



Device manual
RFID compact device
TCP/IP

DTE8x4
DTE9x4

UK

Contents

1.1	<i>Licenses and trademarks</i>	4
2	Preliminary note	5
2.1	<i>Symbols used</i>	5
3	Safety instructions	5
4	Functions and features	5
4.1	<i>Configuration via Ethernet interface</i>	5
4.2	<i>Functions for commissioning</i>	5
5	Function	6
5.1	<i>Connection</i>	7
5.2	<i>"PWR" voltage supply and digital input / output</i>	7
5.3	<i>Field bus connection ETH1 / ETH2</i>	7
5.4	<i>Factory setting of the Ethernet parameters</i>	8
5.4.1	Allowed network infrastructures	9
5.4.2	Linear structure:	9
5.4.3	Ring structure:	9
5.4.4	Star structure:	9
6	Installation	10
7	Operating and display elements	11
7.1	<i>Reset to factory settings</i>	11
7.2	<i>LED indicators</i>	11
8	LED PWR	11
8.1.1	LED Signal	11
8.1.2	LED LINK/ACT on interface ETH1/ETH2	11
8.1.3	Special device LED indicators	12
8.1.4	LED SF System failure	12
8.1.5	LED BF Bus failure	12
10	Putting into operation	13
11	Web interface	13
11.1	<i>Verify and set the IP address of the PC</i>	13
11.2	<i>Tab "Home"</i>	14
11.3	<i>Tab "Network"</i>	15
11.4	<i>Tab "Firmware – firmware update"</i>	16
11.5	<i>Tab "Firmware – Read-/Write head update"</i>	17
11.5.1	Update of the Read-/Write head or the UHF module	18
11.6	<i>Tab "RWH" – Adaptation of the device to the application</i>	19
11.6.1	Stable mode	19
11.6.2	Quick mode	19
11.6.3	Customized mode	19
11.6.4	Common RWH UHF parameter settings	19

11.6.5	Tab RWH – UHF setting “stable”	20
11.6.6	Tab RWH – UHF setting “quick”	21
11.6.7	Tab RWH – UHF setting “customized”	22
11.6.8	Detailed description of the UHF parameter	23
11.7	<i>Tab "IO-Port"</i>	24
11.7.1	Read-/Write head	24
11.7.2	IO-PORT IO-1 and IO-2	25
11.8	<i>Tab "Monitor"</i>	26
11.8.1	Section RWH	27
11.8.2	Section IO-1 / IO-2 port	28
11.8.3	Tab "Monitor" - Tag monitoring	29
11.8.4	Tab "Monitor" - Reading of the ID tag	29
11.8.5	Tab "Monitor" - Writing to the ID tag	30
11.9	<i>Tab "System"</i>	31
11.10	<i>Tab "SNTP"</i>	32
11.11	<i>Tab "IO-Logic"</i>	33
11.11.1	Allowed wildcards within the EPC data	35
11.11.2	Enter more rules	36
11.11.3	Evaluation of the EPC data	37
11.12	<i>Tab "Info"</i>	38
11.13	<i>Tab "Reset"</i>	39
11.14	<i>Open source license information</i>	40
12	Device configuration	41
12.1	<i>Determining the MAC address</i>	41
12.2	<i>Parameter setting of the Ethernet interface</i>	41
12.2.1	Configuration over the web server	41
12.3	<i>Socket connection ETH1 / ETH2</i>	42
13	ASCII protocol of the device	43
13.1	<i>ASCII data frame format of the device</i>	44
13.2	<i>List of supported ASCII commands</i>	46
13.3	<i>Setup of the data communication</i>	47
13.3.1	Device configuration	47
13.3.2	IO channel configuration	50
13.4	<i>Command description</i>	52
13.4.1	Get MAC address of the device	53
13.4.2	Read IP address of the device	54
13.4.3	Write IP address of the device	56
13.4.4	Set LED of the device	58
13.4.5	Read inputs of the IO channel	61
13.4.6	Receive all inputs of the IO channel	63
13.4.7	Write outputs of the IO channel	65
13.4.8	Read diagnostic information of the device	67
13.4.9	Get UHF power levels	69
13.4.10	Set UHF power levels	71
13.4.11	Switch off the antenna field of the read-/write head	73
13.4.12	Get Forward / Reverse UHF power levels	75
13.4.13	Set List of Detected ID tags hold time	77
13.4.14	Get ID tag with highest RSSI value	79
13.4.15	Read EPC values of the UHF ID tags	81
13.4.16	Receive EPC value of the UHF ID tag	83
13.4.17	Receive List of the Detected UHF ID tags	86
13.4.18	Write EPC value of the UHF ID tag selective	89

13.4.19	Read memory bank of the UHF ID tag selective	91
13.4.20	Switch ID tag operation mode	92
13.4.21	Receive memory bank of the UHF ID tag	95
13.4.22	Write User memory of the UHF ID tag selective	98
13.4.23	Set Read-/Write head access password of the UHF ID tags	102
13.4.24	Set write protection password of the UHF ID tag	104
13.4.25	Set lock state of the memory banks of the UHF ID tag	106
13.4.26	Restart device	108
14	Error codes of the device	109
14.1	<i>Error group ID tag (F1FE)</i>	109
14.2	<i>Error group Device (F4FE)</i>	109
14.3	<i>Error group Communication User – Device (F5FE)</i>	110
14.4	<i>Error group Command error – Device (F6FE)</i>	111
15	Glossary	112

1.1 Licenses and trademarks

Microsoft® and Internet Explorer® are registered trademarks of Microsoft Corporation.

CoDeSys® is a registered trademark licensed by 3S-Smart Software Solutions GmbH.

All trademarks and company names are subject to the copyright of the respective companies.

2 Preliminary note

2.1 Symbols used

- ▶ Instruction
- > Reaction, result
- [...] Designation of pushbuttons, buttons or indications
- Cross-reference, Important note
-  Non-compliance can result in malfunction or interference
-  Information Supplementary note

3 Safety instructions

Please read the operating instructions prior to setup of the device. Ensure that the device is suitable for your application without any restrictions.

If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property can occur.

4 Functions and features

The RFID Compact device integrates UHF Read-/Write head and a TCP/IP interface to communicate with a PC or Controller with integrated Ethernet interface. Additionally, 2 IO channels are available which can be configured as input/output to IEC 61131.

The device

- can detect up to 16 ID tags simultaneously
- control up to 2 IEC 61131 input /outputs
- communicates with the higher control level over Ethernet.
- allows device configuration via a web server.

Application examples:

- Material flow control in production lines
- Warehouse management by the automatic detection of stored products
- Tank management, order picking or product tracking

4.1 Configuration via Ethernet interface

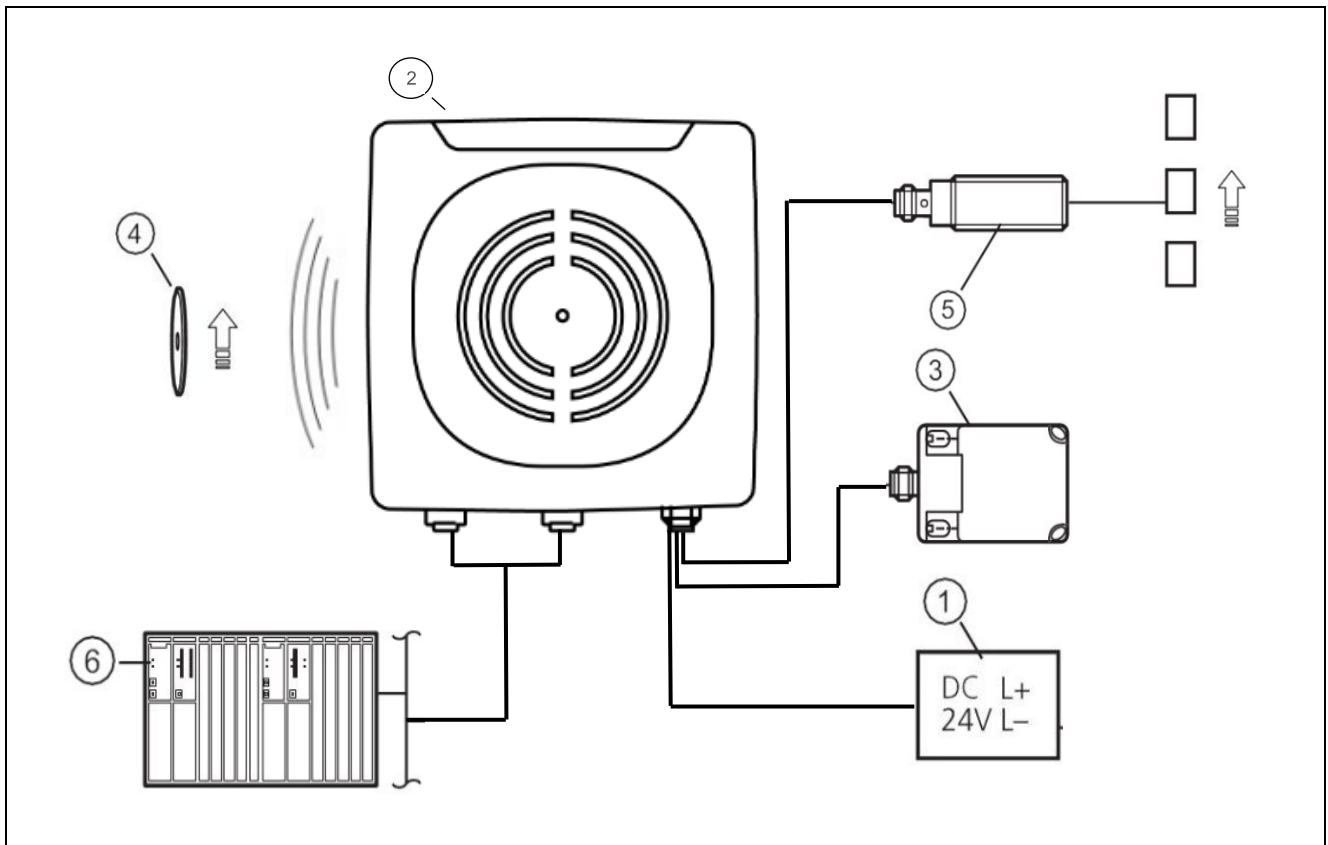
- 10 Mbps and 100 Mbps
- TCP / IP - Transport Control Protocol / Internet Protocol
- IT functionality: HTTP server
- M12, twisted pair

4.2 Functions for commissioning

Via the integrated Webserver it is possible to

- read and write the EPC data of the ID tag
- read and write the User data area of the ID tag
- write to the User data area of the ID tag
- read the input of the IO channels
- write to the output of the IO channels
- read the device information of the device
- read the device information of the integrated Read-/Write head
- update the firmware of the integrated Read-/Write head

5 Function

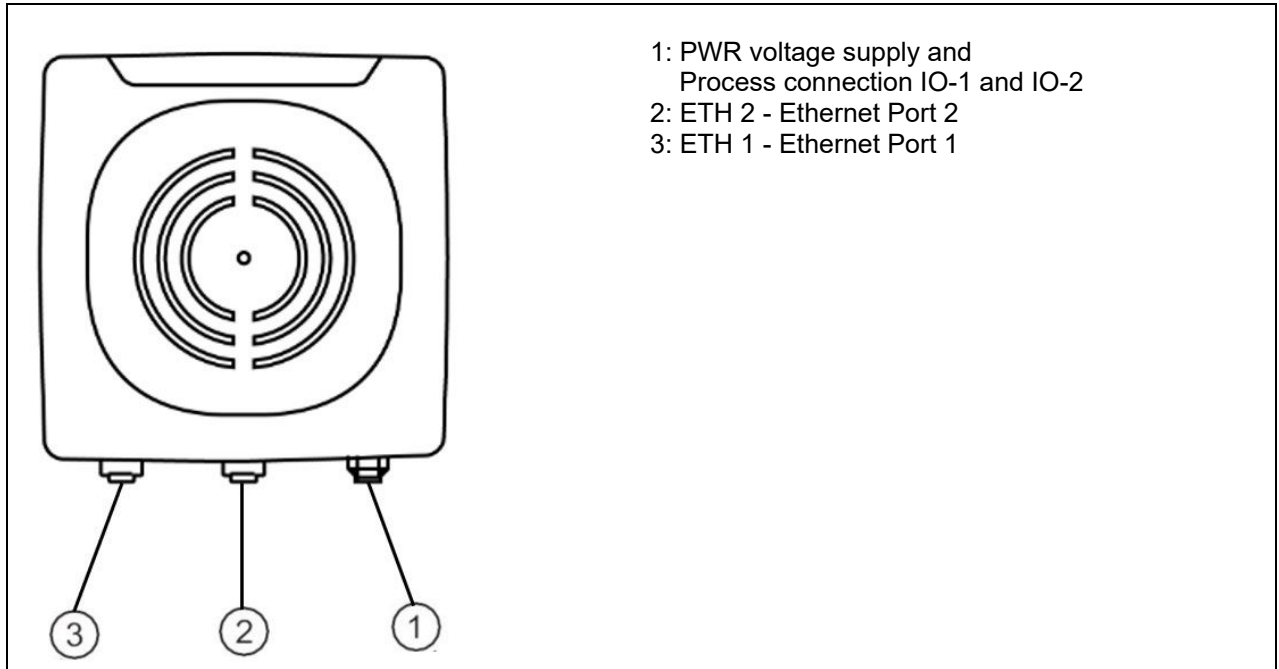


- 1: Voltage supply
- 2: DTE8x4/DTE9x4 device unit
- 3: Actuator
- 4: ID tag

- 5: Sensor
- 6: Ethernet host

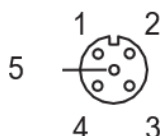
The device processes data from the integrated Read-/Write head and the two IEC 61131 inputs / outputs. The mode of operation for the two IO channels can be set individually via the Ethernet host or the integrated Webserver.

5.1 Connection



5.2 "PWR" voltage supply and digital input / output

► Connect the device to the voltage supply using an M12 connection cable.

	Pin	Connection
	1	24V DC
	2	Switching output (C/Qo) or input (C/Qi) 2
	3	0V
	4	Switching output (C/Qo) or input (C/Qi) 1
	5	not used



Please note that the total current consumption of the device must not exceed the value of 0,5 A.

5.3 Field bus connection ETH1 / ETH2

► Connect the device to an Ethernet host using a suitable M12 Ethernet connection cable.

	Pin	Connection
	1	TD+
	2	RD+
	3	TD-
	4	RD



Screened connection cable required.

5.4 Factory setting of the Ethernet parameters

The following values are preset on delivery of the device:

Parameters	Factory setting
IP address	192.168.0.79
TCP port	33000
Gateway address	192.168.0.100
Subnet mask	255.255.255.0
Auto-negotiation	on
DHCP	Off

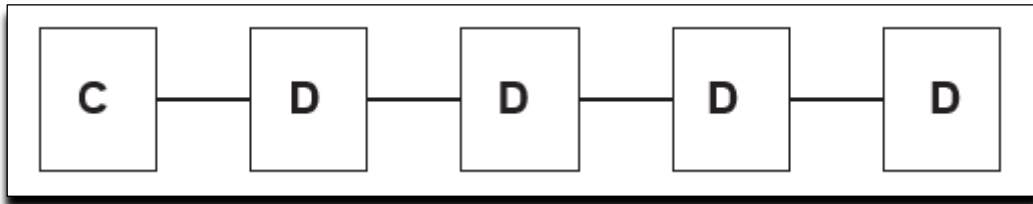


These values are only valid if the device start up with the “Emergency System”.
By default, the Ethernet parameters are set by the Fieldbus controller.

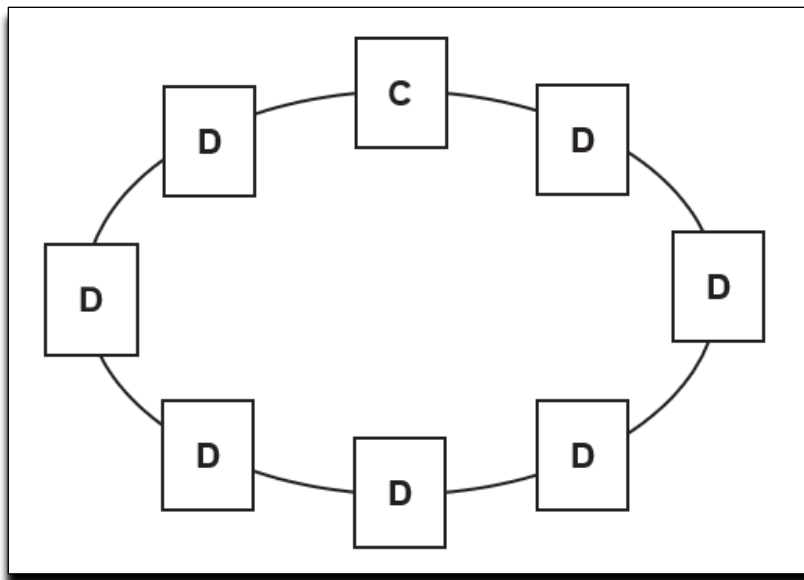
5.4.1 Allowed network infrastructures

The device can be integrated into following network infrastructures.

