



Device manual extension
RFID compact device module
RWH_CMD

UK

DTE601
DTE602

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1 Detailed description of module RWH_CMD

Following functions are available:

1. Detection if an ID tag is in front of the Read-/Write head.
2. Control of Read-/Write head to switch on or off the RFID antenna field.
3. Read of the Unique Identifier number (UID) of the ID tag.
4. Read of the User data of the ID tag.
-> Reading started via control bit "RD". Maximum read length with one command depends on the size of the selected module.
5. Write to the User data of the ID tag.
-> Writing started via control bit "WR". Maximum write length with one command depends on the size of the selected module.
6. Write verified to the User data of the ID tag.
-> Writing verified started via control bit "WR" and "RD". Maximum write length with one command depends on the size of the selected module.
7. Simple diagnostics of the IO channels of the compact device.
8. Simple notification of compact device diagnostics.
9. Remote restart of the compact device

Module ID	Module name	Description	Remark
0	Off (0 Byte In/Out)	Spare module	No data
1	Inactive (20 Byte In/Out) ⁽¹⁾	Cyclic transmission	High impedance
2	Input (20 Byte In/Out) ⁽²⁾	Cyclic transmission	IEC61131 Input
3	Output (20 Byte In/Out) ⁽²⁾	Cyclic transmission	IEC61131 Output
12	RWH_CMD (26 Byte In/Out)	Cyclic command channel	Payload size 20 bytes
13	RWH_CMD (46 Byte In/Out)	Cyclic command channel	Payload size 40 bytes
14	RWH_CMD (66 Byte In/Out)	Cyclic command channel	Payload size 60 bytes
15	RWH_CMD (86 Byte In/Out)	Cyclic command channel	Payload size 80 bytes
16	RWH_CMD (106 Byte In/Out)	Cyclic command channel	Payload size 100 bytes
17	RWH_CMD (126 Byte In/Out)	Cyclic command channel	Payload size 120 bytes
18	RWH_CMD (146 Byte In/Out)	Cyclic command channel	Payload size 140 bytes
19	RWH_CMD (166 Byte In/Out)	Cyclic command channel	Payload size 160 bytes
20	Input (2 Byte In/Out)	Cyclic transmission	IEC61131 Input
21	Output (2 Byte In/Out)	Cyclic transmission	IEC61131 Output

⁽¹⁾ Not recommended, available only for compatibility with DTE10x devices

⁽²⁾ Only needed if diagnostic information of the IO-1 and IO-2 channel want to be read out.

The PLC input and output data image size depends on the selection of the module by the user for each IO channel. Each IO channel can be set individually to one of the available modules.

Example:

No.	RFID channel	Channel IO-1	Channel IO-2	PLC Input / Output data image size [bytes]
1	RWH_CMD (26 Byte In/Out)	OFF (0 Byte In/Out)	OFF (0 Byte In/Out)	26
2	RWH_CMD (46 Byte In/Out)	INPUT (2 Byte In/Out)	OUTPUT (2 Byte In/Out)	50
3	RWH_CMD (166 Byte In/Out)	INPUT (20 Byte In/Out)	OUTPUT (20 Byte In/Out)	206

Note:

- If the number of bytes of all IO channels exceed the limits of the compact device, the configuration is rejected and no data exchange with the PLC will be possible.
- It is in the PLC programmer's responsibility to calculate the correct address offsets and the maximum possible data size of the IO channels within the PLC input/output data image, see chapter "Module RWH_CMD, general description".

1.1 Module “RWH_CMD”, general description

This module allows the user to communicate with the ID tag and the device. Following mode are available

- Read the RSSI, phase and UID data of the ID tag.
Read UID automatically whenever the compact device detects a change of the UID data (Asynchronous mode).
- Read the memory bank of the selected ID tag.
Two different modes are available:
 - Read UID, TID or user data of the ID tag once on request (Synchronous mode).
 - Read User data of the ID tag automatically whenever the compact device detect a change of the UID data (Asynchronous mode).
- Write to the memory bank of the selected ID tag.
Write UID or user data of the ID tag once on request (Synchronous mode).
- Read the diagnostic information of the compact device.
- Switch off and on the antenna field of the Read-/Write head.
- Execute commands to read or write different parameters of the compact device and the Read-/Write head.

Note:

To read and write the user memory of the ID tag as fast as possible, the module size of the IO-channel shall be set to the maximum value.

Available module sizes N per IO-channel ⁽¹⁾	Transferable number of bytes
26	18
46	38
66	58
86	78
106	98
126	118
146	138
166	158

(1) Please check, that the number of bytes, which are transferred by all activated IO-channels, do not exceed the limit of the PLC data input and output image.

(2) Additionally, following limits of the different compact devices must be noticed:

	DTE601	DTE602
Maximum available input or output data size [bytes]	206	206

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	Res	DR	ER	UR	RD	WR	AO	Res
2	CR	Res	Res	Res	Res	Res	Res	TR
3	Data byte 1							
..	...							
N-1	Data byte (N-3)							
N	Data byte (N-2)							

Description Byte 1, "Control byte 1":

Bit	Bit name	Description
0	Res	Reserved. Must be set to default value „0“.
1	AO	„Antenna field Off“ request
2	WR	Mode " WR ite data" to the compact device
3	RD	Mode " ReaD data" from the compact device
4	UR	Mode " UseR / UID / TID bank data access" to the ID tag
5	ER	Mode " E vent controlled R ead" of User memory of the ID tag
6	DR	Mode " D iagnostics R ead" Set by the controller to fetch the diagnostics, signaled by the compact device in the Diag-Status bit
7	Res	Reserved. Must be set to default value „0“.

Note:

The bits WR, RD, DR and ER are level-controlled bits to activate the corresponding mode. The state "1" transfer the mode to the compact device, but it does not activate a command request. This is done by the control bit TR in Control byte 2. Once these bits are set in the control bytes, the corresponding bits in the status bytes are acknowledged, regardless of the setting of the bit TR.

Description Byte 2, "Control byte 2":

Bit	Bit name	Description
0	TR ⁽¹⁾	Toggle Request
1..6	Res	Reserved. Must be set to default value „0“.
7	CR	Mode " C ommand R quest" Activate the command channel of the compact device. If this bit is set, all other modes must be deactivated.

⁽¹⁾ Bit TR is the main control bit to start the commands of the selected mode. When the Controller set the bit TR to the complement of the bit TA in status byte 2 of the PLC process data image, the command is started.

Example:

Bit TA	BIT TR	Description
0	0	No toggle request, command execution not started
0	1	Toggle request, command execution started
1	1	No toggle request, command execution not started
1	0	Toggle request, command execution started

The bit CR activate the command channel mode of the compact device. Several commands can be executed to read out or set various parameters of the device or the Read/Write heads. The execution of the command is controlled by bit TR of control byte 2.

Description Byte 3...n, "Data byte 1...(N-2)":

Dependent on the selected mode, this data area contains the command data to send to the compact device.

Default value "Control byte 1 and 2": 0x00

Mode: Read UID automatically, antenna field on

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	DA	EA	UA	RA	WA	AI	TP
2	CA	Res	Res	Res	Res	GO	CM	TA
2	Data byte 1							
3	Data byte 2							
..	...							
N-1	Data byte (N-3)							
N	Data byte (N-2)							

Description Byte1, "Status byte 1":

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Bit	Bit name	Description
0	TP ⁽¹⁾	ID Tag Present Bit is set to 1 if at least one ID tag is detected by the integrated Read-/Write head. With the channel parameter "data hold time" the status of the bit can be extended.
1	AI ⁽¹⁾	Antenna field Inactive
2	WA ⁽²⁾	Mode "Write data" to the compact device Active
3	RA ⁽²⁾	Mode "Read data" from the compact device Active
4	UA ⁽²⁾	Mode "User data access" Active
5	EA ⁽²⁾	Mode "Receive User data on Event change" Active
6	DA ⁽²⁾	Mode "Diagnostics read" Active
7	DIAG ⁽¹⁾	DIAG nostic data present, but not yet written in the response buffer. The response buffer contains still ID tag data. The diagnostics data will be copied in the response buffer after detecting that DR control bit is set and the bit TR has been toggled by the controller

- (1) Bits TP, AI and DIAG show the current state of the ID tag / antenna field / diagnostic data.
- (2) Bits WA, RA, UA, EA, DA are immediately set when the compact device detects the setting of the corresponding bits in the control bytes 1 and 2 of the PLC data output image. Any change in the settings of these bits to prior received states set the data bytes 1 ... (n-2) to the default value „0“x00. The bit TR does not influence this behavior.

