MANUAL

IQT-18GM-R4-V1-Y911215
IQT-FP-R4-V1-Y911204

PEPPERL+FUCHS
SENSING YOUR NEEDS

With regards to the delivery of products, the current issue of the following document is applicable:
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Declaration of conformity

The IDENT Control System was developed and manufactured compliant with applicable European and North American standards and guidelines.

Note

A corresponding declaration of conformity may be requested from the manufacturer.

The manufacturer of the product, Pepperl+Fuchs GmbH in D-68307 Mannheim, has a certified quality assurance program in accordance with ISO 9001.

ISO9001

c UL US

Symbols Used

Warning

This symbol warns of a danger.

Failure to observe this warning may result in personal injury or death, or property damage or destruction.

Attention

This symbol warns of a possible fault.

Failure to observe the instructions given in this warning may result in the device and any facilities or systems connected to it developing a fault or even failing completely.

Note

This symbol draws your attention to important information.

Safety

Intended use

The IQT-... serial read heads are designed to be stand-alone. Only one read head can be connected to the RS-485 line at a time. The serial connection should be shielded and grounded at both the read head and the cabinet. Proper wiring must be used.

Warning

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

The IQT-... read heads may only be operated by trained professionals in accordance with these operating instructions.

General safety instructions

Any use other than that described in these instructions endangers the safety and functionality of the device and the connected systems.
Only a qualified electrical technician may connect and perform maintenance on the live device.
If malfunctions cannot be eliminated, take the device out of service and secure it from accidental use.
Only the manufacturer can make repairs to the device. Interventions in and modifications to the device are not permissible and render the warranty null and void.

The responsibility for the adherence to local safety standards lies with the operator.

Product description

Product family

Read/write heads

Read head housing styles range from an 18 mm cylindrical to an 80 mm x 80 mm flat pack. Regardless of housing style, the programming steps are identical for all IQT-... heads.

IQT-18GM-R4-V1-Y911215

IQT-FP-R4-V1-Y911204

Tags

13.56 MHz frequency range (inductive)

Tags in this frequency range offer a significantly higher read rate than tags in 125- and 250-kHz systems. Since this is a non-proprietary system, cost-effective tags are available from many third-party manufacturers. The 13.56 MHz technology also makes so-called smart labels possible (tags as stick-on foil with a printed optical barcode).

Available tags have a 64 bit ROM and 896 bits (IQC21-...), 256 bits(IQC31-...), 2048 bits (IQC22-...), or 7936 bits (IQC24-...) of freely programmable memory.

Tags

Handhelds

For process control (read/write functionality, initialization of tags), a mobile read/write device is available.

IQT1-HH20

Accessories

Connection cables for power and serial communication

These dual ended cables can be used without modification for both power and communication. If desired, the male end can be cut off and the read head can be hard-wired back in the main panel.

Connector cables

Standard accessories	Description
Length 2 m (straight socket, right-angled connector)	V1-G-2M-PUR ABG-V1-W
Length 3 m (straight socket, right-angled connector)	V1-G-3M-PUR ABG-V1-W
Length 5 m (straight socket, right-angled connector)	V1-G-5M-PUR ABG-V1-W
Length 10 m (straight socket, right-angled connector)	V1-G-10M-PUR ABG-V1-W
Length 15 m (straight socket, right-angled connector)	V1-G-15M-PUR ABG-V1-W
Length 20 m (straight socket, right-angled connector)	V1-G-20M-PUR ABG-V1-W
Configurable socket, shielded	V1-G-IVH

Special order cables	Description
Length 12 m (straight socket, right-angled connector)	V1-G-12M-PUR ABG-V1-W
Length 30 m (straight socket, right-angled connector)	V1-G-30M-PUR ABG-V1-W
Length 40 m (straight socket, right-angled connector)	V1-G-40M-PUR ABG-V1-W
Length 50 m (straight socket, right-angled connector)	V1-G-50M-PUR ABG-V1-W
Length 70 m (straight socket, right-angled connector)	V1-G-70M-PUR ABG-V1-W
Length 80 m (straight socket, right-angled connector)	V1-G-80M-PUR ABG-V1-W

Converter

This optional converter, Pepperl+Fuchs part number ICZ-R4-R2, is used to convert the RS-485 signal from the read head to an RS-232 signal for use back to a PC or PLC.

ICZ-R4-R2

Installation

Storage and transport

When the device is stored and/or transported, the device must be packaged and prevented from moving and protected from humidity.

The original packaging provides the optimum protection.

