QUICK START GUIDE

IUH-F117-V1-EU
IUH-F117-V1-US
IUH-F117-V1-CN

Read / Write Head for IDENT*Control*

IDENTControl

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"

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1 Introduction

1.1 Purpose of this quick start guide

This quick start guide contains basic instructions for operating the device. However, the manual takes priority over the quick start guide.

1.2 Product documentation on the internet

You can view all the relevant documentation and additional information on your product at http://www.pepperl-fuchs.com. Simply enter the product name or model number in the **Product/Key word search** box and click **Search**.

Select your product from the list of search results. Click on the information you require in the product information list, e.g., **Technical documents**.

A list of all available documents is displayed.

1.3 Declaration of Conformity

All products were 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, 68307 Mannheim, has a certified quality assurance system that conforms to ISO 9001.

ISO**9001**

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FCC ID: IREIUH-F117-V1
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Notice:
Changes or modifications made to this equipment not expressly approved by Pepperl+Fuchs GmbH may void the FCC authorization to operate this equipment.

Note:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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2 Product Description

2.1 General Functions and Features

Figure 2.1

Functions

The read/write head was developed for reading and writing passive read/write tags with an ultra-high operating frequency.

Measurement Range

The measurement range is normally 6 meters. Tags that comply with EPC Gen 2 (ISO/IEC 18000-63) are supported.

Features

The IUH-F117-V1-* read/write head is equipped with the following features:

- Two dual LEDs for function display
- Industrial housing
- Connects to the IDENT*Control* via connector V1 (M12 x 1)
- Protects against failures (such as antenna short-circuiting) and electrostatic discharge

2.2 Indicators and Controls

The IUH-F117-V1-* read/write head has two dual LEDs (green/yellow). The two LEDs are located on opposite sides and are clearly visible. The various indicators mean:

- Green: power on
- Flashing green: attempting to read/write
- Yellow: command executed

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2.3 Connection

The read/write head is connected to the IDENT*Control* control interface via the M12 x 1 connector.

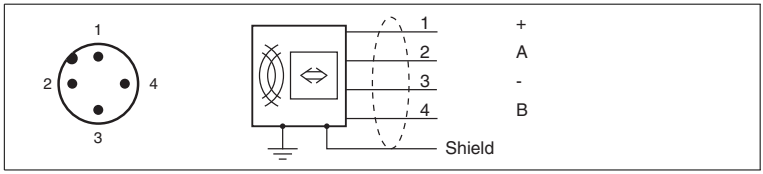

Figure 2.2

2.4 Scope of Delivery

- Read/write head
- Quick start guide

2.5 Accessories

2.5.1 IDENTControl

The read/write head can be connected to Pepperl+Fuchs IDENT*Control* control interfaces.

Interface	Designation
4 read/write heads:	
Ethernet	IC-KP-B17-AIDA1
2 read/write heads:	
PROFIBUS	IC-KP2-2HB6-V15B
Ethernet	IC-KP2-2HB17-2V1D
Serial	IC-KP2-2HRX-2V1
1 read/write head:	
PROFIBUS	IC-KP2-1HB6-V15B IC-KP2-1HB6-2V15B
Ethernet	IC-KP2-1HB17-2V1D
Serial	IC-KP2-1HRX-2V1

Table 2.1

2.5.2 Read/Write Tags

Type	Designation
EPC Gen 2 (ISO/IEC 18000-63)	IUC72-C8-T14 IUC72-F151-M IUC72-F152-M IUC73-F153 IUC76-50-M

Table 2.2

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2.5.3 Connection cable for R/W heads and trigger sensors

Compatible connection cables with shielding are available for connecting the R/W heads and trigger sensors.

Accessories	Description
2 m long (straight female, angled male)	V1-G-2M-PUR-ABG-V1-W
5 m long (straight female, angled male)	V1-G-5M-PUR-ABG-V1-W
10 m long (straight female, angled male)	V1-G-10M-PUR-ABG-V1-W
20 m long (straight female, angled male)	V1-G-20M-PUR-ABG-V1-W
Field connector female, straight, shielded	V1-G-ABG-PG9
Field connector male, straight, shielded	V1S-G-ABG-PG9
Field connector female, angled, shielded	V1-W-ABG-PG9
Field connector male, angled, shielded	V1S-W-ABG-PG9
Dummy plug M12x1	VAZ-V1-B3

Table 2.3

2.5.4 Cable connectors for the power supply

Compatible M12 sockets with an open cable end for connecting the IDENTControl to a power supply are available in different lengths.

Accessories	Designation
Length 2 m (straight socket)	V1-G-2M-PUR
Length 5 m (straight socket)	V1-G-5M-PUR
Length 10 m (straight socket)	V1-G-10M-PUR

Table 2.4

2.5.5 Installation accessories

Two different mounting brackets are available to mount the read/write head on a wall or pole.

Accessories	Designation
Mounting bracket for wall attachment	IUZ-MH10
Mounting bracket for pipe installation (pipe with maximum diameter of 40 mm)	IUZ-MH11

Table 2.5

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3 Installation

3.1 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.

