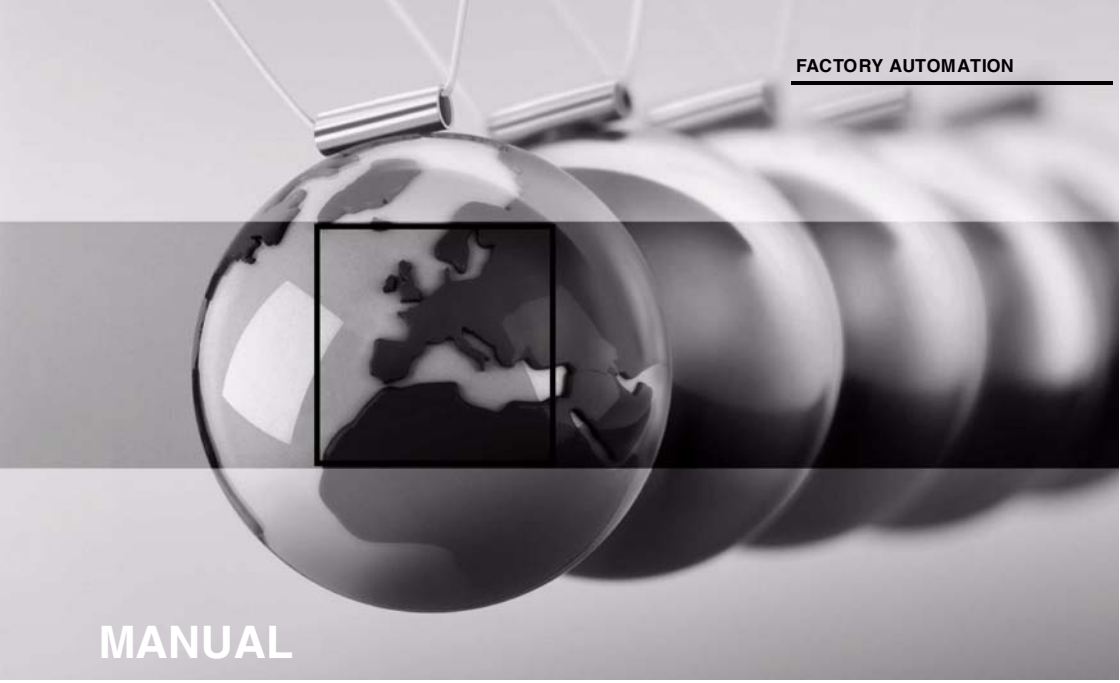
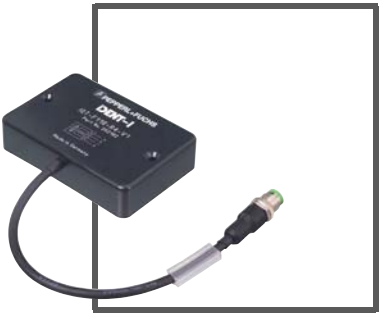


MANUAL

IQT-F116-R4-V1
IQT-F116-R4M-V1
Read/write station (13,56 MHz)



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"

2013-10

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.

Before you install this device and put it into operation, please read the operating instructions thoroughly. The instructions and notes contained in this operating manual will guide you step-by-step through the installation and commissioning procedures to ensure trouble-free use of this product. By doing so, you:

- guarantee safe operation of the device
- can utilize the entire range of device functions
- avoid faulty operation and the associated errors
- reduce costs from downtime and incidental repairs
- increase the effectiveness and operating efficiency of your plant.

Store this operating manual somewhere safe in order to have it available for future work on the device.

After opening the packaging, please ensure that the device is intact and that the package is complete.

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:

Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim
Telephone: +49 621 776-4411
Fax: +49 621 776-274411
E-Mail: fa-info@pepperl-fuchs.com

2013-10

2 Safety

2.1 Symbols relevant to safety

Danger!
This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!
This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

Caution!
This symbol indicates a possible fault.

Non-observance could interrupt devices and any connected facilities or systems, or result in their complete failure.

2.2 Intended use

The read/write station is intended to identify RFID Transponders in the defined frequency and is only to be used for this purpose.

Read through these instructions thoroughly. Familiarize yourself with the device before installing, mounting, or operating.

Always operate the device as described in these instructions to ensure that the device and connected systems function correctly. The protection of operating personnel and plant is only guaranteed if the device is operated in accordance with its intended use.