Unpacking

Take note that the contents are not damaged. In case of damage, inform the post office or delivery agent and notify the supplier.
Check the scope of delivery against your order and the delivery documents.

Keep the original packaging in case the device must be stored or shipped at a later date.

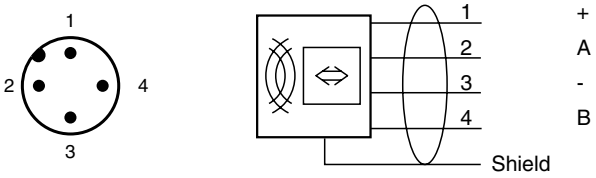
If you have any questions, please contact Pepperl+Fuchs.

Device connection

Plug connectors make installation simple and easy.

Power supply/RS-485 serial connections

Connection is made using an M12 plug connector. On the housing there is a plug with the following pin layout:

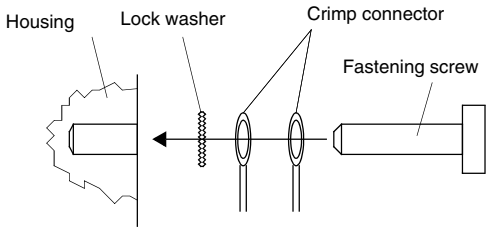


IQT wiring diagram

For the appropriate connection cable, see "Connection cables for power and serial communication"" on page 5.

Ground connection

All read heads should be grounded using the grounding screw (only included with the IQT-FP-...) or directly with a metal bracket. The cable should be grounded at both ends.



Principle of the ground connection

We recommend using a conductor of at least 12 AWG in size for the ground wire.

Instructions for connecting communication interface

The baud rate is configured using a serial command. The following options are available:

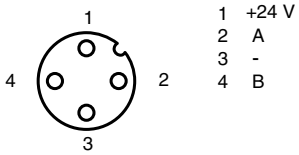
1200, 2400, 4800, 9600, 19200, 38400 bps

When delivered from the factory, 9600 baud is configured.

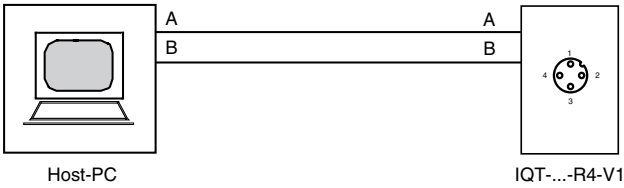
The device works with the following fixed parameters:

- 8 data bits
- 1 start bit
- 1 stop bit
- no parity

The RS-485 interface is connected using a 4-pin M12 connector. The shielding of the cable must be attached to the connector.



Pinout of the M12 connector for RS-485



Example of connection of RS-485 interface to PC

Transmission rates, line lengths, and line types

The maximum cable length between the control unit and the computer depends on the data rate and the level of interference. The value given here is only a suggestion.

Standard	Max. cable length
RS-485	1200 mm

Commissioning

Warning

Before commissioning, make sure that no risk can occur to the installation in which the device is installed, e.g., due to uncontrolled processes.

Connection


Attention

Before commissioning, verify that all connections are correct.

After the power supply is connected, the green LED must light up.

Device settings


Attention

Devices must be configured before connecting them to the interface.

Before commissioning, some parameters may have to be configured.
All parameters are non-volatile. They will remain intact even after a power cycle.
Non-volatile parameters

Parameters	Factory setting	Range
Read/write head		
Tag type	20	20 ... 31
RS-485 interface		
Baud rate	9600	1200, 2400, 4800, 9600, 19200, 38400
Timeout	1 (100 ms)	0 ... 100

Configure the read/write station using the system commands described in the "System commands" table on page 17.

Operation through the communications interface

The commissioning of the IQT-... read head is described below using the serial RS-485 interface, a PC, and a model number IPC21 tag. All the steps below assume that the IQT-... read head is in the factory delivered state.
The factory setting of the transmission rate is 9600 baud with a 100 ms timeout. The data carrier type is preset as "20" (tag type independent).
Check whether you have connected an RS-485 interface.
The transmission rate (baud rate) is selected through the software (see "Instructions for connecting communication interface" on page 8). The following transmission rates are available:

1200, 2400, 4800, 9600, 19200, 38400 bps

When delivered from the factory, 9600 baud is configured. The device works with the following fixed parameters:

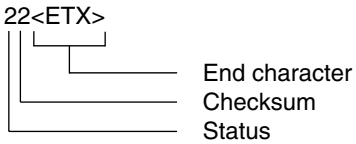
- 8 data bits
- 1 start bit
- 1 stop bit
- no parity

First operating step

On the PC, open the terminal program (e.g. Hyperterminal or the command entry window of the "RFID control," software which can be downloaded from our web page, **www.pepperl-fuchs.com**).