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request A cknowledge
1	CM	Co Ming event If set to 1, the ID tag has entered the transmission window of the Read-/Write head. (Only used for asynchronous commands)
2	GO	GO ing event. If set to 1, the ID tag has left the transmission window of the Read-/Write head. (Only used for asynchronous commands)
3...6	Res	Reserved. Will be set to default value „0“
7	CA	Mode " C ommand mode A ctive"

- (1) Bit TA reflect the state of the command execution of the compact device. When the compact device receives the bit TR from the controller with a complement state of the bit TA, a request to start the command of the selected mode is received from the controller. While the command execution is running, the bit TA will not change its state. When the command has been processed by the compact device, the bit TA will be set to the state of the bit TR

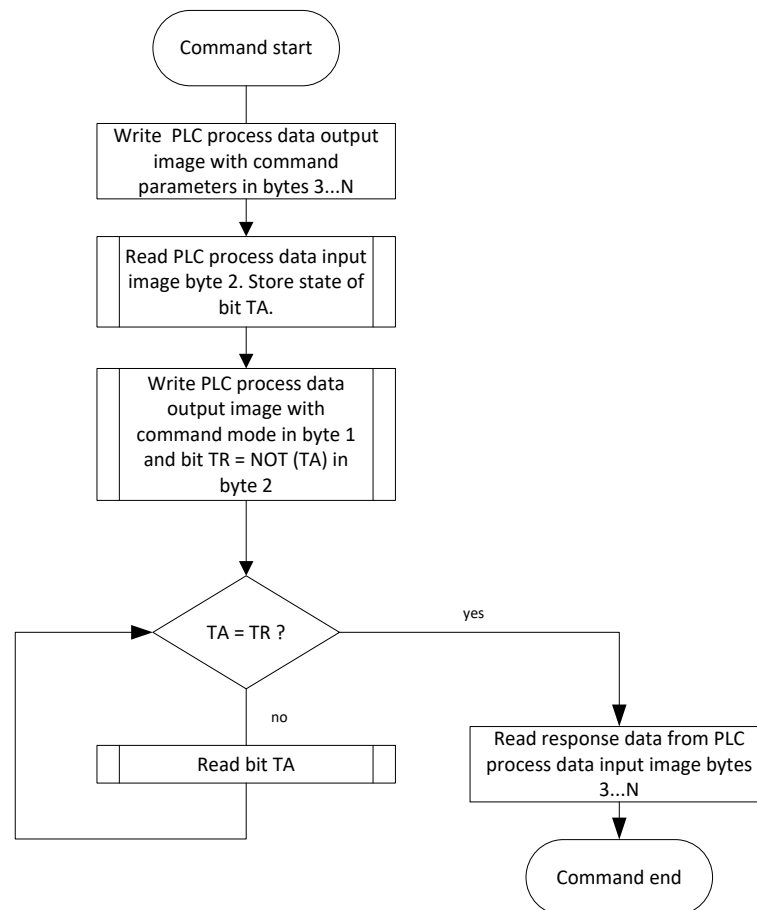
Example:

Bit TR	BIT TA	Description
0	0	Command execution not started or command execution is finished
1	0	Toggle request, command execution started
1	1	Command execution not started or command execution is finished
1	0	Toggle request, command execution started

Description Byte 3...N, "Data byte 1...(N-2)":

Dependent on the selected mode, this data area contains the response data read from the compact device or the diagnostics information.

1.1.1 Command activation with bit TR in PLC process data output image



Note:

It is allowed to setup the command mode and the command parameter in one PLC cycle, together with bit TR = NOT (TA), to activate the command.

1.1.2 Data hold time calculation for asynchronous commands

The setting of the IO-channel parameter “Data hold time” influence the time, how long the bits TP, CM and GO and the response data are kept stable in the process data input image when executing asynchronous command.

By default, this data is transmitted for 3 milliseconds only. After that time, the default data = 0x0 is transmitted.

Please setup the data hold time according to the maximum PLC cycle time.

Formula for data hold time calculation

Data hold time = 2 x PLC maximum cycle time

1.2 Module “RWH_CMD”, Read UID / RSSI data of the ID tag asynchronously

In this mode the UID data and the RSSI value of the ID tag can be read automatically without sending any read request. This mode is suitable if the user does not know when the ID tag is present in front of the Read-/Write head. Additionally, this mode allows the fastest detection of ID tag cause no command request need to be send to the compact device. Please note that the UID is transmitted in real time and the PLC cycle time need to be about factor 2 shorter as the ID tag is detected by the Read-/Write head.

The setting of the IO-channel parameter “Data hold time” influence the time how long the RSSI value and the UID data bytes are kept stable in the process data input image.

PLC process data output image (Module RWH_CMD)

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

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0	“Antenna field on” request	Activate the antenna field. Necessary to communicate with the ID tag.

- ⁽¹⁾ Diagnostics is only available if bit “Diag” is set with in the response data. Otherwise, the response data will return default data “0x00” within byte 3...N.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

- ⁽²⁾ Bit TR = NOT (TA): Command execution is started. For further readings of the UID data, the TR need not to be changed.

Description bytes 3..N:

Must be set to default value „0“x00.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	0	0	0	0	AI	TP
2	0	0	0	0	0	0	0	TA
3	0x00							
4	RSSI + UID data length read							
5	0x00							
6	RSSI value							
7	UID data byte 1 (MSBy)							
8	UID data byte 2							
...	...							
10/14/18/22	UID data byte 4/8/12/16 (LSBy)							
...	...							
N	0x00							

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Description Byte 1, "Status byte 1":

Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
	1	ID tag is detected in front of the Read-/Write head	
AI	0	"Antenna field on" active	-
Diag	0	No error detected	Channel related or channel independent error occurred.
	1	Compact device diagnostics available	

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Set to default value „0“

⁽¹⁾ Bit TR = NOT (TA): Command execution is started.

Description Byte 3..4, "UID + RSSI data length read":

RSSI and UID data length read. Total data length of the RSSI value plus data length of the UID read from ID tag [bytes].

Typical values: [6, 10, 14, 18] bytes

Note: If no ID tag is detected by the Read-/Write head these bytes are set to 0x00.

Description Byte 5..6, "RSSI value":

RSSI value of the ID tag. Reflect the received signal quality of the ID tag. Higher values mean a better reception of the ID tag signal.

Note: If the Read-/Write head has no RSSI value present, these bytes are set to 0x00.

Description Byte 7..10/14/18/22, "UID data byte":

Read UID of the ID tag with length of 32/64/96/128 bit. Unused bytes are set to 0x00. If no ID tag is detected by the Read-/Write head this data field is set to 0x00.

Description Byte 11/15/19/23..N:

Always set to default value „0“x00.

Note:

The setting of the IO-channel parameter "Data hold time" influence the time how long the RSSI value and the UID data bytes are kept stable in the process data input image.

When no ID tag is detected or an error occur while the command is executed, bytes (3..N) are set to default value „0“x00.

1.3 Module “RWH_CMD”, Read User data of the ID tag synchronously

In this mode the User data of the ID tag can be read by setting the bit TR in the PLC process data output image to the complement state of bit TA in the PLC process data input image. This mode is suitable if the user knows when the ID tag is present in front of the Read-/Write head. The read User data are kept in the data bytes 3...N stable while bit TR is not changed.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	0	0	UR=1	RD=1	0	AO=0	0
2	0	0	0	0	0	0	0	TR
3	16-bit read data length [D15...D7]							
4	16-bit read data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7..N	0x00							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0	“Antenna field on” request	Activate the antenna field. Necessary to communicate with the ID tag.
RD ⁽¹⁾	1	Activate mode “Read data”	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.
UR ⁽¹⁾	1	Activate mode “User data access”	

- ⁽¹⁾ Bits RD and UR must have been set to level 1 when the bit TR change its state. It is allowed to set bits RD, UR and TR simultaneously in one PLC cycle.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

- ⁽²⁾ Bit TR = NOT (TA): Command execution is started.

Description Byte 3...4, “16-bit read data length”:

Read data length, limited to a maximum number of (N-6) bytes.

Description Byte 5...6, “16-bit start address”:

Start address of the ID tag User data where the data Must be read from.

Description Byte 7...N, “Not used”:

Must be set to default value „0“x00.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	0	UA=1	RA=1	0	AI	TP
2	0	0	0	0	0	0	0	TA
3	16-bit read data length [D15...D7]							
4	16-bit read data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7... (7+X)	Read data byte 1 ... X							
(8+X) ... N	0x00							

Description Byte 1, "Status byte 1":

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Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI	0	"Antenna field on" active	Reflect the current state of the antenna field setting.
RA	1	Mode "Read data" from the evaluation unit active	Reflect the state of bit RD.
UA	1	Mode "User data" active	Reflect the state of bit UR.
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Diagnostic information can be read out with mode "Diagnostics read"

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request A cknowledge
1..7	-	Will be set to default value „0“ by the evaluation unit

(1) Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the evaluation unit.
 Bytes 3..N contain the command response data.

Description Byte 3...4, "16-bit read data length X":

Number of bytes which could be read successfully from the ID tag. If an error occurs, the read data length is set to 0x0000 and the bit DIAG is set to 1.

Description Byte 5...6, "16-bit start address":

Start address of the ID tag User data where the data is read from.

Description Byte 7...(7+X), "Read data byte 1...X":

This data area contains the data of the User data of the ID tag. Unused bytes are set to 0x00.

Description Byte (8+X)...N:

Will be set to default value „0“x00.

Note:

When no ID tag is detected or an error occur while the command is executed, bytes (3..N) are set to default value „0“x00.

1.4 Module “RWH_CMD”, Read User data of the ID tag asynchronously

In this mode the memory bank of the ID tag can be read automatically. This mode is suitable if the user does not know when the ID tag is present in front of the Read-/Write head.