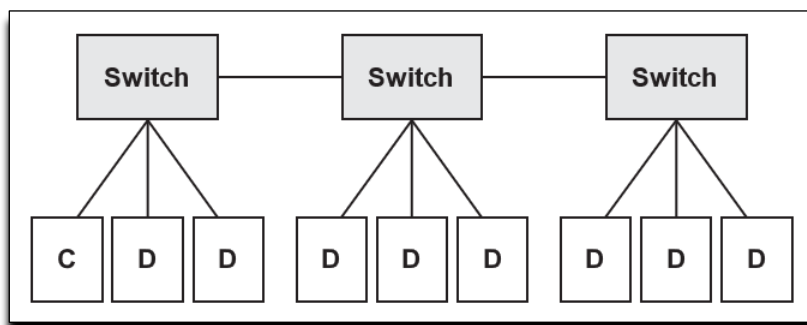
5.4.2 Linear structure:



5.4.3 Ring structure:



5.4.4 Star structure:



C = Controller D = Device

6 Installation

You can find information about installation and electrical connection in the operating instructions for the device at: <https://www.ifm>

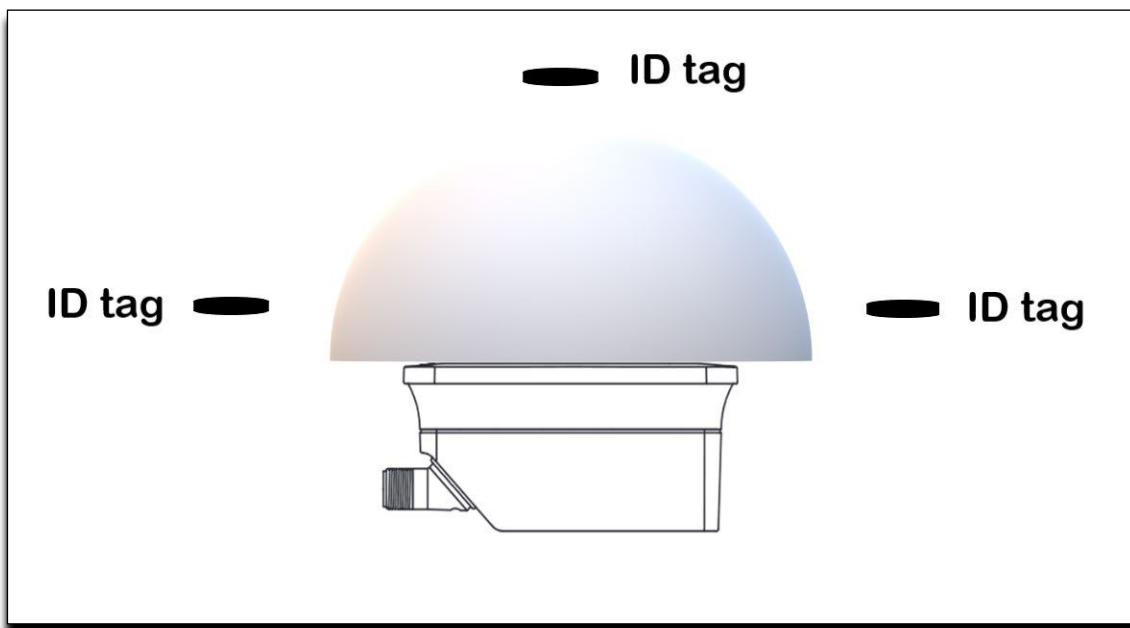


To avoid malfunctions of the UHF functions, do not place any electrically conductive objects within 10 cm of the built-in UHF antenna.



The ID tags should be placed outside a hemisphere, see table below, so that an error-free reading or writing is possible.

Device	Radius for ID Tags	Remark
DTE8x4/DTE9x4	$r = 10\text{ cm}$	Placement within the hemisphere may exceed the limits for the ID tag



7 Operating and display elements

7.1 Reset to factory settings

The Ethernet parameters and the password of the device can be reset to the factory settings. Take the following steps:

- ▶ Remove all cable connections from the device.
- ▶ Insert an electrically conductive bridge between pin 2 and pin 4 on the process connection voltage supply PWR.
- ▶ Connect the unit to the voltage supply.
 - The LEDs of the signal bar (yellow) are on one after the other. Then LED 4 of the signal bar (yellow) flashes at 8 Hz.
- ▶ As soon as the LEDs of the signal bar (yellow) flash at 8 Hz, disconnect the unit
- ▶ Remove the bridge.
- ▶ Connect the device to the voltage.
- ▶ The settings are reset.

7.2 LED indicators

The device indicates the status of the interface via the status LEDs.

8 LED PWR

LED PWR (1x green)	State	Note
On	Voltage supply OK	$18\text{ V} \leq U_{\text{PWR}} \leq 36\text{ V}$
Flashing at 2 Hz	Antenna (HF field) is deactivated	In this case the

8.1.1 LED Signal

LED signal bar LED 1	LED signal bar LED 2	LED signal bar LED 3	LED signal bar LED 4	State
Off	Off	Off	Off	No ID tag detected
On	Off	Off	Off	1 ID tag detected
On	On	Off	Off	2 ID tag detected
On	On	On	Off	3 ID tag detected
On	On	On	On	4 or more ID tags detected

8.1.2 LED LINK/ACT on interface ETH1/ETH2

LED green	LED yellow	Status	Note
Off	Off	No connection to another Ethernet counterpart	Link status "no link"
On	Off	Connection to Ethernet counterpart exists, no data exchange	Link status "link", "no traffic"
On	Flashes sporadically	Connection to Ethernet counterpart exists, data exchange running	Link status "link", "traffic"

8.1.3 Special device LED indicators

LED	State	Note
PWR LED (green) On LEDs of signal bar (yellow) flashing at 8 Hz	Device is in the service mode "emergency system started"	A firmware update is necessary and can be executed via the web server
PWR LED (green) On LEDs of signal bar (yellow) flashing at 8 Hz	Major error, device has to be returned	Hardware fault or permanent data in the device are corrupt
PWR LED (green) On The LEDs of the signal bar (yellow) are on one after the other. Then LED 4 of the signal bar (yellow) flashes at 8 Hz	Reset to factory settings	-

8.1.4 LED SF System failure

LED red	LED green	State	Note
Off	Off	No voltage supply or fault state	Check the voltage supply.
Off	On	Normal operation	Connection to the Ethernet host is established. The device is configured. The data transfer is running.
Flashes	Off	Connection fault	A connection to the Ethernet host was not established. ► Check the voltage supply. ► Check the configuration of the device.
On	Off	Device fault	Overtemperature: ► Try to reduce the ambient temperature or assemble a heatsink on the back of the device. Hardware error of the device: ► Restart the device. If the error remains, send the device for service
Flashes	Flashes	Self test	Starting phase of the device

8.1.5 LED BF Bus failure

LED red	LED green	State	Note
Off	Off	No IP address or no voltage supply	► Check the voltage supply. ► If DHCP is activated, check presence of a DHCP server in the network.
Off	Flashes	Link established, but no data exchange	At least an Ethernet link from one of the Ethernet ports was detected.
Off	On	Connection to host established, data exchange running	Operational Mode of the device
Flashes	Off	No valid configuration	A timeout was found with one of the existing Ethernet connections. ► Check the status of the connection in the Ethernet host.
On	Off	No connection to host	► Check Ethernet cable or power supply of the Ethernet switches
Flashes	Flashes	Self-test	Starting phase of the device

10 Putting into operation

- Connect the device according to the operating instructions.



After connecting the operating voltage, the device is ready for use. The green PWR and BF LEDs of the device will light up after the device is ready and connected to the Ethernet network.

11 Web interface

The device is equipped with an integrated web server that allows to

- read and write EPC data of the ID tag
- read from the User data area of the ID tag
- write to the User data area of the ID tag
- update the firmware of the device
- update the firmware of the built-in Read-/Write head
- update the firmware of the UHF module

The settings are made via a web browser, e.g., Microsoft Internet Explorer® as from V7.0
To access the web server, connect the device to a PC using a suitable M12 Ethernet connection cable.

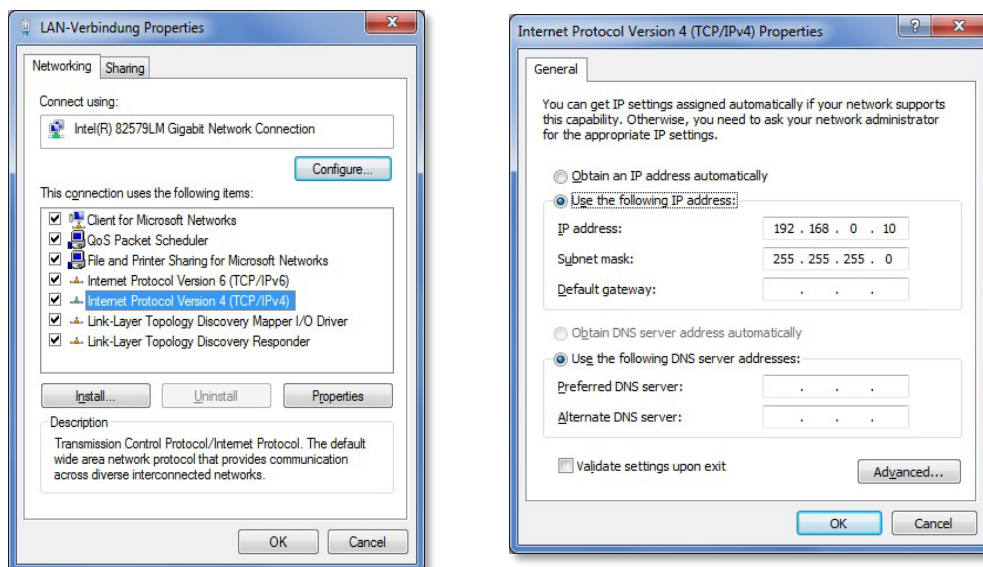
Please note that the device and the PC must be set to the same IP address range.
Default after factory reset: 192.168.0.79, see → [Verify and set the IP address of the PC.](#)

11.1 Verify and set the IP address of the PC

- Activate menu "Internet Protocol Version 4 (TCP/IPv4) Properties".

The Windows menu "Internet protocol (TCP/IP) Properties" is accessible for example via:
Start → Control Panel → Network and Sharing Center → Change adapter settings → Local Area Connection → Properties.

- Select the menu item "Use the following IP address".
- Verify and set the IP address, if necessary (here e.g., 192.168.0.10).
- Enter the subnet mask (255.255.255.0).
- Leave default gateway blank.
- Confirm the settings with [OK].



Changes in the network settings of the PC require extended user rights. Contact your system administrator.

11.2 Tab "Home"



- This is the main menu from where all functions of the device can be accessed. The user can select the language of the device web interface.

11.3 Tab "Network"

Network settings:

TCP/IP parameter	Current settings	New settings
IP address	192.168.0.79	. . .
Subnet mask	255.255.255.0	. . .
Default gateway	192.168.0.100	. . .
DHCP	off	☐ on ☒ off
BOOTP	off	☐ on ☒ off
Port 1 parameter		
Autonegotiation	on	☒ on ☐ off
Port speed	Duplex 100MB	Duplex 100MB ▾
Port 2 parameter		
Autonegotiation	on	☒ on ☐ off
Port speed	Simplex 10MB	Simplex 10MB ▾

WARNING: Changing the IP parameters may cause a loss of connection.

This menu allows different settings Ethernet interface the device to be changed. Ask what settings for the integration of the device into the existing network needed your network administrator.

If the device is connected directly to the PC, a static IP address setting is recommended. Check → [Verify and set the IP address of the PC](#) .



Make sure that the network address of the PC is located within the address range of the device and that it differs from it.

Example:

Red marked address settings must be the same, if Subnet Mask of the device is 255.255.255.0

Ethernet IP address of the PC: 192.168.0.10

IP address of the evaluation: 192.168.0.79



Attention: Be careful when setting the IP address of the device. This address should not exist in the Ethernet network.

11.4 Tab "Firmware – firmware update"

Firmware

Firmware identification

Name	Number	Version	Date
DTE Firmware	113	V4.	2021-
Emergency System	112	4.	-
Bootloader	-	1.	-

Firmware update

Choose the new firmware file (.nxf) you want to install:

No file selected.

Submit your file by clicking on 'transfer'. The transfer will take a few seconds.

WARNING: Do not interrupt power or disconnect the network cable while the transfer is in progress!

Read-/ Write head firmware

[For update of the Read-/Write head firmware click here.](#)

 Please update the Read-/Write head firmware always before update the device firmware !

This menu allows to update the firmware of the device.

- ▶ Open the "Firmware" tab on the browser interface.
- ▶ Choose firmware file of the device and commit via button [transfer].
- ▶ Note: For update of the device firmware only files with extension ".nxf" are accepted.
- ▶ For update of the Read-/Write head firmware select the Link "For update of the Read-/Write head firmware click here". (Check → Tab "Firmware – Read-/Write head update")

 Do not power off the device while the firmware update is running. A firmware update can take up to 3 minutes.
In case of an incomplete firmware update, the device will start up with the Emergency system.
From there a new firmware update can be started.

After the firmware update process is finished following information is displayed.

- ▶ To take effect of the new firmware set the checkbox and press the button "Reset".

Firmware

Firmware transfer and update succeeded!

You should reset the device to apply the changes.

Firmware is being restarted and connections may be interrupted or time out!

☐ Please confirm you want to reset the device.

 Please note that the device needs up to 2 minutes to restart after a firmware update.
During this time the LEDs of the device are switched off.

11.5 Tab "Firmware – Read-/Write head update"

Read-/Write head information:

RWH		
Device type:	DTE	
Hardware version:	1	
IDLink SW:	12	
Firmware version:	1.026	Update
Reader Type:	RS500	1-1740 4515
Reader Firmware Version:	1.8.12.240	Update
Reload		

This menu shows under section "Read-/Write head information" following information.

- Device type
- Hardware and IDLINK software version
- Firmware version
- Reader type
- Reader firmware version

Button	Function
Update	Update the firmware of the Read-/Write head or update the firmware of the UHF module (Reader firmware) Check → Update of the Read-/Write head or the UHF module
Reload	Reload of this page

11.5.1 Update of the Read-/Write head or the UHF module

Antenna firmware

Firmware identification

Type of antenna	Firmware version
DTE	1.
RS500	1.8.

Firmware update

Choose the new antenna firmware file (.afw) you want to install:

DTE0X_1_026.afw

Submit your file by clicking on the button. The transfer will take a few seconds.

WARNING: Do not interrupt power or disconnect the network cable while the transfer is in progress!

Button	Function
Browse	Select the firmware file for the update process Note: For update of the Read-/Write firmware only files with extension “.afw” are accepted. For update of the UHF module firmware only files with extension “.rfw” are accepted.
Transfer	Start the firmware update process

After the firmware update process is finished following information is displayed.

Antenna firmware

Firmware transfer and update succeeded!



If the firmware update fails or the Read-/Write head is not detected by the device at the selected IO- port, the Read-/Write head is accessible via web browser and the following URL:

http://<IP-ADDRESS>/rwhupdate?ioport=<IO-CHANNEL>1&anttype=<ANTENNA_TYPE>&fwVersion=<NUMBER>&setLng=<LANGUAGE>

Parameter name	Description	Remark
IP-ADDRESS	IP address of the device [XXX.XXX.XXX.XXX]	IPv4 address
IO-CHANNEL	IO-Channel number [1...4]	-
ANTENNA_TYPE	Article number of the Read-/Write head [e.g., DTE80x]	6-digit article number
NUMBER	Firmware number [01]	2 digit number. Shall be set to “01”
LANGUAGE	Language of the website [de, en, es, fr, it, ko, pt, ru, zh]	-

Example of URL :

<http://192.168.0.79/diagrwh?ioport=1&anttype=DTE80x&fwVersion=01&setLng=en>



After finishing the firmware update of the Read-/Write head, enter the URL of the device to return to the main menu (→ Tab "Home").

11.6 Tab “RWH” – Adaptation of the device to the application

This menu allows the device to be adapted to the application-specific conditions. To enable quick and easy adjustment, the device offers two basic settings, the “Stable mode” and “Quick mode”.

11.6.1 Stable mode

This setting is intended for the simultaneous and stable detection of up to 16 ID tags. The ID tags should be in the reading field of the device for at least 500 ms.

11.6.2 Quick mode

This setting is intended for the quick acquisition of 2 ID tags. The ID tags should be in the reading field of the device for at least 40 ms.

11.6.3 Customized mode

For special applications the “Customized mode” offer additional parameter to fine tune the ID tag detection of the device.

With this setting, the device can be precisely adapted to the application-specific requirements. In order to achieve the best performance for speed and stability, the following application parameters must be recorded.

- Number of ID tags which are simultaneously in the HF field of the device.
 - ➔ This value shall be entered in the UHF parameter field “Estimated ID tag count”.
- Time span how long the ID tags are at least in the HF field of the device.
 - ➔ This value shall be entered in the parameter field “Inventory time”.

11.6.4 Common RWH UHF parameter settings

- “HF power”
In all modes, the type of memory access to the ID tag can be set over “HF power” setting.



When writing to the ID tag, more HF power is required because it must be supplied with enough energy to change the content of the memory banks.

The “HF Power Write” should be set to higher value than the “HF power read” in case the write process is not stable.



In order to reduce the radiation in the immediate vicinity, the “HF power read” can be reduced.