In the terminal program, set the interface configuration to 9600 baud, 8 data bits, no parity, 1 stop bit, and no protocol/handshake.

If you now switch the power supply to the device off and on again, after the power is restored the following message appears on the terminal:



This tells you that communications are working between the device and the terminal program and that the device is ready to operate. As a check, send the version command

VE#‹CR›

from the terminal. This command should be typed into a text file and sent. Typing on the screen directly will fail because of the 100 ms serial timeout.

Depending on the device connected, you will receive a response with its name, part number, and a version message.

Example:

0 (C) P+F IDENT-I‹CR›‹LF›
IQT-18GM-R4-V1-Y911215‹CR›‹LF›
#911215‹CR›‹LF›
1830635‹CR›‹LF›
05.04.07 #‹CR›

Note

If you receive a different response, communication between your PC and the device is not working correctly (the software number and software date, however, may vary).

Check your installation and repeat the steps for commissioning.

Note

The device ignores capitalization of the commands. That is, commands are not case sensitive. However, please note that all parameters follow the command without spaces.

Protocol with checksum

All commands are concluded with the characters

‹CHCK› = "Checksum"

and

‹ETX› = "End of Text" (‹ETX› = 03h).

These are used for data security in the serial transmission.

For simple operation from a standard terminal, the control unit can also accept a

#‹CR›

instead of

‹CHCK›‹ETX›.

Note

By using the checksum, you increase the data security on the interface.

The checksum is calculated using simple addition of all previous characters with no overflow.

Example of the calculation of the checksum:

For the message without the checksum

VE#‹CR›

or

ve#‹CR›

the checksum should be calculated.

First, an ASCII table is used to look up the hexadecimal values for the characters

"V" = 56h and "E" = 45h

or

"v" = 76h and "e" = 65h.

If these are added, the result is:

"V" = 56h plus "E" = 45h gives the sum 9Bh

or

"v" = 76h plus "e" = 65h gives the sum DBh.

The message with checksum is then

VE‹9Bh›‹ETX›

or

ve‹DBh›‹ETX›.

If a longer message is to be transmitted, there will probably be an overflow in the checksum. That is, the value obtained from the addition will no longer fit in one byte. The overflow is discarded.

To transmit the message

ER000702#‹CR›

with a checksum, the following checksum results:

45h + 52h + 30h + 30h + 30h + 37h + 30h + 32h = 1C0h.

After the overflow is discard, the following message results with the checksum:

ER000702‹C0h›‹ETX›.

The device ignores capitalization of the commands. However, please note that different checksums result for upper- and lowercase letters. Also, do not send the ASCII characters "C0". It is the single ASCII character which has a hexadecimal value of C0. Many characters cannot be entered directly at the keyboard.

Commands

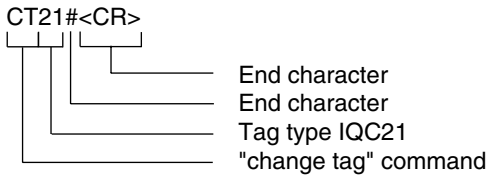
General information about serial interface

The RS-485 serial interface allows simple, fast connection of the IQT-... read head to a PC or PLC. No device address is used. Configuration is limited to setting the desired baud rate and serial timeout desired.

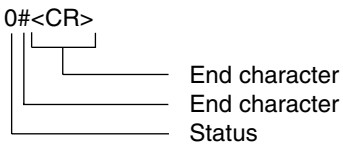
Command examples

1st example: Setting the tag type

When delivered, the tag type 20 is configured. This tag type is used when you want the read head to automatically determine the tag type. The 64 bit code is read first and the tag type is set accordingly. Because the code is read first, the response time is increased by at least 20 ms. To make the system as fast as possible, set the tag type exactly to the model number used (ex. IQC21 to 21). To do this, you send the command "change tag."



As a response you receive:



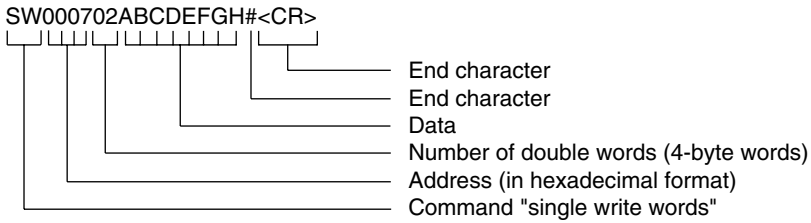
This shows that the read/write head has correctly received the command (status = '0'). You can find an overview of all status codes on page 28.