3.2 Unpacking

Check the product for damage while unpacking. In the event of damage to the product, inform the post office or parcel service and notify the supplier.

Check the package contents against your purchase order and the shipping documents for:

- Delivery quantity
- Device type and version in accordance with the type label
- Any accessories ordered

Retain the original packaging in case you have to store or ship the device again at a later date.

Should you have any questions, please contact Pepperl+Fuchs.

3.3 Mounting

The read/write head is intended for wall mounting or mounting on brackets in internal areas. Please mount the read/write head using only the holes provided in the housing. The preferred mounting direction is with the cable connection facing vertically downwards.

Note!

Do not lay the connection cable in the main beam direction of the antenna.

3.3.1 Room Orientation

The alignment of the read/write tag antennae in relation to the antennae of the read/write head influences the detection range of the system. Make sure the antennae are aligned parallel to each other.

3.3.2 Minimum Distances

When positioning the read/write head, please observe the minimum distances. The lateral distance between the read/write head and metals or liquids should be at least 50 cm. The distance between the read/write head and the ground should be at least 50 cm.

During simultaneous operation of several read/write heads, only one read/write head may ever communicate with a tag at any given time. When arranging the read/write heads, make sure that the measurement ranges do not overlap. You can enlarge or reduce the size of the measurement range by changing the transmitting power. Determine the measurement range of each read/write head at the mounting location.

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Note!

During mounting, take into account how the read/write heads may cause interference with each other. The further the transmission channels of the read/write heads are from each other, the lower the risk of interference.

If you want to transmit with just one read/write head at any given time, use the multiplex mode of the IDENTControl control interface. Multiplex operating mode allows chronologically exclusive access to tags, and prevents mutual interference from read/write heads. For a precise description, see the manual for your control interface.

3.3.3 Polarization

The polarization of an electromagnetic wave emitted from an antenna depends on the electromagnetic field component and the spatial position of the antenna. A fundamental distinction is drawn between linear and circular polarization. The polarization of the read/write head must be adapted to the polarization of the transponder in order for a UHF system to utilize the full sensing range. Refer to the corresponding data sheet for details on the polarization of the transponder.

- Linear polarization: the direction of the vector of an electromagnetic field component that generates an electromagnetic wave with linear polarization is always constant. Linear polarization is available in a vertical and horizontal configuration, which is dependent on the spatial position of the antenna.
- Circular polarization: the vector of an electromagnetic field component that generates an electromagnetic wave with circular polarization rotates around an axis parallel with the beam direction. The rotation of the antenna around the communication axis has no influence.

The IUH-F117-V1 read/write head is supplied with circular polarization. Polarization can be changed from circular to linear using the software on the IDENTControl interface. With linear polarization, the polarization level is aligned horizontally when the read/write head is mounted in the preferred installation direction with the cable connection vertical facing downwards.

3.4 Connection

Connect the read/write head to the IDENTControl control interface using a shielded connection cable (see chapter 2.5.2). Ensure that the shield fully encapsulates the connection cable to avoid EMC interference. (see chapter 3.5)

Warning!

Incorrect electrical connection

Damage to the device or plant caused by incorrect electrical connection.

Check all connections in the plant before commissioning the device.

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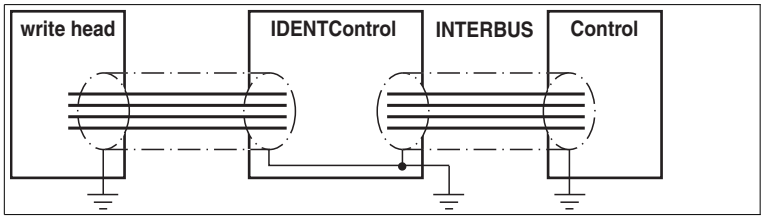
After you connect the supply voltage to the control interface, the PWR/ERR ED lights up green on the device. If the LED does not light up on the device, the power supply is not connected correctly. If the LED lights up red, a device error has occurred. If the PWR/ERR LED flashes red and green alternately once you have connected the read/write head, the power supply does not have sufficient power. If the LED on the read/write head slowly flashes green, the control interface is configured incorrectly.

3.5 EMC Concept

The outstanding noise immunity of the IDENTControl against emission and immission is based on its consistent shielding design, which uses the principle of the Faraday cage. Interference is caught in the shield and safely diverted via the ground connections.



The cable shielding is used to discharge electromagnetic interference. When shielding a cable, you must connect both sides of the shield to ground with low resistance and low inductance.

Note!

If cables with double shields are used, e.g. wire mesh and metalized foil, the both shields must be connected together, with low resistance, at the ends when making up the cable.

Power supply cables are the source of much interference, e.g. from the supply lines of 3-phase electric motors. For this reason, the parallel laying of power supply cables with data and signal cables should be avoided, particularly in the same cable duct.

Note!