- RSSI value
The detection range of the ID tags can be restricted by setting the UHF parameters “Minimum RSSI value” and “Maximum RSSI value” to the required range.

11.6.5 Tab RWH – UHF setting “stable”

UHF settings: Identification: ☐ quick ☒ stable ☐ customized

UHF parameter	Current settings	New settings
Antenna field	on	☒ on ☐ off
HF power read	20 dBm	10 23 20 dBm
HF power write	20 dBm	10 23 20 dBm
minimum RSSI value	-120 dBm	-120 ... 0 -120 dBm
maximum RSSI value	0 dBm	-120 ... 0 0 dBm



This setting is intended for the simultaneous and stable detection of up to 16 ID tags. The ID tags should be in the reading field of the device for at least 500 ms.

UHF Parameter	Range	Mode “stable” setting
Antenna field	on/off	on
HF power read	10...23 dBm	20 dBm
HF power write	10...23 dBm	20 dBm
Idle time	10...255 ms	50 ms
Inventory time	40...1000 ms	200 ms
Estimated ID tag count	1...32767 ID tags	16 ID tags
Inventory mode	0 = small population of tags 1 = big population of tags	1 = big population of tags
LDI timeout	0...65535 ms	500 ms
Minimum RSSI value	-120...0 dBm	-120 dBm
Maximum RSSI value	-120...0 dBm	0 dBm

11.6.6 Tab RWH – UHF setting “quick”

UHF settings: Identification: ☒ quick ☐ stable ☐ customized

UHF parameter	Current settings	New settings
Antenna field	on	☒ on ☐ off
HF power read	20 dBm	10 23 20 dBm
HF power write	20 dBm	10 23 20 dBm
minimum RSSI value	-120 dBm	-120 ... 0 -120 dBm
maximum RSSI value	0 dBm	-120 ... 0 0 dBm



This setting is intended for the quick acquisition of 2 ID tags. The ID tags should be in the reading field of the device for at least 40 ms.

UHF Parameter	Range	Mode “quick” setting
Antenna field	on/off	On
HF power read	10...23 dBm	20 dBm
HF power write	10...23 dBm	20 dBm
Idle time	10...255 ms	10 ms
Inventory time	40...1000 ms	40 ms
Estimated ID tag count	1...32767 ID tags	2 ID tags
Inventory mode	0=small population of tags 1=big population of tags	0=small population of tags
LDI timeout	0...65535 ms	40 ms
Minimum RSSI value	-120...0 dBm	-120 dBm
Maximum RSSI value	-120...0 dBm	0 dBm

11.6.7 Tab RWH – UHF setting “customized”

UHF settings: Identification: ☐ quick ☐ stable ☒ customized

UHF parameter	Current settings	New settings
Antenna field	on	☒ on ☐ off
HF power read	20 dBm	10 23 20 dBm
HF power write	20 dBm	10 23 20 dBm
Idle time	50 ms	10 ... 255 20 ms
Inventory time	200 ms	40 ... 1000 80 ms
Estimated ID tag count	16	1 ... 32767 2
Inventory mode	1: big population of tags	0: small population of tags v
LDI timeout	500 ms	0 ... 65535 200 ms
minimum RSSI value	-120 dBm	-120 ... 0 -60 dBm
maximum RSSI value	0 dBm	-120 ... 0 0 dBm



This setting is intended to setup the device for application-specific requirements which are not covered by UHF setting “stable” and “quick”.

UHF Parameter	Range	Mode “quick” setting
Antenna field	on/off	Allow to switch on or off the HF field. Helpful in commissioning phase to check the reading distance when more than one device is active.
HF power read	10...23 dBm	Allow the adjustment of the transmission power in case of reading the ID tag
HF power write	10...23 dBm	Allow the adjustment of the transmission power in case of writing the ID tag
Idle time	10...255 ms	Allow an automatic switch off the HF field for XX ms.
Inventory time	40...1000 ms	Allow an automatic switch on of the HF field for XX ms.
Estimated ID tag count	1...32767 ID tags	Number of ID tags which are simultaneously in the HF field
Inventory mode	0=small population of tags 1=big population of tags	Setup of the UHF module for scanning of small or big population.
LDI timeout	0...65535 ms	Time after an ID tag is dropped from the List of ID tags when he is non more detected in the HF field.
Minimum RSSI value	-120...0 dBm	Setup of minimum RSSI value which an ID Tag must be detected to be entered in the List of ID tags
Maximum RSSI value	-120...0 dBm	Setup of maximum RSSI value which an ID Tag must be detected to be entered in the List of ID tags

11.6.8 Detailed description of the UHF parameter

- UHF Parameter “HF power read”

Allow the adjustment of the transmission power in case of reading the ID tag.

Note: In near range area 0,01 ... 1m less power is necessary than in far field range > 1 meter.

Example for optimum setting of the HF power read level with ID tag E80386

Distance	HF power read	Remark
0,1 ... 0,5 m	17 dBm	Near range area
0,5 ... 1 m	20 dBm	...
1 m ... 2 m	23 dBm	Far range area

- UHF Parameter “HF power write”

Allow the adjustment of the transmission power in case of writing to the ID tag.

Note: In near range area 0,01 ... 1m less power is necessary than in far field range > 1 meter.

Example for optimum setting of the HF power write level with ID tag E80386, 512 Bit, 64 Byte, 56 bytes user memory.

Distance	HF power write	Remark
0,1 ... 0,5 m	20 dBm	Near range area
0,5 ... 1 m	23 dBm	Medium range
> 1 m	23 dBm	Stable writing critical with ID tag E80386 Other ID tag, e.g., E80413, achieve a greater writing distance. For details see → www.ifm.com

- UHF Parameter “Idle time”

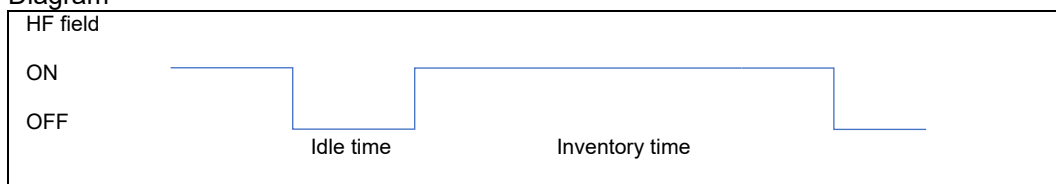
This time describe how long the HF field will be automatically switched off.

Useful to reduce the power dissipation of the device.

- UHF Parameter “Inventory time”

This time define how long the HF field will be automatically switched on.

Diagram



- UHF Parameter “Estimated ID tag count”

Number of ID tags which are simultaneously in the HF field.

- UHF Parameter “Inventory mode”

Setup of the UHF module for scanning of small or big population of ID tags

Small population = 1 ... 8 ID tags

Big population = 8 ... 16 ID tags

- UHF Parameter “LDI timeout”

Time after an ID tag is dropped from the List of ID tags when he is non more detected in the HF field.

- UHF Parameter “Minimum RSSI value” / “Maximum RSSI value”

Setup of minimum/maximum RSSI value which an ID Tag must be detected to be entered in the List of ID tags

11.7 Tab "IO-Port"

IO-Port Configuration		
Global	Current settings	New settings
Fail-safe	off	☐ on ☒ off
Mode	RWH	RWH
Data hold time	0	0 ms
IO-1	Current settings	New settings
Mode	off (0 bytes)	Input
Data hold time	0	0 ms
IO-2	Current settings	New settings
Mode	off (0 bytes)	Output
Data hold time	0	0 ms
		Activate and save Cancel

This menu allows to configure the Read-/Write head and the IO-Ports of the device.

11.7.1 Read-/Write head

The user data length of the read / write head cannot be configured. The maximum length can be up to 1024 characters.



If the Ethernet host is connected with the device, the module size can't be modified.

Parameter "Data hold time" define how long the RFID data are kept stable. This is helpful if the time interval, in which the ID tag data are available, is shorter than the Ethernet host can read these over the fieldbus.

11.7.2 IO-PORT IO-1 and IO-2

The IO-channels can be configured to mode “Off”, “Input” or “Output”.

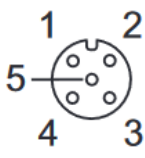
Mode	Function
Off	No function, inactive
Input	IEC 61131 input, payload size 20 bytes
Output	IEC 61131 output, payload size 20 bytes
Input (2 bytes)	IEC 61131 input, payload size 2 bytes
Output (2 bytes)	IEC 61131 output, payload size 2 bytes

Parameter “Data hold time” define how long the IO input data are kept stable. This is helpful if the time interval, in which the IO input is sampled, is shorter than the Ethernet host can read these over the fieldbus.

Button	Function	Remark
Activate and save	The settings are activated and stored non-volatile	After next power-on the stored settings are activated. If the host connect to the device and write a new IO-Port configuration the stored values are overwritten
Cancel	Discard changes	-



Please note, that IO-1 and IO-2 channels are located on M12 connector PWR, Pin 2 and Pin 4.

	Pin	Connection
	1	24 V DC
	2	Digital input / output 2
	3	0 V
	4	Digital input / output 1
	5	Not connected

Pin connection voltage supply

11.8 Tab "Monitor"

Port monitoring

Fieldbus state: 

RWH				
No	Length	EPC	RSSI	Readings
1	8	eb 80 b0 44 3c 00 00 1a	-51	54268
2	16	e2 00 40 80 71 11 00 00 00 00 00 30 18 30 58 33	-45	54271
3	8	e0 04 01 00 0b ad f6 8a	-39	54250
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

This menu shows the data of the Read-/Write head and the state of IO ports of the device.

11.8.1 Section RWH

RWH															
No	Length	EPC											RSSI	Readings	
1	16	e2	00	40	80	71	11	00	00	00	00	00	30	-41	387
2	8	eb	80	b0	44	3c	00	00	1a					-33	387
3	8	e0	04	01	00	0b	ad	f6	8a					-38	387

- Column “No”
Show the entry number of the ID tag.
In case one ID tag is non more detected within the specified LDI time, the entry is cleared and ready to take over a new ID tag.
- Column “Length”
Show the EPC data length in bytes of the ID tag.
- Column “EPC”
Show the EPC data of the ID tag.
► Click on the EPC data to get more information of the ID Tag or to modify the memory.
- Column “RSSI”
Show the RSSI value in [dBm] of the ID tag.
- Column “Readings”:
Show the number of Readings of the EPC data within the specified LDI time.
If the ID tag is non more detected within this time span, the Column Readings is set to 0.



By increasing the LDI timeout the display of the monitor page can be stabilized. The display of the monitor page can be stabilized by increasing the LDI timeout. Please note that the number of ID tags is limited to 16, which could be recognized simultaneously within the set LDI time.

11.8.2 Section IO-1 / IO-2 port

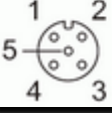
In this example the IO-1 port is configured as Input, IO-2 as output.

IO-1 Input 



Pin	Connection	State
4	switching input (C/Qi)	 1

IO-2 Output 



Pin	Connection	State
2	switching output (C/Qo)	☒ 1

- IO- input

The state of the input can be checked over signal "State".

- IO- output

The state of the output can be set to "0" = 0V or "1" = U_{Power} by click on checkbox "State".



The maximum output current in IO mode "Output" is limited to 100 mA.

11.8.3 Tab "Monitor" - Tag monitoring

This menu allows to:

- read and write the EPC from the ID tag
- read from or write to the User data area of the ID tag
- read the TID from the ID tag

11.8.4 Tab "Monitor" - Reading of the ID tag

The screenshot shows a software interface for monitoring an ID tag. At the top, there is a 'Tag' icon and a text box labeled 'EPC' containing the hexadecimal value 'eb80b0443c00001a'. Below this is a section titled 'Read / Write Tag'. It contains three radio buttons: 'EPC Memory' (unselected), 'User Memory' (selected), and 'TID Memory' (unselected). There are two icons with green arrows representing read and write operations. Below the radio buttons, there are input fields for 'Data format:' (set to 'HEX'), 'Offset:' (set to '0 bytes'), and 'Length:' (set to '64 bytes'). A large text box labeled 'Data:' displays a 64-byte hexadecimal string: '48656C6C6F20576F726C64206920616D2061204944205461672100110D0E0F10001100120013001400150016001700180019001A001B001C001D001E001F0020'. At the bottom right, there is a 'Back' button.

The EPC data is displayed in real time with an update interval of approximately 0,5 seconds.

- ▶ Click  to read from the User data area of the ID tag.
The data length can be set from 1 ...240 bytes. The address offset can be set from 0 bytes up to the last accessible address of the ID tag.
- ▶ Click [Back] to return to the main menu.

With the selection field „Data format“ the received ID tag data can be displayed in two formats:

- „HEX“: Data displayed in hexadecimal format.
Example: „4D4154455249414C3A2038303332333435333132“
- „ASCII“: Data displayed as ASCII character string.
Example: „MATERIAL: 8032345312“

11.8.5 Tab "Monitor" - Writing to the ID tag

Tag  EPC

Read / Write Tag

☐ EPC Memory ☒ User Memory ☐ TID Memory

Data format: 

Offset: bytes

Length: bytes

Data:

20 bytes

- ▶ Click  to write to the User data area of the ID tag.
The data length to be written can be set from 1 to 240 bytes. The address offset can be set from 0 bytes up to the last accessible address of the ID tag. The data length to be written must correspond to the set number of bytes.
- ▶ Click [Back] to return to the main menu.
With the selection field „Data format“ the ID tag data can be input in two formats:
 - „HEX“: Data input in hexadecimal format.
Example: „4D4154455249414C3A2038303332333435333132“
 - „ASCII“: Data input as ASCII character string.
Example: „MATERIAL: 8032345312“

 The parameter “Length” is automatically calculated.

11.9 Tab "System"

System settings

Password protection configuration

Parameter	Current settings	New settings
Password protection:	off	☒ on ☐ off

Parameter	Value
User name:	admin
Old password:	
New password:	
Confirm new password:	

This menu allows to define a password to protect the device against unauthorized access. To enable the password protection the button "New settings" has to be set to "on".

Parameter	Setting	Note
Username	admin	User name could not be changed
Old password	XXXXXX	Default password is "admin". For setting the password for the first, please enter the default password
New password	XXXXXX	Up to 10 characters are allowed
Confirm new password	XXXXXX	Must correspond to the parameter setting "New password"

- Click [Submit] to save the password
- Click [Cancel] to delete all parameter settings



If the password is lost the default password "admin" can be retrieved by a reset to factory settings (→ [Reset to factory settings](#)).

11.10 Tab “SNTP”

SNTP settings

To change the settings fill out the form in the table below and press 'submit'.

Parameter	Current settings	New settings
NTP support:	off	☒ on ☐ off
IP address from NTP server:	0.0.0.0	172 . 19 . 55 . 37
Offset to UTC:	UTC	UTC +0 v
State	not used	
Last sync	-	

If an SNTP server is present in the Ethernet network the internal clock of the device can be synchronized with the external time server.

- Click on button [Submit] to transmit the settings to the device.

SNTP settings

Parameter	Current settings
NTP support:	on
IP address from NTP server:	172.19.55.37
Offset to UTC:	UTC

11.11 Tab "IO-Logic"

With the IO-Logic, the outputs of the Compact device can be controlled, depending on the detected EPC codes of the ID tags.



Please check that the required outputs IO-1 or IO-2 are activated which are used by the IO-Logic function.

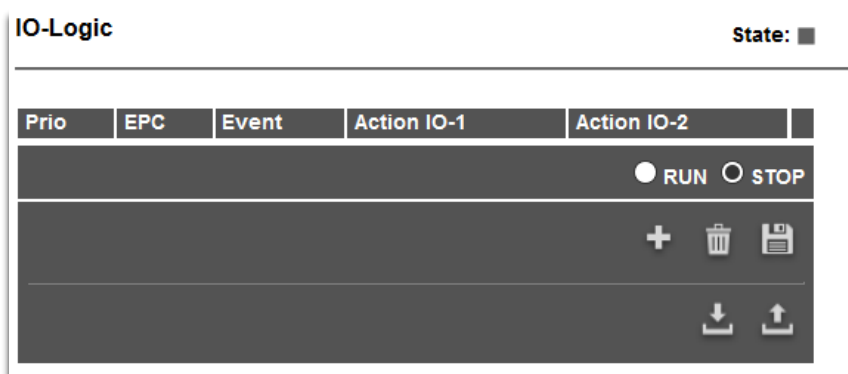
Possible events of the ID tags are as follows:

ID tag event	Description
Coming	ID tag enter the reading field of the Read-/Write head
Going	ID tag leave the reading field of the Read-/Write head

The state of the IO output can be set to following states

Output state	Description
Keep	The level of the Output is not changed
On	The level of the Output is set to High = 24V ⁽¹⁾
Off	The level of the Output is set to Low = 0V ⁽¹⁾

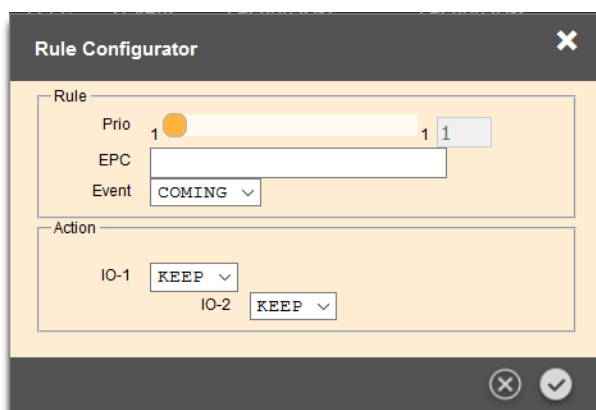
⁽¹⁾ Please note not to exceed the maximum source / sink current of 100 mA



This menu allows to configure the Read-/Write head and the IO-Ports of the device.