Note

The data carrier type is stored in non-volatile memory.

2nd example: Writing 2 double words starting at address 7

Now place an IQC21 tag in front of the read/write head. Send the command "single write words" (for the syntax of this command, see "single write words" on page 24).



If the tag is in the detection range, then you receive the message

0#‹CR›.

Otherwise,

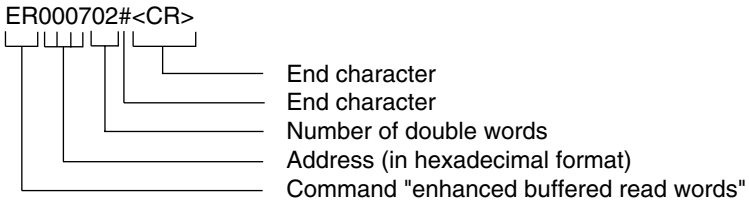
5#‹CR›

is returned to show that writing was not possible because the tag was outside the detection range (status = '5'). You can find an overview of all status codes on page 28.

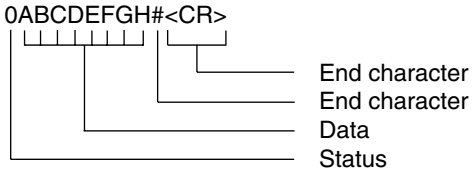
The LED on the read/write head flashes green if the read command is activated and turns yellow if the command has been executed successfully.

3rd Example: Reading 2 double words starting at address 7

Send the read command "enhanced buffered read words" (for the syntax of this command see "enhanced buffered read words" on page 23).



If you bring a tag into the detection range, then the previously written data will be displayed, with the message



Command types

When using commands, the two modes "Single mode" and "Enhanced mode" are differentiated.

Single mode

Each command is executed once, and an immediate response is returned. To use this command, the tag must stop over the read head before the command is sent by the control system.

Enhanced mode

Each command remains active until it is cancelled by the user, a new command is sent, or there is a power cycle. A response is sent when the tag shows up in front of the read head and also when it leaves the detection zone. These commands are typically used to read tags "on the fly."

Command overview

The commands listed are described in detail on the pages shown in the tables below.

System commands

Command description	Abbreviation	Page
Version	VE	19
Change tag	CT	19
Quit	QU	20
Configure interface	CI	20
Configuration store	CS	21
Get state	GS	21
Reset	RS	21

Standard read/write commands

Fixed code (read only)

Command description	Abbreviation	Page
Single read fixcode	SF	22
Enhanced buffered read fixcode	EF	22

Reading data

Command description	Abbreviation	Page
Single read words	SR	23
Enhanced buffered read words	ER	23

Writing Data

Command description	Abbreviation	Page
Single write words	SW	24
Single write words with lock	SL	24
Enhanced buffered write words	EW	24
Enhanced write words with lock	EL	25
Fill datacarrier	S#	25

Special command codes

Command description	Abbreviation	Page
Single inventory read	IV	26

System commands

In the following descriptions, the commands are in bold text.

Text in ‹ ... › is explanatory text for the command sequence.

The device ignores capitalization of the commands. That is, commands are not case sensitive. However, please note that all parameters follow the command without spaces.

version (VE):

Command:	**VE** ‹CHCK› ‹ETX›
Response:	‹Status› (C)P+F IDENT-I ‹Model type› #‹Part no› ‹SW no› ‹SW date› ‹CHCK› ‹ETX›

This command is used to transmit the model number and version information of the read head.

change tag (CT):

Command:	**CT**‹TagType›‹CHCK›‹ETX›
Response:	‹Status›‹CHCK›‹ETX›

This command is used to program the exact tag type the read head will be communicating with. This setting is stored in non-volatile memory in the read head. The following tag types are supported

Tag type	P+F name	Chip type	Access	Bits	Address range
20	20*	Any ISO 15693-compliant tag	R/W fixed code		
21	IQC21	I-Code SLI (Philips)	R/W fixed code	896 64	0...1B h
22	IQC22	Tag-it HF-I (TI)	R/W fixed code	2048 64	0...3F h
23	IQC23	my-D (Infinion)	R/W fixed code	1792 64	0...37 h
24	IQC24	my-D (Infinion)	R/W fixed code	7936 64	0...F7 h
31	IQC31	Tag-it HF-I (TI)	R/W fixed code	256 64	0...7 h

*20 is not an actual data carrier type. In this mode, the read head determines the tag type by first reading the UID (fixed code) before each read or write operation.