After activation of the mode with bit TR = NOT (TA) the evaluation unit start the reading of the User data of the ID tag immediately, regardless if an ID tag is detected or not by setting TA = TR. When the evaluation unit detects a change of the status of the ID tag with TP=0->1 a reading process is started. If the status of the ID tag change with TP=1->0, the data length, the address value, and the read data of the PLC data input image is set to default value = 0x0. The setting of the IO-channel parameter “Data hold time” influence the time, how long the TP bit and the read data from the ID tag is kept stable in the process data input image.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	0	ER=1	UR=1	RD=1	0	AO=0	0
2	0	0	0	0	0	0	0	TR
3	16-bit read data length [D15...D7]							
4	16-bit read data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7...N	0x00							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0	“Antenna field on” request	Activate the antenna field. Necessary to communicate with the ID tag.
RD ⁽¹⁾	1	Activate mode “Read data”	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.
UR ⁽¹⁾	1	Activate mode “User data access”	
ER ⁽¹⁾	1	Activate mode “Receive User data automatically” selected	

- ⁽¹⁾ Bits RD, UR and ER must have been set to level 1 when the bit TR change its state. It is allowed to set bits RD, UR, ER and TR simultaneously in one PLC cycle.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

- ⁽²⁾ Bit TR = NOT (TA): Command execution is started. This Must be done only once. Further commands are executed automatically when the evaluation unit detects a state change of the ID tag from “not present” to “present”.

Description Byte 3...4, “16-bit read data length”:

Read data length, limited to a maximum number of (N-6) bytes.

Description Byte 5...6, “16-bit start address”:

Start address of the ID tag User data where the data Must be read from.

Description Byte 7...N, “Not used”:

Must be set to default value „0“x00.

Note:

The command is executed continuously until it is finished by another command request with setting of TR=NOT (TA). If the command parameter "16-bit read length" and "16-bit start address" shall be changed, the bit TR need to be set to NOT (TA) to restart the command with the changed command parameter.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	EA=1	UA=1	RA=1	0	AI	TP
2	0	0	0	0	0	0	0	TA
3	16-bit read data length [D15...D7]							
4	16-bit read data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7... (7+X)	Read data byte 1 ... X							
(8+X) ... N	0x00							

UK**Description Byte 1, "Status byte1":**

Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI	0	"Antenna field on" active	Reflect the current state of the antenna field setting.
RA	1	Mode "Read data" from the evaluation unit active	Reflect the state of bit RD.
UA	1	Mode "User data" active	Reflect the state of bit UR.
EA	1	Mode "Receive User data automatically" active	Reflect the state of bit ER.
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Diagnostic information can be read out with mode "Diagnostics read"

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request A cknowledge
1..7	-	Will be set to default value „0“ by the evaluation unit

- ⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the evaluation unit.
 Bytes 3..N contain the command response data.

Description Byte 3...4, "16-bit read data length X":

Number of bytes which could be read successfully from the ID tag. If an error occurs, the read data length is set to 0x0000 and the bit DIAG is set to 1.

Description Byte 5...6, "16-bit start address":

Start address of the ID tag User data where the data is read from.

Description Byte 7...(7+X), "Read data byte 1...X":

This data area contains the data of the User data of the ID tag. Unused bytes are set to 0x00.

Description Byte (8+X)...N:

Will be set to default value „0“x00.

Note:

- The command is executed continuously until it is finished by another command request with setting of TR=NOT (TA).
- If the command parameter "16-bit read length" and "16-bit start address" shall be changed, the bit TR need to be set to NOT (TA) to restart the command with the changed command parameter.
- When no ID tag is detected or an error occur while the command is executed, bytes (3..N) are set to default value „0“x00.
- The setting of the IO-channel parameter "Data hold time" influence the time, how long the TP bit and the read data from the ID tag are kept stable in the process data input image.

1.5 Module “RWH_CMD”, Write User data to the ID tag synchronously

In this mode the User data of the ID tag can be written by setting the bit TR in the PLC process data output image to the complement state of bit TA in the PLC process data input image. This mode is suitable if the user knows when the ID tag is present in front of the Read-/Write head.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	0	0	UR=1	0	WR=1	AO=0	0
2	0	0	0	0	0	0	0	TR
3	16-bit write data length [D15...D7]							
4	16-bit write data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7... (7+X)	Write data byte 1 ... X							
(8+X) ... N	0x00							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0	“Antenna field on” request	Activate the antenna field. Necessary to communicate with the ID tag.
WR ⁽¹⁾	1	Activate mode “Write data”	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.
UR ⁽¹⁾	1	Activate mode “User data access”	

- ⁽¹⁾ Bits WR and UR must have been set to level 1 when the bit TR change its state. It is allowed to set bits WR, UR and TR simultaneously in one PLC cycle.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

- ⁽²⁾ Bit TR = NOT (TA): Command execution is started.

Description Byte 3...4, “16-bit write data length X”:

Write data length, limited to a maximum number of (N-6) bytes.

Description Byte 5...6, “16-bit start address”:

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

Description Byte 7...(7+X), “Write data byte 1...X”:

This data area contains the data to write into the User data of the ID tag.

Description Byte (8+X)...N:

Must be set to default value „0“x00.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	0	UA=1	RA=1	0	AI	TP
2	0	0	0	0	0	0	0	TA
3	16-bit write data length [D15...D7]							
4	16-bit write data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7...N	0x00							

Description Byte 1, "Status byte1":

Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI	0	"Antenna field on" active	Reflect the current state of the antenna field setting.
WA	1	Mode "Write data" to the evaluation unit active	Reflect the state of bit WR.
UA	1	Mode "User data" active	Reflect the state of bit UR.
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Diagnostic information can be read out with mode "Diagnostics read"

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request Acknowledge
1..7	-	Will be set to default value „0“ by the evaluation unit

- (1) Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 (2) Bit TA = TR: Command has been processed by the evaluation unit.
 Bytes 3..N contain the command response data.

Description Byte 3...4, "16-bit writes data length":

Number of bytes which could be successfully written to the ID tag. If an error occurs, the write data length is set to 0x0000 and the bit DIAG is set to 1.

Description Byte 5...6, "16-bit start address":

Start address of the ID tag User data where the data is written to.

Description Byte 7...(N-6):

Will be set to default value „0“x00.

Note:

When no ID tag is detected or an error occur while the command is executed, bytes (3..N) are set to default value „0“x00.

1.6 Module “RWH_CMD”, Write User data to the ID tag asynchronously

In this mode the User data of the ID tag can be written automatically. This mode is suitable if the user does not know when the ID tag is present in front of the Read-/Write head.

After activation of the mode with bit TR = NOT (TA) the evaluation unit start the writing of the User data of the ID tag immediately, regardless of if an ID tag is detected or not by setting TA = TR. When the evaluation detects a change of the status of the ID tag with TP=0->1 a writing process is started. If the status of the ID tag change with TP=1->0 the data length and the address value of the PLC data input image are set to default value = 0x0.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	0	ER=1	UR=1	0	WR=1	AO=0	0
2	0	0	0	0	0	0	0	TR
3	16-bit write data length [D15...D7]							
4	16-bit write data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7... (7+X)	Write data byte 1 ... X							
(8+X) ... N	0x00							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0	“Antenna field on” request	Activate the antenna field. Necessary to communicate with the ID tag.
WR ⁽¹⁾	1	Activate mode “Write data”	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.
UR ⁽¹⁾	1	Activate mode “User data access”	
ER ⁽¹⁾	1	Activate mode “Receive User data automatically” selected	

- ⁽¹⁾ Bits WR, UR and ER must have been set to level 1 when the bit TR change its state. It is allowed to set bit WR, UR, ER and TR simultaneously in one PLC cycle.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

- ⁽²⁾ Bit TR = NOT (TA): Command execution is started. This Must be done only once. Further commands are executed automatically when the evaluation unit detects a state change of the ID tag from “not present” to “present”.

Description Byte 3...4, “16-bit write data length X”:

Write data length, limited to a maximum number of (N-6) bytes.

Description Byte 5...6, “16-bit start address”:

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

Description Byte 7...(7+X), “Write data byte 1...X”:

This data area contains the data to write into the User data of the ID tag.

Description Byte (8+X)...N:

Must be set to default value „0“x00.

Note:

The command is executed continuously until it is finished by another command request with setting of TR=NOT (TA). If the command parameter "16-bit read length" and "16-bit start address" shall be changed, the bit TR need to be set to NOT (TA) to restart the command with the changed command parameter.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	EA=1	UA=1	RA=1	0	AI	TP
2	0	0	0	0	0	0	0	TA
3	16-bit write data length [D15...D7]							
4	16-bit write data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7...N	0x00							

UK

Description Byte 1, "Status byte1":

Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI	0	"Antenna field on" active	Reflect the current state of the antenna field setting.
WA	1	Mode "Write data" to the evaluation unit active	Reflect the state of bit WR.
UA	1	Mode "User data" active	Reflect the state of bit UR.
EA	1	Mode "Receive User data automatically" active	Reflect the state of bit ER.
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Diagnostic information can be read out with mode "Diagnostics read"

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request A cknowledge
1..7	-	Will be set to default value „0“ by the evaluation unit

- (1) Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the evaluation unit.
 Bytes 3..N contain the command response data.

Description Byte 3...4, "16-bit writes data length":

Number of bytes which could be successfully written to the ID tag. If an error occurs, the write data length is set to 0x0000 and the bit DIAG is set to 1.

Description Byte 5...6, "16-bit start address":

Start address of the ID tag User data where the data is written to.

Description Byte 7...(N):

Will be set to default value „0“x00.

Note:

When no ID tag is detected or an error occur while the command is executed, bytes (3..N) are set to default value „0“x00.