- Press icon to add a new rule

A popup window come up.

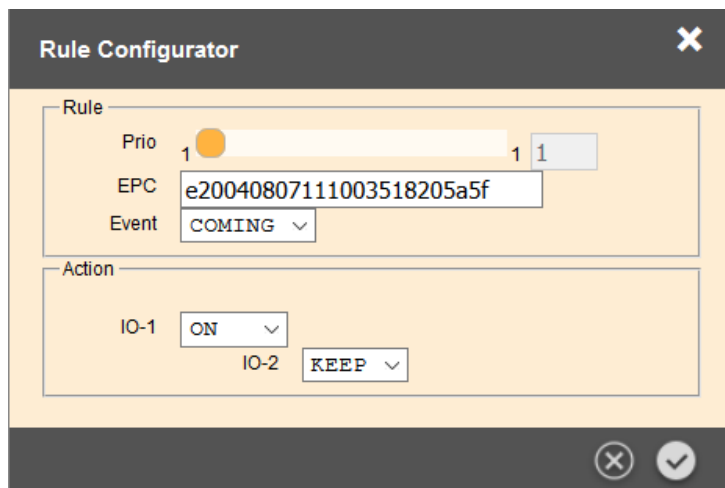


- Please enter the EPC code of the ID tag which shall cause a reaction at output of the Compact device.

Example: ID tag with EPC code “e20040807111003518205a5f” is detected with event “Coming” .
 Note that spelling Upper / lower case don't care.
 Even the EPC data can be set with character “ ” = 0x20 or “:” to separate the bytes.

- Please enter the reaction at the output if the compact device detects the defined EPC code.

Example: Set output of IO-1 to High level



The Rule Configurator dialog box has a title bar with a close button (X). It contains two main sections: 'Rule' and 'Action'. In the 'Rule' section, there is a 'Prio' field with a value of 1, an 'EPC' text field containing 'e20040807111003518205a5f', and an 'Event' dropdown menu set to 'COMING'. In the 'Action' section, there are two dropdown menus: 'IO-1' set to 'ON' and 'IO-2' set to 'KEEP'. At the bottom right of the dialog are two circular buttons: one with an 'X' and one with a checkmark.

- Confirm the inputs by pressing icon .

The popup window is closed and the defined rule is displayed in IO-Logic table.

IO-Logic

State: 

Prio	EPC	Event	Action IO-1	Action IO-2	
1	e20040807111003518205a5f	COMING	ON	KEEP	 

 RUN  STOP

- Press icon  to save the changes.

11.11.1 Allowed wildcards within the EPC data

Following wildcards within the EPC data are supported.

Wildcard	Description
*	Asterisk character stand for characters "0"...9" and "A"...F" and all following characters. Notes: - The Asterix character must be set on the position of the first nibble of the BYTES to be ignored in the filter rule. - The EPC code length of the detected ID tags must not match.
?	Question mark character stand for exactly one character "0"...9" and "A"...F" . Notes: - The first question mark character must be set on the position of the first nibble of the BYTE to be ignored in the filter rule. The first question mark character must be set on the position of the first nibble of the BYTE to be ignored in the filter rule. - The EPC code length of the detected ID tags must match.

Examples for wildcard "??".

EPC code with wildcard	Description
e20040807111003518205a??????	- ID tags with same EPC codes in the first 11 bytes are accepted to set the detected ID tag to "rule matched". - The length of the EPC code <u>must</u> be exactly 14 bytes. EPC: e20040807111003518205a112233 => code match rule EPC: e20040807111003518205a11 => code match rule
e2004080711100?? 18205a5f	- ID tags with same EPC codes in the first 7 bytes and the bytes 9...12 are accepted to set the detected ID tag to "rule matched". - The length of the EPC code <u>must</u> be exactly 14 bytes.

Examples for wildcard “*”.

EPC code with wildcard	Description
e2004080711100*	- ID tags with same EPC codes in the first 7 bytes are accepted to set the detected ID tag to “rule matched”. - The length of the EPC code can be 7...32 bytes EPC = e2004080711100 => code match rule. EPC = e20040807111003518...12 => code match rule. EPC = e2004080711102... => code doesn't match rule. - ID tags with same EPC code in bytes 1...2 and bytes 4...7 as well as any bytes in byte 8...32 set the detected ID tag to “rule matched”. The length of the EPC code can be 7 up to 32 bytes

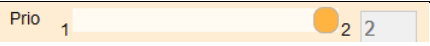
Examples for combined wildcard “??” with “*”.

EPC code with wildcard	Description
e200??80711100*	- ID tags with same EPC code in bytes 1...2 and bytes 4...7 as well as any bytes in byte 8...32 set the detected ID tag to “rule matched”. - The length of the EPC code can be 7 up to 32 bytes

11.11.2 Enter more rules

If desired, new rules can be entered.

By setting the slider “Prio”, the new rule can be placed in the IO-Logic list.

Icon	Description
	A new rule is inserted before the selected line.
	A new rule is appended at the end of the table

Example: If ID tag with EPC code “e20040807111003518205a5f” is detected with “Going” event, switch IO port 1 to OFF state.

IO-Logic

State: ■

Prio	EPC	Event	Action IO-1	Action IO-2	
1	e20040807111003518205a5f	COMING	ON	KEEP	 
2	e20040807111003518205a5f	GOING	OFF	KEEP	 

☒ RUN ☐ STOP

11.11.3 Evaluation of the EPC data

The EPC data of the IO-Logic follow these rules:

1. The rules are evaluated from Prio.1 to Prio.N.
2. The Action "KEEP" of IO-x is only a placeholder and not evaluated.
3. If the EPC data of an ID tag meets a rule, the IO-x output is set to the "ON" or "OFF" state, according to the setting.
4. There is no further evaluation of rules with lower priority.
5. A new evaluation cycle is started after approx. 10 ms.

Best practice for using IO logic:

The more precisely a rule is defined, the higher its priority should be set
Priority 1 > Priority 2 > Priority 3

Example:

Rule EPC = 11223344 is more precise than 112234?? and more precise than 1122*, so following priorities should be set.

IO-Logic				Reaction	
Prio	EPC	Event	Action IO- 1	EPC detected	Output IO-1
1	11223344	COMING	ON	-	OFF
2	112233??	GOING	OFF	11553344	OFF
3	1122*	COMING	ON	11223344	ON
4	11223344	GOING	OFF	11223377	OFF

11.12 Tab "Info"

This menu shows the following information about the device.

Hardware:

Parameter	Value
Power supply state:	fully operable
Temperature:	55°C 131°F
Reader temperature:	45°C 113°F
System time:	00:27:26.308
System date:	2011-01-01

- Temperature of the device



At temperatures > 85° C / 194° F, a heat sink must be mounted on the back of the device.

- Temperature of the UHF module

► For a proper operation of the device the UHF module temperature shall not exceed 85°C.



At temperatures > 85° C / 194° F, reduce the HF power read and write.

- System time

Time gone since device powered up.

In case of setting time by SNTP service, the System date and System time is set automatically.

Production parameters:

Parameter	Value
Product article number:	DTE
Production number:	12345678
Version PermData:	1

- Show the ifm article and production number. Version PermData is used for compatibility checks if newer software is installed

Read-/Write head information:

RWH		
Device type:	DTE	
Hardware version:	1	
IDLink SW:	12	
Firmware version:	1.026	<button>Update</button>
Reader Type:	RS500	1-1740 4515
Reader Firmware Version:	1.8.12.240	<button>Update</button>
<button>Reload</button>		

- Shows the information about the integrated Read-/Write head and the UHF module. Additionally, the firmware update of both units can be done here. Details see → [Update of the Read-/Write head or the UHF module](#).

11.13 Tab "Reset"

Device restart
Firmware is being restarted and connections may be interrupted or time out!
☒ Please confirm you want to reboot the device.

Restart

This menu allows the user to restart the device remotely.
If the device is restarted, all connections are closed and the outputs are switched off.

To restart the device

- ▶ check "Please confirm you want to reboot the device"
- ▶ Click [submit]



If the device does not actualize the Web page, enter the URL of the device in the address line of the Web client to actualize the display.

11.14 Open source license information

The licensed free software is of average quality and suitable for normal use on common personal computers. According to the present state of software technology no guarantee can be assumed for the correct operation or absence of computer viruses nor for the removal of any fault which may occur. In case of an incorrect program ifm electronic gmbh cannot be held liable for cost incurred at the customer (e.g. maintenance, repair or rectification of faults). The exclusion does not apply to damage for which liability is mandatory according to peremptory legal provisions. Copyright by ifm electronic gmbh, Essen. No copies may be made without the written permission of ifm electronic gmbh. This also goes for printing images or text for business use. We reserve the right to make technical alterations.
[license text](#)



The licensed free software information is displayed and can be downloaded from the device.

Extract of the license text file:

DTEXxX Open source licenses information

ifm electronic GmbH

Sections included in this document:

List of licenses included in cJSON by package

List of copyrights included in cJSON by file

List of licenses included in newlib 1.14.0 (ARM syscalls) by package

List of copyrights included in newlib 1.14.0 (ARM syscalls) by file

List of licenses included in MD5 by package

List of copyrights included in MD5 by file

List of licenses included in linenoise by package

List of copyrights included in linenoise by file

List of licenses included in Lua 5.1.4 by package

List of copyrights included in Lua 5.1.4 by file

List of licenses included in pthread by package

List of copyrights included in pthread by file

List of licenses included in STM32 ADC/USART by package

List of copyrights included in STM32 ADC/USART by file

List of licenses included in the STM32 HAL by package

List of copyrights included in the STM32 HAL by file

List of licenses included in web documents by package

List of copyrights included in web documents by file

[Complete licenses Text](#)

Portions of this document were generated with ScanCode, see the corresponding [acknowledge](#) for more information

List of licenses included in cJSON by package

Back to top

/cjson/JSON, MIT License granted by MIT

/cjson/JSON/cJSON/README, MIT License granted by MIT

/cjson/JSON/cJSON, MIT License granted by MIT

12 Device configuration

12.1 Determining the MAC address

To determine the MAC address of the device several options are available.

1. Finding the MAC address on the type label

- The type label is located on the front side of the device.



2. Finding the MAC address via the integrated web server

- The MAC address is located on the "Network" tab below the hardware information.

3. Reading the MAC address via the Controller.

12.2 Parameter setting of the Ethernet interface

12.2.1 Configuration over the web server

Factory Settings of the Ethernet interface

Function	Default value	Remark
DHCP function	off	-
BOOTP	Off	-
IP address	192.168.0.79	See ⁽¹⁾
Gateway address	192.168.0.100	-
Subnet mask	255.255.255.0	-
Auto negotiation	on	See ⁽²⁾
Port speed	10 MBit/s	See ⁽²⁾
Duplex mode	Half duplex	See ⁽²⁾

- (1) If the device does not detect an Ethernet host on the connected Ethernet network, the device has no valid IP address.
By setting the device to the factory settings the IP address can be forced to be set to the default address 192.168.0.79. (→ Reset to factory settings).
- (2) If Auto negotiation between the Compact device and the connected Ethernet node fails, the device is set to 10 MBit/s, half duplex.

12.3 Socket connection ETH1 / ETH2

Pin connection of M12 Ethernet socket, D-coded. The colors refer to the standard T568B.

Signal	Name	Core color	Pin
TD +	Transmission Data +	White/orange	1
TD -	Transmission Data -	Orange	3
RD +	Receive Data +	White/green	2
RD -	Receive Data -	Green	4
Screen	Shield	-	Housing

13 ASCII protocol of the device

General information

The device is functionally divided into 3 channels.

Physical interface	IO channel number	Allowed mode
RFID read/write head	01	RF field on (1) / RF field off
I/O channel 1 (IEC61131)	02	Inactive / Input / Output
I/O channel 2 (IEC61131)	03	Inactive / Input / Output

Required firmware revisions

Following, minimum firmware revisions are required

Runtime firmware	R/W head firmware	UHF firmware
V4.1.6	V1.030	1.8.12.240

13.1 ASCII data frame format of the device

The ASCII protocol of the device is transferred within the payload data of the TCP/IP connection.

ASCII data frame format of the device

Command request sent by host

Character No.	Content	Note
01...04	Ticket number [0001 ... 9999]	The ticket number is a unique identifier the host can send to the device. It enables the host to check if the response of the device refers to the command. "0000" is reserved and cannot be used. Indication in decimal coding. (1)
05	Separator [_]	Default setting: " _ " = 0x5F (2)
06...09	Frame length [0003...nnnn]	The frame length describes the total telegram length, including the end of line characters. Indication in decimal coding. (1)
10	Separator [_]	Default setting: " _ " = 0x5F (2)
11...12	Command code [CU,CI,RU,RI...]	Command code, 2 characters. See chapter Command description for command codes.
13	Separator [_]	Default setting: " _ " = 0x5F (2)
14...nn	Command data	Command parameter. See chapter Command description for command codes.
nn+1...nn+2	End of line characters <CR/LF>	End of line characters 0xD, 0xA. They must be sent with every command.

- (1) Ticket number and telegram length must be send together in the command request.
It is allowed to omit these and send the command request beginning with the "command code".
- (2) The separator can be set by the command CU.

Command response sent by device

Character no.	Content	Note
01...04	Ticket number [0001...9999]	The ticket number sent by the host is mirrored by the device. Indication in decimal coding. (1)
05	Separator [_]	Default setting: " _ " = 0x5F (2)
06...09	Frame length [XXXX]	The frame length describes the total telegram length of the response, including the end of line characters. Indication in decimal coding. (1)
10	Separator [_]	Default setting: " _ " = 0x5F (2)
11...12	Response code [XX]	The command code sent by the host is mirrored in the response code. See chapter Command description for response codes.
13	Separator [_]	Default setting: " _ " = 0x5F (2)
14...nn	Command response [XX...XX]	Command response. See chapter Command description for response codes.
nn+1...nn+2	End of line characters <CR/LF>	End of line characters 0xD,0xA

- (1) The ticket number and frame length are only sent by the device if the host sent the ticket number and the frame length in the command request "CU".
- (2) The device sends the separator defined by the command "CU".

13.2 List of supported ASCII commands

Cmd No.	Command description	Command	
1	Device configuration	CU	Configuration of the device
2	Read active device configuration	GU	Configuration of the device
3	IO channel configuration	CI	IO channel configuration
4	Read active IO channel configuration	GI	IO channel configuration
5	Get MAC address of the device	GM	Get MAC address of the Ident unit
6	Read IP address of the device	RI	Read the IP address of the device
7	Write IP address of the device	WI	Write IP address of the device
8	Set LED of the device	SL	Set LED of the device
9	Read all inputs of the IO channel	RA	Read inputs of the IO channel
10	Receive all inputs of the IO channel	XA	Receive all inputs of the IO channel
11	Write outputs of the IO channel	WO	Write outputs of the IO channel
12	Read diagnostic information of the device	DI	Read diagnostic information of the device
13	Switch of the antenna field of the Read-/Write head	AN	Switch off the antenna field of the read-/write head
14	Get Forward / Reverse UHF power levels	FF	Get Forward / Reverse UHF power levels
15	Set LDI hold time	LT	Set List of Detected ID tags hold time
16	Get ID tag with highest RSSI value	GC	Get ID tag with highest RSSI value
17	Read EPC values of the UHF ID tags	RP	Read EPC of the UHF ID tag
18	Receive EPC value of the UHF ID tag	XP	Receive EPC value of the UHF ID tag
19	Receive List of detected UHF ID tags	XL	Receive List of the Detected UHF ID tags
20	Write EPC value of the UHF ID tag selective	WP	Write EPC value of the UHF ID tag selective
21	Read memory bank of the UHF ID tag selective	RF	Read memory bank of the UHF ID tag selective
22	Receive memory bank of the UHF ID tag	XB	Receive memory bank of the UHF ID tag selective
23	Write memory bank of the UHF ID tag selective	WF	Write UHF data selective
24	Set Read-/Write head access psword of the UHF ID tags	DA	Set Read-/Write head access password of the UHF ID tags
25	Set write protection password of the UHF ID tag	IA	Set write protection password of the UHF ID tag
26	Set lock state of the memory banks of the UHF ID tag	SO	Set lock state of the memory banks of the UHF ID tag

13.3 Setup of the data communication

After the host has established the TCP/IP connection, the parameters of the device must first be set. The host can then change to the "data exchange" mode, see chapter "Communication via Ethernet TCP/ IP".