Default tag type:


Note

In an installation in which only one tag type is used, it is practical to set that tag type. This allows the tags to be detected more quickly.

quit (QU):

Command: **QU**‹CHCK›‹ETX›

Response: ‹Status›‹CHCK›‹ETX›

The command running is cancelled.

configure interface (CI):

Command: **CI**‹Timeout›,‹Baud›‹CHCK›‹ETX›

Response: ‹Status›‹CHCK›‹ETX›

This command is used to set the timeout and baud rate. The values are stored in non-volatile memory in the control unit.


Note

Device settings stored in non-volatile memory only become active after a reset.

The timeout specifies the time after which the device no longer waits for characters in a command. After the timeout expires, the user receives an error message. To disable the timeout, the time must be set to "0".

The number of data bits is always 8. Parity bits are never used.

The following settings are possible:

‹Timeout›: "0" "1"... "100" (x 100 ms, timeout in 100 ms steps)

‹Baud›: 1200, 2400, 4800, 9600, 19200, 38400

A timeout of "1" (100 ms) and a baud rate of "9600" are the default values.

configuration store (CS):

Command:	**CS**‹Mode›‹CHCK›‹ETX›
Response:	‹Status›‹CHCK›‹ETX›

This command allows the last command sent to the read head to be stored in non-volatile memory in the IDENT Control. After the power supply is interrupted or the read head is reset, the read head will execute this command automatically.

‹Mode›="1" activates the mode.

‹Mode›="0" deactivates the mode.

By default, configuration store is not active.

get state (GS):

Command:	**GS**‹CHCK›‹ETX›
Response:	‹Status› TT: ‹TagType›, TO: ‹Timeout› ms, BD: ‹Baud›‹CHK›‹ETX›

This command reads all device settings stored in non-volatile memory in the device that will become active after the next reset.

reset (RS):

Command:	**RS**‹CHCK›‹ETX›
Response:	2‹CHCK›‹ETX›

This command causes all running commands to be cancelled. The device settings are reread from non-volatile memory.

Note

Device settings stored in non-volatile memory only become active after a reset.

Fixed code (read only)

Read only commands return a 64 bit unique number.

single read fixcode (SF):

Command: **SF**‹CHCK›‹ETX›

Response: ‹Status›‹Data›‹CHCK›‹ETX›

Exactly one attempt is made to read a fixed code.

The fixed code length is exactly 8 bytes long. The characters may be unprintable and are typically only evaluated by a PC/PLC program.

enhanced buffered read fixcode (EF):

Command: **EF**‹CHCK›‹ETX›

Response: ‹Status›‹Data›‹CHCK›‹ETX›

Continual attempts are made to read a fixed code. Only changed data are transmitted over the interface. That is, if a new tag is read or if a the same tag leaves and comes back into the detection range.

The status '5' is sent if the tag leaves the detection range.

The fixed code length is exactly 8 bytes long. The characters may be unprintable and are typically only evaluated by a PC/PLC program.

Reading data

single read words (SR):

Command: **SR**‹WordAddr›‹WordNum›‹CHCK›‹ETX›

Response: ‹Status›‹Data›‹CHCK›‹ETX›

Exactly one attempt is made to read ‹WordNum› 32-bit words starting at address ‹WordAddr› (e.g., SR000001‹CHCK›‹EXT› to read 01 32-bit word at address 0000). All ‹WordAddr› and ‹WordNum› parameters are in hexadecimal. To read 10 32-bit words, a length of 0A must be specified.

enhanced buffered read words (ER):

Command: **ER**‹WordAddr›‹WordNum›‹CHCK›‹ETX›

Response: ‹Status›‹Data›‹CHCK›‹ETX›

Continual attempts are made to read ‹WordNum› 32-bit words starting at address ‹WordAddr› (e.g., ER000001‹CHCK›‹STX› to read 01 32-bit word at address 0000). Only changed data is transmitted over the interface. All ‹WordAddr› and ‹WordNum› parameters are in hexadecimal. To read 10 32-bit words, a length of 0A must be specified.

The status '5' is sent when the tag leaves the detection range.