1.7 Module “RWH_CMD”, Write verified User data to the ID tag synchronously

In this mode the User data of the ID tag can be written and read back with one command request. In the first step the command data is written to the ID tag, in the second step it is read back from the ID tag. In the third step the evaluation unit compares the written data with the read data and sends back the result to the PLC. If the written data is identical to the data read back, the read data length in the PLC input data image is set to the write data length of the PLC process data output image, otherwise a diagnostic message is generated.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	0	0	UR=1	RD=1	WR=1	AO=0	0
2	0	0	0	0	0	0	0	TR
3	16-bit write data length [D15...D7]							
4	16-bit write data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7	Write data byte 1							
..	...							
7+(X-1)	Write data byte X							
...	...							
N	0x00							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0	“Antenna field on” request	Activate the antenna field. Necessary to communicate with the ID tag.
WR ⁽¹⁾	1	Activate mode “Write data”	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.
RD ⁽¹⁾	1	Activate mode “Read data”	
UR ⁽¹⁾	1	Activate mode “User data access”	

- ⁽¹⁾ Bits WR, RD and UR must have been set to level 1 when the bit TR change its state. It is allowed to set bits WR, RD, UR and TR simultaneously in one PLC cycle.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

- ⁽²⁾ Bit TR = NOT (TA): Command execution is started.

Description Byte 3...4, “16-bit write data length X”:

Write data length, limited to a maximum number of (N-6) bytes.

Description Byte 5...6, “16-bit start address”:

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

Description Byte 7...(7+X), “Write data byte 1...X”:

This data area contains the data to write to the User data of the ID tag.

Description Byte (8+X)...N:

Must be set to default value „0“x00.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	0	UA=1	RA=1	WA=1	AI	TP
2	0	0	0	0	0	0	0	TA
3	16-bit write data length [D15...D7]							
4	16-bit write data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7...N	0x00							

Description Byte 1, "Status byte1":

Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI	0	"Antenna field on" active	Reflect the current state of the antenna field setting.
WA	1	Mode "Write data" to the evaluation unit active	Reflect the state of bit WR.
RA	1	Mode "Read data" to the evaluation unit active	Reflect the state of bit RD.
UA	1	Mode "User data" active	Reflect the state of bit UR.
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Diagnostic information can be read out with mode "Diagnostics read"

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request A cknowledge
1..7	-	Will be set to default value „0“ by the evaluation unit

- (1) Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the evaluation unit.
 Bytes 3..N contain the command response data.

Description Byte 3...4, "16-bit read data length X":

Number of bytes which could be written and read successfully from the ID tag. If an error occurs, the read data length is set to 0x0000 and the bit DIAG is set to 1.

Description Byte 5...6, "16-bit start address":

Start address of the ID tag User data where the data is written to and read back from.

Description Byte 7...(7+X), "Read data byte 1...X":

This data area contains the data of the User data of the ID tag. Unused bytes are set to 0x00.

Description Byte (8+X)...N:

Will be set to default value „0“x00.

Note:

When no ID tag is detected or an error occur while the command is executed, bytes (3..N) are set to default value „0“x00.

1.8 Module “RWH_CMD”, Write verified User data to the ID tag asynchronously

In this mode the User data of the ID tag can be written and read back automatically. This mode is suitable if the user does not know when the ID tag is present in front of the Read-/Write head.

In the first step the command data is written to the ID tag, in the second step it is read back from the ID tag. In the third step the evaluation unit compares the written data with the read data and sends back the result to the PLC. If the written data is identical to the data read back, the read data length in the PLC input data image is set to the write data length of the PLC process data output image, otherwise a diagnostic message is generated.

After activation of the mode with bit TR = NOT (TA) the evaluation unit start the writing of the User data of the ID tag immediately, regardless of if an ID tag is detected or not by setting TA = TR. When the evaluation unit detects a change of the status of the ID tag with TP=0->1 a writing process is started. If the status of the ID tag change with TP=1->0 the data length, the address value and the read data of the PLC data input image are set to default value = 0x0.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	0	ER=1	UR=1	RD=1	WR=1	AO=0	0
2	0	0	0	0	0	0	0	TR
3	16-bit write data length [D15...D7]							
4	16-bit write data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7... (7+X)	Write data byte 1 ... X							
(8+X) ... N	0x00							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0	“Antenna field on” request	Activate the antenna field. Necessary to communicate with the ID tag.
WR ⁽¹⁾	1	Activate mode “Write data”	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.
RD ⁽¹⁾	1	Activate mode “Read data”	
UR ⁽¹⁾	1	Activate mode “User data access”	
ER ⁽¹⁾	1	Activate mode “Receive User data automatically” selected	

- ⁽¹⁾ Bits WR, RD, UR and ER must have been set to level 1 when the bit TR change its state. It is allowed to set bits WR, RD, UR, ER and TR simultaneously in one PLC cycle.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

- ⁽²⁾ Bit TR = NOT (TA): Command execution is started.

Description Byte 3...4, “16-bit write data length X”:

Write data length, limited to a maximum number of (N-6) bytes.

Description Byte 5...6, "16-bit start address":

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

Description Byte 7...(7+X), "Write data byte 1...X":

This data area contains the data to write to the User data of the ID tag.

Description Byte (8+X)...N:

Must be set to default value „0“x00.

Note:

The command is executed continuously until it is finished by another command request with setting of TR=NOT (TA). If the command parameter "16-bit read length" and "16-bit start address" shall be changed, the bit TR need to be set to NOT (TA) to restart the command with the changed command parameter.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	EA=1	UA=1	RA=1	WA=1	AI	TP
2	0	0	0	0	0	0	0	TA
3	16-bit read data length [D15...D7]							
4	16-bit read data length [D7...D0]							
5	16-bit start address [D15...D8]							
6	16-bit start address [D7...D0]							
7... (7+X)	Read data byte 1 ... X							
(8+X) ... N	0x00							

Description Byte 1, "Status byte1":

Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI	0	"Antenna field on" active	Reflect the current state of the antenna field setting.
WA	1	Mode "Write data" to the evaluation unit active	Reflect the state of bit WR.
RA	1	Mode "Read data" from the evaluation unit active	Reflect the state of bit RD.
UA	1	Mode "User data" active	Reflect the state of bit UR.
EA	1	Mode "Receive User data automatically" active	Reflect the state of bit ER.
Diag	0	No error detected	-
	1	Evaluation unit diagnostics available	Diagnostic information can be read out with mode "Diagnostics read"

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request A cknowledge
1..7	-	Will be set to default value „0“ by the evaluation unit

- (1) Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the evaluation unit.
 Bytes 3..N contain the command response data.

Description Byte 3...4, "16-bit read data length X":

Number of bytes which could be read successfully from the ID tag. If an error occurs, the read data length is set to 0x0000 and the bit DIAG is set to 1.

Description Byte 5...6, "16-bit start address":

Start address of the ID tag User data where the data is written to and read back from.

Description Byte 7...(7+X), "Read data byte 1...X":

This data area contains the data read back from the User data of the ID tag. Unused bytes are set to 0x00.

Description Byte (8+X)...N:

Will be set to default value „0“x00.

Note:

When no ID tag is detected or an error occur while the command is executed, bytes (3..N) are set to default value „0“x00.

1.9 Module “RWH_CMD”, Diagnostics read

In this mode the diagnostic information of the compact device can be read.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	DR	ER	UR	0	0	AO	0
2	0	0	0	0	0	0	0	TR
3	Not used							
..	...							
N-1	Not used							
N	Not used							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
AO	0/1	“Antenna field on” request	Can be left unchanged while mode Diagnostic Read is active
UR	0/1	Mode “User data” access to the ID tag	Can be left unchanged while mode Diagnostic Read is active
ER	0/1	Mode “Event controlled reading” of User memory of the ID tag	Can be left unchanged while mode Diagnostic Read is active
DR ⁽¹⁾	1	Mode “Diagnostics read” active	Diagnostic read is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.

⁽¹⁾ Diagnostics is only available if bit “Diag” within the response data is set. Otherwise, the response data will return default data “0x00” within byte 3...n.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽²⁾	Toggle Request. Controls the execution of the selected mode
1..7	-	Must be set to default value „0“

⁽²⁾ Bit TR = NOT (TA): Command execution is started.

Description byte 3..N:

Not used. These data area can be left unchanged to allow a faster return to the previously executed mode.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	DA	EA	UA	0	0	AI	TP
2	0	0	0	0	0	0	0	TA
3	0x00							
4	Number of error codes							
5	0x00							
6	0x00							
7..10	Error code 1							
11..x	Error code 2..4							
(x+1)..N	0x00							

Description Byte 1, "Status byte":

Bit	Value	Description	Remark
TP	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI	0/1	"Antenna field on" active	Reflect the current state of the antenna field setting.
UA	0/1	Mode "User data" Active	Reflect the current state.
EA	0/1	Mode "Receive User data on Event change" Active	Reflect the current state.
DA	0	Mode "Diagnostics Read" inactive	-
	1	Mode "Diagnostics Read" active	-
Diag	0	No error detected	-
	1	Compact device diagnostics available	If more than 4 error codes are present, this bit is kept in state 1. The user needs to initiate a new diagnostic read to read out the error codes.

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request Acknowledge
1..7	-	Will be set to default value „0“ by the compact device

- (1) Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the compact device.
 Bytes 3..N contain the command response data.

Description Byte 3..4, "Number of error codes":

Number of error codes present in the compact device. Maximum number of error codes to read with one diagnostic read request is 4.