13.3.1 Device configuration

Character no.	Content	Note
01...02	CU	Command code "configure device"
03	—	Separator. For this command it must be set to "underscore" = 0x5F
04...05	00	Failsafe mode [00] = If the TCP connection is closed the IO outputs are switched off [01] = If the TCP connection is closed the IO outputs hold the last state before the connection was closed
06	—	Separator
07...08	00	Reserved [00]
09	—	Separator
10...11	00	Reserved [00]
12	—	Separator
13...14	00	Ticket number [00] = No ticket number is sent by the host [01] = A ticket number is sent by the host
15	—	Separator
16...17	00	Reserved
18	—	"Setup of the separator". This character is used for the following communication between the host and device. Each character of the UNICODE UTF-8 code can be set. Exception: If the character '#' = 0x23 is set, the host will send the following data frames without any Separator. The device will then also send the response without Separator.
19...20	AS	Data format: [AS] = ASCII UTF-8 format
21...22	<CR/LF>	End of line characters 0xD,0xA



A reconfiguration is only possible if the TCP connection is closed and opened again. The frame format for this command is static. The separator for this command must be "_" = 0x5F.



The configuration of the device can be read with the command "GU<CR/LF>". The response corresponds to the response of the command "CU".

Examples:

CU_00_00_00_00_00_AS<CR/LF>	Command without ticket number and with separators
1107_0032_CU_00_00_00_01_00_AS<CR/LF>	Command with ticket number and with separators
CU_00_00_00_00_00.AS<CR/LF>	Command with separator set to "."
CU_00_00_00_00_00#AS<CR/LF>	Command with separator set to "#" -> no separator for the following data communication

Response of the device:

Character no.	Content	Note
01...02	CU	Response code of the command "configure device"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
06	—	Separator
07...08	00	Failsafe mode [00] = If the TCP connection is closed the IO outputs are switched off [01] = If the TCP connection is closed the IO outputs hold the last state before the connection was closed
09	—	Separator
10...11	00	Control register 1 of the IO output driver [00] = default value
12	—	Separator
13...14	00	Control register 2 of the IO output driver [00] = default value
15	—	Separator
16...17	00	Acknowledge the mode "ticket number" [00] = No ticket number is sent by the host [01] = A ticket number will be sent by the host from this moment on
18	—	Separator
19...20	00	Reserved [00]
21	—	Acknowledge the setting "separator setup". From this moment this character must be sent by the host otherwise an error is generated
22...23	AS	Data format [AS] = ASCII UNICODE UTF-8 Codepage 437 format
24...25	<CR/LF>	End of line characters 0xD,0xA

Examples:

CU_00_00_00_00_00_00_AS<CR/LF>	Response without ticket number and with separators
1107_0035_CU_00_00_00_00_00_01_AS<CR/LF>	Response with ticket number and with separators
CU_00_00_00_00_00_00.AS<CR/LF>	Response with separators set to "."
CU_00_00_00_00_00_00#AS<CR/LF>	Response with separators set to "#" -> no separator in following data communication

13.3.2 IO channel configuration

Each channel must be configured separately. Unused channels do not have to be configured.

Host command:

Character no.	Content	Note
01...02	CI	Command code "configure IO channels"
03	—	Must be identical to the character defined in the command CU, field "separator setup".
04...05	01	IO channel number to be configured [01...03]
06	—	Separator
07...08	11	Allowed channel mode IO channel 01: [11] = RFID channel Allowed channel mode IO channel 02/03: [01] = inactive, [02] = input, [03] = output
09	—	Separator
10...13	0000	Data hold time, [milliseconds] [0000 ... 2550] ⁽¹⁾
14	—	Separator
15...17	002	Length of the UHF ID tag block in bytes [002] -> fix value
18	—	Separator
19...21	000	Number of blocks on the UHF ID tag [000] -> fix value
22	—	Separator
23...24	00	Reserved
25	—	Separator
26...27	00	Overcurrent protection at output C/Q0 [00] = off [01] = on (default)
28	—	Separator
29...30	00	Reserved
31...32	<CR/LF>	End of line characters 0xD,0xA

⁽¹⁾ With the data hold time the minimum time wait time between each command response in mode "Receive" can be additionally controlled, independent from the command executed.

ID TAG	Detected	don't care	don't care	Detected	not detected
Data hold timer Th	Th=t1	Th=...ms	TL=t1	TL=...ms	T1=0ms
Timer state	TL started	TL running	TL restarted	TL running	TL expired
Event	ID tag coming	-	-	-	ID tag going



For the "Receive" commands, like "Receive EPC values", the LDI timeout setting influence the wait time between each command response too.



The configuration of the IO channel can be read with the command "GI<CR/LF>".
The response corresponds to the response of the command "CI".

Examples:

CI_01_11_0000_002_000_00_00_00<CR/LF>	Command without ticket number and with separator
CI01110000002000000000<CR/LF>	Command without ticket number and without separator
1107_0042_CI_01_11_0000_002_000_00_00_00<CR/LF> >	Command with ticket number and with separators
11070032CI01110000002000000000<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	CI	Response code of the command "configure IO channels"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel read [01...03]
06	—	Separator
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10...11	11	Channel mode: [01] = inactive, [02] = input, [03] = output, [11] = RFID channel
12	—	Separator
13...16	0000	Data hold time [milliseconds] [0000 ... 2550]
17	—	Separator
18...20	002	Length of the tag block in bytes [002] -> fix value
21	—	Separator
22...24	000	Number of blocks of the ID tag [000] -> fix value
25	—	Separator
26...27	00	Reserved [00]
28	—	Separator
29...30	00	Reserved [00]
31	—	Separator
32...33	00	Reserved [00]
34...35	<CR/LF>	End of line characters 0xD,0xA

Examples:

CI_01_00_11_0000_002_000_00_00_00<CR/LF>	Response without ticket number and with separators
CI0100110000002000000000<CR/LF	Response without ticket number and without separators
1107_0045_CI_01_00_11_0000_002_000_00_00_00<CR/LF>	Response with ticket number and with separators
11070034CI0100110000002000000000<CR/LF>	Response with ticket number and without separators

13.4 Command description

13.4.1 Get MAC address of the device

This command is supported in channel mode "Input, Output and RWH".

Host command:

Char. No.	Content	Remark
01...02	GM	Command code "Get MAC address" of the device
03...04	<CR/LF>	End of line characters is "Carriage return", "Line feed" -> 0x0D,0xA

Examples:

GM<CR/LF>	Command without ticket number and with separators
GM<CR/LF>	Command without ticket number and without separators
1107_0014_GM<CR/LF>	Command with ticket number and with separators
11070012GM<CR/LF>	Command with ticket number and without separators

Response of the device:

Char. No.	Content	Remark
01...02	GM	Response code of command "Get MAC address"
03	—	Separator. Will be same as defined with command CU, field "Separator setup"
04...05	00	Diagnostic information [00] = No diagnostic information present [01] = More diagnostic information available. Can be read out with command "DI"
06	—	Separator
07...23	00:02:01:40:41:EF	MAC address of the device, six Octets, separated by character "."
24...25	<CR/LF>	End of line characters is "Carriage return", "Line feed" -> 0x0D,0xA

Examples:

GM_00_00:02:01:40:41:EF<CR/LF>	Response without ticket number and with separators
GM0000:02:01:40:41:EF<CR/LF>	Response without ticket number and without separators
1107_0035_GM_00_00:02:01:40:41:EF<CR/LF>	Response with ticket number and with separators
11070031GM0000:02:01:40:41:EF<CR/LF>	Response with ticket number and without separators

13.4.2 Read IP address of the device

This command is supported in all channel modes and allow the reading of the IP address, the subnet mask and the Gateway address of the device.

Host command:

Character no.	Content	Note
01...02	RI	Command code "Read IP address"
03...03	<CR/LF>	End of line characters 0xD,0xA

Examples:

RI<CR/LF>	Command without ticket number and with separators
RI<CR/LF>	Command without ticket number and without separators
1107_0014_RI<CR/LF>	Command with ticket number and separators
11070012RI<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	RI	Response code of the command "Read IP address"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
06	—	Separator
07...21	192.168.000.079	Device IP address in the format '[XXX].[XXX].[XXX].[XXX]
22	—	Separator
23...37	255.255.255.000	Network mask of the device in the format '[XXX].[XXX].[XXX].[XXX]
38	—	Separator
39...53	192.168.000.201	Gateway IP address in the format '[XXX].[XXX].[XXX].[XXX]
54...55	<CR/LF>	End of line characters 0xD,0xA

Examples:

RI_00_192.168.000.079_255.255.255.000_192.168.000.201<CR/LF>	Command without ticket number and with separators
RI00192.168.000.079255.255.255.000192.168.000.201<CR/LF>	Command without ticket number and without separators
1107_0065_RI_00_192.168.000.079_255.255.255.000_192.168.000.201<CR/LF>	Command with ticket number and separators
11070059RI00192.168.000.079255.255.255.000192.168.000.201<CR/LF>	Command with ticket number and without separators

13.4.3 Write IP address of the device

This command is supported in all channel modes and allow the setting of the IP address of the device.



The settings of this values are stored nonvolatile.

Host command:

Character no.	Content	Note
01...02	WI	Command code "Write IP address"
03	_	Separator. For this command it must be set to "underscore" = 0x5F
04...16	192.168.000.079	Device IP address in the format '[XXX].[XXX].[XXX].[XXX]
06	_	Separator
07...08	255.255.255.000	Network mask of the device in the format '[XXX].[XXX].[XXX].[XXX]
09	_	Separator
10...11	192.168.000.201	Gateway IP address in the format '[XXX].[XXX].[XXX].[XXX]
21...22	<CR/LF>	End of line characters 0xD,0xA

Examples:

WI_192.168.000.079_255.255.255.000_192.168.000.201<CR/LF>	Command without ticket number and with separators
WI192.168.000.079255.255.255.000192.168.000.201<CR/LF>	Command without ticket number and without separators
1107_0062_WI_192.168.000.079_255.255.255.000_192.168.000.201\<CR/LF>	Command with ticket number and separators
11070057WI192.168.000.079255.255.255.000192.168.000.201<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01..02	WI	Response code of the command " "
03	–	Separator. Is identical to the character defined in the command CU, field "separator setup"
04..05	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
06	–	Separator
07..021	192.168.000.079	Device IP address in the format '[XXX].[XXX].[XXX].[XXX]
22	–	Separator
23..37	255.255.255.000	Network mask of the device in the format '[XXX].[XXX].[XXX].[XXX]
38	–	Separator
39..53	192.168.000.201	Gateway IP address in the format '[XXX].[XXX].[XXX].[XXX]
54..55	<CR/LF>	End of line characters 0xD,0xA

Examples:

WI_00_192.168.000.079_255.255.255.000_192.168.000.201<CR/LF>	Command without ticket number and with separators
WI00192.168.000.079255.255.255.000192.168.000.201<CR/LF>	Command without ticket number and without separators
1107_0065_WI_00_192.168.000.079_255.255.255.000_192.168.000.201<CR/LF>	Command with ticket number and separators
11070059WI00192.168.000.079255.255.255.000192.168.000.201<CR/LF>	Command with ticket number and without separators

Parameter „LED 01...24“:

LED number	LED label
01	BF RED
02	BF GREEN
03	SF RED
04	SF GREEN
05	reserved
06	reserved
07	AUX
08	Ethernet Port 1 Link GREEN
09	EthernetPort 1 Traffic YELLOW
10	EthernetPort 2 Link GREEN
11	EthernetPort 2 Traffic YELLOW
12	Bargraph LED 1 YELLOW
13	Bargraph LED 2 YELLOW
14	Bargraph LED 3 YELLOW
15	Bargraph LED 4 YELLOW
16	Device mode RED
17	Device mode GREEN
18	Device mode BLUE
19...24	reseved



Unused LED numbers are ignored and implemented for future use.

Examples:

[illegible]

Response of the device:

Char. No.	Content	Remark
01...02	SL	Response code of command "Set LED"
03	_	Separator. Will be same as defined with command CU, field "Separator setup"
04...05	00	Reserved
06	_	Separator
07...08	00	Diagnostic information [00] = No diagnostic information present [01] = More diagnostic information available. Can be read out with command "DI"
09	_	Separator
10...11	MN	Mode of the [AT] = Automatic. Device control the LED [MN] = Manual. User control the LED of the device
12	_	Separator
13...83	01_01_01_01_01_01_01_01_01_0 1_01_01_01_01_01_01_01_01_01_0 _01_01_01_01_01	Setting of LED 1...21 [00] = Set LED off [01] = Set LED on Note: In mode „AT“ all LED states are set to 00 = Off
84...85	<CR/LF>	End of line characters is "Carriage return", "Line feed" - > 0x0D,0xA

Examples:

SL_00_00_MN_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01<CR/LF>	Response without ticket number and with separators
SL0000MN0101010101010101010101010101010101010101010101010101<CR/LF>	Response without ticket number and without separators
1107_0095_SL_00_00_MN_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01_01<CR/LF>	Response with ticket number and with separators
11070066SL0000MN0101010101010101010101010101010101010101010101010101<CR/LF>	Response with ticket number and without separators

13.4.5 Read inputs of the IO channel

This command is supported in the channel mode "Input".

Host command:

Character no.	Content	Note
01...02	RA	Command code "read inputs"
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup".
04...05	02	Number of the IO channel to be read [02...03]
06...07	<CR/LF>	End of line characters 0xD,0xA

Examples:

RA_01<CR/LF>	Command without ticket number and with separators
RA01<CR/LF>	Command without ticket number and without separators
1107_0017_RA_01<CR/LF>	Command with ticket number and with separators
11070014RA01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	RA	Response code of the command "read inputs"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel read from [02...03]
06	—	Separator
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10...11	00	State of the channel input C/Qi [00] = off [01] = on
12	—	Separator
13...14	00	Reserved [00] = default value
15...16	<CR/LF>	End of line characters 0xD,0xA

Examples:

RA_01_00_00_00_<CR/LF>	Response without ticket number and with separators
RA01000000<CR/LF>	Response without ticket number and without separators
1107_0026_RA_01_00_00_00<CR/LF>	Response with ticket number and with separators
11070020RA01000000<CR/LF>	Response with ticket number and without separators

13.4.6 Receive all inputs of the IO channel

This command is supported in the channel mode "Input".

Host command:

Character no.	Content	Note
01...02	XA	Command code "Receive inputs"
03	–	Separator. Must be identical to the character defined in the command CU, field "separator setup".
04...05	01	Number of the IO channel to be read [02...03]
06...07	<CR/LF>	End of line characters 0xD,0xA

Examples:

XA_01<CR/LF>	Command without ticket number and with separators
XA01<CR/LF>	Command without ticket number and without separators
1107_0017_XA_01<CR/LF>	Command with ticket number and with separators
11070014XA01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	XA	Response code of the command "receive inputs"
03	–	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel read from [01...03]
06	–	Separator
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	–	Separator
10...11	00	State of the channel input C/Qi [00] = off [01] = on
12	–	Separator
13...14	00	Reserved [00] = default value
15...16	<CR/LF>	End of line characters 0xD,0xA

Examples:

XA_01_00_00_00<CR/LF>	Response without ticket number and with separators
XA01000000<CR/LF>	Response without ticket number and without separators
1107_0026_XA_01_00_00_00<CR/LF>	Response with ticket number and with separators
11070020XA01000000<CR/LF>	Response with ticket number and without separators

This command is ideal if the host does not know when the state of the inputs change. The host need to send the command only once, the device only sends the input data if a change of the status of the inputs are detected.

Data exchange example:

Host request	Command response of the device	IO channel state
XA_01<CR/LF>	XA_01_00_00_00<CR/LF>	C/Qi=off / IQ=off

13.4.7 Write outputs of the IO channel

This command is supported in the channel mode "output".

Host command:

Character no.	Content	Note
01...02	WO	Command code "write output"
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup".
04...05	01	Number of the IO channel to be written [02...03]
06	—	Separator
07...08	00	State of the channel output C/Q0 [00] = off [01] = on
09	—	Separator
10...11	00	Reserved [00] = default value
12...13	<CR/LF>	End of line characters 0xD,0xA

Examples:

WO_01_00_00<CR/LF>	Command without ticket number and with separators
WO010000<CR/LF>	Command without ticket number and without separators
1107_0023_WO_01_00_00<CR/LF>	Command with ticket number and with separators
11070018WO010000<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	WO	Response code of the command "write output"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel written to [01...03]
06	—	Separator
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10...11	00	State of the channel input C/Qi [00] = off [01] = on
12	—	Separator
13...14	00	Reserved [00] = default value
15	—	Separator
16...17	00	Reserved [00] = default value
18...19	<CR/LF>	End of line characters 0xD,0xA

Examples:

WO_01_00_00_00_00<CR/LF>	Response without ticket number and with separators
WO0100000000<CR/LF>	Response without ticket number and without separators
1107_0029_WO_01_00_00_00_00<CR/LF>	Response with ticket number and with separators
11070022WO0100000000<CR/LF>	Response with ticket number and without separators

13.4.8 Read diagnostic information of the device

This command is supported in the channel mode "input, output and RWH".

