

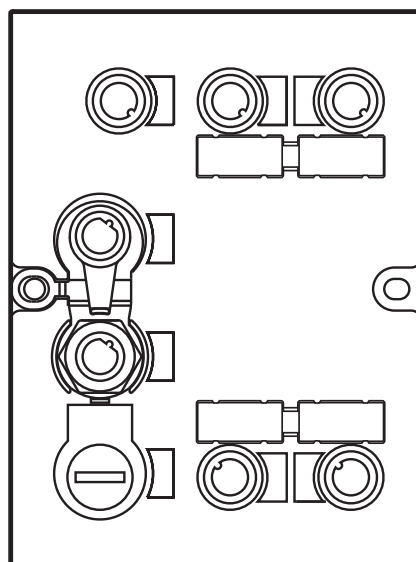


Device Manual
RFID evaluation unit

DTE101

UK

706407 / 01 09 / 2016



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1 Preliminary note

1.1 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

2 Safety instructions

Please read the operating instructions prior to set-up 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

3 Functions and features

The RFID evaluation unit integrates a Profinet IO interface and 4 channels for the connection of field devices. Each channel can be used either for the connection of an R/W head or as input/output to IEC 61131.

The device

- controls the data exchange to the R/W heads or the sensor/actuator level.
- communicates with the higher-level control level via Profinet IO.
- 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

3.1 Ethernet interface

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

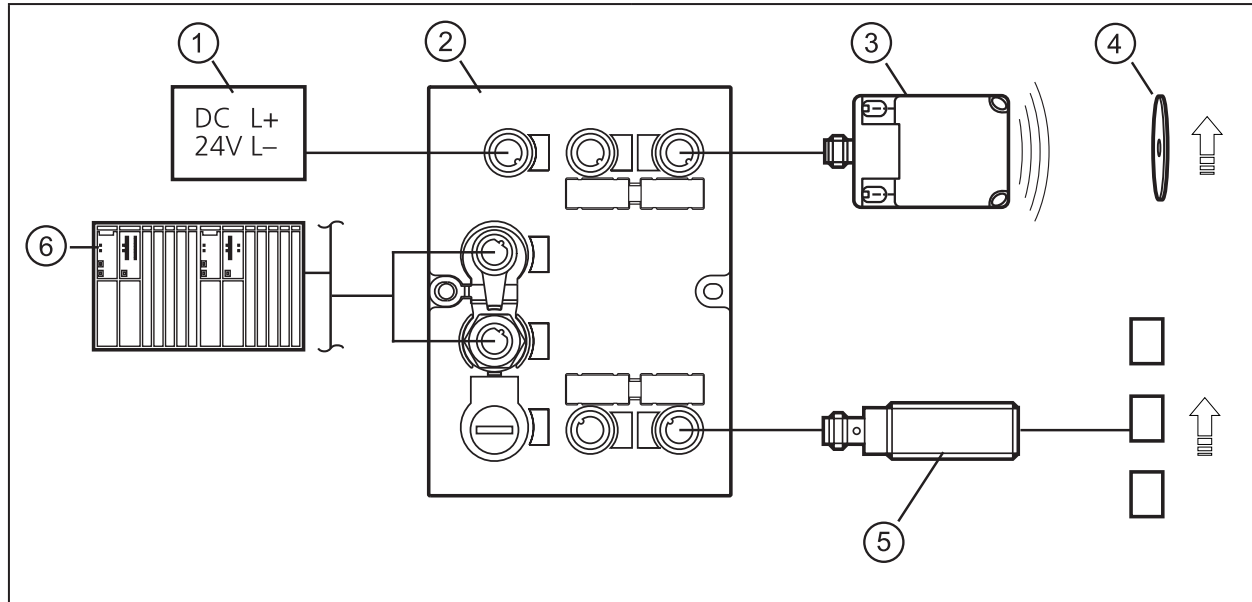
3.2 Functions for commissioning

Via the integrated web server it is possible to

- read the UID of the tag
- read the User data area of the tag
- write to the User data area of the tag
- read the input of the IO channels

- write to the output of the IO channels
- read the device information of the evaluation unit
- read the device information of the connected R/W heads

4 Function

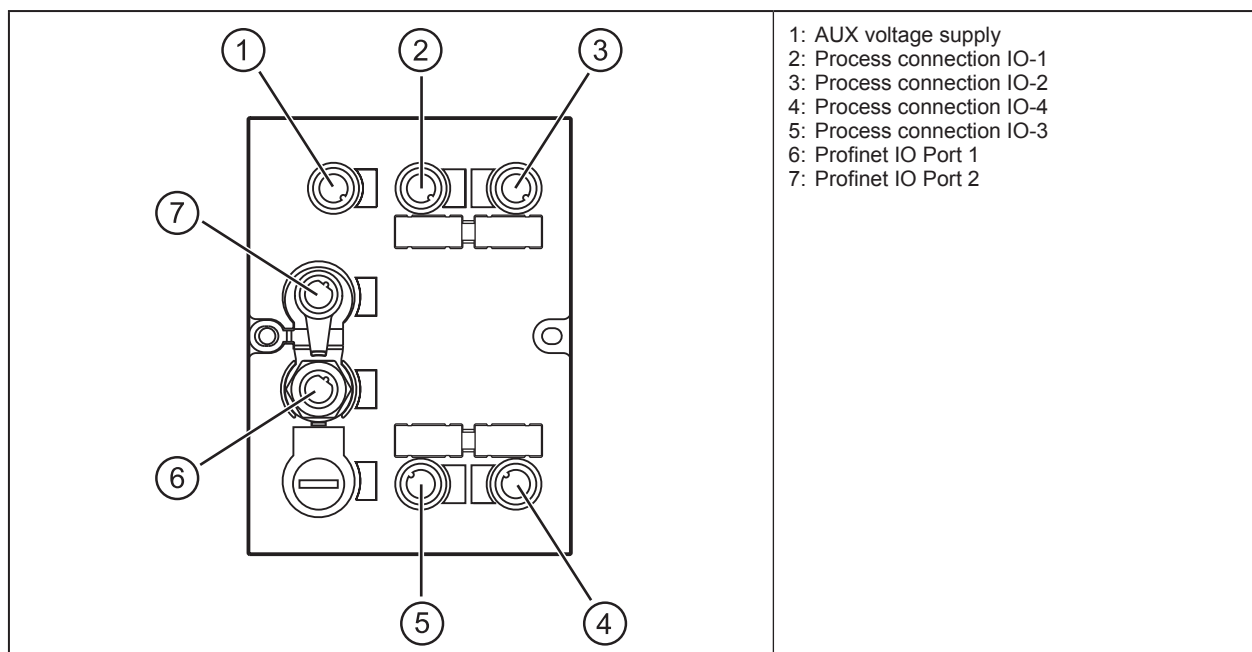


- | | |
|---|-----------------------|
| 1: Voltage supply | 5: Sensor |
| 2: RFID evaluation unit | 6: Profinet IO master |
| 3: Read/write head type ANT51x / ANT41x | |
| 4: tag | |

The RFID evaluation unit processes data from up to 4 RFID read/write heads (type ANT51x/ANT41x) or IEC 61131 inputs / outputs. The mode of operation for each port can be set individually via the Profinet IO master.

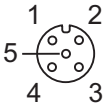
For further information about port configuration, see → 9 Configuration

4.1 Connection




4.1.1 "AUX" voltage supply

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

	Pin	Connection
	1	24 V DC
	2	not used
	3	0 V
	4	not used
	5	not used

4.1.2 Field bus connection Profinet IO Port 1 / Port 2

► Connect the device to a Profinet IO master using a suitable M12 Ethernet connection cable.

 <p>Note: screened connection cable required</p>	Pin	Connection
	1	TD+
	2	RD+
	3	TD-
	4	RD-

Factory setting of the Ethernet parameters

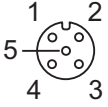
The following values are preset on delivery of the device:


Parameters	Factory setting
IP address	192.168.0.79
Gateway address	192.168.0.100
Subnet mask	255.255.255.0
Auto-negotiation	on
DHCP	off


The settings can be changed via the web server of the device or via the Profinet IO controller.

4.1.3 Process connections "IO-1 ... IO-4"

Each process connection can be used as input/output to IEC 61131 or for connection of an RFID read/write head type ANT51x/ANT41x.

	Pin	Connection
	1	L+
	2	switching input (I/Q)
	3	L-
	4	switching output (C/Qo) or input (C/Qi)
	5	not used

 The evaluation unit has to be disconnected before field units are connected.

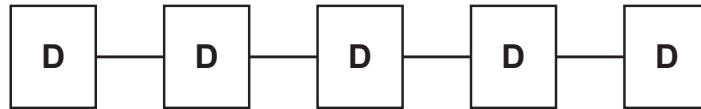
 Please note that the total current consumption of the device must not exceed the value of 3 A.

You can find information about the matching read/write heads on our website at:

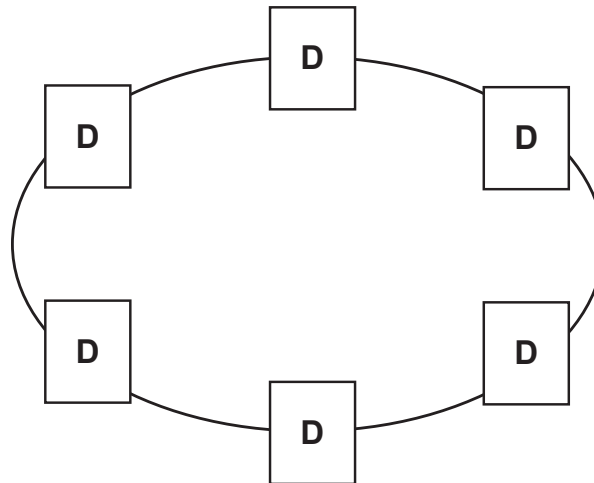
www.ifm.com → Data sheet search → e.g. ANT4 or ANT5

4.2 Allowed network infrastructures

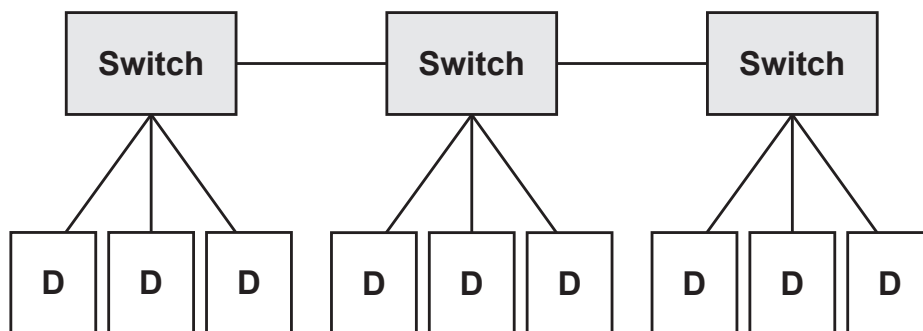
Linear structure:



Ring structure:



Star structure:



UK

5 Installation

You can find information about installation and electrical connection in the operating instructions for the unit at:

www.ifm.com → Data sheet search → DTE101 → Operating instructions

6 Operating and display elements

6.1 Reset to factory settings

The Ethernet parameters 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 1 and pin 3 on the process connection IO-3.
 - ▶ Connect the device with the voltage supply and wait until the yellow LED indication on AUX and IO-3 flashes at approx. 8 Hz.
 - ▶ Remove the conductive bridge from process connection IO-3.
 - ▶ Disconnect the device from the voltage supply and connect it again.
- > The settings are reset.

6.2 LED indicators

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

6.2.1 LED AUX

LED green	LED yellow	Status	Note
Off	Off	No voltage supply	$U_{AUX} < 5 \text{ V}$
On	Flashes at 2 Hz	Voltage supply too low	$5 \text{ V} \leq U_{AUX} \leq 18 \text{ V}$
On	Off	Voltage supply OK	$18 \text{ V} \leq U_{AUX} \leq 36 \text{ V}$

6.2.2 LED Profinet IO Port 1 / Port 2

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"

6.2.3 LED SF (module status)

LED red	LED green	Status	Note
Off	Off	No voltage supply	Check the voltage supply.
Off	Flashing	Node flash test	Flash test initiated by the Profinet IO controller.
Off	On	Operating mode	Connection to the Profinet IO controller was established and the device was configured correctly. Data transfer running.
Flashing	Off	IO channel error	An error at the IO channels was detected: - Overload - Overcurrent - Internal error. Restart the device. If the error still exists, return the device.
On	Off	Device error	Software error, hardware error of the device Restart the device. If the error still exists, return the device.
Flashing	Flashing	Self-test	Starting phase of the device

6.2.4 LED BF (network status)

LED red	LED green	Status	Note
Off	Off	No voltage supply	Check the voltage supply
Off	Flashing	Connection established, STOP mode	Profinet IO controller in STOP mode
Off	On	Connection established, RUN mode	Profinet IO controller in RUN mode
Flashing	Off	Connection established, invalid configuration of the device	Check the configuration of the device
On	Off	No connection to the Profinet IO controller	Check cabling of the device
Flashing	Flashing	Self-test	Starting phase of the device

UK

6.2.5 LEDs IO1 ... IO4

The LED indications of the process connections differ with each connection configuration.

Use as input to IEC 61131

LED green	LED yellow	Status	Note
Off	Off	Interface deactivated	Interface in Profinet IO controller not configured
On	Off	Interface activated, input on L level (0 V)	-
On	On	Interface activated, input on H level (24 V)	-
Flashes at 8 Hz	Flashes at 8 Hz	Overload or short circuit	-

Use as output to IEC 61131

LED green	LED yellow	Status	Note
Off	Off	Interface deactivated	Interface in Profinet IO controller not configured
On	Off	Interface activated, output L-active (0 V)	-
On	On	Interface activated, output H-active (24 V)	-
Flashes at 8 Hz	Flashes at 8 Hz	Overload or short circuit	-

Use with RFID read/write heads

LED green	LED yellow	Status	Note
Off	Off	Interface deactivated	Interface in Profinet IO controller not configured
Flashes at 2 Hz	Off	Interface activated, R/W head off	-
On	Off	Interface activated, tag not in the field	-
On	On	Interface activated, tag in the field	-
Flashes at 8 Hz	Flashes at 8 Hz	Overload, short-circuit or communication error	-

6.2.6 Special device- LED indications

LED	Status	Note
Green AUX LED on Yellow AUX LED flashes at 8 Hz Yellow IO1...IO4 LEDs flash 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.
Green AUX LED on Yellow AUX LED flashes at 8 Hz Green IO1...IO4 LEDs flash at 8 Hz Yellow IO1...IO4 LEDs flash at 8 Hz	Major error, device has to be returned.	Hardware fault or permanent data in the device are corrupt.
Green AUX LED on Yellow AUX LED flashes at 8 Hz Yellow IO3 LED flashes at 8 Hz	Reset to factory settings	-

7 Putting into operation

- ▶ Connect the device according to the operating instructions.
- > After connecting the operating voltage, the unit is ready for use.



