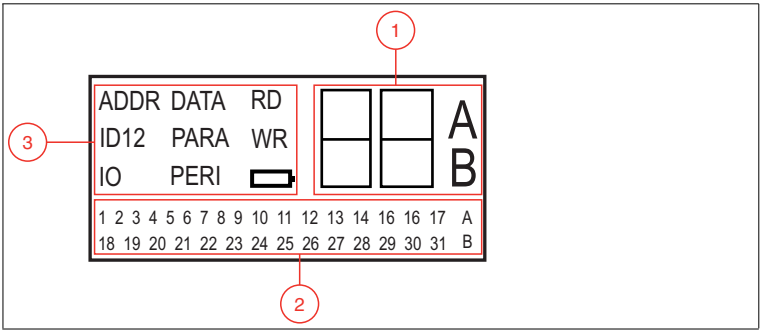
The AS-Interface connection adapter on the top of the addressing device is used to connect AS-Interface nodes (sensors, actuators, and interface modules) to the addressing device. The following devices and models can be connected directly to the addressing device by plugging into the AS-Interface connecting adapter:

- Devices with M12 plug
- VariKont M-System
- VariKont-System
- FP models
- AS-Interface modules (*-G1, *-G4, *-G16)

For models with an integrated addressing jack, please use the VAZ-PK-1.5M-V1-G adapter cable included the delivery package.

An additional M12 plug is provided on the front of the housing. It provides a connection option for an external bulk power, AUX, for nodes. Due to the integrated decoupling coils, you can connect a DC or AS-i voltage to supply the slaves and save battery charge. A extension cable is provided with the delivery package in case an extension is required.

4.5.2 LC display



1 Address and data display

2 Address field

3 Operating mode display

Address and data display

Depending on the operating mode, two digits and the letters A and B are used to display various information in this area of the display.

- The address of the currently selected AS-Interface node differs according to the AS-Interface specification supported and the address areas **Standard** (shown without letters), **A** and **B**.
- Target address which is to be communicated to the currently selected AS-Interface node
- Display of read data
- Display of data to be written

Address field

All the AS-Interface nodes of the AS-Interface network are shown in this area of the display:

- If the addressing device detects AS-Interface nodes from various address areas, the various address areas are identified in the right-hand section of the address field, as follows:
  - Without letters: For AS-Interface nodes that do not support the AS-Interface specification 2.1.
  - A: For AS-Interface nodes belonging to address area A.
  - B: For AS-Interface nodes belonging to address area B.

  The display of the detected addresses in the respective address area changes every 2 seconds.
- The addresses of all AS-Interface nodes currently connected to the addressing device are shown in the **Addressing** operating mode by flashing digits. In all other operating modes, the addresses of the AS-Interface nodes shown flashing are those being actively accessed.
- During **Addressing**, the non-flashing digits represent addresses of AS-Interface nodes that have been assigned addresses by the addressing device.

Operating mode display

The current operating mode is shown in this area of the display.

4.5.3 Button assignment

Button	Description
↑	Set values (e.g.slave address, ID1 data, slave parameters, slave data), change of operating mode
↓	Set values (e.g. slave address, ID1 data, slave parameters, slave data)
PRG	The function depends on the operating mode: ■ transfer of a new slave address to the slave (ADDR) ■ transfer of ID1 data (ID1) ■ transfer of slave parameters (PARA) ■ transfer of slave data (DATA)

2012-07

Button	Description
ADR	Switch on addressing device, search and read out slave addresses Double click: switch off addressing device
MODE	Change between operating modes

4.5.4 Button combinations

Button combinations	Description
ADR & PRG	Function dependent on the duration of pressing: ■ Short press: address 0 is assigned to the connected slave ■ Long press: the list of assigned slaves is deleted
ADR & ↑ or ↓	Navigate through source addresses of several slaves connected to the addressing device
MODE & ↑ or ↓	Navigate through the operating modes