2.3 General notes on safety

Only instructed specialist staff may operate the device in accordance with the operating manual.

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.

The connection of the device and maintenance work when live may only be carried out by a qualified electrical specialist.

The operating company bears responsibility for observing locally applicable safety regulations.

Store the not used device in the original packaging. This offers the device optimal protection against impact and moisture.

Ensure that the ambient conditions comply with regulations.

Note!

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.

2.4 Specific safety instructions

2.4.1 Read/write station IQT-F116-R4*-V1

Warning!

Uncontrolled processes may harm your plant

Before commissioning, make sure that no danger can arise to the plant in which the device is integrated.

Power supply

The device may only be operated at a current limited power source according to EN 60950.

3 Product description

This product is a read/write station with serial interface RS485. The read/write station reads and writes at a frequency of 13,56 MHz. The device is characterised particularly by its flat design with cable outlet and integrated M12-plug. The housing is resistant to welding bead formation, so that the write/read station can be used in a welding area.

Figure 3.1 IQT-F116-R4-V1

Figure 3.2 IQT-F116-R4M-V1

4 Installation

4.1 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.

4.2 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.

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.

4.3 Assembly and connection of the read /write station

Note!

Do not install that the read/write station directly onto metallic surfaces. Keep a **minimum distance of 50 mm** around the equipment to metal.

If you wish to install several devices next to each other, keep a **minimum distance of 210 mm** in order to avoid interference.

Install the equipment on an even surface.

Installation and connection

1. Fasten the equipment with two screws through the assembly holes in the housing.
2. Connect the device to a computer, with a RS 485 interface.

5 Operation

5.1 General Information about Tag Types

Read/write tag 13.56 MHz (inductive)

Read/write tags in this frequency range offer a considerably higher reading speed than read/write tags for the 125 kHz and 250 kHz system. Since this is a nonproprietary system, cost- effective tags are available from many third-party manufacturers.

By issuing a command, you can notify the device of the specific read/write tag with which it is to communicate.

The following read/write tags are currently supported:

Tag types 13.56 MHz

Data carrier type	Chip type	Details	Desig-nation P+F	Access	Bits	Block addresses [HEX]
20	ISO 15693	All data carriers that conform with ISO	1)	R/W Fixcode	- 64	- -
21	I code SLI	Philips	IQC21	R/W Fixcode	896 64	0...1B -
22	Tag-it HF-I	'Plus' by Texas Instruments	IQC22	R/W Fixcode	2k 64	0...3F -
23	SRF55V02P	my-D by Infinion	IQC23	R/W Fixcode	2k 64	0...38 -
24	SRF55V10P	my-D by Infinion	IQC24	R/W Fixcode	10k 64	0...F7 -

Table 5.1 Tag types 13.56 MHz

1) The purpose of this data carrier type is to read the UID (fix code) of all data carriers supported by Pepperl+Fuchs that conform with ISO 15693.

The read/write tags all feature a read/write range in which data can be written and modified, as well as a protected memory in which the read-only code is saved. This read-only code is issued by the manufacturer only once and can be read using a command, but not altered.

Below you will find an overview of the memory setup and the memory capacities of the various read/write tags:

Read-Only or Read/Write Tag	Access	Address Range <WordAddr>	Data Range <WordNum>	Memory Capacity in Bytes
ICODE_SLI	Read/write	0000 ... 001D	01 ... 1C	112
ICODE_SLI	Read-Only Code	-	-	8
TAGIT_HFI	Read/write	0000 ... 0039	01 ... 20*	256
TAGIT_HFI	Read-Only Code	-	-	8
SRF_55V02P	Read/write	0000 ... 0037	01 ... 20*	224
SRF_55V02P	Read-Only Code	-	-	8
SRF_55V10P	Read/write	0000 ... 00F7	01 ... 20*	992
SRF_55V10P	Read-Only Code	-	-	8

Table 5.2 * The data range <WordNum> is limited either by the maximum memory capacity of the read/write tag, or by the memory bank of the read/write unit.

5.2 Command overview

The commands in the list are described in detail on the following pages.