Writing data

single write words (SW):

Command: **SW**‹WordAddr›‹WordNum›‹Data›‹CHCK›‹ETX›

Response: ‹Status›‹CHCK›‹ETX›

Exactly one attempt is made to write ‹WordNum› 32-bit words starting at address ‹WordAddr› (e.g., SW000001ABCD‹CHCK›‹ETX› writes "abcd" to address 0 on the tag). Data is written in 4 byte blocks only and the string must be exactly the correct length to be executed. If the command is successful, then the data is written. All ‹WordAddr› and ‹WordNum› parameters are in hexadecimal. To read 10 32-bit words, a length of 0A must be specified.

single write words with lock (SL):

Command: **SL**‹WordAddr›‹WordNum›‹Data›‹CHCK›‹ETX›

Response: ‹Status›‹CHCK›‹ETX›

Exactly one attempt is made to write ‹WordNum› 32-bit words starting at address ‹WordAddr›(e.g., SL000001ABCD‹CHCK›‹ETX› writes "abcd" to address 0 on the tag). Data is written in 4 byte blocks only and the string must be exactly the correct length to be executed. If the command is successful, then the data is written and the registers are locked. All ‹WordAddr› and ‹WordNum› parameters are in hexadecimal. To read 10 32-bit words, a length of 0A must be specified.

Note

Data can never be changed again and the registers cannot be unlocked.

enhanced buffered write words (EW):

Command: **EW**‹WordAddr›‹WordNum›‹Data›‹CHCK›‹ETX›

Response: ‹Status›‹CHCK›‹ETX›

Attempts are made to write ‹WordNum› 32-bit words starting at address ‹WordAddr› until one is successful (e.g., EW000001ABCD‹CHK›‹ETX› writes "abcd" to address 0 on the tag). After every successful write, the response is sent and then the device switches to continuous reading. The same tag is then read until it leaves the detection range or a new tag appears in the detection range. After this occurs, the command starts again with write attempts. All ‹WordAddr› and ‹WordNum› parameters are in hexadecimal. To read 10 32-bit words, a length of 0A must be specified.

The status '05' is returned if the tag leaves the detection range or the tag is not yet in the detection range.

If two tags are introduced to the reading area, one immediately after the other, there is no status '05' sent between the two reads.

enhanced buffered write words with lock (EL):

Command:	**EL**‹WordAddr›‹WordNum›‹Data›‹CHCK›‹ETX›
Response:	‹Status›‹CHCK›‹ETX›

Attempts are made to write ‹WordNum› 32-bit words starting at address ‹WordAddr› until one is successful (e.g., EL000001ABCD‹CHCK›‹ETX› writes "abcd" to address 0 on the tag). After every successful write, the response is sent and the device switches to continuous reading. The same tag is then read until it leaves the detection range or a new tag appears in the detection range. Then the command starts again with write attempts. All ‹WordAddr› and ‹WordNum› parameters are in hexadecimal. To read 10 32-bit words, a length of 0A must be specified.

The status '05' is returned if the tag leaves the detection range or the tag is not yet in the detection range.

If two tags are introduced to the reading area, one immediately after the other, there is no status '05' sent between the two reads. Data is written in 4 byte blocks only and the string must be exactly the correct length to be executed. If the command is successful, the data is written and the registers are locked.

Note

Data can never be changed again and the registers cannot be unlocked.

fill datacarrier (S#):

Command:	**S#**‹WordAddr›‹WordNum›‹FillSign›‹CHCK›‹ETX›
Response:	‹Status›‹CHCK›‹ETX›

The tag is written beginning with the given start address ‹WordAddr› with ‹WordNum› number of fill characters ‹Fill Sign›. The ‹WordNum› for this command is 4 characters long. This is required because of the high data capacity of tags. If the ‹WordNum› is left at “0000”, then the entire tag from the start address to the end of its memory is filled. For example, if the command S#00000000A‹CHCK›‹ETX› is sent, the entire tag is filled with the letter ‘A’.

Special command codes

single inventory read (IV):

Command:	**IV**‹CHCK›‹ETX›
Response:	‹Status›‹Data›‹CHCK›‹ETX› ‹Status›‹Data› ‹CHCK›‹ETX› ... F000‹TagsRead›‹CHCK›‹ETX

This command acts the same as the "single read fixcode" command except more than one tag can be read at one time and the command is terminated with a length indicator. This command only runs a single time and shuts off. Two tags are guaranteed to be read at the same time, but more are possible. This depends on tag size, placement, and mounting.