4.5.5 Connections

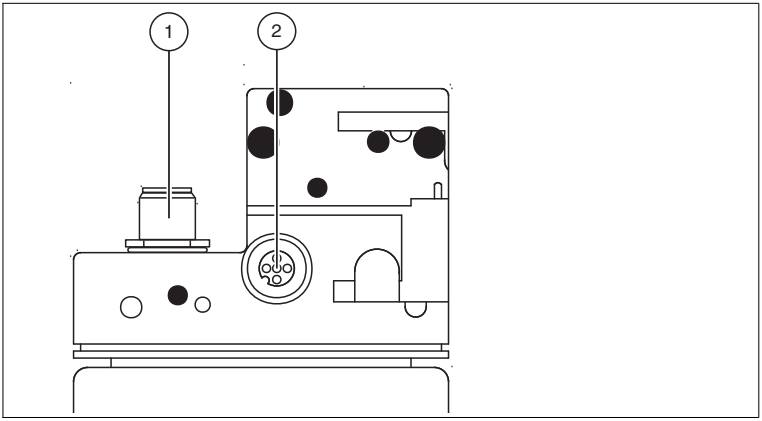


Figure 4.1 Connection adapter

1. External power supply (M12 plug)
2. Slave connection (M12 socket)

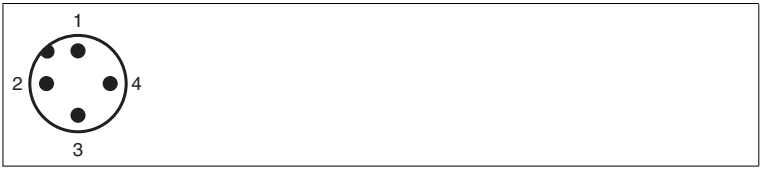


Figure 4.2 External power supply (M12 plug)

1. + AS-Interface/DC
2. - AUX
3. - AS-Interface/DC
4. + AUX

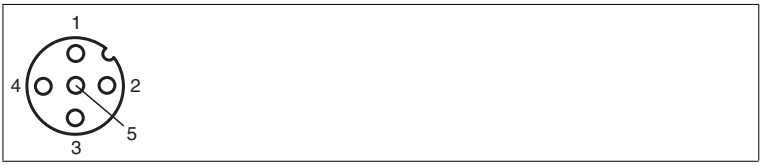


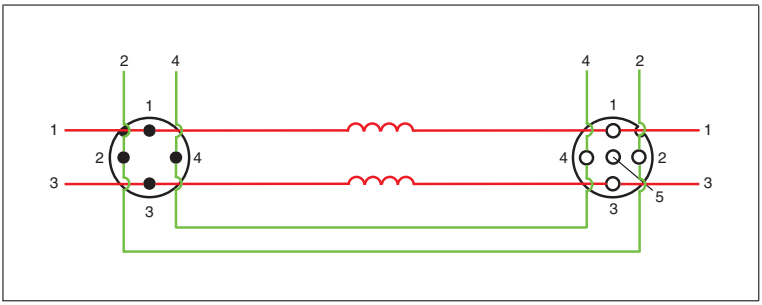
Figure 4.3 Slave connection (M12 socket)

1. + AS-Interface
2. - AUX
3. - AS-Interface
4. + AUX
5. Reserved (do not use)

4.5.6 Application example

Connecting an external supply voltage to

1. supply a heavy consumer load. Power supply through:
   - AUX – inputs/outputs
   - AS-Interface/DC – inputs/outputs
2. Conserve the battery
   - for longer operating life



External power supply (M12 connector)

1. + AS-Interface/DC
2. - AUX
3. - AS-Interface/DC
4. + AUX

Slave connection (M12 connector)

1. + AS-Interface:
2. - AUX
3. - AS-Interface:
4. + AUX
5. Reserved (do not use)

The supply voltage connected to the AUX inputs on the M12 connector, external power supply, is directly connected to the AUX outputs of the M12 slave connection.

The supply voltage, connected to the AS-Interface/DC inputs on the M12 external power supply is separated from the AS-Interface/DC outputs of the M12 slave connection by the decoupling coils.