Description Byte 5..6:

Always set to default value „0“x00.

Description Byte 7..x, "Error code 1..4":

Error codes of the compact device. Details see chapter "Error codes of the compact device". One error code has always a length of 4 bytes.

Note: If less than 4 error codes are present, the unused bytes are set to default value „0“x00.

Description Byte (x+1) ... N:

Always set to default value „0“x00.

1.10 Module “RWH_CMD”, Execute command synchronously

In this mode several commands can be send to the compact device to read out or to write data to the compact device.

PLC process data output image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	0	0	0	0	RD ⁽²⁾	WR ⁽¹⁾	0	0
2	CM=1	0	0	0	0	0	0	TR
3	16-bit command length, MSBy							
4	16-bit command length, LSBy							
5	16-bit command code, MSBy							
6	16-bit command code, LSBy							
7	Command parameter 1, MSBy							
8	Command parameter 1, LSBy							
9	Command parameter 2, MSBy							
10	Command parameter 2, LSBy							
...	...							
N	0x00							

Description byte 1, “Control byte 1”:

Bit	Value	Description	Remark
WR ⁽¹⁾	1	Activate mode “PUT” command	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.
RD ⁽²⁾	1	Activate mode “GET” response	Command is started after bit TR is set to NOT (TA) in status byte 2 of the PLC data input image.

- ⁽¹⁾ Bit WR or RD must have been set to level 1 when the bit TR change its state. It is allowed to set bits WR and TR or RD and TR simultaneously in one PLC cycle.

Description byte 2, “Control byte 2”:

Bit	Bit name	Description
0	TR ⁽¹⁾	Toggle Request. Controls the execution of the selected mode
1..6	-	Must be set to default value „0“
7	CM	Command Mode active Must be set to 1 to activate “command mode”

- ⁽¹⁾ Bit TR = NOT (TA): Command execution is started

Description Byte 3...4, “16-bit command length X”:

Command data length, including length of command code. Limited to a maximum number of (N-6) bytes.

Description Byte 5...6, “16-bit command code”:

Command code. Available commands see section “Overview of the available commands”.

Description Byte 7...N, “16-bit command parameter 1...X”:

Command parameter. Unused bytes are set to 0x00.

PLC process data input image (Module RWH_CMD)

Byte no.	Bit							
	7	6	5	4	3	2	1	0
1	DIAG	0	0	0	RA	WA	AI	TP
2	CA	0	0	0	0	0	0	TA
3	16-bit response data length, MSBy							
4	16-bit response data length, LSBY							
5	16-bit response code, MSBy							
6	16-bit response code, LSBY							
7	16-bit response data 1, MSBy							
8	16-bit response data 1, LSBY							
9	16-bit response data 2, MSBy							
10	16-bit response data 2, LSBY							
...	...							
N	0x00							

Description Byte 1, "Status byte1":

Bit	Value	Description	Remark
TP ⁽¹⁾	0	No ID tag detected in front of the Read-/Write head	-
	1	ID tag is detected in front of the Read-/Write head	Bit is set to 1 if the ID tag is detected by the R/W head. With the channel parameter "data hold time" the status of the bit can be extended.
AI ⁽¹⁾	0	"Antenna field on" active	Reflect the current state of the antenna field setting.
WA	1	Mode "PUT" command to the compact device active	Reflect the state of bit WR.
RA	1	Mode "GET" data from the compact device active	Reflect the state of bit RD.
DIAG ⁽¹⁾	0	No error detected	-
	1	Compact device diagnostics available	Diagnostic information can be read out with mode "Diagnostics read"

- (1) Bits TP, AI and DIAG show the current state of the ID tag / HF antenna field / diagnostic data, independent of the setting of bit TR.
- (2) Bits WA, RA are immediately set when the compact device detects the setting of the corresponding bits WR and RD in the control byte 1 of the PLC data output image. Any change in the settings of these bits to prior received states set the data bytes 3 ... (N) to the default value „0"x00. The bit TR does not influence this behavior.

Description Byte 2, "Status byte 2":

Bit	Bit name	Description
0	TA ⁽¹⁾	Toggle request A cknowledge
1..6	-	Will be set to default value „0" by the compact device
7	CA ⁽²⁾	Command mode A ctive

- (1) Bit TA = NOT (TR): Command execution is running
 Bit TA = TR: Command has been processed by the compact device
- (2) Bit CA is immediately set when the compact device detects the setting of bit CR in the control bytes 2 of the PLC data output image. Any change of bit CR to prior received state set the data bytes 3 ... (N) to the default value „0"x00. The bit TR does not influence this behavior.

Description Byte 3...4, "16-bit response data length X":

Response data length include response code. Limited to a maximum number of (N-4) bytes.

Description Byte 5...6, "16-bit response code":

Response code of the command request.

Description Byte 7...(N), "16-bit response data 1...X":

This data area contains the response data of the command. Unused bytes are set to 0x00.

Note:

If an error occurs, the bytes 7...N are set to 0x0000 and the bit DIAG is set to 1.

1.10.1 Overview GET / SET commands

Command	Control word ⁽¹⁾	Command length	Command code	Parameter 1	Parameter 2	Parameter 3 .. (N)
GET IDENT DIAGNOSIS	0x0880	0x0002	0x62C8	0x0000	0x0000	0x0000
GET MAC ADDRESS	0x0880	0x0002	0x62C9	0x0000	0x0000	0x0000
GET HF POWER LIST	0x0880	0x0002	0x62CE	0x0000	0x0000	0x0000
GET HF POWER SETTING	0x0880	0x0002	0x62CF	0x0000	0x0000	0x0000
GET BARGRAPH STATE	0x0880	0x0002	0x62D0	0x0000	0x0000	0x0000
GET BLOCKS LOCKED	0x0880	0x0006	0x62D1	STB	NOB	0x0000
GET DSFID	0x0880	0x0002	0x62D2	0x0000	0x0000	0x0000
GET AFI	0x0880	0x0002	0x62D3	0x0000	0x0000	0x0000
GET UID-RSSI	0x0880	0x0002	0x62CD	0x0000	0x0000	0x0000
SET HF POWER LEVEL	0x0480	0x0004	0x65D6	PWR	0x0000	0x0000
SET BARGRAPH STATE	0x0480	0x0004	0x65D7	State	0x0000	0x0000
SET BLOCKS LOCKED	0x0480	0x0006	0x65D8	STB	NOB	0x0000
SET DEVICE RESET	0x0480	0x0004	0x65D9	RDT	0x0000	0x0000
SET DSFID	0x0480	0x0004	0x65DA	DSFID	0x0000	0x00000
SET AFI	0x0480	0x0004	0x65DB	AFI	0x0000	0x0000
SET DSFID LOCKED	0x0480	0x0002	0x65DC	0x0000	0x0000	0x0000
SET AFI LOCKED	0x0480	0x0002	0x65DD	0x0000	0x0000	0x0000
SET ID tag	0x0480	0x0008	0x65DE	LEN	ADDR	DEF
Reboot device	0x0480	0x0004	0x65D9	Countdown value	0x0000	0x0000

⁽¹⁾ = TR bit in control byte must be set to NOT (TA) to activate the command.

1.10.2 Command “GET DIAGNOSIS”

With this command the diagnostic data of the compact device can be read by the controller.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xC8	Command code (LSBy)
7...N	0x00	Not used

(1) Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04 + (4*X)	Response length (LSBy), X=Number of error codes
5	0x62	Response code (MSBy)
6	0xC8	Response code (LSBy)
7	0x00	Not used
8	0x00 ... (4*X)	Number of error codes [X= 0x0...0x4]
9...12	Error code 1	Error code 1. See chapter “Error codes of the compact device”
13...X	...	...
(X+1)..N	0x00	Not used

(1) Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the compact device.

1.10.3 Command “GET MAC ADDRESS”

With this command the media access control (MAC) address of the compact device can be read by the controller.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xC9	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x08	Response length (LSBy)
5	0x62	Response code (MSBy)
6	0xC9	Response code (LSBy)
7	Octet 1	Media access control address, octet 1
8	Octet 2	Media access control address, octet 2
9	Octet 3	Media access control address, octet 3
10	Octet 4	Media access control address, octet 4
11	Octet 5	Media access control address, octet 5
12	Octet 6	Media access control address, octet 6
13...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the compact device

1.10.4 Command “GET HF POWER LIST”

With this command the controller can read out the available HF power levels of the Read-/Head.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xCE	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x02 + (n)	Response length (LSBy)
5	0x62	Response code (MSBy)
6	0xCE	Response code (LSBy)
7	0x00	Not used
8	0x00 ... X	Number of power levels. X = [0...5] 0x0 = No entry in HF power list 0x1 = one level (e.g., 100%)n 0x2 = two levels (e.g., 0% and 100%) ...
9	PWR1	First available power level. [%] e.g., 0x0 = 0% => HF field off
10	PWR2	Second available power level. [%] e.g., 0x64 = 100% => HF field on.
11...X	...	...
(X+1)..N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit

Note:

If the command is not supported by the Read-/Write head, the evaluation unit set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.5 Command “GET HF POWER SETTING”

With this command the controller can read out the current HF power level setting of the Read-/Head.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xCF	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x62	Response code (MSBy)
6	0xCF	Response code (LSBy)
7	0x00	Not used
8	PWR1	Current HF power level active in the Read-/Write head [%] e.g. 0x32 = 50%
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit

Note:

If the command is not supported by the Read-/Write head, the evaluation unit set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.6 Command “GET BARGRAPH STATE”

With this command the controller can read out the LED bar graph state of the Read-/Write head.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xD0	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x62	Response code (MSBy)
6	0xD0	Response code (LSBy)
7	0x00	Not used
8	State ⁽²⁾	Current setting of the LED bar graph of the Read-/Write head 0x00 = Binary mode 0x01 = Count mode (default value)
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the compact device.