Legend

‹Baud›	: Baud rate: 2400, 4800, 9600, 19200, 38400 bps
‹CHCK› without	: 1 byte ASCII, 8-bit checksum from addition of all characters overflow.
‹CR›	: 1 ASCII character, 13d, carriage return
‹Data›	: ‹WordNum› times 4 bytes. During communication of a word, the highest byte is sent first and the low byte last.
‹ETX›	: 1 ASCII character, 03d, End of Text
‹Fill Sign›	: 1 ASCII character, any character from 000d to 255d
‹LF›	: 1 ASCII character, 10d, Line feed
‹Mode›	: 1 ASCII character, '0': configuration store off '1': configuration store on, next command is stored
‹Model type›	: Order code of product
‹Part no›	: Item number, 6 ASCII characters '0' through '9'
‹Status›	: 1 ASCII character (see table on page ?)
‹SW no›	: Software number of application software
‹SW date›	: Versions date of application software
‹TagType›	: 2 ASCII characters, example: ‘21’ for IQC21
‹Timeout›	: 1 to 3 ASCII characters Timeout of interface in (0 ... 100) x 100 ms; after this time is elapsed an error message is sent. '0' deactivates the timeout
‹WordAddr›	: 4 ASCII characters, starting word address in the tag, range from '0000' to 'FFFF' depending on tag type.
‹WordNum›	: 2 ASCII characters, number of words to read or write, range from '00' to '20' (128 bytes) : 4ASCII characters, number of words to clear range from '0000' to 'FFFF'' depending on the tag type used for the S# command

Error/status messages

Status	Meaning
0	Command executed without errors

Error message sent by the ID system

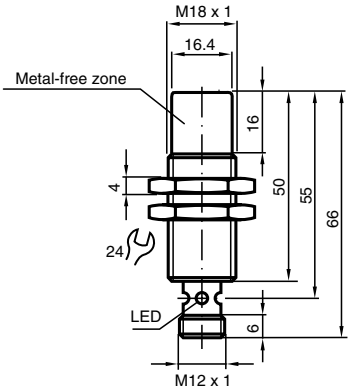
Status	Meaning
2	Switch-on message, reset was executed
4	Incorrect or incomplete command or parameter not in valid range
5	No tag in detection range
6	Hardware error e.g., error on self-test or read/write head defective
7	Internal device error
8	Reserved

Troubleshooting

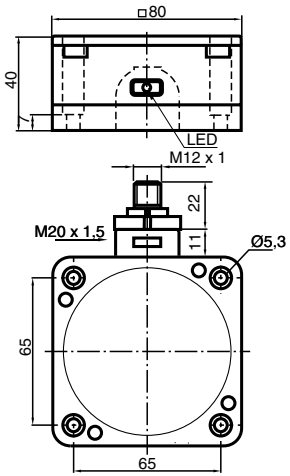
No LEDs:	Check power. 24 V must be applied to pins 1+ and 3-
LED blinking green:	Command is running on read/write head
LED amber:	Command successful and tag remains in front of read head.
Serial data corrupt:	Check baud rate. default is 9600 but it can be changed via command. Try 19200 and 38400 and power cycle each time. Correct baud rate will show 22 on power up.
Response always 4:	Not sending data fast enough. Put data in text file and send text file. Checksum is wrong or one of the command parameters is wrong.
Response starts with 5:	Place tag over read head and try again or you are trying to write to a memory cell that is locked.

Technical data

Dimensions



IQT-18GM-R4-V1-Y911215 dimension drawing



IQT-FP-R4-V1-Y911204 dimension drawing

General data

IQT-18GM-R4-V1-Y911215

General specifications		
Operating frequency		13.56 MHz
Transfer rate		26 kBit/s
Indicators/operating means		
LED green/yellow		green: power on green flashing: read/write attempt performed yellow: tag detected
Electrical specifications		
Rated operational voltage	U_e	20 ... 30 V DC, ripple 10% SS, PELV
Power consumption	P_0	‹1.2 W
Supply		From clean power source with 5 W slow blow fuse
Interface		
Physical		RS 485 point-to-point connection
Protocol		ASCII
Transfer rate		9600 Bit/s default, programmable 1200 Bit/s to 38400 Bit/s
Cable length		‹1200 m (3937.2 ft)
Ambient conditions		
Operating temperature		-25 ... 70 °C (-13 ... 158 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications		
Protection class		IP67
Connection		plug connector M12 x 1
Material		
Housing		Crastin (PBT) face / Stainless steel housing
Encapsulation compound		CY 221/HY 2966
Installation		not embeddable
Distance between two heads		›80 mm
Weight		approx. 40 g (1.3 oz)
Compliance with standards and directives		
Standard conformity		
Electromagnetic compatibility		EN 61326
Protection class		EN 60529