The green power supply LEDs of the read/write heads will light up after enabling the corresponding module in the module configuration.

8 Web server

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

- configure the IP settings of the unit
- update the firmware
- setup and monitor the R/W heads, digital inputs and outputs

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 evaluation unit and the PC must be set to the same IP address range.

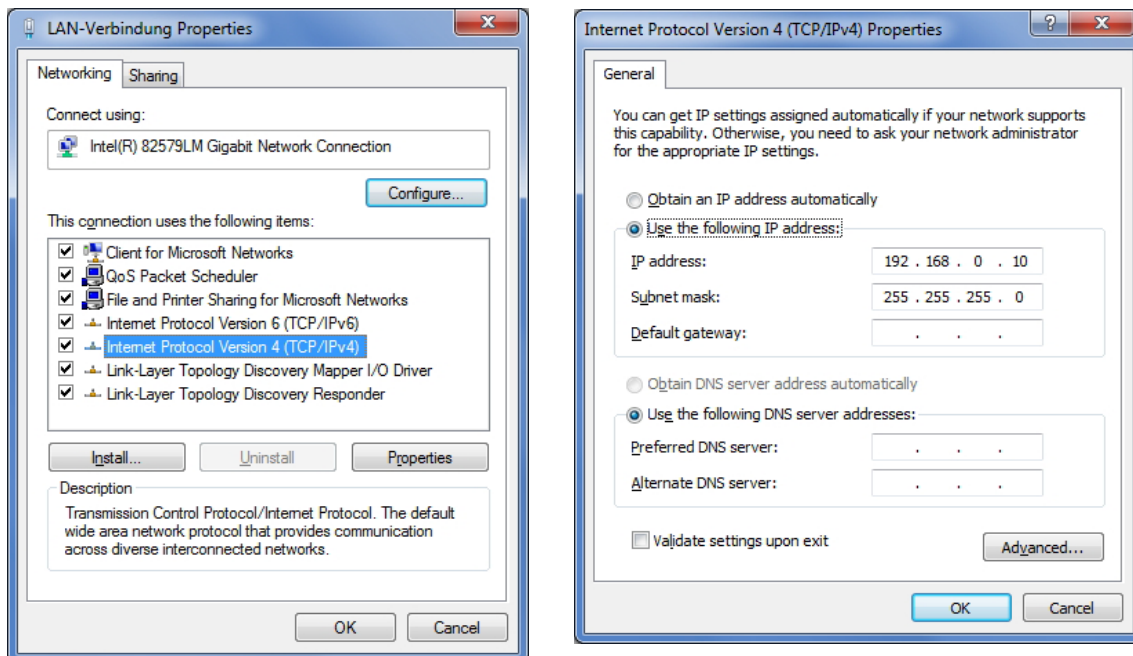
Default: 192.168.0.x (→ 8.1 Verify and set the IP address of the PC)

- ▶ Open the web browser on the PC and enter the IP address of the evaluation unit

Default: <http://192.168.0.79>

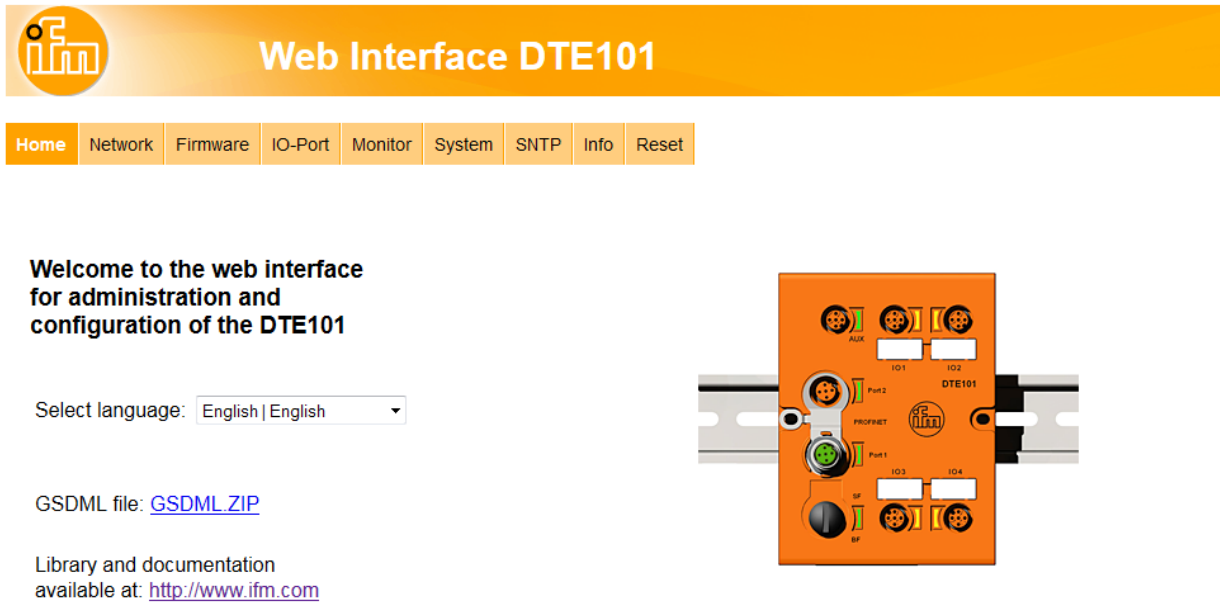
8.1 Verify and set the IP address of the PC

- ▶ 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.

8.2 Tab "Home"



Welcome to the web interface for administration and configuration of the DTE101

Select language:

GSDML file: [GSDML.ZIP](#)

Library and documentation available at: <http://www.ifm.com>

This is the main menu from where all functions of the evaluation unit can be accessed. Additionally the Profinet IO GSDML file of the RFID evaluation unit can be downloaded to configure the device within a PLC.

8.3 Tab "Network"



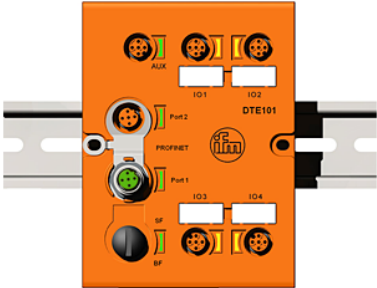
Web Interface DTE101

Home
Network
Firmware
IO-Port
Monitor
System
SNTP
Info
Reset

Network settings:

TCP/IP parameter	Current settings	New settings
IP address	192.168.0.79	<input type="text" value="."/> <input type="text" value="."/> <input type="text" value="."/> <input type="text" value="."/>
Subnet mask	255.255.255.0	<input type="text" value="."/> <input type="text" value="."/> <input type="text" value="."/> <input type="text" value="."/>
Default gateway	192.168.0.100	<input type="text" value="."/> <input type="text" value="."/> <input type="text" value="."/> <input type="text" value="."/>
Port 1 parameter		
Autonegotiation	on	
Port speed	Duplex 100MB	
Port 2 parameter		
Autonegotiation	on	
Port speed	Simplex 10MB	

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



Hardware information

Article: DTE101
 Hardware version: 5
 Firmware version: V1.1.12
 Serial number: 10431
 Production date: 2015-12-16 11:19
 MAC-address: 00:02:01:40:28:BF

UK

This menu allows to change various Ethernet interface settings of the evaluation unit.

Consult your network administrator which settings are necessary to integrate the device into the existing network.

If the evaluation unit is directly connected with the PC, a static IP address setting is recommended (→ 8.1 Verify and set the IP address of the PC).



The network address of the PC must reside within the address range of the evaluation unit.

Example:


PC Ethernet IP address: 192.168.0.10
 evaluation unit IP address: 192.168.0.79

Address settings marked in red must be the same if subnet mask of the evaluation unit is 255.255.255.0.



Be careful when setting the IP address of the evaluation unit. This address should not yet exist in the Profinet IO network.

8.4 Tab "Firmware"



Web Interface DTE101

Home Network Firmware IO-Port Monitor System SNTP Info Reset

Firmware

Firmware identification

Name	Number	Version	Date
DTE101 Firmware	11114744	V1.1.12	2016-08-30
Emergency System	-	1.0.0	-
Bootloader	-	1.3.7	-


Firmware update

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

Keine Datei ausgewählt

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!



Hardware information

Article: DTE101
Hardware version: 5
Firmware version: V1.1.12
Serial number: 10431
Production date: 2015-12-16 11:19
MAC-address: 00:02:01:40:28:BF

This menu allows to update the firmware of the evaluation unit.

- ▶ Open the "Firmware" tab on the browser interface.
- ▶ Choose firmware file DTE101.nxf and submit via button [transfer]



Do not interrupt power or disconnect cables from the system while the firmware transfer is in progress.

8.5 Tab "IO port"

Web Interface DTE101

Home
Network
Firmware
IO-Port
Monitor
System
Sntp
Info
Reset

IO-Port Configuration

Global	Current settings	New settings
Fail-safe	off	<input type="radio"/> on <input checked="" type="radio"/> off
IO-1		
Mode	Inactive	Inactive ▼
IO-2		
Mode	Inactive	Inactive ▼
IO-3		
Mode	Inactive	Inactive ▼
IO-4		
Mode	Inactive	Inactive ▼
		<input type="button" value="Activate and save"/> <input type="button" value="Cancel"/>

Hardware information

Article: DTE101
Hardware version: 5
Firmware version: V1.1.12
Serial number: 10431
Production date: 2015-12-16 11:19
MAC-address: 00:02:01:40:28:BF

UK

This menu allows to configure the IO ports of the evaluation unit.
Each IO channel can be configured to mode "Inactive", "Input", "Output" and "RWH".

Mode	Function
Inactive	No function, inactive
Input	IEC 61131 input
Output	IEC 61131 output
RWH	RFID read/write head (Type ANT4xx or ANT5xx)

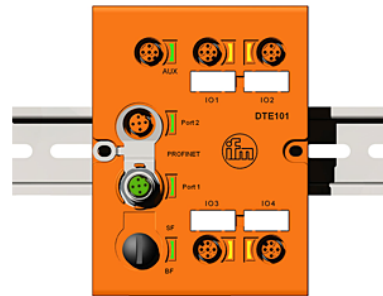


Web Interface DTE101

- Home
- Network
- Firmware
- IO-Port**
- Monitor
- System
- SNTP
- Info
- Reset

IO-Port Configuration

Global	Current settings	New settings
Fail-safe	off	<input type="radio"/> on <input checked="" type="radio"/> off
IO-1	Current settings	New settings
Mode	Inactive	RWH
Data hold time	0	0 ms
Overload detection	on	<input checked="" type="radio"/> on <input type="radio"/> off
Overcurrent detection	on	<input checked="" type="radio"/> on <input type="radio"/> off
Number of blocks	256	256 1...256
Block size	4	4 Byte
UID edge triggered reading	off	<input type="radio"/> on <input checked="" type="radio"/> off
IO-2	Current settings	New settings
Mode	Inactive	Input
Data hold time	0	0 ms
Overload detection	on	<input checked="" type="radio"/> on <input type="radio"/> off
IO-3	Current settings	New settings
Mode	Inactive	Output
Data hold time	0	0 ms
Overload detection	on	<input checked="" type="radio"/> on <input type="radio"/> off



Hardware information

Article:	DTE101
Hardware version:	5
Firmware version:	V1.1.12
Serial number:	10431
Production date:	2015-12-16 11:19
MAC-address:	00:02:01:40:28:BF

“Data hold time” define how long the RFID data are kept stable. This is helpful if the time interval, in which the RFID tag data are available, is shorter than the host can read these from the RFID unit.

“Number of blocks” define the number of blocks available on the ID tag.

“Block size” define the number of bytes per block available on the ID tag.



If the value "Block size" does not match the physically value of the ID tag, the read and write commands will fail.

“UID edge controlled” allow the reading of the UID of the ID tag once by setting bit "RD" from 0 to 1 in the process data output image of the controller. This mode is suitable if the user knows when the tag is present in front of the Read-/Write head. The read UID is kept in the data bytes 2...18 stable while bit RD is set to 1.

- ▶ Set “Overload detection” to “off” if the load on terminal “L+” is above 0,5 A.



The current is limited to 0,7 A by hardware.

- ▶ Set “Overcurrent detection” to “off” if load on terminal “C/Co” is above 0,5 A.



The current is limited to 0,6 A by hardware.

- ▶ Set "High Current" to “on” if the current on ports IO-3 and/or IO-4, terminal “C/Co”, shall be possible to 1 A.



The maximum power input shall not exceed 3,0 A, otherwise the device can be damaged.

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 evaluation unit and write a new IO-Port configuration the stored values are overwritten
Cancel	Discard changes	-

8.6 Tab "Monitor"

Web Interface DTE101

Home
Network
Firmware
IO-Port
Monitor
System
SNTP
Info
Reset

Port monitoring Fieldbus state:

IO-1 RWH

UID: E0:16:28:01:06:58:E9:71

IO-2 Input

Pin	Connection	Pin	Connection	State
1	L+	2	switching input (I/Q)	<input type="radio"/> 0
3	L-	4	switching input (C/Qi)	<input type="radio"/> 0

IO-3 Output

Pin	Connection	Pin	Connection	State
1	L+	2	switching input (I/Q)	<input type="radio"/> 0
3	L-	4	switching output (C/Qo)	<input type="checkbox"/> 0

IO-4 Inactive

Channel configured as inactive.

Hardware information

Article: DTE101

Hardware version: 5

Firmware version: V1.1.12

Serial number: 10431

Production date: 2015-12-16 11:19

MAC-address: 00:02:01:40:28:BF

UK

This menu shows the data of each port which is detected by the evaluation unit.

In this example the IO-1 port is configured as RFID read/write head, IO-2 port as input, IO-3 port as output and IO-4 port as inactive.

- ▶ Click to switch to submenu "Read/write head information".
- ▶ Click to switch to submenu "Tag monitoring - read and write".