Host command:

Character no.	Content	Note
01...02	DI	Command code "read diagnostics"
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup".
04...05	01	Number of the IO channel to be read [01...03]
06...07	<CR/LF>	End of line characters 0xD,0xA

Examples:

DI_01<CR/LF>	Command without ticket number and with separators
DI01<CR/LF>	Command without ticket number and without separators
1107_0017_DI_01<CR/LF>	Command with ticket number and with separators
11070014DI01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	DI	Response code of the command "read diagnostics"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel read from [01...03]
06	—	Separator
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10...11	03	Number of diagnostic codes. Each code has 4 characters. [00...03]
12	—	Separator
13...nn	F4...00	Diagnostic code (example)
nn+1...nn+2	<CR/LF>	End of line characters 0xD,0xA

Examples:

DI_01_00_03_F4FE0100F4FE0300F4FE8900<CR/LF>	Response without ticket number and with separators
DI010003F4FE0100F4FE0300F4FE8900<CR/LF>	Response without ticket number and without separators
1107_0048_DI_01_00_03_F4FE0100F4FE0300F4FE8900<CR/LF>	Response with ticket number and with separators
11070042DI010003F4FE0100F4FE0300F4FE8900<CR/LF>	Response with ticket number and without separators

13.4.9 Get UHF power levels

This command is supported in the channel mode "RWH" .

Host command:

Character no	Content	Note
01..02	GF	Command code "Get UHF power levels" of the Read-/Write head
03	—	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06..07	<CR/LF>	End of line characters 0xD,0xA

Examples:

GF_01<CR/LF>	Command without ticket number and with separators
GF01<CR/LF>	Command without ticket number and without separators
1107_0018_GF_01<CR/LF>	Command with ticket number and separators
11070015GF01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	GF	Response code "Get UHF power levels" of the Read-/Write head
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..14	10.00	Receive power level set [dBm] 4 digits, 5 characters fix length. Range 10.00 dBm ... 23.00 dBm
15	—	Separator
16..20	23.00	Transmit power level set [dBm] 4 digits, 5 characters fix length. Range 10.00 dBm ... 23.00 dBm
21..22	<CR/LF>	End of line characters 0xD,0xA

Examples:

GF_01_00_10.00_23.00<CR/LF>	Command without ticket number and with separators
GF010010.0023.00<CR/LF>	Command without ticket number and without separators
1107_0032_GF_01_00_10.00_23.00<CR/LF>	Command with ticket number and separators
11070026GF010010.0023.00<CR/LF>	Command with ticket number and without separators

13.4.10 Set UHF power levels

This command is supported in the channel mode "RWH".



The settings of this values are stored nonvolatile.

Host command:

Character no	Content	Note
01..02	SF	Command code "Set UHF power levels" of the Read-/Write head
03	_	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	_	Separator
07..011	10.00	Receive power level [dBm] 4 digits, 5 characters fix length. Range 10.00 dBm ... 23.00 dBm
12	_	Separator
13..17	23.00	Transmit power level [dBm] (1) 4 digits, 5 characters fix length. Range 10.00 dBm ... 23.00 dBm
18..19	<CR/LF>	End of line characters 0xD,0xA

(1) If any data is to be written on the ID tag, the transmission power should be set to the maximum value to achieve a maximum distance between the UHF antenna and the ID tag.



Please note, that the needed energy in write mode is much higher than in read mode.

Examples:

SF_01_10.00_23.00<CR/LF>	Command without ticket number and with separators
SF0110.0023.00<CR/LF>	Command without ticket number and without separators
1107_0029_SF_01_10.00_23.00<CR/LF>	Command with ticket number and separators
11070024SF0110.0023.00<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	SF	Response code "Set UHF power levels" of the Read-/Write head
03	—	Separator . Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..14	10.00	Receive power level set [dBm]
15	—	Separator
16..20	23.00	Transmit power level set [dBm]
21..22	<CR/LF>	End of line characters 0xD,0xA

Examples:

SF_01_00_10.00_23.00<CR/LF>	Command without ticket number and with separators
SF010010.0023.00<CR/LF>	Command without ticket number and without separators
1107_0032_SF_01_00_10.00_23.00<CR/LF>	Command with ticket number and separators
11070026SF010010.0023.00<CR/LF>	Command with ticket number and without separators

13.4.11 Switch off the antenna field of the read-/write head

This command is supported in the channel mode "RWH".

Host command:

Character no.	Content	Note
01...02	AN	Command code "antenna field off"
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup".
04...05	01	Number of the IO channel to be written [01]
06	—	Separator
07...08	01	Set antenna status [00] = antenna field off [01] = antenna field on
09...10	<CR/LF>	End of line characters 0xD,0xA

Examples:

AN_01_01<CR/LF>	Command without ticket number and with separators
AN0101CR/LF>	Command without ticket number and without separators
1107_0020_AN_01_01<CR/LF>	Command with ticket number and with separators
11070016AN0101<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	AN	Response code of the command "switch antenna field off"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel written to [01]
06	—	Separator
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10...11	01	Set antenna status [00] = antenna field off [01] = antenna field on
12...13	<CR/LF>	End of line characters 0xD,0xA

Examples:

AN_01_00_01<CR/LF>	Response without ticket number and with separators
AN010001<CR/LF>	Response without ticket number and without separators
1107_0023_AN_01_00_01<CR/LF>	Response with ticket number and with separators
11070010AN010001<CR/LF>	Response with ticket number and without separators

13.4.12 Get Forward / Reverse UHF power levels

This command is supported in the channel mode "RWH" .

Host command:

Character no	Content	Note
01..02	FF	Command code "Get Forward Reverse power level" of the Read-/Write head
03	_	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06..07	<CR/LF>	End of line characters 0xD,0xA

Examples:

FF_01<CR/LF>	Command without ticket number and with separators
FF01<CR/LF>	Command without ticket number and without separators
1107_0018_FF_01<CR/LF>	Command with ticket number and separators
11070015FF01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	FF	Command response "Get Forward Reverse power level" of the Read-/Write head
03	_	Separator . Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	_	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	_	Separator
10..15	-01.20	Reverse power [dBm] 4 digits with sign character, 6 characters fix length Range: -50.00 dBm ... + 23.00 dBm (1)(3)
16	_	Separator
17..22	+23.00	Forward power [dBm] 4 digits, 6 characters fix length. Range +00 .00 dBm ... +25 .00 dBm (2)(3)
23..24	<CR/LF>	End of line characters 0xD,0xA

(1) Notes to the measured reflected power

Reverse power [dBm]	Reverse power [mW]	Rating	Meaning
+20 ... +23	100 ... 200	bad	50% ... 100% of the output power is reflected back to the UHF antenna, so very low power will reach the ID-Tag and the reading distance will be short This may happen, if an object is directly placed before the UHF antenna or the ID-tag is near at the UHF antenna
+03 ... +20	20 ... 100	poor	10% ... 50% of the output power is reflected back to the HF antenna
-50 ... +03	10E-6 ... 20	good	Most of the output power is send out from the antenna, so the ID-tag can be read well

(2) This value shows the current measured output level of the Read-/Write head. Deviations from the set output level +0/-3dBm are normal.

(3) Please note, the values are only updated when the ID-tags are inventoried by the Read-/Write. If the UHF transmitter is shut off, the last measured values are transmitted.

Examples:

FF_01_00_-01,20_23.00<CR/LF>	Command without ticket number and with separators
FF0100-01,2023.00<CR/LF>	Command without ticket number and without separators
1107_0033_FF_01_00_-01,20_23.00<CR/LF>	Command with ticket number and separators
11070027FF0100-01,2023.00<CR/LF>	Command with ticket number and without separators

13.4.13 Set List of Detected ID tags hold time

This command is supported in the channel mode "RWH".

The **List of Detected ID tags (LDI)** hold time can be used to set the time span until the ID tag is removed from the device internal ID tag list. Out of the ID tag list the host notifications "COMING" and "GOING" are created.

When the ID tag is detected by the Read-/Write head, the LDI timer is started and a coming event is generated. Once the ID tag is detected again, the LDI timer is restarted. In case the ID tag wasn't detected until the LDI timer reaches the set hold time the ID tag is removed from the LDI and a going event is generated.



The LDI timer can help to create a stable process data input image with less coming and going events.

Example: LDI hold time DIHT

ID TAG state:	Detected	<i>Not detected</i>	Detected	<i>Not detected</i>	<i>Not detected</i>
LDI timer TL:	TL=0ms	TL=...ms	TL=0ms	TL=...ms	T1=LDI_HT ⁽¹⁾
Timer state:	TL restarted	TL running	TL restarted	TL running	TL expired
Host Notification:	ID tag coming	-	-	-	ID tag going

⁽¹⁾ LDI Hold Time

Host command:

Character no	Content	Note
01..02	LT	Command code "Set LDI hold time"
03	_	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	_	Separator
07..011	00000	Reserved
12	_	Separator
13..17	00100	LDI hold time [ms] ⁽¹⁾ 5 characters fix length. [00000 ms ..65535 ms]
18..19	<CR/LF>	End of line characters 0xD,0xA

⁽¹⁾ If the LDI hold time shall only control the time between the COMING and GOING notification to the host, the data hold time need to be set to 0ms.

Examples:

LT_01_00000_00100<CR/LF>	Command without ticket number and with separators
LT0100000000100<CR/LF>	Command without ticket number and without separators
1107_0029_LT_01_00000_00100<CR/LF>	Command with ticket number and separators
11070024LT0100000000100<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	LT	Response code "Set LDI hold time"
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..14	00000	Reserved
15	—	Separator
16..20	00100	Set LDI hold time [ms] 5 characters fix length.
21..22	<CR/LF>	End of line characters 0xD,0xA

Examples:

LT_01_00_00000_00100<CR/LF>	Command without ticket number and with separators
LT010000000000100<CR/LF>	Command without ticket number and without separators
1107_0032_LT_01_00_00000_00100<CR/LF>	Command with ticket number and separators
11070026LT010000000000100<CR/LF>	Command with ticket number and without separators

13.4.14 Get ID tag with highest RSSI value

This command is supported in the channel mode "RWH".

With this command the host can get the ID tag with the highest RSSI value detected by the Read-/Write head.

Host command:

Character no	Content	Note
01..02	GC	Command code "Get ID tag with highest RSSI value" of the Read-/Write head
03	_	Separator. Must be same as defined with command GC, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06..07	<CR/LF>	End of line characters 0xD,0xA

Examples:

GC_01<CR/LF>	Command without ticket number and with separators
GC01<CR/LF>	Command without ticket number and without separators
1107_0017_GC_01<CR/LF>	Command with ticket number and separators
11070014GC01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	GC	Command response "Get ID tag with highest RSSI value" of the Read-/Write head
03	_	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	_	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	_	Separator
10..15	-45.00	RSSI value [dBm] [-99,99...-00,01]
16	_	Separator
17..18	12	EPC data length [bytes] [01...32]
19	_	Separator
20..43	E2004000840F 020012909375	EPC data [byte] 2 character per Byte
44..45	<CR/LF>	End of line characters 0xD,0xA

Examples:

GC_01_00_-45.00_12_E2004000840F020012909375<CR/LF>	Command without ticket number and with separators
GC0100-45.0012E2004000840F020012909375<CR/LF>	Command without ticket number and without separators
1107_0055_GC_01_00_-45.00_12_E2004000840F020012909375<CR/LF>	Command with ticket number and separators
11070048GC0100-45.0012E2004000840F020012909375<CR/LF>	Command with ticket number and without separators

13.4.15 Read EPC values of the UHF ID tags

This command is supported in the channel mode "RWH".

Host command:

Character no.	Content	Note
01...02	RP	Command code "Read EPC" from UHF ID tag
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel to be read [01]
06...07	<CR/LF>	End of line characters 0xD,0xA

Examples:

RP_01<CR/LF>	Command without ticket number and with separators
RP01<CR/LF>	Command without ticket number and without separators
1107_0019_RP_01<CR/LF>	Command with ticket number and with separators
11070016RP01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	RP	Command code "Read EPC" from UHF ID tag
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel to be read [01]
06	—	Separator.
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator.
10...12	001	Number of ID tags with elements RSSI, phase, EPC data size, EPC data [001...016]
13	—	Separator.
14...19	-45,00	RSSI value [dBm] [-80,00...00,00]
20	—	Separator.
21...23	180	Phase [°] [0°...360°]

24	—	Separator.
25.6	12	EPC data size [Bytes]
27	—	Separator.
28...51	E2004000840F020012909375	EPC data
52...53	<CR/LF>	End of line characters 0xD,0xA

Examples:

RP_01_00_001_- 45,00_180_12_E2004000840F020012909375<CR/LF>	Response without ticket number and with separators
RP0100001- 45,0018012E2004000840F020012909375<CR/LF>	Response without ticket number and without separators
1107_0063_RP_01_00_001_- 45,00_180_12_E2004000840F020012909375<CR/LF>	Response with ticket number and with separators
11070054RP0100001- 45,0018012E2004000840F020012909375<CR/LF>	Response with ticket number and without separators



Each UHF ID tag, which is detected / no more detected in the reading field of the UHF antenna, generate a separate response to the connected host.

Data exchange example:

Host request	Command response of the device	UHF ID tag state
RP_01<CR/LF>	RP_01_00_000<CR/LF>	No UHF ID tag detected
RP_01<CR/LF>	RP_01_00_003 _45,00_180_12_E2004000840F020012909375 _48,30_220_08_840F020012909234 _42,50_085_12_E2004000840F020012906734<CR/LF>	Three UHF ID tags detected
RP_01<CR/LF>	RP_01_00_002 _46,20_234_12_E2004000840F020012909375 _39,20_125_12_E2004000840F020012906734<CR/LF>	One ID tag left transmission window

13.4.16 Receive EPC value of the UHF ID tag

This command is supported in the channel mode "RWH".

Host command:

Character no.	Content	Note
01...02	XP	Command code "Receive EPC" from UHF ID tag
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel to be read [01]
06...07	<CR/LF>	End of line characters 0xD,0xA

Examples:

XP_01<CR/LF>	Command without ticket number and with separators
XP01<CR/LF>	Command without ticket number and without separators
1107_0017_XP_01<CR/LF>	Command with ticket number and with separators
11070014XP01<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	XP	Command code "Set UHF parameter"
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel to be read [01]
06	—	Separator.
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator.
10...12	COM	Event mode "COM" = Coming event. UHF ID tag detected. "GOI" = Going event. UHF ID tag disappeared. "000" = Undefined event
13	—	Separator.
14...19	-45,00	RSSI value [dBm] [-80,00...00,00]
20	—	Separator.
21...23	180	Phase [°] [0°...360°]
24	—	Separator.
25.6	12	EPC data size [Bytes]
27	—	Separator.
28...51	E2004000840F020012909375	EPC data
52...53	<CR/LF>	End of line characters 0xD,0xA

Examples:

XP_01_00_COM_- 45,00_180_12_E2004000840F020012909375<CR/LF>	Response without ticket number and with separators
XP0100COM-45,0018012E2004000840F020012909375<CR/LF>	Response without ticket number and without separators
1107_0063_XP_01_00_COM_- 45,00_180_12_E2004000840F020012909375<CR/LF>	Response with ticket number and with separators
11070054XP0100COM- 45,0018012E2004000840F020012909375<CR/LF>	Response with ticket number and without separators



Each UHF ID tag, which is detected / non more detected in the reading field of the UHF antenna, generate a separate response to the connected host.

Data exchange example:

Host request	Command response of the device	UHF ID tag state
XP_01<CR/LF>	XP_01_00_000_-00,00_000_00<CR/LF>	No UHF ID tag detected
<none>	XP_01_00_COM_- 45,00_180_12_E2004000840F020012909375<CR/LF>	Three UHF ID tags detected at once - First message
<none>	XP_01_00_COM_- 48,30_220_08_840F020012909234<CR/LF> XP_01_00_COM_- 45,00_180_12_E2004000840F020012909375<CR/LF>	- Second message
<none>	XP_01_00_COM_- 42,50_085_12_E2004000840F020012906734<CR/LF>	- Third message
<none>	XP_01_00_GOI_- 51,50_145_08_840F020012909234<CR/LF>	One ID tag left transmission window. Last detected RSSI and phase value of the ID tag is send back to the host

13.4.17 Receive List of the Detected UHF ID tags

This command is supported in channel mode "RWH".

With this command the host can receive the List of detected ID tags (LDI).

Notes:

A new message is send from the device to the host when a change in the LDI is detected.

If the command is interrupted by another command, the events of the ID tags are not stored and transmitted after reactivating of the receive command.