The circuit ground is conductively connected to the housing of the write/read head and to the protective ground. (Connection image → see Figure 2.2 on page 7)

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4 Commissioning

4.1 Device Settings

Warning!

Device not configured or configured incorrectly

Configure the device prior to commissioning. A device that has not been configured or configured incorrectly may lead to faults in the plant.

Before commissioning the read/write head, the control interface must first be configured. To do so, refer to the "Commissioning" chapter of the manual for your control interface.

Configure the read/write heads with the system commands. For a parameterization example, see see chapter 4.2.

Caution!

Uncontrolled triggered processes

Before commissioning the device, make sure that all processes are running smoothly; otherwise damage may occur in the plant.

4.2 Operation via the Command Interface

This section shows you how to operate the IUH-F117-V1 read/write head using an IDENTControl control interface with serial interface. The commissioning procedure described relates to the RS 232 interface and involves a PC. The examples include the syntax for coding the commands and parameters via the Ethernet TCP/IP and PROFIBUS interface. Further details about these codes and the factory settings for your IDENTControl control interface can be found in the manual.

Note!

Hexadecimal Display

In the examples, hexadecimal values are shown in the format .xx. A decimal point is followed by 2 characters of hexadecimal code.

.03 = <ETX>

.41 = A_{ASCII}

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Example:

In the examples below, the read/write head is connected to channel 1 of the control interface.

Reading Tags

Enhanced Read Read-Only Code

Send the enhanced read read-only code command to the read/write head. The LEDs on the read/write head flash green.

	Serial	Ethernet	PROFIBUS
Command:	EF1	.00.04.1D.03	.1D.03
Confirmation:	-	.00.06.1D.03.FF.0B	.1D.03.FF.0B
Response:	.35.31	.00.06.1D.03.05.0C	.1D.03.05.0C

Table 4.1 Enhanced read read-only code, no tag in the measurement range

Move a tag into the read/write head's measurement range. When the tag has been detected and the read-only code has been read out, the LED on the read/write head turns yellow. The read-only code is displayed in the terminal program.

	Serial	Ethernet	PROFIBUS
Response:	.30.31.E2.04.26.70.18.01.00.00	.00.0E.1D.03.00.37.E2.04.26.70.18.01.00.00	.1D.03.00.37.E2.04.26.70.18.01.00.00

Table 4.2 Enhanced read read-only code, tag is entering the measurement range

Describing Tags

Single Write Special Read-Only Code

Send the single write special read-only code command to the read/write head while a tag is in the measurement range. .

	Serial	Ethernet	PROFIBUS
Command:	SP1E.30.00.11.22.33.44.55.66.77.88.99.AA.BB.CC	.00.14.0D.E3.00.00.30.00.11.22.33.44.55.66.77.88.99.AA.BB.CC	.0D.E3.00.00.30.00.11.22.33.44.55.66.77.88.99.AA.BB.CC
Confirmation:	-	.00.06.0D.E3.FF.2D	.0D.E3.FF.2D
Response:	.30.31	.00.06.0D.03.00.2E	.0D.03.00.2E

Table 4.3 Single write special read-only code, tag is in the measurement range

Single Read Special Read-Only Code

As confirmation, read out the read-only code of the tag within the read/write head's measurement range via the single read special read-only code command.
.

	Serial	Ethernet	PROFIBUS
Command:	SS10	.00.04.0A.02	.0A.02
Confirmation:	-	.00.06.0A.02.FF.2F	.0A.02.FF.2F
Response:	.30.31.34.00.11.22.33.44.55.66.77.88.99.AA.BB.CC	.00.14.0A.02.00.48.34.00.11.22.33.44.55.66.77.88.99.AA.BB.CC	.0A.02.00.48.34.00.11.22.33.44.55.66.77.88.99.AA.BB.CC

Table 4.4 Single read special read-only code, tag is in the measurement range

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Parameterizing the Read/Write Head

Setting and Requesting the Transmission Power

Read out the read/write head's transmission power with the read parameter PT command:

	Serial	Ethernet	PROFIBUS
Command:	RP1UPT.00.00	.00.09.BE.03.00.55.50.54.00.00	.BE.03.00.55.50.54.00.00
Confirmation:	-	.00.06.BE.03.FF.3E	.BE.03.FF.3E
Response:	.30.31.07.D0	.00.08.BE.03.00.3F.07.D0	.BE.03.00.3F.07.D0

The read/write head's set transmission power is 2000 mW ($7D0_{hex}$ corresponding to 2000_{dec}).

Change the transmission power of the read/write head to 500 mW (500_{dec} corresponding to $1F4_{hex}$) via the write parameter PT command:

	Serial	Ethernet	PROFIBUS
Command:	WP1UPT.00.02.01.F4	.00.0B.BF.03.00.55.50.54.00.02.01.F4	.BF.03.00.55.50.54.04.00.02.01.F4
Confirmation:	-	.00.06.BF.03.FF.11	.BF.03.FF.11
Response:	.30.31	.00.06.BF.03.00.12	.BF.03.00.12

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