8.6.1 Read/write head information

Web Interface DTE101

Home
Network
Firmware
IO-Port
Monitor
System
SNTP
Info
Reset

Read/write header information:

RWH	IO-1
Article number:	ANT411
Device type:	3
Hardware version:	1
Firmware version:	1 Update
IDLink SW:	5
Production date:	2013-02-22

Back

Hardware information

Article: DTE101
 Hardware version: 5
 Firmware version: V1.1.12
 Serial number: 10431
 Production date: 2015-12-16 11:19
 MAC-address: 00:02:01:40:28:BF

This menu shows the following information about the selected read/write head:

- Article number
- Device type
- Hardware version
- Firmware version
- ID link software
- Production date

Button	Function	Remark
Update	Go to menu "Antenna firmware"	-
Back	Return to the main menu	-

8.6.2 Antenna firmware

UK

This menu allows to update the firmware of the Read-/Write head connected at the selected port.

- ▶ Open the “Firmware” tab on the browser interface.
- ▶ Choose firmware file "xxx.afw" and submit via button [Transfer].



Do not interrupt power or disconnect cables from the system while the firmware transfer is in progress.

Button	Function	Remark
Browse	Open new dialog window to browse to the Read-/Write head firmware file	-
Transfer	Send antenna firmware to connected Read-/Write head	If the update process is finished the evaluation unit reboots the Read-/Write head automatically. A restart of the evaluation unit is not necessary.
Back	Return to the main menu.	-

If the firmware update fail or the Read-/Write head is not detected by the evaluation unit 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 evaluation unit [XXX.XXX.XXX.XXX]	IPV4 address
IO-CHANNEL	IO-Channel number [1..4]	-
ANTENNA_TYPE	Article number of the Read-/Write head [e.g. ANT512]	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=ANT513&fwVersion=01&setLng=en`



After finishing the firmware update of the Read-/Write head, enter the URL of the evaluation unit to return to the main menu (→ 8 Web server).

8.6.3 Tag monitoring

This menu allows to:

- read the UID from the tag
- read from or write to the User data area of the tag

8.6.4 Reading from the tag

Web Interface DTE101

Home Network Firmware IO-Port **Monitor** System SNTP Info Reset

Tag RWH IO-1

UID: E0:16:28:01:06:58:E9:71

Number of blocks: 32

Block size: 4 bytes

Read / Write Tag

Length: 20 bytes (1..240)

Offset: 0 bytes

Data format: HEX

Data: 4D4154455249414C3A2038303332333435333132


20 bytes

Back

Hardware information

Article: DTE101
Hardware version: 5
Firmware version: V1.1.12
Serial number: 10431
Production date: 2015-12-16 11:19
MAC-address: 00:02:01:40:28:BF

The UID 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 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 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“

8.6.5 Writing to the tag

The screenshot displays the 'Web Interface DTE101' with a navigation menu including Home, Network, Firmware, IO-Port, Monitor (selected), System, SNTP, Info, and Reset. The 'Tag RW' section shows the UID as E0:16:28:01:06:58:E9:71, 32 blocks, and a block size of 4 bytes. The 'Read / Write Tag' section is active, showing a length of 20 bytes, an offset of 0 bytes, and the data format set to ASCII. The data field contains 'MATERIAL: 8032345312'. A 'Back' button is visible at the bottom right of the interface. To the right, a photograph of the DTE101 hardware is shown, featuring various ports (AUX, IO1, IO2, IO3, IO4) and a 'PROFIBET' label. Below the hardware image, a 'Hardware information' box lists: Article: DTE101, Hardware version: 5, Firmware version: V1.1.12, Serial number: 10431, Production date: 2015-12-16 11:19, and MAC-address: 00:02:01:40:28:BF.

- ▶ Click  to write to the User data area of the tag.

The data length to be written can be set from 1...240 bytes. The address offset can be set from 0 bytes up to the last accessible address of the 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 tag data can be input in two formats:

- „HEX“ : Data input in hexadecimal format.
Example: „4D41544455249414C3A2038303332333435333132“
- „ASCII“: Data input as ASCII character string.
Example: „MATERIAL: 8032345312“



The parameter “Length” is automatically calculated.

8.7 Tab "System"

Web Interface DTE101

Home
Network
Firmware
IO-Port
Monitor
System
SNTP
Info
Reset

System settings

Password protection configuration

Parameter	Current settings	New settings
Password protection:	off	<input checked="" type="radio"/> on <input type="radio"/> off

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

Hardware information

Article: DTE101
 Hardware version: 5
 Firmware version: V1.1.12
 Serial number: 10431
 Production date: 2015-12-16 11:19
 MAC-address: 00:02:01:40:28:BF

UK


This menu allows to define a password to protect the evaluation unit against unauthorised 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"
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 (→ 6.1 Reset to factory settings).

8.8 Tab "SNTP"




Web Interface DTE101

Home Network Firmware IO-Port Monitor System SNTP Info Reset

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	<input checked="" type="radio"/> on <input type="radio"/> off
IP address from NTP server:	0.0.0.0	<input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="0"/> . <input type="text" value="210"/>
Offset to UTC:	UTC	UTC+1 CET ▾
State	not used	
Last sync	-	




Hardware information

Article: DTE101
Hardware version: 5
Firmware version: V1.1.12
Serial number: 10431
Production date: 2015-12-16 11:19
MAC-address: 00:02:01:40:28:BF

If an SNTP server is present in the Ethernet network, the internal clock of the evaluation unit can be synchronised with the external time server.

- ▶ Click [Submit] to transfer the settings to the evaluation unit.

8.9 Tab "Info"



Web Interface DTE101

Home Network Firmware IO-Port Monitor System SNTP Info Reset

Hardware:


Parameter	Value
Power supply state:	fully operable
Temperature:	44°C 111°F
System time:	02:50:23.945
System date:	2011-01-01

I&M1 parameters:

Parameter	Value
Tag location:	
Tag function:	

Production parameters:

Parameter	Value
Product article number:	DTE101AB
Production number:	2215063
Version PermData:	1



Hardware information

Article: DTE101
Hardware version: 5
Firmware version: V1.1.12
Serial number: 10431
Production date: 2015-12-16 11:19
MAC-address: 00:02:01:40:28:BF

UK

This menu shows the following information about the evaluation unit:

- Power supply state
- Temperature
- System time
- System date
- Production parameters



For a proper operation of the evaluation unit the "Power Supply State" should show as "fully operable".

8.10 Tab "Reset"



Web Interface DTE101

Home Network Firmware IO-Port Monitor System SNTP Info **Reset**

Device reset

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

Please confirm you want to reboot the device.



Hardware information

Article: DTE101
Hardware version: 5
Firmware version: V1.1.12
Serial number: 10431
Production date: 2015-12-16 11:19
MAC-address: 00:02:01:40:28:BF

This menu allows the user to reset the evaluation unit remotely.

If the device is reset, all connections are closed and the outputs are switched off.

- ▶ To reset the evaluation unit, check "Please confirm you want to reset the device".
- ▶ Click [Reset].

9 Configuration

9.1 Parameter setting of the evaluation unit

The following settings can be configured via the web server:

Function	Default value	Remark
DHCP function	off	See (1)
IP address	192.168.0.79	
Gateway address	192.168.0.100	
Subnet mask	255.255.255.0	
Autonegotiation	on	See (2)
Port speed	10 MBit/s, 100 MBit/s	See (2)
Duplex mode	Half duplex	See (2)

Table 1: Factory Settings of the Ethernet interface

- (1) If the device does not detect a DHCP server on the connected Ethernet network, the default address 192.168.0.79 is set. After rebooting the device, the DHCP function is disabled and the default address is active. It is also possible to disable the DHCP function and to set the default address by resetting the device to the factory settings (→ 6.1 Reset to factory settings).
- (2) If autonegotiation between the evaluation unit and the connected Ethernet node fails, the device is set to 10 MBit/s, half duplex.

9.2 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 top of the device above the AUX connector.




2. Scanning the MAC address with a data matrix code reader

The code is located on the type label and can be read with any data matrix code scanner.



3. Finding the MAC address via the integrated web server

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



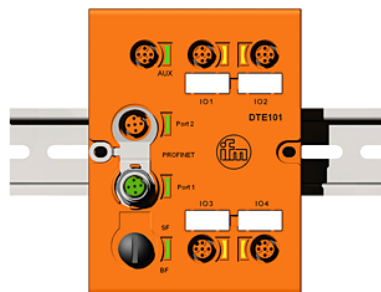
Web Interface DTE101

Home Network Firmware IO-Port Monitor System SNTP Info Reset

Network settings:

TCP/IP parameter	Current settings	New settings
IP address	192.168.0.79	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
Subnet mask	255.255.255.0	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
Default gateway	192.168.0.100	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
Port 1 parameter		
Autonegotiation	on	<input type="text"/>
Port speed	Duplex 100MB	<input type="text"/>
Port 2 parameter		
Autonegotiation	on	<input type="text"/>
Port speed	Simplex 10MB	<input type="text"/>

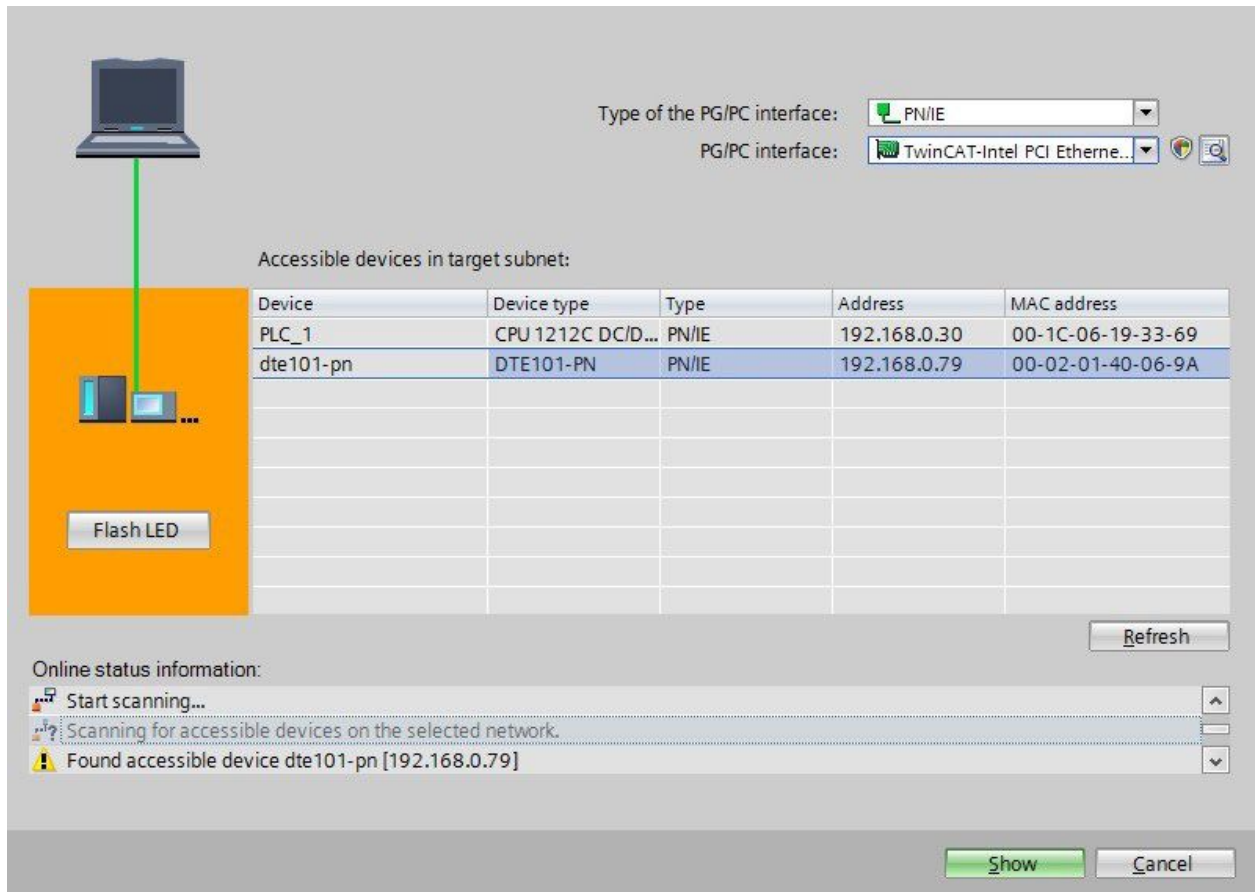
WARNING: Changing the IP parameters may cause a loss of connection.



Hardware information

Article: DTE101
Hardware version: 5
Firmware version: V1.1.12
Serial number: 10431
Production date: 2015-12-16 11:19
MAC-address: 00:02:01:40:28:BF

4. Reading the MAC address via the Profinet IO controller.



UK

The MAC address of the evaluation unit can be read from the Profinet IO controller of the PLC.

Example: Devices accessible via Siemens TIAPORTAL, i.e. 00 02 01 40 06 9A.

9.3 Connection concept of the Profinet IO interface

The device can be connected to two Ethernet lines, one for each of the connectors "Port 1" and "Port 2". The integrated Ethernet switch allows to build a line structure; an external switch is not required. The device only has one MAC address enabling the system to address the evaluation unit with a single IP address.

Both Ethernet ports have the same functionality, excluding software updates via the web server which are only possible via "Port 1".