Caution!

Maximum current 2 A

Connect only individual slaves to the M12 slave port. Note the maximum current of 2 A, if you operate a slave with electronic switching outputs.

Exceeding the maximum current can lead to the destruction of the looping!

Note!

The master can stay in online mode. The slave connected to the M12-slave connection is not recognized by the master.

5 Commissioning

5.1 Preparation

The addressing device battery is delivered fully charged. Nevertheless, as a result of self-discharge, the charge may not be sufficient to operate the addressing device. Therefore, we recommend that you charge the battery for at least 24 hours prior to commissioning.

Note!

The battery cannot be overcharged.

Charging battery

1. Connect the plug of the plug-in power-supply unit cable to the device connecting jack.
2. Connect the plug-in power-supply unit to the mains power supply.

   ↳ The battery is charged.

Connecting the AS-Interface slaves

Proceed as follows to connect an AS-Interface slave:

1. Insert devices with an M12 connector or VariKont, VariKont M Series devices as well as FP model devices and *-G1 *-G4 and *-G16 series interface modules directly into the designated location on the connecting adapter and ensure that they are firmly seated.
2. For devices with an integrated addressing jack, connect the VAZ-PK-1.5M-V1-G adapter cable (provided with delivery) to the device and plug the other end of the cable into the addressing device.
3. If necessary, connect an external power supply.

Connecting an external power supply

1. Connect the external power supply to the M12 connector on the front of the housing.
2. A extension cable is provided in the delivery package in case an extension is required.

Warning!

No reverse polarity protection

The device can be damaged or destroyed if the polarity is reversed.

- Connect the brown strand to AS-i + (pin 1), the blue to AS-i - (pin 3).
- Connect to AUX 24V PELV (not short-circuit protected).
- Observe the connection layout see chapter 4.5.5

Switching on the addressing device

1. Connect an AS-Interface slave.
2. Briefly press the ADR button.

   ↳ The addressing device switches on in the **Addressing** operating mode and shows the address of the current AS-Interface slave.

Manually switching off addressing device

1. In **Adressing** operating mode, briefly press the ADR button twice consecutively.

   ↳ The addressing device switches itself off.
2. The addressing device switches itself off after a few minutes of inactivity.

Changing operating mode

You have several options to set the various operating modes.

1. Briefly press the MODE button to change operating modes.
2. Alternatively, press and hold the MODE button and scroll through the individual operating modes using the ↑ and ↓ buttons.
3. Press and hold the MODE button for approx. 2 s. On releasing the button, the addressing device switches to **Addressing** operating mode.

   ↳ The current operating mode is shown in the operating mode display.

5.2 Storage and transport

For storage and transport purposes, package the unit using shockproof packaging material and protect it against moisture. The best method of protection is to package the unit using the original packaging. Furthermore, ensure that the ambient conditions are within allowable range.

6 Operation

6.1 **Addressing** operating mode

The addressing is divided into 3 individual procedures. The following table shows the individual processes:

Note!

When addressing AS-Interface slaves connected to the handheld, make sure that the address 0 is not occupied. Otherwise, an error message may occur.

Procedure	Addressing
Selecting the source address	■ **one AS-Interface slave connected**: The address of the connected AS-Interface slave is automatically detected as the source address. ■ **several AS-Interface slaves connected**: The source address must be manually selected, see "Navigating through addresses / selecting source address when several slaves are connected" on page 18.
Selection of target address	See "Setting the target address" on page 19 When being addressed, if the target address is occupied by a further connected AS-Interface slave, the addressing device issues an error message.
Start addressing	See "Starting addressing" on page 19

Navigating through addresses / selecting source address when several slaves are connected

Press the ADR button to select the AS-Interface slave to which you want to assign a new address. If several AS-Interface slaves are connected to the addressing device, press the ADR button several times or press and hold the ADR button and scroll through the addresses using the ↑ and ↓ buttons.

Synonymous use of standard and A addresses

Note!