System commands

Command description	Abbreviation	Page
version	**VE**	See "version VE" on page 12
quit	**QU**	See "quit QU" on page 13
change tag	**CT**	See "change tag CT" on page 12
configure interface	**CI**	See "configure interface CI" on page 13
reset	**RS**	See "reset RS" on page 13
configuration store	**CS**	See "configuration store CS" on page 13

Commands for IQT-F116-R4M-V1 only

Command description	Abbreviation	Page
set device address	**SD**	See "set device address SD" on page 14
get device address	**GA**	See "get device address GA" on page 14

2013-10

Standard read/write commands

Read data

Command description	Abbreviation	Page
single read words	**SR**	See "single read words SR" on page 14
enhanced buffered read words	**ER**	See "enhanced buffered read words ER" on page 14

Write data

Command description	Abbreviation	Page
single write words	**SW**	See "single write words SW" on page 14
enhanced buffered write words	**EW**	See "enhanced buffered write words EW" on page 15

Fixcode

Command description	Abbreviation	Page
single read fixcode	**SF**	See "single read fixcode SF" on page 15
enhanced buffered read fixcode	**EF**	See "enhanced buffered read fixcode EF" on page 15

5.3 System commands

Note!

Command structure

Since the IQT-F116-R4**M**-V1 features a device adress (= <DeviceNo>), you must specify the device address within the commands.

For the IQT-F116-R4-V1 the device address is not applicable.

Examples

Command structure IQT-F116-R4-V1:

Command: <CommandCode><CommandParameters><CHCK><ETX>

Response: <Status><Data><CHCK><ETX>

Command structure IQT-F116-R4**M**-V1:

Command:
<CommandCode>**<DeviceNo>**<CommandParameters><CHCK><ETX>

Response: <Status>**<DeviceNo>**<Data><CHCK><ETX>

Optionally you can replace <CHK><ETX> with #<CR>.

version VE

This command transfers the software version.

Command:	VE <DeviceNo> <CHCK> <ETX>
Response:	<Status> <DeviceNo> (c) P+F IDENT-I <Type code> <Part no.> <SW no.> <Date> <CHCK> <ETX>

change tag CT

This command sets the transponder type the reader communicates with. The delivery status is type "21".

Command:	CT <DeviceNo> <TagType> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

The following transponder types are currently supported:

Tag types 13.56 MHz

Data carrier type	Chip type	Details	Desig-nation P+F	Access	Bits	Block addresses [HEX]
20	ISO 15693	All data carriers that conform with ISO	1)	R/W Fixcode	- 64	- -
21	I code SLI	Philips	IQC21	R/W Fixcode	896 64	0...1B -
22	Tag-it HF-I	'Plus' by Texas Instruments	IQC22	R/W Fixcode	2k 64	0...3F -
23	SRF55V02P	my-D by Infinion	IQC23	R/W Fixcode	2k 64	0...38 -
24	SRF55V10P	my-D by Infinion	IQC24	R/W Fixcode	10k 64	0...F7 -

Table 5.3 Tag types 13.56 MHz

1) The purpose of this data carrier type is to read the UID (fix code) of all data carriers supported by Pepperl+Fuchs that conform with ISO 15693.

With the <TagType> "20" a mixed operation with different transponder types is possible. Since the read/write station requires a significantly longer time for the Autodetect, only static read and write is useful in this mode. In the "Autodetect"-mode, the parameters word start address and number of words are only checked, if a tag is read or writen, because the memory areas of different transponder types are different. Therefore the error message "status 4" can only occur, when a transponder is in front of the read/write station.

quit QU

The running enhanced-buffered read or write commands are canceled.

Command:	QU <DeviceNo> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

configure interface CI

This command sets the timeout and the baud rate. The values are stored in a non-volatile manner. A change always requires a reset to take effect.

The timeout indicates the amount of time, after which the device no longer waits for more characters in a command. After the timeout runs through, the user gets an error message. To deactivate the timeout, the time must be set to “0”.

The number of data bits is always 8. A parity bit is never used.

Command:	CI <DeviceNo> <Timeout>, <Baud> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

The following settings are possible:

<Timeout>:	"0“ ... “100” (x 100 ms, timeout in 100-ms steps
<Baud>:	"1200“ , "2400“ , "4800“ , "9600“ , "19200“, "38400"

The default values are a timeout of “0” and a baud rate of “38400”.

reset RS

This command sets the changed system settings, e.g. timeout and baud rate, newly loaded from the non-volatile memory.

Command:	RS <DeviceNo> <CHCK> <ETX>
Response:	"2" <DeviceNo> <CHCK> <ETX>

configuration store CS

If <Param> = “1”, the next command entered in this setting is stored in the non-volatile memory. This command is also executed. After a reset it is automatically active again.