Socket connection Port 1 and Port 2:

M12 Ethernet socket, D-coded

Signal	Name	Core colour	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

Table 2: Pin connection Ethernet interface



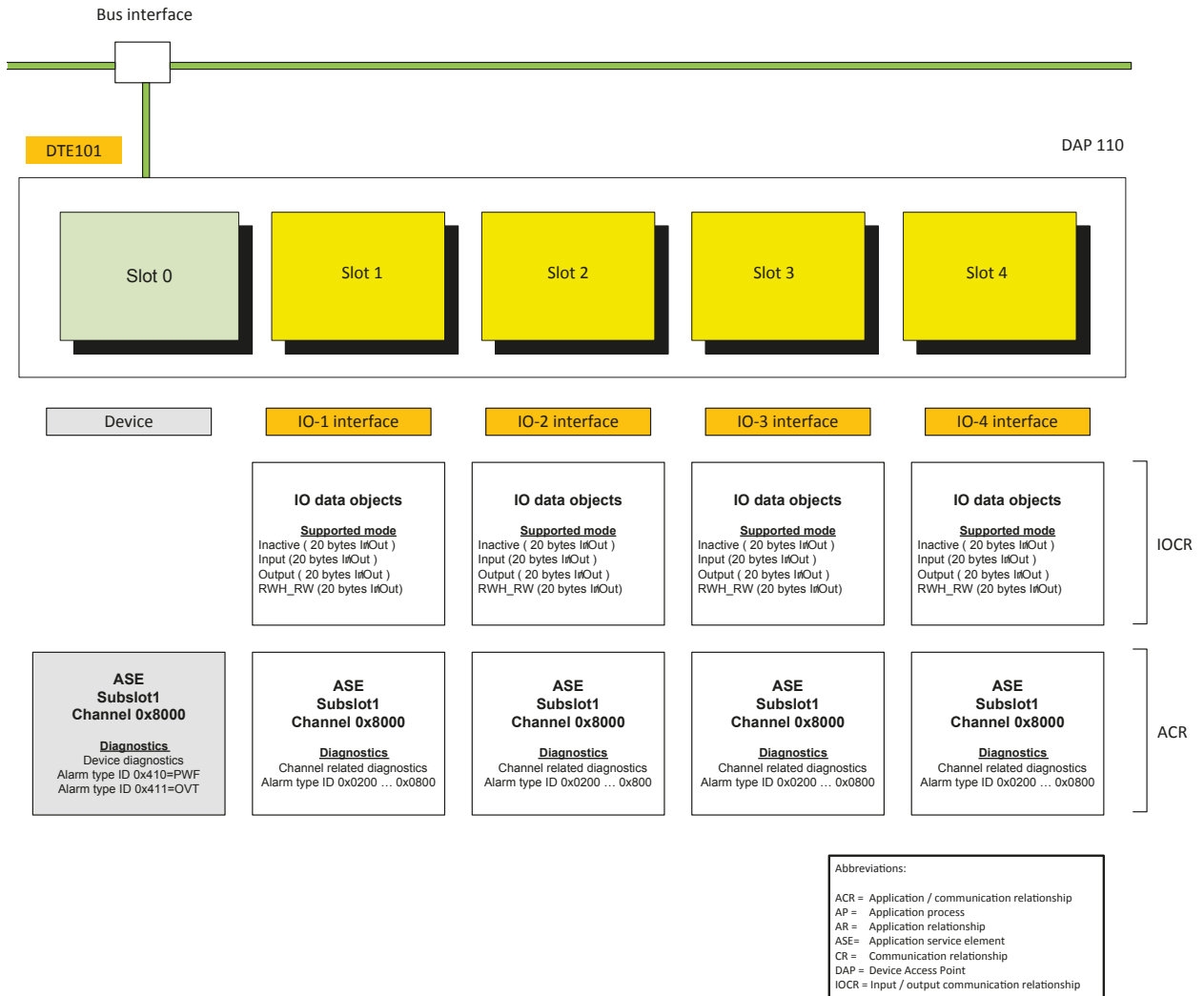
The colours refer to the standard T568B.

9.4 Profinet IO device profile

The device has no specific device profile.

10 PLC process data image

10.1 Address model of the RFID evaluation unit with Profinet IO



UK

10.1.1 Process data input image

Each IO channel occupies 20 bytes of the PLC process data input, regardless if it is activated or not. Total size is fixed to 80 bytes.

10.1.2 Process data output image

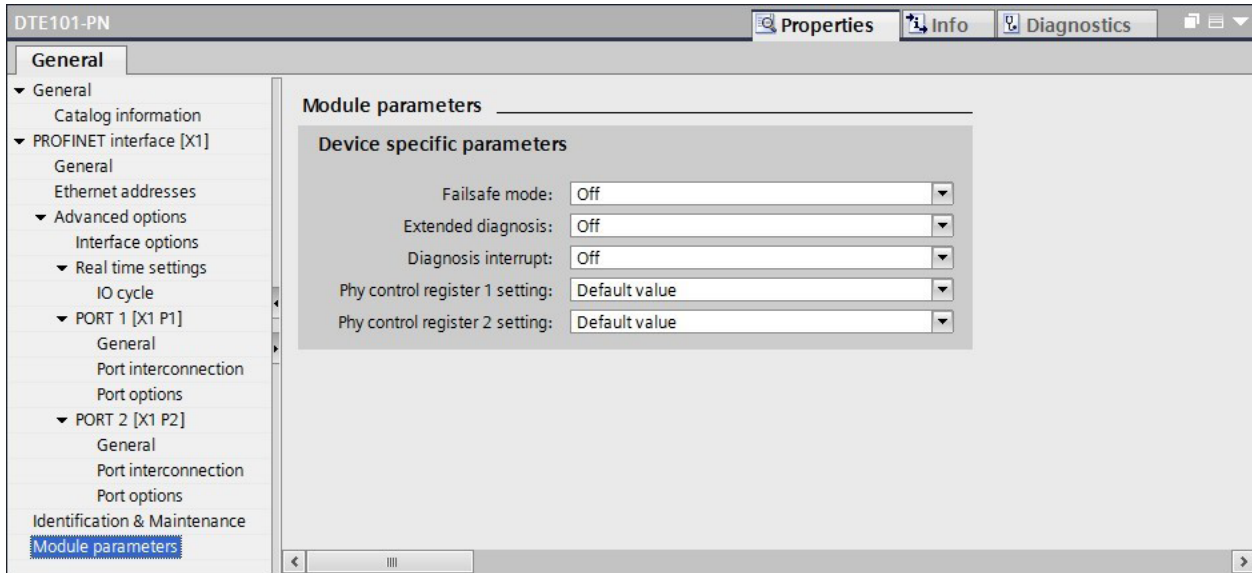
Each IO channel occupies 20 bytes of the PLC process data output, regardless if it is activated or not. Total size is fixed to 80 bytes.

11 Parameter setting

The parameters of the unit are set via the device view of the PLC with the integrated Profinet IO controller. The 4 IO channels of the RFID evaluation unit can be configured depending on the application.

11.1 Device parameters

The device-specific parameters can be set at Properties of the device.



11.1.1 Failsafe mode

Mode	Function
Failsafe mode = off	The IO channel is deactivated if no connection to the Profinet IO scanner is established (default).
Failsafe mode = on	The IO channels remain activated and the outputs keep the state received last if no connection to the Profinet IO scanner is established.

11.1.2 Extended diagnosis

Mode	Function
Extended diagnosis = off	Extended device diagnosis inactive. Only standard diagnostics is sent from the evaluation unit (default).
Extended diagnosis = on	Extended device diagnostics active.

11.1.3 Diagnosis interrupt

Mode	Function
Diagnosis interrupt = off	Only state message is sent (default).
Diagnosis interrupt = on	High priority diagnostics is sent from the evaluation unit.

11.1.4 Phy control register 1 and 2

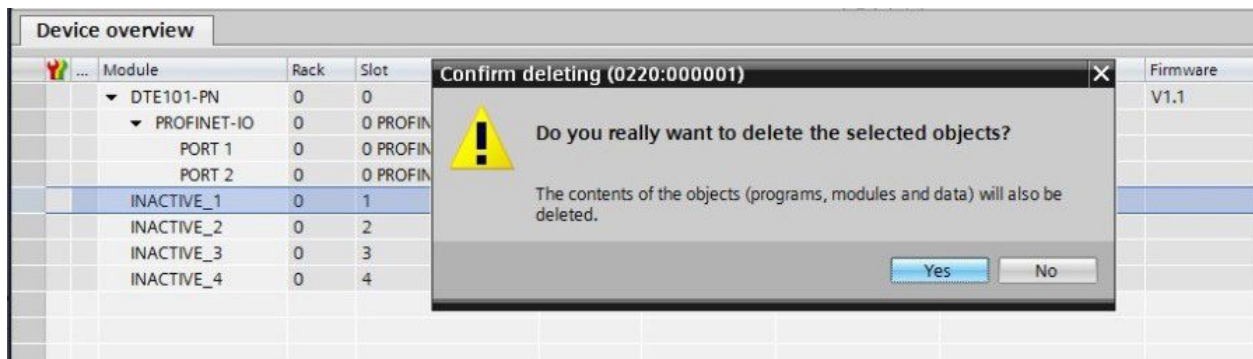
Value	Function
Default value	Default settings are taken for the configuration of the IO hardware drivers.
Customer value	Customer settings are taken for the configuration of the IO hardware drivers. The values need to be set in the GSDML file of the device, see entries IDT_PHY1_CTRL_VALUE1 and IDT_PHY1_CTRL_VALUE1.

11.2 Module setting within the PLC

The module-specific parameters can be set at Properties of the device. By default all IO channels are deactivated.

Device overview								
Module	Rack	Slot	I address	Q address	Type	Order no.	Firmware	
▼ DTE101-PN	0	0			DTE101-PN	DTE101	V1.1	
▼ PROFINET-IO	0	0	PROFINET-IO		DTE101-PN			
PORT 1	0	0	PROFINET-IO PORT 1		PORT 1			
PORT 2	0	0	PROFINET-IO PORT 2		PORT 2			
INACTIVE_1	0	1	256...275	256...275	INACTIVE	Output deactivated		
INACTIVE_2	0	2	276...295	276...295	INACTIVE	Output deactivated		
INACTIVE_3	0	3	296...315	296...315	INACTIVE	Output deactivated		
INACTIVE_4	0	4	316...335	316...335	INACTIVE	Output deactivated		

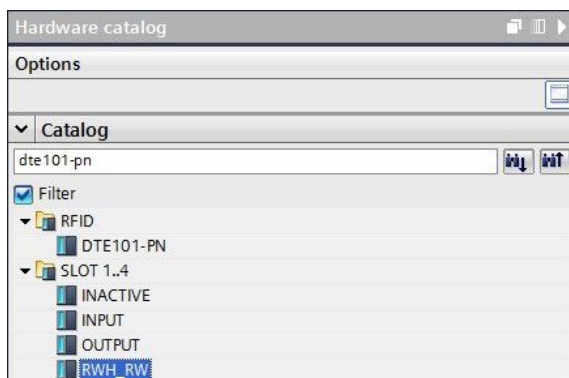
To activate the IO channel the entry "INACTIVE_x" must be deleted. The respective line needs to be marked and with key it can be deleted.



After deleting the module, the line is blank and can be configured with a new module.

Device overview								
Module	Rack	Slot	I address	Q address	Type	Order no.	Firmware	
▼ DTE101-PN	0	0			DTE101-PN	DTE101	V1.1	
▶ PROFINET-IO	0	0	PROFINET-IO		DTE101-PN			
	0	1						
INACTIVE_2	0	2			INACTIVE	Output deactivated		
INACTIVE_3	0	3			INACTIVE	Output deactivated		
INACTIVE_4	0	4			INACTIVE	Output deactivated		

The available modules can be found in the hardware catalogue of the PLC. Set catalogue filter to dte101-pn to find it quickly. Click on the desired module in the hardware catalogue.



The selected module will be copied to the marked slot.

Device overview							
Module	Rack	Slot	I address	Q address	Type	Order no.	
▼ DTE101-PN	0	0			DTE101-PN	DTE101	
▶ PROFINET-IO	0	0	PROFINET-IO		DTE101-PN		
RWH_RW_1	0	1			RWH_RW	Read/write head	
INACTIVE_2	0	2			INACTIVE	Output deactivated	
INACTIVE_3	0	3			INACTIVE	Output deactivated	
INACTIVE_4	0	4			INACTIVE	Output deactivated	

11.3 Module parameters

The parameters of the modules Input, Output and RWH_RW can be set.

11.3.1 Module inactive

This module is needed to switch off the IO channel. Parameters are not available.

11.3.2 Module input

Parameter	Value
Data hold time	Hold time of the inputs I/Q and C/Qi can be set in milliseconds 0 ms (default).
Overload detection	On: Overload on terminal L+ of the IO port is monitored (default). Off: Monitoring is off.

11.3.3 Module output

Parameter	Value
Data hold time	Hold time of the input I/Q can be set in milliseconds.
Overload detection	On: Overload on terminal L+ of the IO port is monitored (default). Off: Monitoring is off.
Overcurrent detection	On: Overload on terminal C/Qo of the IO port is monitored (default). Off: Monitoring is off

11.3.4 Module RWH_RW

Parameter	Value
Tag number of blocks	Number of blocks available on the tag. 0 = 256 (default) 1..255 = Number of blocks Please refer to the data sheet of the tag to see how many blocks are available.
Tag block size	Block size in bytes of the tag. 4/8/16/32/64/128/255 Please refer to the data sheet of the tag for the block size.
UID edge controlled	Edge-controlled reading of the UID via bit RD in the control word of the module RWH_RW (default: off).
Data hold time	Hold time of the TP bit and UID information of the tag in milliseconds. 0 ms (default).
Overload detection	On: Overload on terminal C/Qo of the IO port is monitored (default). Off: Monitoring is off.
Overcurrent detection	On: Overload on terminal C/Qo of the IO port is monitored (default). Off: Monitoring is off.

12 Detailed module description

Following functions are available:

- Detection if an tag is in front of the R/W head.
- Control of R/W head to switch on or off the RFID antenna field.
- Read of the Unique Identifier number (UID) of the tag.
- Read of the User data of the tag.
Reading started via control bit "RD". Maximum read length with one command is 16 bytes. (1)
- Write to the User data of the tag.
Writing started via control bit "WR". Maximum write length with one command is 16 bytes. (1)
- Write verified to the User data of the tag.
Writing verified started via control bit "WR" and "RD". Maximum write length with one command is 16 bytes. (1)
- Simple diagnostics of the IO-x channels of the evaluation unit.
- Simple notification of evaluation unit diagnostics.
- Remote restart of the evaluation unit

(1) If more data than 16 bytes had to be read or written, the user must repeat the command with changed offset parameter.

Each IO channel can be configured to the following modes:

Module name	Description	Remark
Inactive (20 bytes In/Out)	Cyclic transmission	High impedance
Input (20 bytes In/Out)	Cyclic transmission	IEC61131 input
Output (20 bytes In/Out)	Cyclic transmission	IEC61131 output
RWH_RW (20 bytes In/Out)	Cyclic command channel	Command channel

The PLC input data image and output data image has a size of 4 x 20 bytes = 80 bytes.

12.1 Module "Inactive"

This module allows the user to

- switch off an unused process interface IO-1 ... IO-4.
- read the diagnostic information of the evaluation unit.

PLC process data output (Module Inactive):

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR	0	0	0	0	0	0
2	0x00							
3	0x00							
...	...							
19	0x00							
20	0x00							

UK

Description Byte 1 "Control byte"

Bit	Value	Description	Remark
DR (1)	0	No read request	Data bytes 2 ... 20 of the PLC process data input is set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the diagnostics response is available

(1) Diagnostic information from the evaluation unit is only available if bit "Diag" within the response data is set.