When addressing a slave, the address area of the target address is automatically adapted to the connected slave:

1. To assign an address to a connected slave with or without extended addressing, it is sufficient to specify a target address in the standard address area or in address area A. For a slave without extended addressing, the addressing device assigns the set address automatically in the standard address area. For a slave with extended addressing, the addressing device assigns the set address automatically as an A address.
2. To assign an address in address area B, you must specify target address area B. See "Setting the target address" on page 19. If a slave without extended addressing is connected, the addressing device shows a fault message.

2012-07

Setting the target address

Set the target address using the ↑ and ↓ buttons.

Tip

Addresses marked as occupied

The already assigned addresses are stored in the addressing device in a list of assigned addresses and shown in the address field of the display as a non-flashing number. This list is available after restarting the addressing device. You can therefore avoid duplicate addressing.

Starting addressing

Briefly press the PRG button to start addressing.

Deleting the list of assigned addresses

To delete the list of assigned addresses, press and hold the PRG and ADR buttons simultaneously for approx. 2 s.

Assigning address 0 to slave

To assign address 0 to a connected slave, press and briefly hold the buttons PRG and ADR simultaneously.

6.2 **Read ID** operating mode

As soon as you switch to the **Read ID** operating mode, the ID code of the active AS-Interface slave is read in and shown in the address and data display. The value of the ID-Code is always **A**for A/B Slaves.

Repeat reading

To repeat the reading of the code, press the ADR button.

6.3 **Read/write ID1** operating mode

Note!

AS-Interface Specification 2.1

This function applies only to AS-Interface slaves that support Specification 2.1.

As soon as you switch to the **Read/write ID1** operating mode, the ID1 code of the active AS-Interface slave is read in and is shown in the address and data display.

Repeat reading

To repeat the reading of the code, press the ADR button.

Write ID1 Code

Note!

The value of the ID1 Code ranges from 0 to 15 for standard AS-Interface slaves and from 0 to 7 for A/B slaves.

To write an ID1 Code to the active AS-Interface slave, proceed as follows:

1. Set the desired value for the ID1 Code with the [↑] and [↓] buttons.

   ↳ The **RD**display goes out when scrolling up and down.

2. Press the [PRG] button to write the desired value permanently to the active AS-Interface slave,.

   ↳**WR**appears in the operating mode display.

6.4 **Read ID2** operating mode

Note!

AS-Interface Specification 2.1

This function applies only to AS-Interface slaves that support Specification 2.1.

As soon as you switch to the **Read ID2** operating mode, the ID2 code of the active AS-Interface slave is read in and is shown in the address and data display. It is not possible to change this value.

Repeat reading

To repeat the reading of the code, press the [ADR] button.

6.5 **Read IO** operating mode

As soon as you switch to the **Read IO** operating mode, the IO code of the active AS-Interface slave is read in and is shown in the address and data display.

Repeat reading

To repeat the reading of the code, press the [ADR] button.

6.6 **Read Peripheral Fault** operating mode

As soon as you switch to the **Read Peripheral Fault** operating mode, the address and data display indicates if there is a peripheral fault on the AS-Interface slave. A peripheral fault is present if the value 1 is displayed. The cause of the fault depends on the AS-Interface slave being used.

Repeat reading

To repeat the reading of the code, press the [ADR] button.

2012-07

6.7 **Set Slave Parameter** operating mode

In the operating mode **Read/write slave data**, the slave parameter value activates the data transmission from the addressing device to the AS-Interface slave. The standard value is 15 for standard AS-Interface slaves and 7 for A/B slaves.

The set data value is retained until:

- You change the active address in the **Addressing** operating mode,
- You replace the AS-Interface slaves which have the same address but different ID, ID2, or IO codes.
- The addressing device is automatically switched off or manually switched off after a long period without use.

You must adapt the corresponding slave parameters according to the AS-Interface slave used.

Set parameters

1. Set the desired slave parameter value with the ↑ and ↓ buttons.

   ↳ By scrolling up and down, the **RD**display goes out.