IQT-FP-R4-V1-Y911204

General specifications		
Operating frequency		13.56 MHz
Transfer rate		26 kBit/s
Indicators/operating means		
LED green/yellow		green: power on green flashing: read/write attempt performed yellow: tag detected
Electrical specifications		
Rated operational voltage	U_e	20 ... 30 V DC, ripple 10% SS, PELV
Power consumption	P_0	‹1.3 W
Supply		From clean power source with 5 W slow blow fuse
Interface		
Physical		RS 485 point-to-point connection
Protocol		ASCII
Transfer rate		9600 Bit/s default, programmable 1200 Bit/s to 38400 Bit/s
Cable length		‹1200 m (3937.2 ft)
Ambient conditions		
Operating temperature		-25 ... 70 °C (-13 ... 158 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications		
Protection class		IP67
Connection		plug connector M12 x 1
Material		
Housing		Crastin (PBT) housing/metal base
Lower section		aluminum die casting
Encapsulation compound		CY 221/HY 2966
Installation		not embeddable
Distance between two heads		›150 mm
Weight		approx. 380 g (12.2oz)
Compliance with standards and directives		
Standard conformity		
Electromagnetic compatibility		EN 61326
Protection class		EN 60529

Read/write range

Read/write range in air

Read/write range in air (13.56 MHz data carrier)

Data carrier	Reading range in mm	
	IQT-18GM-R4-V1-Y911215	IQT-FP-R4-V1-Y911204
IQC21-30P	0 ... 35	0 ... 65
IQC21-50F-T10	0 ... 69	0 ... 126
IQC21-50P	0 ... 55	0 ... 100
IQC21-58	0 ... 25	0 ... 65
IQC22-C1	0 ... 70	0 ... 135
IQC22-C4	0 ... 35	0 ... 125
IQC22-C5	0 ... 45	0 ... 80
IQC22-22-T9	0 ... 29	0 ... 54
IQC31-22-T9	0 ... 29	0 ... 54

Read/write range on steel

Note

When mounting the data carrier on steel, the read and write range is decreased in comparison to mounting in air.

Data carrier	Reading range in mm	
	IQT-18GM-R4-V1-Y911215	IQT-FP-R4-V1-Y911204
IQC21-58	0 ... 35	0 ... 70

ASCII table

hex	dec	ASCII	hex	dec	ASCII	hex	dec	ASCII	hex	dec	ASCII
00	0	NUL	20	32	Space	40	64	@	60	96	‘
01	1	SOH	21	33	!	41	65	A	61	97	a
02	2	STX	22	34	“	42	66	B	62	98	b
03	3	ETX	23	35	#	43	67	C	63	99	c
04	4	EOT	24	36	$	44	68	D	64	100	d
05	5	ENQ	25	37	%	45	69	E	65	101	e
06	6	ACK	26	38	&	46	70	F	66	102	f
07	7	BEL	27	39	‘	47	71	G	67	103	g
08	8	BS	28	40	(	48	72	H	68	104	h
09	9	HT	29	41	)	49	73	I	69	105	i
0A	10	LF	2A	42	*	4A	74	J	6A	106	j
0B	11	VT	2B	43	+	4B	75	K	6B	107	k
0C	12	FF	2C	44	,	4C	76	L	6C	108	l
0D	13	CR	2D	45	-	4D	77	M	6D	109	m
0E	14	SO	2E	46	.	4E	78	N	6E	110	n
0F	15	SI	2F	47	/	4F	79	O	6F	111	o
10	16	DLE	30	48	0	50	80	P	70	112	p
11	17	DC1	31	49	1	51	81	Q	71	113	q
12	18	DC2	32	50	2	52	82	R	72	114	r
13	19	DC3	33	51	3	53	83	S	73	115	s
14	20	DC4	34	52	4	54	84	T	74	116	t
15	21	NAK	35	53	5	55	85	U	75	117	u
16	22	SYN	36	54	6	56	86	V	76	118	v
17	23	ETB	37	55	7	57	87	W	77	119	w
18	24	CAN	38	56	8	58	88	X	78	120	x
19	25	EM	39	57	9	59	89	Y	79	121	y
1A	26	SUB	3A	58	:	5A	90	Z	7A	122	z
1B	27	ESC	3B	59	;	5B	91	[	7B	123	{
1C	28	FS	3C	60	‹	5C	92	\	7C	124	l
1D	29	GS	3D	61	=	5D	93	]	7D	125	}
1E	30	Rs	3E	62	›	5E	94	^	7E	126	~
1F	31	US	3F	63	?	5F	95	_	7F	127	DEL

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