Description Bytes 2...20

Not used. Should be set to 0x00 within the PLC process data output.

PLC process data input image (Module Inactive):

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	0	0	0	0	0	0
2	0x00 / Number of diagnostic messages							
3	0x00 / Function_Num							
4	0x00 / Error_Decode							
5	0x00 / Error_Code_1							
6	0x00 / Error_Code_2							
...	...							
20	Not used							

Description Byte 1 "Status byte"

Bit	Value	Description	Remark
DR-RDY	0	Reading not started or evaluation unit diagnostic data not ready	-
	1	Diagnostics read ready	Diagnostics read response from evaluation unit is ready and available in bytes 2...n.
Diag	0	No diagnostics available	-
	1	Evaluation unit diagnostics occurred	Data not yet written in the response buffer. The response buffer still contains default values 0x00. The diagnostic data will be copied to the response buffer after detecting the DR control bit is set within the control byte.

Description Byte 2 "Number of diagnostic messages"

Number of diagnostic messages.

(0 = no diagnostics, 1...4 = 1...4 diagnostic message(s)).

Description Bytes 3...n

If bit "DR-RDY" within the status byte is set, these bytes contain the error codes of the evaluation unit. Otherwise these bytes are set to the default value 0x00 by the evaluation unit.

If more than one diagnostic message is available, all will be transferred. Up to 4 diagnostic messages can be transferred (→ 14 Error codes).

Description Bytes (n+1)...20

Will be set to default value 0x00 by the evaluation unit.

12.2 Module "Input"

This module allows the user to

- read the binary inputs of the process interfaces IO-1 ... IO-4.
- read the diagnostic information of the evaluation unit.

PLC process data output (Module Input)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR	0	0	0	0	0	0
2	0x00							
3	0x00							
...	...							
19	0x00							
20	0x00							

Description Byte 1 "Control byte"

Bit	Value	Description	Remark
DR (1)	0	No read request	Data bytes 2 ... 20 of the PLC process data input is set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the diagnostics response is available

(1) Diagnostics is only available, if bit "Diag" within the response data is set.

Description Bytes 2...20

Not used. Should be set to 0x00 within the PLC process data output image.

PLC process data input image (Module Input)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	0	0	OL	0	I/Q	C/Qi
2	0x00 / Number of diagnostic events							
3	0x00 / Error code byte 1							
4	0x00 / Error code byte 2							
5	0x00 / Error code byte 3							
6	0x00 / Error code byte 4							
...	...							
20	Not used							

UK

Description Byte 1 "Status byte"

Bit	Value	Description	Remark
C/Qi (1)	0	Input voltage at C/Qi < 8 V	Level of C/Qi is measured by hardware
	1	Input voltage at C/Qi > 11 V	Level of C/Qi is measured by hardware
I/Q (1)	0	Input voltage at I/Q < 8 V	Level of I/Q is measured by hardware
	1	Input voltage at I/Q > 11 V	Level of I/Q is measured by hardware
OL	0	L+ OK	Set by hardware
	1	Overload on L+	Set by hardware
DR-RDY	0	Reading not started or evaluation unit diagnostic data not ready	-
	1	Diagnostics read ready	Diagnostics read response from evaluation unit is ready and available in bytes 2...5
Diag	0	No diagnostics available	-
	1	evaluation unit diagnostics occurred	Data not yet written in the response buffer. The response buffer contains still default values 0x00. The diagnostics data will be copied in the response buffer, after detecting that the DR control bit is set within the control byte.

(1) Diagnostics is only available, if bit "Diag" within the response data is set.

Description Byte 2 "Number of diagnostic messages"

Number of diagnostic messages.

(0 = no diagnostics, 1...4 = 1...4 diagnostic message(s)).

Description Bytes 3...n

If bit "DR-RDY" within the Status byte is set these bytes contain the error codes of the evaluation unit. Otherwise these bytes are set to default value 0x00 by the evaluation unit.

If more than one diagnostic message is available this is appended. Up to 4 diagnostic messages could be transferred (→ 14 Error codes).

Description Bytes (n+1)...20

Will be set to default value 0x00 by the evaluation unit.

12.3 Module "Output"

This module allows the user to

- read the binary inputs of the process interfaces IO-1 ... IO-4.
- write to binary outputs of the process interfaces IO-1 ... IO-4.
- read the diagnostic information of the evaluation unit.

PLC process data output image (Module Output)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR	0	0	0	HC	0	C/Qo
2	0x00							
3	0x00							
...	...							
19	0x00							
20	0x00							

Description Byte 1 "Control byte"

Bit	Value	Description	Remark
C/Qo	0	Output set to C/Qo low	-
	1	Output set to C/Qo high	-
HC	0	Allow highside output current of max. 0.5 A at C/Qo	Bit HC only valid on channel IO-3 and channel IO-4
	1	Allow highside output current of max. 1 A at C/Qo	Bit HC only valid on channel IO-3 and channel IO-4
DR (1)	0	No read request	Data bytes 2 ... 20 of the PLC process data input is set to 0x00.
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the diagnostics response is available.

(1) Diagnostics is only available, if bit "Diag" within the response data is set.

Description Bytes 2...20

Not used. Should be set to 0x00 within the PLC process data output image.

PLC process data input image (Module Output)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	0	0	OL	HC	I/Q	C/QI
2	0x00 / Number of diagnostic messages							
3	0x00 / Error code byte 1							
4	0x00 / Error code byte 2							
5	0x00 / Error code byte 3							
6	0x00 / Error code byte 4							
...	...							
20	Not used							

Description Byte 1 "Status byte"

Bit	Value	Description	Remark
C/Qi	0	Input voltage at C/Qo = L	Level of C/Qi is not measured but taken from the output value C/Qo
	1	Input voltage at C/Qo = H	Level of C/Qi is not measured but taken from the output value C/Qo
I/Q	0	Input voltage at I/Q < 8 V	Level of I/Q is measured by hardware
	1	Input voltage at I/Q > 11 V	Level of I/Q is measured by hardware
HC	0	Current of max 0.5 A enabled at C/Qo	-
	1	Current of max 1 A enabled at C/Qo	Only valid on channel IO-3 and IO-4
OL	0	L+ OK	Set by hardware
	1	Overload on L+	Set by hardware
DR-RDY	0	Reading not started or evaluation unit diagnostic data not ready	-
	1	Diagnostics read ready	Diagnostics read response from evaluation unit is ready and available in byte 2...5.
Diag	0	No diagnostics available.	-
	1	Evaluation unit diagnostics occurred	Data not yet written in the response buffer. The response buffer contains still default values 0x00. The diagnostics data will be copied in the response buffer, after detecting that the DR control bit.is set within the control byte.

Description Byte 2 "Number of diagnostic messages"

Number of diagnostic messages.
(0 = no diagnostics, 1...4 = 1...4 diagnostic message(s)).

Description Bytes 3...n

If bit "DR-RDY" within the Status byte is set these bytes contain the error codes of the evaluation unit. Otherwise these bytes are set to default value 0x00 by the evaluation unit.

If more than one diagnostic message is available this is appended. Up to 4 diagnostic messages could be transferred (→ 14 Error codes).

Description Bytes (n+1)...20

Will be set to default value 0x00 by the evaluation unit.

12.4 Module "RWH_RW"

This module allows the user to

- read the UID of the tag over the R/W head at process interface IO-1 ... IO-4. Two different modes are available:
 - Read UID once on request (Synchronous mode).
 - Read UID automatically whenever the evaluation unit detect a change of the UID data (Asynchronous mode).
- read the User data of the tag over the R/W head at process interface IO-1 ... IO-4. Two different modes are available:
 - Read User data of the tag once on request (Synchronous mode).
 - Read User data of the tag automatically whenever the evaluation unit detect a change of the UID data (Asynchronous mode).
- write to the User data area of the tag over the R/W head at process interface IO-1 ... IO-4.
- write verified to the User data area of the tag.
- read the diagnostic information of the evaluation unit and the process interface IO-1 ... IO-4.
- switch the antenna field of the R/W head off and on.

PLC process data output image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Res	DR	ER	UR	RD	WR	AO	Res
2	Data byte 1							
3	Data byte 2							
...	...							
19	Data byte 18							
20	Data byte 19							

Description Byte 1 "Control byte"

Bit	Bit name	Description
0	Res	Reserved
1	AO	"Antenna field Off" request
2	WR	Write data to the User data area of the tag
3	RD	Read data from the User data area of the tag or receive UID message controlled
4	UR	Mode "Access to the User data area of the tag"
5	ER	Mode "Event controlled Reading of User memory of the tag"
6	DR	Evaluation unit Diagnostics Read, set by the controller to fetch the diagnostics, signaled by the evaluation unit in the Diag status bit
7	Res	Reserved



The bits WR, RD, DR are edge controlled bits. The change from state "0->1" activates the command request. The state "1" forces the evaluation unit to hold the response data. The state "0" forces the evaluation unit to set the data within the process data input from bytes 2...20 to the default value "0x00".



It is not allowed to set the bits WR, RD, DR simultaneously because the module can handle only one request! Otherwise an error message is created (Diag bit =1).

Description Bytes 2...20 "Data bytes 1...19"

Depending on the selected mode this data area contains command data to sent to the evaluation unit.

Default value "Control byte": 0x00

Mode: Read UID automatically, antenna field on

PLC process data input image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	EA	UD	RD-RDY	WR-RDY	AI	TP
2	Data byte 1							
3	Data byte 2							
...	...							
19	Data byte 18							
20	Data byte 19							

Description Byte 1 "Status byte"

Bit	Bit name	Description
0	TP	Tag present
1	AI	Antenna field Inactive
2	WR-RDY	WR ite data to User data area of the tag ReaDY
3	RD-RDY	ReaD data from the User data area of the tag ReaDY
4	UD	Mode "Access to the User Data area of the tag" active
5	EA	Mode "Receive User data on Event change Active"
6	DR-RDY	Diagnostics Read response ReaDY and available in the response buffer. Coding: byte 2: number of diagnostic messages byte 3-6: diagnostic message 1 byte 7..10: diagnostic message 2 byte 11..14: diagnostic message 3 byte 15..18: diagnostic message 4 (1)
7	Diag	Evaluation unit DIAGnostics occurred, but not yet written in the response buffer. The response buffer contains still tag data. The diagnostics data will be copied in the response buffer, after detecting that the DR control bit is set by the controller

(1) Coding of diagnostic messages (→ 14 Error codes)

Description Bytes 2...20 "Data bytes 1...19"

Dependent on the selected mode this data memory contains the response data read from the evaluation unit or the diagnostics information.

12.5 Module “RWH_RW”, Read UID of the tag synchronously

In this mode the UID of the tag can be read once by setting the bit RD from 0 to 1. This mode is suitable if the user knows when the tag is present in front of the R/W head. The read UID is kept in the data bytes 2...18 stable while bit RD is set to 1.

PLC process data output image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR (2)	0	0	RD (1)	0	AO=0	0
2	Not used							
...	...							
20	Not used							

Description Byte 1 “Control byte”

Bit	Value	Description	Remark
AO	0	“Antenna field on” request inactive	Activate the antenna field
	1	“Antenna field off” request	Deactivate the antenna field
RD (1)	0	UID no read request	UID length/data is cleared in data bytes 2...20 of the PLC process data input
	0 -> 1	Edge: UID read request	Starts the reading of the UID.
	1	UID hold request	RD must be kept on 1 until the command response is available . The UID length/ data is transmitted in data byte 2...20 of the PLC process data input.
DR (2)	0	No read request	Data bytes 2 ... 20 of the process data input set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the command response is available

- (1) Bit RD is only evaluated if the channel parameter “UID edge controlled” is set. Otherwise the UID will be read continuously regardless of the setting of bit RD. Simultaneous activation of bits DR and RD is not allowed!
- (2) Diagnostics is only available, if bit “Diag” within the response data is set. Otherwise the response data will return default data “0x00” within byte 2...20.

PLC process data input image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	0	0	RD-RDY	0	AI=0	TP
2	UID data length read							
3	UID data byte 1 (MSBy)							
4	UID data byte 2							
...	...							
18	UID data byte 16							
19	0x00							
20	0x00							

Description Byte 1 “Status byte”

Bit	Value	Description	Remark
TP	0	No tag detected in front of the R/W head	-
	1	Tag is detected in front of the R/W head	Bit is set as long as the tag is detected in front of the R/W head regardless of the setting of the channel parameter “Data hold time”
AI	0	“Antenna field on” request active	-
	1	“Antenna field off” request active	-
RD-RDY	0	“UID read” not read or user parameter “Read edge controlled” not set or error occurred	Data in byte 2 ... 18 is set to default values 0x00
	1	“UID read” ready	Data in byte 2 ... 18 valid
DR-RDY	0	No diagnostic read request or diagnostic data not ready.	-
	1	Diagnostics read request from evaluation unit ready.	Error code: byte 2: number of diagnostic messages byte 3-6: diagnostic message 1 byte 7..10: diagnostic message 2 byte 11..14: diagnostic message 3 byte 15..18: diagnostic message 4
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	-

Description Byte 2 ”UID data length read”

UID data length read. Data length of the UID read from tag [bytes].



If no tag is detected by the R/W head, this byte is set to 0x00.

Description Bytes 3 ... 6/10/14/18 ”UID data byte”

Read UID of the tag with a length of 32/64/96/128 bits. Unused bytes are set to 0x00.



If no tag is detected by the R/W head, this data field is set to 0x00.

Description Bytes 19 ... 20

Always set to 0x00.

12.6 Module “RWH_RW”, Read UID of the tag asynchronously

In this mode the UID of the tag can be read automatically without sending any read request. This mode is suitable if the user do not know when the tag is present in front of the R/W head. Additionally this mode allows the fastest detection of the tag, because no command request need to be send to the evaluation unit. Please note that the UID is transmitted in real time and the PLC cycle time need to be about factor 2 shorter as the tag is detected by the R/W head.

PLC process data output image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR (1)	0	0	0	0	AO=0	0
2	Not used							
...	...							
20	Not used							

Description Byte 1 “Control byte”

Bit	Value	Description	Remark
AO	0	“Antenna field on” request inactive	Activate the antenna field
	1	“Antenna field off” request	Deactivate the antenna field
DR (1)	0	No read request	Data bytes 2 ... 20 of the process data input are set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the command response is available

- (1) Reading of the diagnostics is only possible if ER is set to 0. Diagnostics is only available, if bit “Diag” within the response data is set. Otherwise the response data will return the default data “0x00” within byte 2...20 of the response data.