2. Press the PRG button.

   ↳**WR**appears in the operating mode display. The parameter value is temporarily accepted, but not transferred to the slave.

6.8 **Read/write Slave Data** operating mode

PRG button is pressed briefly	Send previously set output data once to an AS-Interface slave/display set output data
PRG button pressed and held	Cyclic sending of previously set output data
ADR button is pressed briefly	Read out input data once from the AS-Interface slave and send previously set output data to the AS-Interface slave.
ADR button pressed for 2 seconds.	Cyclic reading of the input data, cyclic sending of previously set output data.

Setting and sending output data

1. Set the desired output data value using the ↑ and ↓ buttons.

   ↳ The **RD** display goes out when scrolling.

2. To temporarily save the desired output data value and transmit it once to the active AS-Interface slave, briefly press the PRG button. If you want to execute a cyclic output data exchange, you must (for security reasons) press and hold the PRG button. The output data value is cyclically transmitted to the AS-Interface slave until you release the button.

   ↳**WR**appears in the operating mode display.

The output data value is 0 as standard.

Tip

Checking output data

You can check the set output data by briefly pressing the ↑ or ↓ button. The set output data are displayed. No data is transferred to the slave.

The set output data value is temporarily stored in the handheld. The output data value is shown on the display as long as you do not press the ↑, ↓ or ADR buttons. If the displayed output data value deviates from the stored output data after pressing the ADR button, then:

1. press the PRG button once. The set output data are shown and the **RD** goes out.
2. Set the desired output data value if necessary using the ↑ and ↓ buttons or
3. briefly press the PRG button to temporarily save the set output data value and transmit it once to the active AS-Interface slave.

The set data value is retained until:

- You change the active address in the **Addressing** operating mode,
- You replace the AS-Interface slaves which have the same address but different ID, ID2, or IO codes.
- The addressing device is automatically switched off or manually switched off after a long period without use.

Reading data from the AS-Interface slave

Note!

When input data are read from the AS-Interface slave, the output data and/or parameter values are also automatically transmitted from the addressing device to the AS-Interface slave. Check that these values do not endanger the trouble-free operation of your plant.

To read the input data from the AS-Interface slave, briefly press the ADR button. If you press the ADR button for at least 2 seconds, the input data from the AS-Interface slave is cyclically read and the output data from the addressing device is sent to the AS-Interface slave. This continues until you press any button on the addressing device. The addressing devices does not switch itself off.

Complex communication protocols

The addressing device supports the following complex communication protocols:

- AS-Interface slaves with the **profile S-7.A.7** are detected as AS-Interface slaves with extended addressing and 4 inputs and 4 outputs and are correctly handled.

- AS-Interface slaves with the **Profile S-0.B** and **S-7.B** are detected as AS-Interface slaves and handled in accordance with AS-Interface at Work.

All other complex communication protocols are not supported and are handled by the addressing device as standard AS-Interface slaves.

Safety Code (AS-Interface Safety At Work)

As soon as both input channels of an AS-Interface safety slave are active, a cyclic sequence of 8 x 4 bits is transmitted to the addressing device. These data are designated as the Safety-Code. The Safety-Code is defined as follows:

Cycle	Structure of the data packet
1	00zz
2	yyxx
3	yyxx
4	yyxx
5	yyxx
6	yyxx
7	yyxx
8	yyxx

The Safety-Code always starts with the data packet 00zz. Thus this denotes the start of a new safety code. The two y-bits of the following data packets are never simultaneously 0. The two x-bits of the following data packets are 00.

Read Safety-Code (AS-Interface Safety at Work)

Reading Safety-Codes is supported by this addressing device. To be able to read Safety-Codes, proceed as follows:

1. Make sure that the two input channels of the AS-Interface safety slaves are active.
2. Press the ADR button.

   ↳ Each time the button is pressed, the hexadecimal value of the respective data packet of the Safety-Code, beginning with the first data packet 00zz, is shown in the address and data display.