⁽²⁾ State = Binary: If one or more ID tags are detected, the bargraph LED's 1...4 are switched on
State = Count: The number of detected ID tags are displayed by the number of LED's turned on. (0 ... 4 or more ID tags detected)

Note:

If the command is not supported by the Read-/Write head, the compact device set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.7 Command “GET BLOCKS LOCKED”

With this command the controller can check which memory areas of the ID tag have a write protection.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x06	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xD1	Command code (LSBy)
7	0x00	Not used
8	STB	Block number of the first block which shall be checked for state "Blocked locked". X = [0x0.. nan] Note: nan shall not exceed the module size – 8 and the number of blocks of the ID tag – 1.
9	0x00	Not used
10	NOB	Number of blocks which shall be checked [0x1.. 0xFF] Note: Number of blocks shall not exceed (N-8) bytes. STB + NOB shall not exceed number of blocks of the ID tag.
11...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04 + X	Response length (LSBy)
5	0x62	Response code (MSBy)
6	0xD1	Response code (LSBy)
7	0x00	Not used
8	NOB	Number of blocks which were checked for state "Block locked". X = [0x1.. nn]
9	BS1	Status of block with number STB: 0x0 = Block is unlocked 0x1 = Block is locked
...	...	...
9+(X-1)	BSX	Status of block with number STB+(X-1): 0x0 = Block is unlocked 0x1 = Block is locked,
(9+X)...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit

Note:

If the command is not supported by the Read-/Write head, the evaluation unit set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.8 Command “GET DSFID”

With this command the controller can read out the data structure format identifier (DSFID) of the ID tag.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xD2	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x62	Response code (MSBy)
6	0xD2	Response code (LSBy)
7	0x00	Not used
8	DSFID	Data structure format identifier of the ID tag [0x0 .. 0xFF]
(9...N)	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

1.10.9 Command “GET AFI”

With this command the controller can read out the application family identifier (AFI) of the ID tag.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xD3	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x62	Response code (MSBy)
6	0xD3	Response code (LSBy)
7	0x00	Not used
8	AFI	Application family identifier of the ID tag [0x0 .. 0xFF]
(9...N)	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

1.10.10 Command “GET UID-RSSI”

With this command the controller can read out the UID of ID tag and the RSSI value from the Read-/Write head.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x62	Command code (MSBy)
6	0xCD	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x08	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x0E	Response length (LSB). Fixed to 14 bytes, regardless of UID length.
5	0x62	Response code (MSBy)
6	0xCD	Response code (LSBy)
7	0x00	Not used
8	0x06 / 0x0A	RSSI and UID data length [6,10]
9	0x00	Not used
10	RSSI	RSSI value of the ID tag. Reflect the received signal quality of the ID tag. Higher values mean a better reception of the ID tag signal. If no ID tag is detected by the Read-/Write head this data field is set to 0x00.
11...X	UID	Read UID of the ID tag with length of 4/8/16/32 bytes. Unused bytes are set to 0x00. If no ID tag is detected by the Read-/Write head this data field is set to 0x00.
11...X	...	...
(X+1)..N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the evaluation unit

Note:

If the command is not supported by the Read-/Write head, the evaluation unit set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.11 Command “SET HF POWER LEVEL”

With this command the controller can set the HF power level of the Read-/Write head.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x04	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xD6	Command code (LSBy)
7	0x00	Not used
8	PWR	HF power level to activate in the Read-/Write head [%] e.g. 0x32 = 50% The available power levels depend on the read/write head used. With the command “Get HF power list”, the available power levels can be read out.
8...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xD6	Response code (LSBy)
7	0x00	Not used
8	PWR	Current HF power level active in the Read-/Write head [%] e.g. 0x32 = 50%
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit

Note:

If the command is not supported by the Read-/Write head, the evaluation unit set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.12 Command “SET BARGRAPH STATE”

With this command the controller can set the LED bar graph state of the Read-/Write head.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x04	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xD7	Command code (LSBy)
7	0x00	Not used
8	State	Setting of the LED bar graph of the Read-/Write head 0x00 = Off 0x01 = On
9...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xD7	Response code (LSBy)
7	0x00	Not used
8	State	Current setting of the LED bar graph of the Read-/Write head 0x00 = Off 0x01 = On
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit

Note:

If the command is not supported by the Read-/Write head, the evaluation unit set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.13 Command “SET BLOCKS LOCKED”

With this command the controller can set a write protection on a specific user memory area of the ID tag.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x06	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xD8	Command code (LSBy)
7	0x00	Not used
8	STB	Block number of the first block which shall be set into state "Blocked locked". [0x0.. nn] Note: nn shall not exceed number of blocks of the ID tag - 1
9	0x00	Not used
10	NOB	Number of blocks which shall be set into state "Blocked locked". [0x1.. 0xFF] Note: STB + NOB shall not exceed number of blocks of the ID tag.
11...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xD8	Response code (LSBy)
7	0x00	Not used
8	State	0x0 = Blocks locked failed 0x1 = Blocks locked ok
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

Note:

If the command is not supported by the Read-/Write head, the evaluation unit set the flag DIAG in status byte 2. The error code can be read out with command “GET IDENT DIAGNOSIS”.

1.10.14 Command “SET DEVICE RESET”

With this command the controller can read out the LED bar graph state of the Read-/Write head.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x04	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xD9	Command code (LSBy)
7	0x00	Not used
8	RDT	Restart Delay Time [ms*10] 0x00 = Restart of the evaluation unit without delay 0x01... 0xFF = Restart of the evaluation unit within XX * 10 ms
9...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xD9	Response code (LSBy)
7	0x00	Not used
8	CRT	Countdown Restart delay Time [ms*10] Value is decremented from “Restart delay time”, set in byte RTD of the PLC process data output image, to 0x0. After that, the restart sequence is executed.
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

Note:

It is sufficient to execute this command at one IO channel. Once the command is started, the other active IO channels will not be actualized in the process data input image.

1.10.15 Command “SET DSFID”

With this command the controller can write the data structure format identifier (DSFID) of the ID tag.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x04	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xDA	Command code (LSBy)
7	0x00	Not used
8	DSFID	Data structure format identifier to write to the ID tag [0x0 .. 0xFF]
9...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xDA	Response code (LSBy)
7	0x00	Not used
8	DSFID	Data structure format identifier of the ID tag (echo of the command) [0x0 .. 0xFF]
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

1.10.16 Command “SET AFI”

With this command the controller can write the application family identifier (AFI) of the ID tag.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x04	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xDB	Command code (LSBy)
7	0x00	Not used
8	AFI	Application family identifier to write to the ID tag [0x0 .. 0xFF]
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x04	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xDB	Response code (LSBy)
7	0x00	Not used
8	AFI	Application family identifier of the ID tag (echo of the command) [0x0 .. 0xFF]
9...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
 Bit TA = TR: Command has been processed by the evaluation unit.

1.10.17 Command “SET DSFID LOCKED”

With this command the controller can protect the data structure format identifier (DSFID) of the ID tag against modification.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xDC	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x02	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xDC	Response code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

1.10.18 Command “SET AFI LOCKED”

With this command the controller can protect the application family identifier (AFI) of the ID tag against modification.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x02	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xDD	Command code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x02	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xDD	Response code (LSBy)
7...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

1.10.19 Command “SET ID tag”

With this command the controller can setup the User data memory of the ID tag with a predefined value.

PLC process data output image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Control byte 1
2	0x80 ⁽¹⁾	Control byte 2
3	0x00	Command length (MSBy)
4	0x08	Command length (LSBy)
5	0x65	Command code (MSBy)
6	0xDE	Command code (LSBy)
7..8	LEN ⁽²⁾	Write data LEN gth in bytes which shall be set to [DEF] value. [0x0] = Auto detect the number of blocks of the ID tag. [0x1.. nn] = Number of blocks which shall be set with the value of byte DEF. Note: ADDR + LEN shall not exceed the number of bytes of the ID tag.
9..10	ADDR	User memory start address of the ID tag to be set to [DEF] value. [0x0.. nn] Note: nn shall not exceed the number of bytes of the ID tag - 1
11	0x00	Not used
12	DEF	DEF ault data value of the ID tag [0x00 ... 0xFF]
13...N	0x00	Not used

⁽¹⁾ Bit TR Must be set to NOT (TA) to start the command.

⁽²⁾ Please refer to data sheet of the ID tag if the number of blocks of the ID tag can be evaluated automatically

PLC process data input image (Module RWH_CMD)

Byte No.	Content	Remark
1	0x04	Status byte 1
2	0x80 ⁽¹⁾	Status byte 2
3	0x00	Response length (MSBy)
4	0x08	Response length (LSBy)
5	0x65	Response code (MSBy)
6	0xDE	Response code (LSBy)
7..8	LEN	Write data LEN gth in bytes which were set to [DEF] value.
9..10	ADDR	User memory start ADDR ress of the ID tag which was set to [DEF] value
11	0x00	Not used
12	DEF	DEF ault data value of the ID tag [0x00 ... 0xFF]
13...N	0x00	Not used

⁽¹⁾ Bit TA = NOT (TR): Command execution is running. Bytes 3..N are set to default value „0“x00.
Bit TA = TR: Command has been processed by the evaluation unit.