PLC process data input image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	0	0	0	0	AI=0	TP
2	UID data length read							
3	UID data byte 1 (MSBy)							
4	UID data byte 2							
...	...							
18	UID data byte 16							
19	0x00							
20	0x00							


Description Byte 1 "Status byte"

Bit	Value	Description	Remark
TP	0	No tag detected in front of the R/W head	-
	1	Tag is detected in front of the R/W head	Bit is set as long as the parameter "Data hold time" is set.
AI	0	"Antenna field on" request active	-
	1	"Antenna field off" request active	-
DR-RDY	0	No diagnostic read request or diagnostic data not ready.	-
	1	Diagnostics read request from evaluation unit ready.	Error code: byte 2: number of diagnostic messages byte 3-6: diagnostic message 1 byte 7..10: diagnostic message 2 byte 11..14: diagnostic message 3 byte 15..18: diagnostic message 4
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	-

UK


Description Byte 2 "UID data length read"

Data length of the UID read from the tag [bytes].

 If no tag is detected by the R/W head, this byte is set to 0x00. The data length is held according to the setting of the channel parameter "Data Hold Time".

Description Bytes 3 ... 6/10/14/18 "UID data byte"

Read UID of the tag with a length of 32/64/96/128 bits. Unused bytes are set to 0x00.

 If no tag is detected by the R/W head, this data field is set to 0x00. UID data bytes are held according to the setting of the channel parameter "Data Hold Time".

Description Bytes 19 ... 20

Always set to 0x00.

12.7 Module “RWH_RW”, Read User data of the tag synchronously

In this mode the User data of the tag can be read edge controlled by setting the bit RD from 0 to 1. This mode is suitable if the user knows when the tag is present in front of the R/W head. The read User data is kept in the data bytes 2...18 stable while bit RD is set to 1.

PLC process data output image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR (3)	ER=0	UR=1 (1)	RD (2)	0	AO=0	0
2	Read data length							
3	16 bit start address [D15...D8]							
4	16 bit start address [D7...D0]							
5	Not used							
...								
20	Not used							

Description Byte 1 “Control byte”

Bit	Value	Description	Remark
AO	0	“Antenna field on” request inactive	Activate the antenna field
	1	“Antenna field off” request	Deactivate the antenna field
RD (2)	0	No read request of User data	User data length/data is cleared in data byte 2...20 of the PLC process data input image.
	0->1	edge: User data read request	Starts the reading of the User data.
	1	User data hold request	RD must be kept on 1 until the command response is available. The User data length/data is transmitted in data byte 2...20 of the PLC process data input image.
UR (1)	1	Mode “User data” selected	Must be set to 1 to access the User data of the tag
ER	0	Mode “Read User data synchronously” selected	Must be set to 0 for reading the User data synchronously
DR (3)	0	No read request	Data bytes 2 ... 20 of the process data input are set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the command response is available

- (1) Mode can be changed every time if bit “RD” and “DR” are set to 0 => no command active.
- (2) Simultaneous activation of bits DR and RD is not allowed!
- (3) Reading of the diagnostics is only possible if RD is set to 0. Diagnostics is only available, if bit “Diag” within the response data is set. Otherwise the response data will return the default data “0x00” within byte 2...20 of the response data.

Description Byte 2 “read data length”

Read data length, limited to a maximum number of 16 bytes.

Description Byte 3 ... 4 “16 bit start address”

Start address of the tag User data where the data has to be read from.

Description Byte 5 ... 20 “not used”

These bytes are ignored.

PLC process data input image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	EA=0	UD=1	RD-RDY	0	AI	TP
2	Read data length							
3	Read data byte 1							
4	Read data byte 2							
...	...							
18	Read data byte 16							
19	0x00							
20	0x00							

UK

Description Byte 1 "Status byte"

Bit	Value	Description	Remark
TP	0	No tag detected in front of the R/W head	-
	1	Tag is detected in front of the R/W head	Bit is set as long as the parameter "Data hold time" is set.
AI	0	"Antenna field on" request active	-
	1	"Antenna field off" request active	-
RD-RDY	0	No command request detected or command execution active	Read length / Read data byte is cleared in data byte 2...17 of the PLC process data input image.
	1	Command execution is ready	Diag bit is not set: Command execution ok. Read length / Read data byte is set in data byte 2...17 of the PLC process data input image. Diag bit is set: Command execution not ok. Read length / Read data bytes are set to zero.
UD	1	Mode "Read/write used data of the tag" active	Feedback of the selected mode.
EA	0	Mode "Receive User data of the tag on request" active	Feedback of the selected mode.
DR-RDY	0	No diagnostic read request or diagnostic data not ready	-
	1	Diagnostics read request from evaluation unit ready.	Error code: byte 2: number of diagnostic messages byte 3-6: diagnostic message 1 byte 7..10: diagnostic message 2 byte 11..14: diagnostic message 3 byte 15..18: diagnostic message 4
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Channel related or channel independent error occurred.

Description Byte 2 "Read data length"

Read data length [bytes].

Description Bytes 3 ... 20 "Read data byte 1 ... 16"

In mode "User data" this data area contains the User data of the tag. Unused bytes are set to 0x00.



In read diagnostics mode this data area contains detailed error codes.

12.8 Module “RWH_RW”, Read User data of the tag asynchronously

In this mode the User data of the tag can be read automatically without sending any read request. This mode is suitable if the user knows when the tag is present in front of the R/W head. Additionally this mode allows the fastest detection of the tag, because no command request needs to be sent to the evaluation unit. Please note that the User data is transmitted in real time and the PLC cycle time needs to be about factor 2 shorter as the tag is detected by the R/W head.

PLC process data output image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR (3)	ER=1 (2)	UR=1 (1)	RD=1 (2)	0	AO=0	0
2	Read data length							
3	16 bit start address [D15...D8]							
4	16 bit start address [D7...D0]							
5	Not used							
...								
20	Not used							

Description Byte 1 “Control byte”

Bit	Value	Description	Remark
AO	0	“Antenna field on” request inactive	Activate the antenna field
	1	“Antenna field off” request	Deactivate the antenna field
RD (2) UR (1) ER (2)	1	Mode “Receive User data automatically” selected	Must be set to 1 to access the User data of the tag (1)
DR (3)	0	No read request	Data bytes 2 ... 20 of the process data input are set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the command response is available

- (1) Mode can be changed every time if bit “RD”, “ER” and “DR” are set to 0 => no command active.
- (2) If bit ER and RD are set to 1 a reading process of the User data of the tag is started when a change of the bit TP is detected. The user gets only a message from the evaluation unit if the state of the tag changes from “not present to present” and from “present to not present”. This helps to limit the requests which are needed to be sent from the PLC.
- (3) Reading of the diagnostics is only possible if ER and RD is set to 0. Diagnostics is only available, if bit “Diag” within the response data is set. Otherwise the response data will return the default data “0x00” within byte 2...20 of the response data.

Description Byte 2 “read data length”

Read data length, limited to a maximum number of 16 bytes.

Description Byte 3 ... 4 “16 bit start address”

Start address of the tag User data where the data has to be read from.

Description Byte 5 ... 20 “not used”

These bytes are ignored.

PLC process data input image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	EA	UD=1	RD-RDY	0	AI	TP
2	Read data length							
3	Read data byte 1							
4	Read data byte 2							
...	...							
18	Read data byte 16							
19	0x00							
20	0x00							

Description Byte 1 “Status byte”

Bit	Value	Description	Remark
TP	0	No tag detected in front of the R/W head	-
	1	Tag is detected in front of the R/W head	Bit is set as long as the parameter “Data hold time” is set.
AI	0	“Antenna field on” request active	-
	1	“Antenna field off” request active	-
RD-RDY	0	No command request detected or command execution active	Read length / Read data byte is cleared in data byte 2...17 of the PLC process data input image.
	1	Command execution is ready.	Diag bit is not set: Command execution ok. Read length / Read data byte is set in data byte 2...17 of the PLC process data input image. Diag bit is set: Command execution not ok. Read length / Read data bytes are set to zero.
UD	1	Mode “Read/write used data of the tag” active	Feedback of the selected mode.
EA	0	Mode “Receive User data of the tag on request” active	-
	1	Mode “Message controlled reception of the User data of the tag” active	-
DR-RDY	0	No diagnostic read request or diagnostic data not ready	-
	1	Diagnostics read request from evaluation unit ready	Error code: byte 2: number of diagnostic messages byte 3-6: diagnostic message 1 byte 7..10: diagnostic message 2 byte 11..14: diagnostic message 3 byte 15..18: diagnostic message 4
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	-

Description Byte 2 ”Read data length”

Data length read from the tag [bytes].

 The data length is held according to the setting of the channel parameter “Data Hold Time”.

Description Bytes 3 ... 20 ”Read data byte 1 ... 16”

In mode “User data” this data area contains the User data of the tag. Unused bytes are set to 0x00.

 In read diagnostics mode this data area contains detailed error codes. The data length is held according to the setting of the channel parameter “Data Hold Time”.

12.9 Module “RWH_RW”, Write User data of the tag

In this mode the User data of the tag can be written.

PLC process data output image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR (3)	0	UR=1 (1)	0	WR (2)	AO=0	0
2	Write data length							
3	16 bit start address [D15...D8]							
4	16 bit start address [D7...D0]							
5	Write data byte 1							
...	..							
20	Write data byte 16							

Description Byte 1 “Control byte”

Bit	Value	Description	Remark
AO	0	“Antenna field on” request inactive	Activate the antenna field
	1	“Antenna field off” request	Deactivate the antenna field
WR (2)	0	No write request	-
	0->1	Write “User data to the tag” request	Data byte 5 ... 20 is written to the User data of the tag.
	1	Write request active	WR must be kept on 1 until the command response is available.
UR (1)	1	Mode “User data” selected	Must be set to 1 to access the User data of the tag
DR (3)	0	No read request	Data bytes 2 ... 20 of the process data input are set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the command response is available

- (1) Mode can be changed every time if bit “DR” and “WR” are set to 0 => no command active.
- (2) A simultaneously activation of bit DR with bit WR not allowed!
- (3) Diagnostics is only available, if bit “Diag” within the response data is set. A simultaneously activation of bit DR with bit WR not allowed! Otherwise the evaluation unit will return default data “0x00” within byte 2...20 of the response data.

Description Byte 2 “write data length”

Write data length, limited to a maximum number of 16 bytes.

Description Byte 3 ... 4 “16 bit start address”

Start address of the tag User data where the data has to be written to.

Description Byte 5 ... 20 “write data byte”

In write mode the data to be written has to be copied in this data area. (write data bytes 1 ... 16).

PLC process data input image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	0	UD=1	0	WR-RDY	AI	TP
2	Write data length							
3	0x00							
...	...							
20	0x00							

Description Byte 1 "Status byte"

Bit	Value	Description	Remark
TP	0	No tag detected in front of the R/W head	-
	1	Tag is detected in front of the R/W head	Bit is set as long as the parameter "Data hold time" is set.
AI	0	"Antenna field on" request active	-
	1	"Antenna field off" request active	-
WD-RDY	0	No command request detected or command execution active	-
	1	Command execution is ready.	-
UD	1	Mode "Write User data to the tag" active	Feedback of the selected mode.
DR-RDY	0	No diagnostic read request or diagnostic data not ready.	-
	1	Diagnostics read request from evaluation unit ready.	Error code: byte 2: number of diagnostic messages byte 3-6: diagnostic message 1 byte 7..10: diagnostic message 2 byte 11..14: diagnostic message 3 byte 15..18: diagnostic message 4
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Channel related or channel independent error occurred.

Description Byte 2 "Write data length"

Data length read from the tag [bytes].

Description Bytes 3 ... 20

In write mode this bytes are set 0x00.



In read diagnostics mode this data area contains detailed error codes.

12.10 Module “RWH_RW”, Write verified User data of the tag

In this mode the User data of the tag can be written and read back with one command request.

In the first step the command data is written to the tag, in the second step it is read back from the tag. In the third step the evaluation unit compares the written data with the read data and sends back the result to the PLC.

PLC process data output image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR (3)	0	UR=1 (1)	RD (2)	WR (2)	AO=0	0
2	Write data length							
3	16 bit start address [D15...D8]							
4	16 bit start address [D7...D0]							
5	Write data byte 1							
...	..							
20	Write data byte 16							

Description Byte 1 “Control byte”

Bit	Value	Description	Remark
AO	0	“Antenna field on” request inactive	Activate the antenna field
	1	“Antenna field off” request	Deactivate the antenna field
WR (2) RD (2)	0	No write verified request active	Data byte 2 ... 20 of the process data input image is set to 0x00.
	0->1	Write verified to the “User data of the tag” request	Data byte 5 ... 20 are written to the User data of the tag. Afterwards the data bytes are read back from the tag.
	1	Write verified request active	WR must be kept to 1 until the command response is available.
UR (1)	1	Mode “User data” selected	Must be set to 1 to access the User data of the tag
DR (3)	0	No read request	Data bytes 2 ... 20 of the process data input are set to 0x00
	0 -> 1	Read diagnostics of the evaluation unit	-
	1	Diagnostics read request active	DR must be kept on 1 until the command response is available

- (1) Mode can be changed every time if bit “DR” and “WR” are set to 0 => no command active.
- (2) Bits WR and RD must be set simultaneously in the command request.
- (3) Diagnostics is only available, if bit “Diag” within the response data is set. A simultaneously activation of bit DR with bit WR not allowed! Otherwise the evaluation unit will return default data “0x00” within byte 2...20 of the response data.

Description Byte 2 “write data length”

Write data length, limited to a maximum number of 16 bytes.

Description Byte 3 ... 4 “16 bit start address”

Start address of the tag User data where the data has to be written to.

Description Byte 5 ... 20 “write data byte”

In write mode the data to be written has to be copied in this data area. (write data bytes 1 ... 16).