Host command:

Character no	Content	Note
01..02	XL	Command code "Receive List of detected ID tags" of the Read-/Write head
03	—	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06..07	<CR/LF>	End of line characters 0xD,0xA

Examples:

XL_01<CR/LF>	Command without ticket number and with separators
XL01<CR/LF>	Command without ticket number and without separators
1107_0017_XL_01<CR/LF>	Command with ticket number and with separators
11070014XL01<CR/LF>	Command with ticket number and without separators

Response of the compact device:

Character no	Content	Note
01..02	XL_	Response code "Receive List of detected ID tags" of the Read-/Write head
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..11	03	Index of the ID tag in LDI [01..16]
12	—	Separator
13..14	03	Event of the ID tag [03] = ID tag is detected
15	—	Separator
16..20	00021	Number of readings since first detection [00001...65535]
21	—	Separator
22..27	-45.00	RSSI value [dBm] [-99,99...-00,01]
28	—	Separator
29..31	180	Phase [degree] [000...360]
32	—	Separator
33..34	12	EPC data length [bytes] [01..32]
35	—	Separator
36..59	E200400 0840F02 0012909 375	EPC data [byte] 2 character per Byte
60..61	<CR/LF>	End of line characters 0xD,0xA

Examples:

XL_01_00_03_01_00021_- 45.00_180_12_E2004000840F020012909375<CR/LF>	Command without ticket number and with separators
XL0100030100021- 45.0018012E2004000840F020012909375<CR/LF>	Command without ticket number and without separators
1107_0071_XL_01_00_03_01_00021_- 45.00_180_12_E2004000840F020012909375<CR/LF>	Command with ticket number and with separators
11070060XL0100030100021- 45.0018012E2004000840F020012909375<CR/LF>	Command with ticket number and without separators

Example of the command when command is running

Command	Response	Remark
XL_01<CR/LF>	XL_01_00_00_00_00000_000.00_000_00<CR/LF>	First response
-	XL_01_00_03_00_00001_- 55.80_019_12_E20040807111005018205A61<CR/LF>	Change in list entry 2 detected, new ID tag detected
-	XL_01_00_03_01_00021_- 55.80_168_12_E20040807111005018205A61<CR/LF>	Change in list entry 2 detected, ID tag values changed
-	XL_01_00_03_00_00001_- 53.90_050_12_E20040807111004918205A5C<CR/LF>	Change in list entry 3 detected, new ID tag detected
-	XL_01_00_03_01_00021_- 53.90_033_12_E20040807111004918205A5C<CR/LF>	Change in list entry 3 detected, ID tag values changed
-	XL_01_00_03_01_00001_- 53.10_016_12_E20040807111004818205A54<CR/LF>	Change in list entry 0 detected, new ID tag detected
-	XL_01_00_03_01_00012_- 52.30_165_12_E20040807111004818205A54<CR/LF>	Change in list entry 0 detected, ID tag values changed
	XL_01_00_03_01_00001_- 53.30_148_12_E20040807111004818205A54<CR/LF>	Change in list entry 0 detected, ID tag lost once and detected again

13.4.18 Write EPC value of the UHF ID tag selective

Host command:

Character no.	Content	Note
01...02	WP	Command code "write to user data memory"
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup".
04...05	01	Number of the IO channel to be written [01...03]
06	—	Separator
07...08	12	EPC data length of the ID tag which shall be written [bytes] [00...32] (1)
09	—	Separator
10...32	E2004000840F020012909375	EPC data of the UHF ID tag which shall be written [bytes]
33	—	Separator
34...5	12	EPC data length to write [bytes] [0...32] (1)
36	—	Separator
37...61	E2004000840F020047836213	EPC data to be written to the ID tag. [bytes]
62...63	<CR/LF>	End of line characters 0xD,0xA

⁽¹⁾ A maximum EPC code length of 32 bytes is supported.

Examples:

WP_01_12_E2004000840F020012909375_12_E2004000840F020064482213<CR/LF>	Command without ticket number and with separators
WP0112E2004000840F02001290937512E2004000840F020064482213<CR/LF>	Command without ticket number and without separators
1107_0073_WP_01_12_E2004000840F020012909375_12_E2004000840F020064482213<CR/LF>	Command with ticket number and with separators
11070064WP0112E2004000840F02001290937523E2004000840F020064482213<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01...02	WP	Response code of the command "read user data memory"
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04...05	01	Number of the IO channel written to [01]
06	—	Separator
07...08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10...11	12	EPC data length of the ID tag which was selected [bytes] [0...32]
12	—	Separator
13...32	E2004000840F020012909375	EPC data of the UHF ID tag which was selected
33	—	Separator
34...5	12	EPC data length which was written [bytes] [0...32]
36	—	Separator
41...64	E2004000840F020047836213	EPC data which was written to the ID tag [bytes]
65...66	<CR/LF>	End of line characters 0xD,0xA

Examples:

WP_01_00_12_E2004000840F020012909375_12_E2004000840F020064482213<CR/LF>	Response without ticket number and with separators
WP0112E2004000840F02001290937512E200400840F020064482213<CR/LF>	Response without ticket number and without separators
1107_0073_WP_01_00_12_E2004000840F020012909375_12_E2004000840F020064482213<CR/LF>	Response with ticket number and with separators
11070066WP010012E2004000840F02001290937512E2004000840F020064482213<CR/LF>	Response with ticket number and without separators

13.4.19 Read memory bank of the UHF ID tag selective

This command is supported in channel mode "RWH".

With this command the host can read the selected UHF memory bank.

Host command:

Character no.	Content	Note
01..02	RF	Command code "Read UHF memory bank"
03	_	Separator. For this command it must be set to "underscore" = 0x5F
04...05	01	Number of the IO channel to be written [01]
06	_	Separator
07..09	USR	Memory bank to read from [EPC,TID,USR]
10	_	Separator
11..12	12	EPC code length of the ID tag to be read [bytes]
13	_	Separator
14..37	E20040...9375	EPC code of the ID tag to be read
38	_	Separator
39..41	ASC	Mode to read from the memory bank. [ASC]: Data read is send with ASCII characterrs [HEX]: Data read is send in hex code, e.g., 20
42	_	Separator
43..47	00032	Address of the memory bank of the ID tag where to start reading [bytes]
48	_	Separator
49..52	0008	Data read length Mode ASC: [character] Mode HEX: [bytes]
53..54	<CR/LF>	End of line characters 0xD,0xA

Examples:

RF_01_USR_12_E2004000840F020012909375_ASC_00032_0008<CR/LF>	Command without ticket number and with separators
RF01USR12E2004000840F020012909375ASC000320008<CR/LF>	Command without ticket number and without separators
1107_0064_RF_01_USR_12_E2004000840F020012909375_ASC_00032_0008<CR/LF>	Command with ticket number and separators
11070055RF01USR12E2004000840F020012909375ASC000320008<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no.	Content	Note
01..02	RF	Response code of the command " "
03	—	Separator. Is identical to the character defined in the command CU, field "separator setup"
04..05	01	Number of the IO channel written to [01]
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..12	USR	Memory bank read [EPC,TID,USR]
13	—	Separator
14..15	12	EPC code length of the ID tag read [bytes]
16	—	Separator
17..40	E20040...9375	EPC code of the ID tag read
41	—	Separator
42..44	ASC	Mode read from the memory bank. [ASC]: Data read is send with ASCII character [HEX]: Data read is send in hex code, e.g., 31 -> character "1"
45	—	Separator
46..50	00032	Address of the memory bank of the ID tag read [bytes]
51	—	Separator
52..55	0008	Data read length Mode ASC: [character] Mode HEX: [bytes]
56	—	Separator
57..64	PLANT-A1	Data read from the memory bank
65..66	<CR/LF>	End of line characters 0xD,0xA

Examples:

RF_01_00_USR_12_E2004000840F020012909375_ASC_00032_0008_PLANT-A1<CR/LF>	Command without ticket number and with separators
RF0100USR12E2004000840F020012909375ASC000320008PLANT-A1<CR/LF>	Command without ticket number and without separators
1107_0076_RF_01_00_USR_12_E2004000840F020012909375_ASC_00032_0008_PLANT-A1<CR/LF>	Command with ticket number and separators
11070065RF0100USR12E2004000840F020012909375ASC000320008PLANT-A1<CR/LF>	Command with ticket number and without separators

13.4.20 Switch ID tag operation mode

This command is supported in channel mode "RWH".

With this command the UHF ID tag operation mode can be set.



The settings of this values are stored nonvolatile.

Character no.	Content	Note
01...02	IO	Command code "ID tag operation mode"
03	—	Separator. Must be identical to the character defined in the command CU, field "separator setup".
04...05	01	Number of the IO channel to be written [01]
06	—	Separator
07...08	00	ID tag operation mode [00] = Read EPC ⁽¹⁾ [01] = Read EPC with User memory ⁽²⁾
12...13	<CR/LF>	End of line characters 0xD,0xA

⁽¹⁾ This is the fastest mode to detect the ID Tags in the HF field of the Read-/Write head.

⁽²⁾ This mode need to be set to read the EPC data and the User memory of the ID Tag.

Examples:

IO_01_00<CR/LF>	Command without ticket number and with separators
IO0100<CR/LF>	Command without ticket number and without separators
1107_0020_IO_01_00<CR/LF>	Command with ticket number and with separators
11070016IO0100<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	IO	Response code " ID tag operation mode "
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..11	00	ID tag operation mode [00] = Read EPC [01] = Read EPC with User memory
12..13	<CR/LF>	End of line characters 0xD,0xA

Examples:

IO_01_00_00<CR/LF>	Command without ticket number and with separators
IO010000<CR/LF>	Command without ticket number and without separators

1107_0023_IO_01_00_00<CR/LF>	Command with ticket number and separators
11070018IO010000<CR/LF>	Command with ticket number and without separators

13.4.21 Receive memory bank of the UHF ID tag

This command is supported in the channel mode "RWH" .

With this command the host can receive automatically data from the selected memory bank of any detected ID tag.



Before this command can be used, the ID tag operation mode need to be set to mode "Read EPC with User memory" → [Switch ID tag operation mode](#)

Please note, that a maximum of 64 Bytes from the memory bank can be received with this command

Host command:

Character no	Content	Note
01..02	XB	Command code "Receive UHF memory bank" of the ID tag
03	_	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel to receive from [01 . .0X]
06	_	Separator
07..09	USR	Memory bank to receive [TID]: Identification number of the ID tag [USR]: User memory bank of the ID tag
10	_	Separator
11..13	ASC	Read mode [ASC]: Read data in ASCII format [HEX]: Read data in HEX format. Per HEX value 2 characters are transmitted. Example for text "Hello world": ASC="Hello world" HEX="48656C6C6F20776F726C64"
14	_	Separator
15..19	00032	Data address offset [bytes]
20	_	Separator
21..24	0008	Data length to receive: [0001..0064] Mode ASC: Number of characters Mode HEX: Number of bytes, e.g., 48 65 -> 2 bytes Real data length of the received data. Limited to 64 byte cause read of inventory with memory data bank in one cycle is supported by UHF module
25..26	<CR/LF>	End of line characters 0xD,0xA

Examples:

XB_01_USR_ASC_00032_0008<CR/LF>	Command without ticket number and with separators
XB01USRASC000320008<CR/LF>	Command without ticket number and without separators
1107_0036_XB_01_USR_ASC_00032_0008<CR/LF>	Command with ticket number and separators
11070029XB01USRASC000320008<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	XB	Response code "Receive UHF memory bank" of the ID tag
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel received [01 . .0X]
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..12	COM	Event mode of the ID tag [COM] = Coming, ID tag enter UHF antenna field [GOI] = Going, ID tag left UHF antenna field
13	—	Separator
14..15	12	Length of EPC [bytes]
16	—	Separator
17..40	E2004000840F020012909375	EPC data of the ID tag read
41	—	Separator
42..44	USR	Memory bank received: [TID]: Identification number of the ID tag [USR]: User memory bank of the ID tag
45	—	Separator
46..48	ASC	Read mode [ASC]: Data send in ASCII format [HEX]: Data send in HEX format
49	—	Separator
50..54	00032	Data address offset [bytes]
55	—	Separator

56..59	0008	Data length received Mode ASC: Number of ASCII characters, e.g., "PLANT-A1" -> 8 characters Mode HEX: Number of bytes, e.g., "48 65" -> 2 bytes
60	—	Separator
61..68	PLANT-A1	Data read from selected memory bank
69...70	<CR/LF>	End of line characters 0xD,0xA

Examples:

XB_01_00_COM_12_E2004000840F020012909375_USR_ASC_00032_0008_PLANT-A1<CR/LF>	Command without ticket number and with separators
XB0100COM12E2004000840F020012909375USRASC000320008PLANT-A1<CR/LF>	Command without ticket number and without separators
1107_0076_XB_01_00_COM_12_E2004000840F020012909375_USR_ASC_00032_0008_PLANT-A1<CR/LF>	Command with ticket number and separators
11070064XB0100COM12E2004000840F020012909375USRASC000320008PLANT-A1<CR/LF>	Command with ticket number and without separators

Example of the command:

Command	Response	Remark
XB_01_USR_ASC_00032_0008<CR/LF>	XB_01_00_000_00_000_000_00000_0000<CR/LF>	First response
-	XB_01_00_COM_12_E200...9375_USR_ASC_00032_0008_PLANT-A1<CR/LF>	ID tag 1 detected
-	XB_01_00_GOI_12_E200...9375_000_000_00000_0000<CR/LF>	ID tag 1 non more detected
-	XB_01_00_COM_12_E200...5A5F_USR_ASC_00032_0008_Wheel-72<CR/LF>	ID tag 2 detected
-	XB_01_00_COM_12_E200...2A9E_USR_ASC_00032_0008_Gear-743<CR/LF>	ID tag 3 detected

13.4.22 Write User memory of the UHF ID tag selective

This command is supported in the channel mode "RWH".

With this command the host can write to the selected UHF memory bank.



During the write process, the data is automatically checked by a read operation for correct writing to the ID tag. It is therefore no longer necessary to read back the written data again.

Host command:

Character no	Content	Note
01..02	WF	Command code "Write selective to the detected ID tag" of the Read-/Write head
03	—	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	—	Separator
07..09	USR	Memory bank to write: [USR]
10	—	Separator
11..12	12	EPC data length [bytes] [01..32]
13	—	Separator
14..37	E200...9375	EPC data of the ID tag to write [byte] 2 character per Byte
38	—	Separator
39..41	ASC	Write mode [ASC]: Write data in ASCII format [HEX]: Write data in HEX format. Per HEX value 2 characters are transmitted. Example for text "Hello world": ASC="Hello world" HEX="48656C6C6F20776F726C64"
42	—	Separator
43..47	00032	Data address offset [bytes]
48	—	Separator
49..52	0008	Data length to write Mode ASC: Number of ASCII characters, e.g., "PLANT-A1" -> 8 characters Mode HEX: Number of bytes, e.g., "48 65" -> 2 bytes
53	—	Separator
54..61	PLANT-A1	Data to write to the memory bank
62..63	<CR/LF>	End of line characters 0xD,0xA

Examples:

WF_01_USR_12_E2004000840F020012909375_ASC_00032_0008_PLANT-A1<CR/LF>	Command without ticket number and with separators
WF01USR12E2004000840F020012909375ASC000320008PLANT-A1<CR/LF>	Command without ticket number and without separators
1107_0073_WF_01_USR_12_E2004000840F020012909375_ASC_00032_0008_PLANT-A1<CR/LF>	Command with ticket number and separators
11070063WF01USR12E2004000840F020012909375ASC000320008PLANT-A1<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	WF	Response code "Write selective to the detected ID tag" of the Read-/Write head
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 .. 0X]
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..12	USR	Memory bank written
13	—	Separator
14..15	12	EPC data length [bytes] [01..32]
16	—	Separator
17..40	E200...9375	EPC data of the ID tag written [byte] 2 character per Byte
41	—	Separator
42..44	ASC	[ASC]: Data written in ASCII format [HEX]: Data written in HEX format. Per HEX value 2 characters are transmitted.
45	—	Separator
46..50	00032	Data address offset [bytes]
51	—	Separator
52..55	0008	Data length written Mode ASC: Number of ASCII characters, e.g., "PLANT-A1" -> 8 characters Mode HEX: Number of bytes, e.g., "48 65" -> 2 bytes
56	—	Separator
57..64	PLANT-A1	Data written Note, that this data is not read back from the memory bank.
65..66	<CR/LF>	End of line characters 0xD,0xA

Examples:

WF_01_00_USR_12_E2004000840F020012909375_ASC_00032_0008_PLANT-A1<CR/LF>	Command without ticket number and with separators
WF0100USR12E2004000840F020012909375ASC000320008PLANT-A1<CR/LF>	Command without ticket number and without separators
1107_0076_WF_01_00_USR_12_E2004000840F020012909375_ASC_00032_0008_PLANT-A1<CR/LF>	Command with ticket number and separators
11070065WF0100USR12E2004000840F020012909375ASC000320008PLANT-A1<CR/LF>	Command with ticket number and without separators

13.4.23 Set Read-/Write head access password of the UHF ID tags

This command is supported in channel mode "RWH".



The settings of this values are stored nonvolatile.

The Read-/Write head access password is used to get write access to memory banks of the ID tags which are write protected by password.

If the Read-/Write head access password does not match the password of the write protected ID tags, data can't be written on the memory bank "EPC" and "USER".

Dependent on the combination of "Read-/Write head password" matches "ID tag password" the Memory banks has full access or none.

ID tag lock state ⁽¹⁾	Read-/Write head password ⁽²⁾	ID tag password ⁽²⁾	Memory bank read	Memory bank write
UNLOCKED	NO SET	NO SET	Full access	Full access
UNLOCKED	NO SET	SET	No access	No access
UNLOCKED	SET	NO SET	Full access	Full access
UNLOCKED	SET	Identical to „Read-/Write head password“	Full access	Full access
LOCKED	NO SET	Don't care	- ⁽³⁾	- ⁽³⁾
LOCKED	SET	NO SET	Full access	No access
LOCKED	SET	Identical to „Read-/Write head password“	Full access	Full access

⁽¹⁾ Numeric ID tag lock state

ID tag lock state	Numeric value	ID tag LOCK behavior	Remark
UNLOCKED	0x0001	UNLOCKED	State changeable
LOCKED	0x0003	LOCKED	State changeable

⁽²⁾ Numeric values passwords

Password	Numeric value
NO SET	0x00000000
SET	0x00000001 ... 0xFFFFFFFF

⁽³⁾ ID tag not visible for the device.