2 Data frame examples

In the following examples the compact device is configured with the built in Read-/Write.

Note:

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

2.1 Module “RWH_CMD”, Read UID and RSSI value asynchronously

The example shows the built in Read-/Write head with a payload length of 26 bytes.

2.1.1 Payload traffic view

Last response from the evaluation unit:

0000000000000000000000000000000000000000000000000000000000000000

Note:

The evaluation of the response of the Compact device is necessary to get the state of the bit TA in byte 2 of the PLC process data input image.

Command requests send by Controller:

0000000000000000000000000000000000000000000000000000000000000000

Controller: “Read UID of the ID tag” . Bit TR is not changed.

Response sends by the Compact device:

0100000A0003e00401004c5f494c000000000000000000000000000000000000

Compact device: Send “ID tag is in field” with RSSI value and UID data with length of 8 bytes.

2.1.2 Payload traffic view, read diagnostics

Command requests send by Controller:

4001000000000000000000000000000000000000000000000000000000000000

Controller: Read diagnostics information

Response sends by Compact device when command has been processed:

400100010000F4FE0300000000000000000000000000000000000000000000000

Compact device: Diagnostics information with 1 element, diagnostics " Read-/Write head not operating cause time out occurred " .

Note:

Before the UID can be read again, the DR bit within the Control byte must be reset.
Here an example how to reset the DR bit.

0000000000000000000000000000000000000000000000000000000000000000

Controller: Remove diagnostics read request. Activate mode by sending bit TR = NOT (TA).

2.2 Module “RWH_CMD”, Read User data of the ID tag synchronously

The example shows the built in Read-/Write head with a payload length of 26 bytes.

2.2.1 Payload traffic view

Last response from the Compact device:

0100000A0003e00401004c5f494c000000000000000000000000

Note:

The evaluation of the response of the Compact device is necessary to get the state of the bit TA in byte 2 of the PLC process data input image.

Command requests send by Controller:

1801000A000400000000000000000000000000000000000000

Controller: “Read User data of the ID tag synchronously” with 10 bytes from start address 0x0004.

Response sends by Compact device while command is processed:

1900000000000000000000000000000000000000000000000

Compact device: No ID tag detected, response data set to default values.

...

Response sends by Compact device when command has been processed:

1901000A0004112233445566778899AA000000000000000000

Compact device: “Read User data of the ID tag asynchronously” with 10 bytes from start address 0x0004.

2.2.2 Payload traffic view, read diagnostics

Command requests send by Controller:

5000000000000000000000000000000000000000000000000

Controller: Read diagnostics information. Activate mode by sending bit TR = NOT (TA).

Response sends by Compact device when command has been processed:

500100010000F4FE0300000000000000000000000000000000

Compact device: Diagnostics information with 1 element, diagnostics " Read-/Write head not operating cause time out occurred ".

Note:

Before the User data can be read again, the DR bit within the Control byte must be reset.
Here an example how to reset the DR bit:

Command requests send by Controller:

1800000A000400000000000000000000000000000000000000

Controller: Remove diagnostics read request. Reactivate mode “Read User data of the ID tag synchronously” by sending bit TR = NOT (TA).

2.3 Module “RWH_CMD”, Read User data of the ID tag asynchronously

The example shows the built in Read-/Write head with a payload length of 26 bytes.

2.3.1 Payload traffic view

Last response from the Compact device:

0100000A0003e00401004c5f494c000000000000000000000000

Note:

The evaluation of the response of the Compact device is necessary to get the state of the bit TA in byte 2 of the PLC process data input image.

Command requests send by Controller:

3801000A000400000000000000000000000000000000000000

Controller: “Read User data of the ID tag asynchronously” with 10 bytes from start address 0x0004.

Response sends by Compact device when no ID tag is detected.

3800000000000000000000000000000000000000000000000

Compact device: No ID tag detected, response data set to default values.

...

Response sends by Compact device when ID tag is detected:

3901000A0004112233445566778899AA00000000000000000000

Compact device: New ID tag detected; 10 bytes of User data read from start address 0x0004.

Note:

While the command is not finished, no other commands can be started.

2.3.2 Payload traffic view, read diagnostics

Command requests send by Controller:

7000000000000000000000000000000000000000000000000

Controller: Read diagnostics information. Activate mode by sending bit TR = NOT (TA).

Response sends by Compact device when command has been processed:

700100010000F4FE0300000000000000000000000000000000

Compact device: Diagnostics information with 1 element, diagnostics " Read-/Write head not operating cause time out occurred ".

Note:

Before the User data can be read again, the DR bit within the Control byte must be reset.

Here an example how to reset the DR bit on both channels:

Command requests send by Controller:

3800000A000400000000000000000000000000000000000000

Controller: Remove diagnostics read request. Reactivate mode “Read User data of the ID tag asynchronously” by sending bit TR = NOT (TA).

2.4 Module “RWH_CMD”, Write User data of the ID tag synchronously

The example shows the built in Read-/Write head with a payload length of 26 bytes.

2.4.1 Payload traffic view

Last response from the Compact device:

0100000A0003e00401004c5f494c000000000000000000000000

Note:

The evaluation of the response of the Compact device is necessary to get the state of the bit TA in byte 2 of the PLC process data input image.

Command requests send by Controller:

140100040008C1C2C3C4000000000000000000000000000000

Controller: Write 4 bytes from start address 0x0008 to User data of the ID tag.

Response sends by Compact device while command is processed:

150000000000000000000000000000000000000000000000

Compact device: Send “ID tag is in field”, response data set to default values.

...

Response sends by Compact device when command has been processed:

150100040008000000000000000000000000000000000000

Compact device: Send “ID tag is in field”. User data memory written successfully with 4 bytes from start address 0x0008.

2.4.2 Payload traffic view, read diagnostics

Command requests send by Controller:

50000000000000000000000000000000000000000000000

Controller: Read diagnostics information.

Activate mode by sending bit TR = NOT (TA).

Response sends by Compact device when command has been processed:

500100010000F4FE03000000000000000000000000000000

Compact device: Diagnostics information with 1 element, diagnostics " Read-/Write head not operating cause time out occurred ".

Note:

Before the User data can be read again, the DR bit within the Control byte must be reset.
Here an example how to reset the DR bit.

Command requests send by Controller:

1400000A0004000000000000000000000000000000000000

Controller: Remove diagnostics read request. Reactivate mode “Write User data to the ID tag” by sending bit TR = NOT (TA).

2.5 Module “RWH_CMD”, Write User data of the ID tag asynchronously

The example shows the built in Read-/Write head with a payload length of 26 bytes.

2.5.1 Payload traffic view

Last response from the Compact device:

0100000A0003e00401004c5f494c000000000000000000000000

Note:

The evaluation of the response of the Compact device is necessary to get the state of the bit TA in byte 2 of the PLC process data input image.

Command requests send by Controller:

340100040008C1C2C3C4000000000000000000000000000000

Controller: Write 4 bytes from start address 0x0008 to User data of the ID tag.

Response sends by Compact device while command is processed:

3500000000000000000000000000000000000000000000000

Compact device: Send “ID tag is in field”, response data set to default values.

...

Response sends by Compact device:

35010004000800000000000000000000000000000000000000
0000000000000000

Compact device: Send “ID tag is in field”. User data memory written successfully with 4 bytes from start address 0x0008.

2.5.2 Payload traffic view, read diagnostics

Command requests send by Controller:

7000000000000000000000000000000000000000000000000
0000000000000000

Controller: Read diagnostics information from channel IO-1, “Read UID of the ID tag” from channel IO-2.
Activate mode by sending bit TR = NOT (TA).

Response sends by Compact device when command has been processed:

700100010000F4FE0300000000000000000000000000000000
0000000000000000

Compact device: Diagnostics information with 1 element, diagnostics " Read-/Write head not operating cause time out occurred ".

Note:

Before the User data can be read again, the DR bit within the Control byte must be reset.
Here an example how to reset the DR bit on both channels:

Command requests send by Controller:

3400000A000400000000000000000000000000000000000000
0000000000000000

Controller: Remove diagnostics read request on channel IO-1 and IO-2. Reactivate mode “Write User data to the ID tag asynchronously” by sending bit TR = NOT (TA).

2.6 Module “RWH_CMD”, Write verified User data of the ID tag synchronously

The example shows the built in Read-/Write head with a payload length of 26 bytes.

2.6.1 Payload traffic view

Last response from the Compact device:

0100000A0003e00401004c5f494c0000000000000000000000000000

Note:

The evaluation of the response of the Compact device is necessary to get the state of the bit TA in byte 2 of the PLC process data input image.

Command requests send by Controller:

1C0100040008C1C2C3C4000000000000000000000000000000

Controller: Write verified 4 bytes from address 0x0008 to User data of ID tag.

Response sends by Compact device while command is processed:

[illegible]

Compact device: Send "ID tag is in field", response data set to default values.

...

Response sends by Compact device when command has been processed:

1D0100040008C1C2C3C400000000000000000000000000000000

Compact device: Send "ID tag is in field" with User data read back from the ID tag.

2.6.2 Payload traffic view, read diagnostics

Command requests send by Controller:

[illegible]

Controller: Read diagnostics information. Activate mode by sending bit TR = NOT (TA).