PLC process data input image (Module RWH_RW)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Diag	DR-RDY	0	UD=1	RD-RDY	WR-RDY	AI	TP
2	Write data length							
3	0x00							
...	...							
20	0x00							

Description Byte 1 "Status byte"

Bit	Value	Description	Remark
TP	0	No tag detected in front of the R/W head	-
	1	Tag is detected in front of the R/W head	Bit is set as long as the parameter "Data hold time" is set.
AI	0	"Antenna field on" request active	-
	1	"Antenna field off" request active	-
WD-RDY RD-RDY	0	No command request detected or command execution active	-
	1	Command execution is ready.	Result of the comparison is given back in byte 2.
UD	1	Mode "Write User data to the tag" active	Feedback of the selected mode.
DR-RDY	0	No diagnostic read request or diagnostic data not ready.	-
	1	Diagnostics read request from evaluation unit ready.	Error code: byte 2: number of diagnostic messages byte 3-6: diagnostic message 1 byte 7..10: diagnostic message 2 byte 11..14: diagnostic message 3 byte 15..18: diagnostic message 4
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Channel related or channel independent error occurred.

Description Byte 2 "Read data length"

If the comparison of the written and read data is successful the read data length is identical to the write data length.

Description Bytes 3 ... 20

These bytes contain the User data read back from the tag.



In read diagnostics mode this data area contains detailed error codes.

12.11 Restart of the evaluation unit

The evaluation unit can be remotely restarted. The device shut off the fieldbus interface and the IO ports and execute than a power on cycle.



This command can be executed in all modules.



The control and status byte must have value 0x0 before the command is started.

PLC process data output image (Module Command Restart)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	1	1	1	1	1	1	1	1
2	Restart delay time [ms*10]							
...	...							
20	0x00							

Description Byte 1 “Control byte”

Bit	Value	Description	Remark
D0 ... D7	0	No restart request	Dependent of the activated module, the response data may contain tag data
	0 -> 1	Restart request initiated	-
	1	Restart request active	-

Description Byte 2

0x0 Restart evaluation unit immediately (Default value)

0x1 ... 0xFF Restart evaluation unit after delay time. Time in [ms*10]

Description Byte 3 ... 20

Not used. Should be set to 0x00 within the PLC process data output image.

PLC process data input image (Module Command Restart)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	1	1	1	1	1	1	1	1
2	Restart delay time [ms*10]							
...	...							
20	0x00							

Description Byte 1 “Status byte”

Bit	Value	Description	Remark
D0 ... D7	0	No restart active	-
	0->1	Restart initiated	-
	1	Restart active	-

Description Byte 2

0x0 .. 0xFF Actualized restart delay time [ms*10]. Value is decremented from “Restart delay time” set in Control byte to 0x0. After that, the restart sequence is executed.

Description Bytes 3 ... 20

Not used. Set to default value 0x00 by the evaluation unit.

13 Examples

In the following examples the evaluation unit is configured for 2 R/W heads at channel IO-1 and channel IO-2. The R/W heads are connected on both channels. Channel 3 and channel 4 are unconnected.



The values shown in the payload traffic view are in hexadecimal notation. 30 = 0x30 = 48 decimal.

13.1 Read UID on request (synchronous mode)

13.1.1 Command sequence view

			Step 0: no tag in field	Step 1: tag in field	Step 2: tag still in field	Step 3: no tag in field	Step 4: no tag in field	Remark
PLC process data output	Byte 1	0	0	0	0	0	0	
		1	AO	0	0	0	0	
		2	WR	0	0	0	0	
		3	RD	0	0	1	1	Set RD to 1 when TP = 1 is detected
		4	UR	0	0	0	0	
		5	ER	0	0	0	0	
		6	DR	0	0	0	0	
		7	0	0	0	0	0	
Byte 2			0x00	0x00	0x00	0x00	0x00	
Byte 3			0x00	0x00	0x00	0x00	0x00	
Byte 4			0x00	0x00	0x00	0x00	0x00	
Byte 5			0x00	0x00	0x00	0x00	0x00	
...			
Byte 19			0x00	0x00	0x00	0x00	0x00	
Byte 20			0x00	0x00	0x00	0x00	0x00	

			Step 0: no tag in field	Step 1: tag in field	Step 2: tag still in field	Step 3: tag left the field	Step 4: no tag in field	Remark	
PLC process data input	Byte 1	0	TP	0	1 (1)	1	0	0	
		1	AI	0	0	0	0	0	
		2	WR-RDY	0	0	0	0	0	
		3	RD-RDY	0	0	0	0	0	
		4	UD	0	0	0	0	0	
		5	EF	0	0	0	0	0	
		6	DR-RDY	0	0	0	0	0	
		7	Diag	0	0	0	0	0	
Byte 2 (UID length)			0x00	0x00	0x04	0x04	0x00	Data is hold until RD is set to 0	
Byte 3 (UID data)			0x00	0x00	0xE0 (2)	0xE0	0x00		
Byte 4 (UID data)			0x00	0x00	0x04	0x04	0x00		
Byte 5 (UID data)			0x00	0x00	0x01	0x01	0x00		
...				
Byte 19			0x00	0x00	0x00	0x00	0x00		
Byte 20			0x00	0x00	0x00	0x00	0x00		

(1) TP bit indicate that the tag is detected by the R/W head.

(2) UID data, the length is dependent from the tag (125kHz = 4 Byte; 13,56 MHz = 8 Byte).

13.2 Receive UID automatically (asynchronous mode)



The parameter "Read of UID edge controlled" must be set to 0x00 in the channel configuration.

13.2.1 Command sequence view

		Step 0: no tag in field	Step 1: tag in field	Step 2: tag still in field	Step 3: no tag in field	Step 4: no tag in field	Remark	
PLC process data output	Byte 1	0	0	0	0	0		
		1	AO	0	0	0	0	
		2	WR	0	0	0	0	
		3	RD	0	0	0	0	No need for RD setting
		4	UR	0	0	0	0	
		5	ER	0	0	0	0	
		6	DR	0	0	0	0	
		7	0	0	0	0	0	
	Byte 2	0x00	0x00	0x00	0x00	0x00		
	Byte 3	0x00	0x00	0x00	0x00	0x00		
Byte 4	0x00	0x00	0x00	0x00	0x00			
Byte 5	0x00	0x00	0x00	0x00	0x00			
...			
Byte 19	0x00	0x00	0x00	0x00	0x00			
Byte 20	0x00	0x00	0x00	0x00	0x00			

		Step 0: no tag in field	Step 1: tag in field	Step 2: tag still in field	Step 3: no tag in field	Step 4: no tag in field	Remark	
PLC process data input	Byte 1	0	TP	0	1 (1)	0	1 (1)	
		1	AI	0	0	0	0	
		2	WR-RDY	0	0	0	0	
		3	RD-RDY	0	0	0	0	
		4	UD	0	0	0	0	
		5	EF	0	0	0	0	
		6	DR-RDY	0	0	0	0	
		7	Diag	0	0	0	0	
	Byte 2 (UID length)	0x00	0x08	0x00	0x08	0x00		
	Byte 3 (UID data)	0x00	0xE0 (2)	0x00	0xE0	0x00		
Byte 4 (UID data)	0x00	0x04	0x00	0x03	0x00			
Byte 5 (UID data)	0x00	0x01	0x00	0x0C	0x00			
...			
Byte 19	0x00	0x00	0x00	0x00	0x00			
Byte 20	0x00	0x00	0x00	0x00	0x00			

(1) TP bit indicate that the tag is detected by the R/W head.

(2) UID data, the length is dependent from the tag (125kHz = 4 Byte; 13,56 MHz = 8 Byte).

13.3 Access to the User data of the tag

To access the User data of the tag, the IO channel has to be set into “user” mode. This can be done by setting the UR bit of the control byte to 1. In the following command sequence , the tag is in the reading field of the R/W head.

			Step 0: Tag in field	Step 1: Activate bit UR	Step 2: Wait for bit UD	Remark	
PLC process data output	Byte 1	0	0	0	0	Now the R/W head is able to proceed read and write requests to the User data of the tag.	
		1	AO	0	0		
		2	WR	0	0		
		3	RD	0	0		
		4	UR	0	1		
		5	0	0	0		
		6	DR	0	0		
		7	0	0	0		
	Byte 2			0x00	0x00		0x00
	Byte 3			0x00	0x00		0x00
	Byte 4			0x00	0x00		0x00
	Byte 5			0x00	0x00		0x00

Byte 19			0x00	0x00	0x00		
Byte 20			0x00	0x00	0x00		

			Step 0: Tag in field	Step 1: Activate bit UR	Step 2: Wait for bit UD	Remark	
PLC process data input	Byte 1	0	TP	1	1	Now the R/W head is able to proceed read and write requests to the User data of the tag.	
		1	AI	0	0		
		2	WR-RDY	0	0		
		3	RD-RDY	0	0		
		4	UD	0	1		
		5	EF	0	0		
		6	DR-RDY	0	0		
		7	Diag	0	0		
	Byte 2			0x08	0x08		0x00
	Byte 3			0xE0	0xE0		0x00
	Byte 4			0x04	0x04		0x00
	Byte 5			0x04	0x04		0x00

Byte 19			0x00	0x00	0x00		
Byte 20			0x00	0x00	0x00		

13.4 Read User data of the tag on request (synchronous mode)

With one command cycle up to 16 bytes can be read. To read more data, the command cycle has to be repeated with adapted address setting.



The control and status byte must have value "10" (UD activated) before the following command sequence can be started.

13.4.1 Command sequence view

			Step 1: Bit UD is true	Step 2: Start reading (1)	Step 3: Wait for bit RD-RDY (2)	Step 4: Reset bit RD	Step 5: Wait for reset bit RD-RDY
PLC process data output	Byte 1	0	0	0	0	0	0
		1	AO	0	0	0	0
		2	WR	0	0	0	0
		3	RD	0	1	1	0
		4	UR	1	1	1	1
		5	0	0	0	0	0
		6	DR	0	0	0	0
		7	0	0	0	0	0
	Byte 2 (data length)		0x00	0x08	0x08	0x00	0x00
	Byte 3 (address MSB)		0x00	0x00	0x00	0x00	0x00
	Byte 4 (address LSB)		0x00	0x10	0x10	0x00	0x00
Byte 5		0x00	0x00	0x00	0x00	0x00	
...		
Byte 19		0x00	0x00	0x00	0x00	0x00	
Byte 20		0x00	0x00	0x00	0x00	0x00	

			Step 1: Bit UD is true	Step 2: Start reading (1)	Step 3: Wait for bit RD-RDY (2)	Step 4: Reset bit RD	Step 5: Wait for reset bit RD-RDY
PLC process data input	Byte 1	0	TP	1	1	1	1
		1	AI	0	0	0	0
		2	WR-RDY	0	0	0	0
		3	RD-RDY	0	0	1	1
		4	UD	1	1	1	1
		5	EF	0	0	0	0
		6	DR-RDY	0	0	0	0
		7	Diag	0	0	0	0
	Byte 2 (data length)		0x00	0x00	0x08	0x12	0x00
	Byte 3 (data)		0x00	0x00	0x12	0x34	0x00
	Byte 4		0x00	0x00	0x34	0x56	0x00
Byte 5		0x00	0x00	0x56	0x56	0x00	
...		
Byte 19		0x00	0x00	0x00	0x00	0x00	
Byte 20		0x00	0x00	0x00	0x00	0x00	

- (1) Data length and the memory address of the tag has to be set.
- (2) The reading data can be read out from byte 3, the length is dependent from the reading length.

13.5 Write User data to the tag (synchronous mode)

With one command cycle up to 16 bytes can be written. To write more data, the command cycle has to be repeated with adapted address setting.



The control and status byte must have value "10" before the following command sequence can be started.

13.5.1 Command sequence view

			Step 1: Bit UD is true	Step 2: Start writing (1)	Step 3: Wait for bit WR-RDY	Step 4: Reset bit RD	Step 5: Wait for reset bit WR-RDY
PLC process data output	Byte 1	0	0	0	0	0	0
		1	AO	0	0	0	0
		2	WR	0	1	1	0
		3	RD	0	0	0	0
		4	UR	1	1	1	1
		5	0	0	0	0	0
		6	DR	0	0	0	0
		7	0	0	0	0	0
	Byte 2 (data length)		0x00	0x08	0x00	0x00	0x00
	Byte 3 (address MSB)		0x00	0x00	0x00	0x00	0x00
	Byte 4 (address LSB)		0x00	0x10	0x00	0x00	0x00
...		
Byte 19		0x00	0x00	0x00	0x00	0x00	
Byte 20		0x00	0x00	0x00	0x00	0x00	

			Step 1: Bit UD is true	Step 2: Start writing (1)	Step 3: Wait for bit WR-RDY	Step 4: Reset bit RD	Step 5: Wait for reset bit WR-RDY
PLC process data input	Byte 1	0	TP	1	1	1	1
		1	AI	0	0	0	0
		2	WR-RDY	0	0	1	0
		3	RD-RDY	0	0	0	1
		4	UD	1	1	1	1
		5	EF	0	0	0	0
		6	DR-RDY	0	0	0	0
		7	Diag	0	0	0	0
	Byte 2		0x00	0x00	0x00	0x12	0x00
	Byte 3		0x00	0x00	0x00	0x34	0x00
	Byte 4		0x00	0x00	0x00	0x56	0x00
...		
Byte 19		0x00	0x00	0x00	0x00	0x00	
Byte 20		0x00	0x00	0x00	0x00	0x00	

(1) Data length and the memory address of the tag has to be set.

13.6 Write verified to user memory to the tag (synchronous mode)



The control and status byte must have bit UR and UD set to 1 before the following command sequence can be started.

13.6.1 Command sequence view

			Step 0: no tag in field	Step 1: tag in field	Step 2: tag still in field	Step 3: tag left the field	Step 4: tag left the field	Remark	
PLC process data output	Byte 1	0	0	0	0	0	0		
		1	AO	0	0	0	0		
		2	WR	0	0	1	1	0	Set WR and RD to 1 when TP=1 is detected
		3	RD	0	0	1	1	0	
		4	UR	1	1	1	1	1	Set UR to 1
		5	ER	0	0	0	0	0	
		6	DR	0	0	0	0	0	
		7	0	0	0	0	0	0	
	Byte 2 (Data length)		0x00	0x00	0x10	0x10	0x00	Number of User data bytes to write	
	Byte 3 (Address-H)		0x00	0x00	0x00	0x00	0x00	Address (H-Byte)	
	Byte 4 (Address-L)		0x00	0x00	0x02	0x02	0x00	Address (L-Byte)	
	Byte 5		0x00	0x00	0xAA	0xAA	0x00	User data byte 1	
	Byte 6		0x00	0x00	0xBB	0xBB	0x00	User data byte 2	
	
	Byte 20		0x00	0x00	0x00	0x00	0x00		

			Step 0: no tag in field	Step 1: tag in field	Step 2: tag still in field	Step 3: tag left the field	Step 4: tag left the field	Remark	
PLC process data input	Byte 1	0	TP	0	1 (1)	1	0	0	
		1	AI	0	0	0	0	0	
		2	WR-RDY	0	0	1	1	0	
		3	RD-RDY	0	0	1	1	0	
		4	UD	1	1	1	1	1	
		5	EF	0	0	0	0	0	
		6	DR-RDY	0	0	0	0	0	
		7	Diag	0	0	0	0	0	
	Byte 2 (Data length)		0x00	0x00	0x10 (2)	0x10	0x00	Number of bytes read from the tag	
	Byte 3 (User data)		0x00	0x00	0xAA	0xAA	0x00	User data byte 1 read	
	Byte 4 (User data)		0x00	0x00	0xBB	0xBB	0x00	User data byte 2 read	
	
	Byte 19		0x00	0x00	0x00	0x00	0x00		
	Byte 20		0x00	0x00	0x00	0x00	0x00		

(1) TP bit indicate that the tag is detected by the R/W head.