<Param> = “0” deletes the stored command.

Command:	CS <DeviceNo> <Param> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

Note!

Data collision

Only use the previous command if a single address is on the network.

Executing this command on more than one address will result in data collision.

Commands for IQT-F116-R4M-V1 only

set device address SD

This command changes the DeviceNo in multidrop mode from <OldDeviceNo> to <NewDeviceNo>. The default device adress is "01".

Command:	SD <OldDeviceNo> <NewDeviceNo> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

get device address GA

This command reads the DeviceNo of a station. For reading the DeviceNo of a station only one single station must be connected to the RS485 interface. Otherwise a collision on the RS485 line would occur when several stations can reply to the command. The default device address is "01".

Command:	GA <DeviceNo> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

5.4 Read/write commands

single read words SR

One attempt is made to read <WordNum> 32-bit words from the address <WordAddr>.

Command:	SR <DeviceNo> <WordAddr> <WordNum> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <Data> <CHCK> <ETX>

enhanced buffered read words ER

An attempt is made until successful, to read <WordNum> 32-bit words from the address <WordAddr>. Only changing data is transferred via the interface. When a data carrier leaves the read range, the status “5” is output.

Command:	ER <DeviceNo> <WordAddr> <WordNum> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <Data> <CHCK> <ETX>

Note!

Data collision

Only use the previous command if a single address is on the network.

Executing this command on more than one address will result in data collision.

single write words SW

One attempt is made to write <WordNum> 32-bit words from the address <WordAddr>.

Command:	SW <DeviceNo> <WordAddr> <WordNum> <Data> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

2013-10

enhanced buffered write words EW

An attempt is made until successful, to write <WordNum> 32-bit words to the address <WordAddr>. When successful a status 0 is sent. If there is no tag or a tag leaves then a status 5 is sent. The command remains running.

Command:	EW <DeviceNo> <WordAddr> <WordNum> <Data> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <CHCK> <ETX>

Note!

Data collision

Only use the previous command if a single address is on the network.

Executing this command on more than one address will result in data collision.

single read fixcode SF

One attempt is made to read a fixcode.

Command:	SF <DeviceNo> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <Data> <CHCK> <ETX>

enhanced buffered read fixcode EF

An attempt is made until successful to read a fixcode. When successful a status 0 is sent. If there is no tag or a tag leaves then a status 5 is sent. The command remains running.

Command:	EF <DeviceNo> <CHCK> <ETX>
Response:	<Status> <DeviceNo> <Data> <CHCK> <ETX>

Note!

Data collision

Only use the previous command if a single address is on the network.

Executing this command on more than one address will result in data collision.

5.5 Legend

<CHCK>:	1 ASCII character, 8-bit checksum with the addition of all preceding characters, without overrun
<CR>	1 ASCII character 13
<Data>:	<WordNum> times 4 bytes, a fixcode will always return exacty 8 bytes
<DeviceNo>:	Read head number 2 ASCII characters, range from "01" to "1E"
<ETX>:	1 ASCII character 03
<Status>:	1 ASCII character
<SW-No>:	Application software number
<Tagtype>:	2 ASCII characters
<Timeout>:	Interface timeout; an error message is sent after this time runs out
<WordAddr>:	Word start address in the data carrier, 4 ASCII characters, range from ‘0000h’ to ‘FFFFh’, depending on data carrier type
<WordNum>:	Number of words to be read or written, 2 ASCII characters. Range from "01" to "FF", depending on data carrier type

2013-10

FACTORY AUTOMATION – SENSING YOUR NEEDS

Worldwide Headquarters
Pepperl+Fuchs GmbH
68307 Mannheim · Germany
Tel. +49 621 776-0
E-mail: info@de.pepperl-fuchs.com

USA Headquarters
Pepperl+Fuchs Inc.
Twinsburg, Ohio 44087 · USA
Tel. +1 330 4253555
E-mail: sales@us.pepperl-fuchs.com

Asia Pacific Headquarters
Pepperl+Fuchs Pte Ltd.
Company Registration No. 199003130E
Singapore 139942
Tel. +65 67799091
E-mail: sales@sg.pepperl-fuchs.com

www.pepperl-fuchs.com

PEPPERL+FUCHS
SENSING YOUR NEEDS

TDOCT1431A_ENG
10/2013