Response sends by Compact device when command has been processed:

500100010000F4FE03000000000000000000000000000000000000

Compact device: Diagnostics information with 1 element, diagnostics " Read-/Write head not operating cause time out occurred ".

Note:

Before the User data can be read again, the DR bit within the Control byte must be reset.

Here an example how to reset the DR bit on both channels:

Command requests send by Controller:

[illegible]

Controller: Remove diagnostics read request. Reactivate mode "Write verified User data to the ID tag" by sending bit TR = NOT (TA).

2.7 Module “RWH_CMD”, Execute command synchronously

The example shows the built in Read-/Write head with a payload length of 26 bytes.

2.7.1 Payload traffic view

Last response from the Compact device:

0100000A0003e00401004c5f494c00000000000000000000000000000001000A0002e00801138ca1d7cb000000000
0000000000000000

Note:

The evaluation of the response of the Compact device is necessary to get the state of the bit TA in byte 2 of the PLC process data input image.

Command requests send by Controller:

0881000662D10006000A000000000000000000000000000000000000000000000001000000000000000000000000000000
0000000000000000

Controller: Send command “Get Blocks locked” of ID tag from block number 6 up to block number 15 at channel IO-1. No command execution on channel IO-2.

Response sends by Compact device:

09810000000000000000000000000000000000000000000000000000000000000001000000000000000000000000000000
0000000000000000

Compact device: Send “ID tag detected” at channel IO-1, response data set to default values in channel IO-1 while command is processed. “No ID tag detected” at channel IO-2.

2.7.2 Payload traffic view, read diagnostics

Command requests send by Controller:

0880000262C800000000000000000000000000000000000000000000000000000001000000000000000000000000000000
0000000000000000

Controller: Send command “Get Ident diagnosis” from channel IO-1. No command execution on channel IO-2.

Response sends by Compact device:

0980000862C80001F4FE0300000000000000000000000000000000000000000000001000000000000000000000000000000
0000000000000000

Compact device: Diagnostics information with 1 element, diagnostics " Read-/Write head not operating cause time out occurred ".

Note:

Before the User data can be read again, the DR bit within the Control byte must be reset.
Here an example how to reset the DR bit on both channels:

Command requests send by Controller:

3801000A000400000000000000000000000000000000000000000000000000000003800008000200000000000000000000000
0000000000000000

Controller: Remove diagnostics read request on channel IO-1 and IO-2. Reactivate mode “Read User data of the ID tag asynchronously” by sending bit TR = NOT (TA).

3 Error codes of the compact device

Error codes are signaled with bit “Diag” within the status byte of the response data of the compact device. 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 on all channels.
Note: Inactive channels can only transfer hardware diagnostic events.

Examples:

- Command response of the compact device for diagnostic read over bit “DR”:
5101 0001 0000 **F4FE9000**
- Command response of the compact device for command “GET IDENT DIAGNOSIS”
0880 0008 62C8 0001 **F4FE9000**

3.1 Error group ID tag (F1FE)

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

3.2 Error group compact device (F4FE)

Error group	Error Code	Description
Compact device	F4FE0100	Power supply failure
Ident Unit	F4FE0200	Hardware failure, short circuit and overload
Compact device	F4FE0201	Allowed temperature exceeded
Compact device	F4FE0300	Read-/Write head not operating cause time out occurred
Compact device	F4FE0400	Command buffer overflow IO-Server Queue (Internal error)
Compact device	F4FE0500	Data buffer overflow, memory allocation (Internal error)
Compact device	F4FE0600	Command in this mode not supported (Internal error)
Compact device	F4FE8100	ID-Link Master inactive. e.g., after power (Internal error)
Compact device	F4FE8200	Internal IO-Port server error (Internal error)
Compact device	F4FE8300	IO-Port invalid parameter Internal error, e.g., channel (Internal error)
Compact device	F4FE8400	Vendor specific error on PUT
Compact device	F4FE8500	IO-Port server resets channel
Compact device	F4FE8600	Data not available for delayed C/Q inputs or delayed UID (Internal error)
Compact device	F4FE8700	IO-Port channel reconfiguration not allowed yet (internal error)
Compact device	F4FE8800	IO-Port parameter selector flag not set (internal error)
Compact device	F4FE8900	General error detected from ID-Link Master
Compact device	F4FE8A00	CRC error detected from ID-Link Master
Compact device	F4FE8B00	Object not found detected from ID-Link Master
Compact device	F4FE8C00	Data read/write size within command not valid
Compact device	F4FE8D00	IO-Port channel is reconfigured
Compact device	F4FE8E00	Read-/Write head could not process command e.g. Read/write length exceeded, ID tag memory error, write to locked block
Compact device	F4FE8F00	ID tag data length exceed (Block size * Block number)
Compact device	F4FE9001	Short circuit at output driver detected
Compact device	F4FE9002	Under voltage at output driver detected
Compact device	F4FE9003	Overload at output driver detected
Compact device	F4FE9004	Over temperature at output driver detected
Compact device	F4FE9005	Line break to Read-/Write head
Compact device	F4FE9006	Upper limit reached at output driver
Compact device	F4FE9007	Under voltage at C/Qo detected
Compact device	F4FE9008	Read-/Write head failure detected
Compact device	F4FE9009	Read-/Write head communication error
Compact device	F4FE900A	I ² C communication error (Internal error)
Compact device	F4FE900B	I ² C communication parity error (Internal error)
Compact device	F4FE900C	Command rejected cause antenna field switched off
Compact device	F4FE900D	Internal data of PROFNET stack corrupt (Internal error)
Compact device	F4FE900E	R/W head do not support this object
Compact device	F4FE9401	Frontend Error detected by Read-/Write head
Compact device	F4FE9402	General error detected by Read-/Write head
Compact device	F4FE9403	ID-Link Error detected by Read-/Write head
Compact device	F4FE9404	Buffer overrun Error detected by Read-/Write head
Compact device	F4FE9405	Over temperature at front end detected
Compact device	F4FE9406	R/W head error detect reverse power to high
Compact device	F4FE9407	Reset of R/W head detected
Compact device	F4FE9408	R/W head HAL error detected
Compact device	F4FEA000	Invalid command code detected
Compact device	F4FEA001	Invalid command parameter detected

Compact device	F4FEA002	Invalid command data detected
Compact device	F4FEA003	Ticket number or ticket length detected

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

3.3 Error group Communication User – compact device (F5FE)

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

3.4 Error group Command error – compact device (F6FE)

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

4 Glossary

Definition	Remark
Adaptor	Bus device of an EtherNet/IP network.
Antenna	RFID antenna built in a Read-/Write head.
Asynchronously	Data of the command response is updated after the device detects a state change of the ID tag from “not present” to “present” or vice versa.
Block size	Size of one block of the ID tag, for HF ID tags 4 128 bytes.
CoDeSys	Soft PLC from 3S-Smart Software Solutions GmbH.
Compact device	RFID Identification unit DTE60x with integrated Read-Write head.
Connection	Describes the logical connection between two objects, e.g., Controller and slave.
Controller	See definition PLC.
Event	Events can occur in several ways: COM ing event: An ID tag or a signal change from L-> H level on the I/O is newly detected. UPD ate event: An event that has already been signaled is repeated. GO ing event: An ID tag is no longer recognized within a period or a signal change from H-> L level is detected.
EDS	E lectronic D ata S heet. Device description file for EtherNet/IP.
Emergency system	Web server with reduced functionality to download the firmware of the device.
EPC	E lectronic P roduct C ode.
EtherNet/IP	EtherNet Industrial Protocol from ODVA.
ETSI	E uropean T elecommunications S tandards I nstitute.
FCC	F ederal C ommunications C ommission. Responsible for standardization of Information and Communication in North America.
Hexadecimal	Numeral format, which use 16 values to represent a numeric value. 0..9, A, B, C, D, E, F
ID tag, transponder	RFID ID tag, e.g., E80360, E80370, ...
N	Selected module size N of the IO-channel.
ODVA	O pen D eviceNet V endors A ssociation Incooperated.
PC	P ersonal c omputer, e.g., desktop computer, notebook.
PermData	P ermanent D ata Nonvolatile data area of the device for storage of user specific settings, like fieldbus parameter, address settings and so on.

PLC	P rogrammable L ogic C ontroller. e.g., Allen Bradley Compact Logix, Beckhoff CX5020, Siemens CPU 315-2 DP/PN.
PNO	P ROFINET N utzer O rganisation. User organization representing the PROFIBUS and PROFINET fieldbus system.
Process data input image	Data area where the PLC can read the outputs of the external periphery devices. (%IBx)
Process data output image	Data area where the PLC can write to the inputs of the external periphery devices. (%QBx)
Read-/Write head	RFID Read-/Write head. In compact devices already integrated.
RSSI	R ecieve S ignal S trength I ndicator. Reflect the received signal quality of the ID tag. Higher values mean a better reception of the ID tag signal.
Scanner	Bus master of a PROFINET or EtherNet/IP network.
Synchronously	Data of the command response is updated immediately with the currently detected state of the ID tag.
UID	Unique, only readable numeric value of an ID tag (U nique I Dentifier)
User data	Data area of the ID tag which can be read and written randomly.
Web client	PC program to send “http protocol” requests, e.g., Firefox, Internet Explorer.
Web server	Built in “http protocol” server to service request from a PC.