7 Error messages

The following messages can appear in the addressing device display.

Error code	Meaning	Description	Remedy
F1	AS-Interface overload	Current consumption of the AS-Interface slaves connected to the addressing device is too high.	Connect an external power supply.
F2	Slave not found	No AS-Interface slave has been found at the active address	Check the address or connect an AS-Interface slave.
F3	Programming error	When programming the address or the IDI code, the value could not be permanently stored in the AS-Interface slave's EEPROM.	If necessary, repeat the programming.
F4	Target address occupied	The target address, to which the current AS-Interface slave is to be reprogrammed, is occupied.	Assign a different address to the active AS-Interface slave.
F5	Address 0 occupied	Address 0 is occupied by another AS-Interface slave	Make sure that address 0 is not occupied.
F6	Standard AS-Interface slave found instead of the A/B-Slave	The standard operation cannot be executed because the active AS-Interface slave does not satisfy the specification 2.1	You cannot use the **Read IO**, **Set slave parameters**, and **Read/write slave data** operating modes with the currently connected standard AS-Interface slave.
F7	A-/B slave found instead of the standard AS-Interface slave	The active standard AS-interface slave has been replaced by an A-/B slave	Assign an address to the A-/B-Slave in the corresponding address area A or B.
F8	Reception error	Due to a fault, the AS-Interface slave response could not be correctly received	Carry out the action again.

8 Technical data

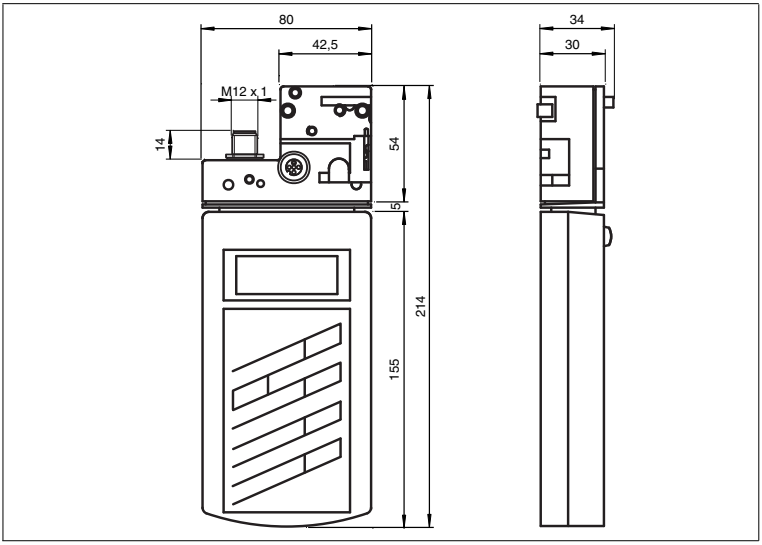


Figure 8.1

General specifications

AS-Interface specification	V3.0
Operating mode	plug-in charging unit, 230 V AC, included in the delivery package

Indicators/operating means

Display	LC display
Keyboard	membrane keys, 5 keys

Electrical specifications

Operating duration	8 h or ≥ 250 read/write procedures for fully charged battery
Power supply	battery mode, please use only battery charger included with delivery to charge (charging time about 14 h)

Interface

Interface type	AS-Interface, short-circuit and overload protected
Open loop voltage	28 V (internal power supply)
Load current	100 mA at 25 V (internal power supply)

Interface 2

Interface type	M12 connector for external power supply
Physical	AUX: 24 V PELV, 2 A (not short-circuit proof) AS-Interface: 31,6 V PELV (DC or AS-Interface), 200 mA (short-circuit proof)

Ambient conditions

Ambient temperature	0 ... 40 °C (32 ... 104 °F)
Storage temperature	-20 ... 40 °C (-4 ... 104 °F)

Mechanical specifications

Protection degree	IP20
Material	
Housing	plastic
Mass	approx. 275 g

FACTORY AUTOMATION – SENSING YOUR NEEDS

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