Host command:

Character no.	Content	Note
01...02	DA	Command code "Set Read-/Write head access password of the ID tags"
03	_	Separator. For this command it must be set to "underscore" = 0x5F
04...05	00	Number of the IO channel of the Read-/Write head
06	_	Separator
07...14	00	Read-/Write head access password [Hex value] ⁽¹⁾ 2 words, 8 characters fix length
15...16	<CR/LF>	End of line characters 0xD,0xA

⁽¹⁾ The default Read-/Write head access password of the UHF ID tags is "00000000".

Examples:

DA_01_01020304<CR/LF>	Command without ticket number and with separators
DA0101020304<CR/LF>	Command without ticket number and without separators
1107_0026_DA_01_01020304<CR/LF>	Command with ticket number and separators
11070022DA0101020304<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	DA	Response code "Set access password of the ID tags"
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head
06	—	Separator
07..08	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..17	01020304	[Hex value] 2 words, 8 characters fix length
18..19	<CR/LF>	End of line characters 0xD,0xA

Examples:

DA_01_00_01020304<CR/LF>	Command without ticket number and with separators
DA010001020304<CR/LF>	Command without ticket number and without separators
1107_0029_DA_01_00_01020304<CR/LF>	Command with ticket number and separators
11070024DA010001020304<CR/LF>	Command with ticket number and without separators

13.4.24 Set write protection password of the UHF ID tag

This command is supported in the channel mode "RWH".

The write protection password of the ID tag is used to protect the memory banks of the ID tag against overwriting.



If the write protection password of the ID tag does not match the Read-/Write head access password of the ID tags, data cannot be read or written on the memory bank "RESERVED", memory banks "EPC" and "USER" can only be read. "TID" memory can in general only be read, regardless of the setting of the write protection password of ID tag. Additionally, the lock and permalock operation of the ID tag is blocked.

Host command:

Character no	Content	Note
01..02	IA	Command code "Set write protection password of the UHF ID tag"
03	—	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	—	Separator
07..014	01020304	Write protection password of the UHF ID tag (1) [Hex value] 2 words, 8 characters fix length
15	—	Separator
16..17	12	EPC data length [bytes] [01.. 32]
18	—	Separator
19..42	E2004000840F020012909375	EPC data [byte] 2 character per Byte
43..44	<CR/LF>	End of line characters 0xD,0xA

(1) The default write protection password of the UHF ID tag is "00000000", which means that the password is not set. Any other value will activate the password protection.

Examples:

IA_01_01020304_12_E2004000840F020012909375<CR/LF>	Command without ticket number and with separators
IA010102030412E2004000840F020012909375<CR/LF>	Command without ticket number and without separators
1107_0054_IA_01_01020304_12_E2004000840F020012909375<CR/LF>	Command with ticket number and separators
11070048IA010102030412E2004000840F020012909375<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	IA	Command response "Set write protection password of the UHF ID tag" of the Read-/Write head
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .04]
06	—	Separator
07..08	00	[00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..17	01020304	Write protection password of the UHF ID tag [Hex value] 2 words, 8 characters fix length
18	—	Separator
19..20	12	EPC data length [bytes] [00, 01..32] (1)
21	—	Separator
22..45	E2004000840F020012909375	EPC data [byte] 2 character per Byte
46..47	<CR/LF>	End of line characters 0xD,0xA

⁽¹⁾ Response in case of an error, if the write protection password of the UHF ID tag could not be set:
IA_01_01_00000000_00<CR><LF>

Examples:

IA_01_00_01020304_12_E2004000840F020012909375<CR/LF>	Command without ticket number and with separators
IA01000102030412E2004000840F020012909375<CR/LF>	Command without ticket number and without separators
1107_0057_IA_01_00_01020304_12_E2004000840F020012909375<CR/LF>	Command with ticket number and separators
11070050IA01000102030412E2004000840F020012909375<CR/LF>	Command with ticket number and without separators

13.4.25 Set lock state of the memory banks of the UHF ID tag

This command is supported in the channel mode "RWH".

With this command the memory bank of the ID tags can be locked or unlocked, whereby the lock state can be set to "permanent" or "non-permanent".

In case of state "permanent lock", the lock state of the memory bank can never be changed again.

Host command:

Character no	Content	Note
01..02	SO	Command code "Set lock state of the memory bank" of the Read-/Write head
03	_	Separator. Must be same as defined with command CU, field "Separator setup"
04..05	01	Number of the IO channel of the Read-/Write head [01 . .0X]
06	_	Separator
07..09	USR	Memory bank to lock: [EPC]: EPC memory bank of the ID tag [USR]: User memory bank of the ID tag
10	_	Separator
11..12	01	ID tag lock state: [01] = Unlocked (Unlock memory bank volatile) [03] = Locked (Lock memory bank volatile)
13	_	Separator
14..15	12	EPC data length [bytes] [01.. 32]
16	_	Separator
17..40	E200...9375	EPC data [byte] 2 character per Byte
41..42	<CR/LF>	End of line characters 0xD,0xA

Examples:

SO_01_USR_01_12_E2004000840F020012909375<CR/LF>	Command without ticket number and with separators
SO01USR0112E2004000840F020012909375<CR/LF>	Command without ticket number and without separators
1107_0052_SO_01_USR_01_12_E2004000840F020012909375<CR/LF>	Command with ticket number and separators
11070045SO01USR0112E2004000840F020012909375<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	SO	Command response "Set lock state of the memory bank" of the Read-/Write head
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	01	Number of the IO channel of the Read-/Write head [01 .. 0X]
06	—	Separator
07..08	00	[00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
09	—	Separator
10..12	USR	Memory bank locked: [000]: Error on command execution [EPC]: EPC memory bank of the ID tag [USR]: User memory bank of the ID tag
13	—	Separator
14..15	00	ID tag lock state: [00] = Error on command execution [01] = Unlocked (Unlock memory bank volatile) or Error on command execution [02] = Perma-unlocked (Unlock memory volatile) [03] = Locked (Lock memory bank volatile) [0X] = Perma-locked (Lock memory bank nonvolatile)
16	—	Separator
17..18	12	EPC data length [bytes] [00, 01..32] (1)
19	—	Separator
20..43	E200...9375	EPC data [byte] 2 character per Byte
44..45	<CR/LF>	End of line characters 0xD,0xA

⁽¹⁾ Response in case of an error, if the memory bank lock state of the ID tag cannot be changed:
SO_01_01_000_00_00<CR><LF>

Examples:

SO_01_USR_01_12_E2004000840F020012909375<CR/LF>	Command without ticket number and with separators
SO01USR0112E2004000840F020012909375<CR/LF>	Command without ticket number and without separators
1107_0052_SO_01_USR_01_12_E2004000840F020012909375<CR/LF>	Command with ticket number and separators
11070045SO01USR0112E2004000840F020012909375<CR/LF>	Command with ticket number and without separators

13.4.26 Restart device

This command is supported in all channel modes.

With this command the device can be restarted remotely.

Host command:

Character no.	Content	Note
01..02	DR	Command code "Device Restart"
03..04	<CR/LF>	End of line characters 0xD,0xA



After the device confirmed the reception of this command a restart cycle is executed. The boot up phase is similar to a power restart.

Examples:

DR<CR/LF>	Command without ticket number and with separators
DR<CR/LF>	Command without ticket number and separators
1107_0014_DR<CR/LF>	Command with ticket number and separators
11070012DR<CR/LF>	Command with ticket number and without separators

Response of the device:

Character no	Content	Note
01..02	DR	Response code of the command "Device restart"
03	—	Separator. Is identical to the character defined in the command CU, field "separator set-up"
04..05	00	Diagnostic information [00] = no diagnostic information [01] = diagnostic information available. It can be read with the command "DI"
06..07	<CR/LF>	End of line characters 0xD,0xA

Examples:

DR_00<CR/LF>	Response without ticket number and with separators
DR00<CR/LF>	Response without ticket number and separators
1107_0017_DR_00<CR/LF>	Response with ticket number and separators
11070014DR00<CR/LF>	Response with ticket number and without separators

14 Error codes of the device

Errors are signaled with the byte “Diag” set to “01” within the command response of the Ident unit.
The error code itself can be read out with the command “DI” → [Read diagnostic information of the device](#)

Example:

Command response of the Ident unit for command “DI”

DI_01_01_01_01_F4FE9000<CR/LF>

14.1 Error group ID tag (F1FE)

Error group	Error Code	Description
ID Tag	F1FE0200	ID tag presence error or R/W head communication error with the ID tag
ID Tag	F1FE0300	Address or command does not fit the ID tag characteristics, memory size invalid
ID Tag	F1FE0400	ID tag is defective, replace ID tag or battery
ID Tag	F1FE0500	ID tag memory overflow. EPC > 16 bytes
ID Tag	F1FE0900	Command not supported by the ID tag
ID Tag	F1FE0A00	Access violation e.g., block locked. Refer to ISO18000-x
ID Tag	F1FE0B00	General ID tag error which is not specified in detail
ID Tag	F1FE0C00	Unknown internal error

14.2 Error group Device (F4FE)

Error group	Error Code	Description
Device	F4FE0100	Power supply failure
Ident Unit	F4FE0200	Hardware failure, short circuit and overload
Device	F4FE0201	Allowed temperature exceeded
Device	F4FE0300	Read-/Write head not operating cause time out occurred
Device	F4FE0400	Command buffer overflow IO-Server Queue (Internal error)
Device	F4FE0500	Data buffer overflow, memory allocation (Internal error)
Device	F4FE0600	Command in this mode not supported (Internal error)
Device	F4FE8100	ID-Link Master inactive. e.g., after power (Internal error)
Device	F4FE8200	Internal IO-Port server error (Internal error)
Device	F4FE8300	IO-Port invalid parameter Internal error, e.g., channel (Internal error)
Device	F4FE8400	Vendor specific error on PUT
Device	F4FE8500	IO-Port server reset channel
Device	F4FE8600	Data not available for delayed C/Q inputs or delayed EPC (Internal error)
Device	F4FE8700	IO-Port channel reconfiguration not allowed yet (internal error)
Device	F4FE8800	IO-Port parameter selector flag not set (internal error)
Device	F4FE8900	General error detected from ID-Link Master
Device	F4FE8A00	CRC error detected from ID-Link Master
Device	F4FE8B00	Object not found detected from ID-Link Master
Device	F4FE8C00	Data Read-/Write size within command not valid
Device	F4FE8D00	IO-Port channel is reconfigured
Device	F4FE8E00	Read-/Write head could not process command e.g., Read-/Write length exceeded, ID tag memory error, write to locked block
Device	F4FE8F00	ID tag data length exceed (Block size * Block number)

Device	F4FE9001	Short circuit at output driver detected
Device	F4FE9002	Under voltage at output driver detected
Device	F4FE9003	Overload at output driver detected
Device	F4FE9004	Over temperature at output driver detected
Device	F4FE9005	Line break to Read-/Write head
Device	F4FE9006	Upper limit reached at output driver
Device	F4FE9007	Under voltage at C/Qo detected
Device	F4FE9008	Read-/Write head failure detected
Device	F4FE9009	Read-/Write head communication error
Device	F4FE900A	I ² C communication error (Internal error)
Device	F4FE900B	I ² C communication parity error (Internal error)
Device	F4FE900C	Command rejected cause antenna field switched off
Device	F4FE900D	Internal data of PROFNET stack corrupt (Internal error)
Device	F4FE900E	R/W head do not support this object
Device	F4FE9401	Frontend Error detected by Read-/Write head
Device	F4FE9402	General error detected by Read-/Write head
Device	F4FE9403	ID-Link Error detected by Read-/Write head
Device	F4FE9404	Buffer overrun Error detected by Read-/Write head
Device	F4FE9405	Over temperature at front end detected
Device	F4FE9406	R/W head error detect reverse power to high
Device	F4FE9407	Reset of R/W head detected
Device	F4FE9408	R/W head HAL error detected
Device	F4FEA000	Invalid command code detected
Device	F4FEA001	Invalid command parameter detected
Device	F4FEA002	Invalid command data detected
Device	F4FEA003	Ticket number or ticket length detected

Error group	Error Code	Description
Device	F4FEA100	Configuration of device failed (CR1 / CR2)
Device	F4FEA200	Configuration of IO-channel failed (Internal error)
Device	F4FEA300	Reading of Inputs C/Qi / IQ (Internal error)
Device	F4FEA400	Write of output C/Qo failed (Internal error)
Device	F4FEA500	Setting of high current failed (Internal error)
Device	F4FEA600	Read of EPC failed (Internal error)
Device	F4FEA700	Read of User data memory of the ID tag failed (Internal error)
Device	F4FEA800	Write to user memory of the ID tag failed, command WU (Internal error)
Device	F4FEA900	Write to user memory of the ID tag failed, command WV (Internal error)
Device	F4FEAA00	Verification of the user memory of the ID tag failed, commands "WV" (Internal error)
Device	F4FEAB00	Setting of Antenna field on/off failed, command "AN"
Device	F4FEAC00	ID-Link master could not read the ID tag blocks (Internal error)
Device	F4FEAD00	Block size/number of blocks could not be read from the ID tag

Error group	Error Code	Description
Device	F4FED100 ... F4FEFF00	Internal command execution failure

14.3 Error group Communication User – Device (F5FE)

Error group	Error Code	Description
-------------	------------	-------------

Communication User - Device	F5FE0800	Command from another user being processed (indicated by device)
Communication User - Device	F5FE8000	More than one command requested by User (DR,WR,Diag)
Communication User - Device	F5FE8100	Synchronous read or write command is tried to abort
Communication User - Device	F5FE8300	Asynchronous read command parameter invalid
Communication User - Device	F5FE8400	Invalid command request in module RWH_CMD detected
Communication User - Device	F5FE8500	Module size too short to execute commands

14.4 Error group Command error – Device (F6FE)

Error group	Error Code	Description
Communication User - Device	F6FE0300	Invalid command parameter (e.g., data range) (indicated by device)

15 Glossary

Definition	Remark
Adaptor	Participant of an Ethernet network, listening to an Ethernet host.
Antenna	RFID antenna.
Asynchronously	Data of the command response is updated after the device detects a state change of the ID tag from "not present" to "present" or vice versa.
Block size	Size of one block of the ID tag, for UHF ID tags always 2 bytes.
Compact device	RFID Identification unit with integrated Read-Write head. e.g., DTE8x1, DTE8x4, ...
Connection	Describes the logical connection between two objects, e.g., Controller and slave.
Controller	See definition PLC.
Data hold time	Minimum time between a notification is send from the device to the host. Mainly used with "Receive" commands to reduce the TCP/IP data traffic.
Event	Events can occur in several ways: COMing event: An ID tag or a signal change from L-> H level on the I/O is newly detected. UPD ate event: An event that has already been signaled is repeated. GOI ng event: An ID tag is no longer recognized within a period of time or a signal change from H-> L level is detected.
Emergency system	Web server with reduced functionality to download the firmware of the device.
EPC	E lectronic P roduct C ode.
Ethernet host	Controller of the device, e.g., personal computer, notebook ...
ETSI	E uropean T elecommunications S tandards I nstitute.
FCC	F ederal C ommunications C ommission. Responsible for standardization of Information and Communication in North America.
Hexadecimal	Numeral format, which use 16 values to represent a numeric value. 0...9, A, B, C, D, E, F
ID tag, transponder	RFID ID tag, e.g., E80393, E80409, ...
LDI	L ist of D etected I D tags. A list in which all ID tags are collected that were recognized at least once within the LDI timeout period.
Memory bank	The memory of the UHF ID is separated into 4 memory banks. EPC = Contain EPC data. Read-/write access. TID = Contain TID data. Read access only. User = Contain User data. Read-/write access. Reserved = Access and kill password data. Read-/write access.
N	Selected module size N of the IO-channel.
PC	P ersonal C omputer, e.g., desktop computer, notebook.
PermData	P ermanent D ata Nonvolatile data area of the device for storage of user specific settings, like fieldbus parameter, address settings and so on.
PLC	P rogrammable L ogic C ontroller. e.g., Allen Bradley Compact Logix, Beckhoff CX5020, Siemens CPU 315-2 DP/PN.
Process data input image	Data area where the PLC can read the outputs of the external periphery devices. (%IBx)
Process data output image	Data area where the PLC can write to the inputs of the external periphery devices. (%QBx)

Receive command	A command which initiates a process on the device to send notifications to the host without any request.
Read-/Write head	RFID Read-/Write head. In Compact devices already integrated.
RSSI	Receive Signal Strength Indicator. Reflect the received signal quality of the ID tag. Higher values mean a better reception of the ID tag signal.
Synchronously	Data of the command response is updated immediately with the currently detected state of the ID tag.
TID	T ransponder I dentifier. Unique number of the UHF ID tag, read only.
UHF	U ltra- H igh F requency. Frequency range 300MHz 3GHz ETSI range: 865 ... 868 MHz FCC range: 902 ... 928 MHz
User data	Data area of the ID tag which can be read and written randomly.
Web client	PC program to send "http protocol" requests, e.g., Firefox, Internet Explorer.
Web server	Built in "http protocol" server to service request from a PC.

Reference:

- [1] EPC™ Radio-Frequency Identity Protocols Generation-2 UHF RFID, Specification for RFID Air Interface Protocol for Communications at 860 MHz – 960 MHz Version 2.0.0 Ratified