(2) Number of User data bytes read from the tag.

13.7 Read User data of the tag automatically (asynchronous mode)

! The control and status byte must have value “10” before the following command sequence can be started.

13.7.1 Command sequence view

			Step 0: no tag in field	Step 1: no tag in field	Step 2: tag in field	Step 3: no tag in field	Step 4: tag in field	Remark	
PLC process data output	Byte 1	0	0	0	0	0	0		
		1	AO	0	0	0	0		
		2	WR	0	0	0	0		
		3	RD	0	1	1	1	1	Set ER and RD synchronously to 1
		4	UR	1	1	1	1	1	Set UR to 1
		5	ER	0	1	1	1	1	
		6	DR	0	0	0	0	0	
		7	0	0	0	0	0	0	
	Byte 2 (Data length)		0x00	0x10	0x10	0x10	0x10		Number of User data bytes to read
	Byte 3 (Address-H)		0x00	0x00	0x00	0x00	0x00		Address (H-Byte)
Byte 4 (Address-L)		0x00	0x02	0x02	0x02	0x02		Address (L-Byte)	
Byte 5		0x00	0x00	0x00	0x00	0x00			
...				
Byte 19		0x00	0x00	0x00	0x00	0x00			
Byte 20		0x00	0x00	0x00	0x00	0x00			

			Step 0: no tag in field	Step 1: no tag in field	Step 2: tag in field	Step 3: no tag in field	Step 4: tag in field	Remark	
PLC process data input	Byte 1	0	TP	0	0	1 (1)	0	1	
		1	AI	0	0	0	0	0	
		2	WR-RDY	0	0	0	0	0	
		3	RD-RDY	0	1	1	1	1	
		4	UD	1	1	1	1	1	
		5	EF	0	1	1	1	1	
		6	DR-RDY	0	0	0	0	0	
		7	Diag	0	0	0	0	0	
	Byte 2 (Data length)		0x00	0x00	0x10 (2)	0x00	0x10 (2)		Number of bytes read
	Byte 3 (User data)		0x00	0x00	0x11	0x00	0xAA		User data byte 1
Byte 4 (User data)		0x00	0x00	0x22	0x00	0xBB		User data byte 2	
Byte 5 (User data)		0x00	0x00	0x33	0x00	0xCC		User data byte 3	
...		
Byte 19		0x00	0x00	0x00	0x00	0x00			
Byte 20		0x00	0x00	0x00	0x00	0x00			

(1) TP bit indicate that the tag is detected by the R/W head.

(2) User data length of the tag.

13.8 Read diagnostics information

Dependent on the previously executed command, the diagnostic request must be prepared.



The control and status byte must have value "00" before the following command sequence can be started.

13.8.1 Command sequence view, read diagnostics in mode "Read UID"

		Step 0: diagnostics event	Step 1: set bit DR	Step 5: wait for bit DR- RDY	Step 6: reset bit DR	Step 7: wait for reset bit DR-RDY	
PLC process data output	Byte 1	0	0	0	0	0	
		1	AO	0	0	0	0
		2	WR	0	0	0	0
		3	RD	0	0	0	0
		4	UR	0	0	0	0
		5	0	0	0	0	0
		6	DR	0	1	1	0
		7	0	0	0	0	0
	Byte 2 (data length)		0x00	0x00	0x00	0x00	0x00
	Byte 3 (address MSB)		0x00	0x00	0x00	0x00	0x00
	Byte 4 (address LSB)		0x00	0x00	0x00	0x00	0x00
...		
Byte 19		0x00	0x00	0x00	0x00	0x00	
Byte 20		0x00	0x00	0x00	0x00	0x00	

		Step 0: diagnostics event	Step 1: set bit DR	Step 5: wait for bit DR- RDY	Step 6: reset bit DR	Step 7: wait for reset bit DR-RDY		
PLC process data input	Byte 1	0	TP	0	0	0		
		1	AI	0	0	0		
		2	WR-RDY	0	0	0	0	
		3	RD-RDY	0	0	0	0	
		4	UD	0	0	0	0	
		5	EF	0	0	0	0	
		6	DR-RDY	0	0	1	1	0
		7	Diag	1	0	0	0	0
	Byte 2		0x00	0x00	0x02	0x00	0x00	
	Byte 3		0x00	0x00	0xF1	0x00	0x00	
	Byte 4		0x00	0x00	0xFE	0x00	0x00	
...			
Byte 19		0x00	0x00	0x00	0x00	0x00		
Byte 20		0x00	0x00	0x00	0x00	0x00		

13.8.3 Command sequence view, read diagnostics in mode “Read/write User data of the tag”

			Step 0: tag in field	Step 1: diagnostics event	Step 2: prepare diag. read	Step 3: start diag. read	Step 4: end diag. read	Remark
PLC process data output	Byte 1	0	0	0	0	0	0	
		1	AO	0	0	0	0	
		2	WR	0	0	0	0	
		3	RD	0	1	0	0	Set RD=0 to read diagnostics
		4	UR	1	1	1	1	Keep UR=1
		5	ER	0	0	0	0	
		6	DR	0	0	0	1	Set DR to 1 to read diagnostics
		7	0	0	0	0	0	
	Byte 2		0x00	0x00	0x00	0x00	0x00	
	Byte 3		0x00	0x00	0x00	0x00	0x00	
	Byte 4		0x00	0x00	0x00	0x00	0x00	
	Byte 5		0x00	0x00	0x00	0x00	0x00	
	
	Byte 19		0x00	0x00	0x00	0x00	0x00	
Byte 20		0x00	0x00	0x00	0x00	0x00		

			Step 0: tag in field	Step 1: diagnostics event	Step 2: prepare diag. read	Step 3: start diag. read	Step 4: end diag. read	Remark
PLC process data input	Byte 1	0	TP (1)	1	1	1	1	
		1	AI	0	0	0	0	
		2	WR-RDY	0	0	0	0	
		3	RD-RDY	0	1	0	0	
		4	UD	1	1	1	1	
		5	EF	0	0	0	0	
		6	DR-RDY	0	0	0	1	
		7	Diag	0	1 (2)	1	0	
	Byte 2 (Diag length)		0x00	0x00	0x00	0x01 (3)	0x00	
	Byte 3 (Diag data)		0x00	0x00	0x00	0xF1	0x00	
	Byte 4 (Diag data)		0x00	0x00	0x00	0xFE	0x00	
	Byte 5 (Diag data)		0x00	0x00	0x00	0x02	0x00	
	Byte 6 (Diag data)		0x00	0x00	0x00	0x00	0x00	
	
Byte 20		0x00	0x00	0x00	0x00	0x00		

- (1) TP=1 indicate that the tag is detected by the R/W head.
- (2) Diagnostic detected by the evaluation unit.
- (3) Number of error codes.



14 Error codes

Error codes are signalled with bit “Diag” within the status byte of the response data of the evaluation unit. If more diagnostic events are available, the channel can transfer up to 4 diagnostics simultaneously. The hardware diagnostic events which are device relevant are indicated by the Diag bit of all channels and the user may choose any of the channels to read out the diagnostic event. The inactive channel can only transfer hardware diagnostic events.

Example:

Command response of the evaluation unit for command “DR”
C001F4FE9000

14.1 Error group tag F1FE

Error group	Error Code	Description
Tag	F1FE0200	Presence error (indicated by evaluation unit), tag has left the transmission window
	F1FE0300	Address or command does not fit the tag characteristics (memory size, indicated by evaluation unit)
	F1FE0400	Tag is defective (replace tag or battery)
	F1FE0500	Tag memory overflow (UID > 16 bytes)
	F1FE0900	Command not supported by the tag
	F1FE0A00	Access violation (e.g. block locked, refer to ISO18000-x)
	F1FE0B00	General tag error which is not specified
	F1FE0C00	Unknown internal error

14.2 Error group evaluation unit F4FE

Error group	Error Code	Description
evaluation unit	F4FE0100	Power supply failure
Ident Unit	F4FE0200	Hardware failure , short circuit and overload
evaluation unit	F4FE0201	Allowed temperature exceeded
evaluation unit	F4FE0300	R/W head not operating because time out occurred
evaluation unit	F4FE0400	Command buffer overflow IO-Server Queue (Internal error)
evaluation unit	F4FE0500	Data buffer overflow, memory allocation (Internal error)
evaluation unit	F4FE0600	Command in this mode not supported (Internal error)
evaluation unit	F4FE8100	ID-Link Master inactive, e.g. after power (Internal error)
evaluation unit	F4FE8200	Internal IO-Port server error (Internal error)
evaluation unit	F4FE8300	IO-Port invalid parameter Internal error, e.g. channel (Internal error)
evaluation unit	F4FE8400	Vendor specific error on PUT
evaluation unit	F4FE8500	IO-Port server resets channel
evaluation unit	F4FE8600	Data not available for delayed C/Q inputs or delayed UID (Internal error)
evaluation unit	F4FE8700	IO-Port channel reconfiguration not allowed yet (internal error)
evaluation unit	F4FE8800	IO-Port parameter selector flag not set (internal error)
evaluation unit	F4FE8900	General error detected from ID-Link Master
evaluation unit	F4FE8A00	CRC error detected from ID-Link Master
evaluation unit	F4FE8B00	Object not found detected from ID-Link Master
evaluation unit	F4FE8C00	Data read/write size within command not valid
evaluation unit	F4FE8D00	IO-Port channel is reconfigured
evaluation unit	F4FE8E00	R/W head could not process command, e.g. read/write length exceeded, tag memory error or write to locked block
evaluation unit	F4FE8F00	tag data length exceed (Block size * Block number)
evaluation unit	F4FE9001	Short circuit at output driver detected
evaluation unit	F4FE9002	Under voltage at output driver detected
evaluation unit	F4FE9003	Overload at output driver detected
evaluation unit	F4FE9004	Over temperature at output driver detected
evaluation unit	F4FE9005	Line break to Read/Write head
evaluation unit	F4FE9006	Upper limit reached at output driver
evaluation unit	F4FE9007	Under voltage at C/Go detected
evaluation unit	F4FE9008	R/W head failure detected
evaluation unit	F4FE9009	R/W head communication error
evaluation unit	F4FE900A	I ² C communication error (Internal error)
evaluation unit	F4FE900B	I ² C communication parity error (Internal error)
evaluation unit	F4FE9401	Frontend error detected by R/W head

Error group	Error Code	Description
evaluation unit	F4FE9402	General error detected by R/W head
evaluation unit	F4FE9403	ID-Link Error detected by R/W head
evaluation unit	F4FE9404	Buffer overrun Error detected by R/W head
evaluation unit	F4FEA000	Invalid command code detected
evaluation unit	F4FEA001	Invalid command parameter detected
evaluation unit	F4FEA002	Invalid command data detected
evaluation unit	F4FEA003	Ticket number or ticket length detected
evaluation unit	F4FEA100	Configuration of evaluation unit failed (CR1/CR2)
evaluation unit	F4FEA200	Configuration of IO-channel failed (Internal error)
evaluation unit	F4FEA300	Reading of Inputs C/Qi / IQ (Internal error)
evaluation unit	F4FEA400	Write of output C/Qo failed (Internal error)
evaluation unit	F4FEA500	Setting of high current failed (Internal error)
evaluation unit	F4FEA600	Read of UID failed (Internal error)
evaluation unit	F4FEA700	Read of User data memory of the tag failed (Internal error)
evaluation unit	F4FEA800	Write to user memory of the tag failed, command WU (Internal error)
evaluation unit	F4FEA900	Write to user memory of the tag failed, command WV (Internal error)
evaluation unit	F4FEAA00	Verification of the user memory of the tag failed, commands "WV" (Internal error)
evaluation unit	F4FEAB00	Setting of Antenna field on/off failed, command "AN"
evaluation unit	F4FEAC00	ID-Link master could not read the tag blocks (Internal error)

14.3 Error group Communication User F5FE

Error group	Error Code	Description
Communication User - evaluation unit	F5FE0800	Command from another user being processed (indicated by evaluation unit)
	F5FE8000	More than one command requested by user (DR, WR, Diag)
	F5FE8100	Synchronous read or write command is tried to abort
	F5FE8300	Asynchronous read command parameter invalid

15 Glossary

Definition	Description
Antenna	RFID antenna built in a R/W head
Block size	Size of one block of the tag, e.g. 4/8/32 bytes
Connection	Describes the logical connection between two objects.
Controller	PLC e.g. Siemens PU 315-2 DP/PN
Emergency System	Web server with reduced functionality to download the firmware of the evaluation unit.
Evaluation unit	RFID Ident unit DTE101
GSDML	General Station Description in XML format
Hexadecimal	Numeral format, which use 16 values to represent a numeric value (0..9, A, B, C, D, E, F).
MRP	Media Redundant Protocol supports the media redundance in a ring structure of an Ethernet environment.
PC	Personal computer, e.g. desktop computer, notebook.
PermData	Nonvolatile data area of the evaluation unit for storage of user specific settings, like fieldbus parameter, address settings etc.
PLC	Programmable Logic Controller, e.g. Siemens PU 315-2 DP/PN
Process data input image	Data area where the controller can read the outputs of the external periphery devices (%IBx).
Process data output image	Data area where the controller can write to the inputs of the external periphery devices (%QBx).
Profinet IO	Industrial Ethernet protocol for communication with devices in an industrial environment
Profinet IO controller	Comparable to a master system
Profinet IO device	Comparable to a slave system
R/W head	Read/write head, e.g. ANT411, ANT513
Tag	RFtag, e.g. E80360, E80370
User data	Data area of the 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 requests from a PC