Readme

For sample project:

Demo_S7V15_1500_RFID-HF_U-INT_FB-IOMapp_Bus_Mode_5RWH_V1.0.0

Content

1. General information

1.1 Revision history and changes

Revision	Date	Author	Changes
0.10	25.08.2020	A.Bäker	Initial version
0.20			
1.00	25.08.2020	A.Bäker	The revision should be changed to version 1.00 with the technical release. Revision below 1.00 are unreleased preliminary revisions.

1.2 Project information

Topics	Data
Name of the sample project :	Demo_S7V15_1500_RFID-HF_U-INT_FB-IOMapp_Bus_Mode_5RWH_V1.0.0
Short description / Target definition :	
Category :	
Department / Company / Author ID :	Hans Turck GmbH&Co.KG Mülheim an der Ruhr

1.3 Instructions for use

This sample project has been created with great care and is available to the USER free of charge. TURCK does not guarantee faultlessness, excludes all liability and warranty claims, which can be excluded by law and has no obligation to correct any errors. This example project has been tested to a limited extent and has been tested only for its functionality as described. Compliance with the applicable standards, regulations and guidelines as well as the responsibility for safety considerations and use of the sample project is subject to the USER.

1.4 Range of validity

This sample project is based on the hardware and software of the respective manufacturers as well as on the associated documentation. Therefore, this example project only applies to the described installation. New hardware and software versions may require modified handling. Please see the detailed description in the respective manuals.

2. Reference Material

2.1 Hardware

List of used Hardware and their firmware versions.

Vendor	Part no.	Type	Revision	Comment	Quantity
Siemens	6ES7 1513-1AL00-0AB0	CPU 1513-1 PN	FW v1.8		
Turck	6814029	TBEN-S2-2RFID-4DXP	FW3.6.1.0		

2.2 Software

Operating system information

Used programming software and configuration tools (e.g. Programming environment, libraries, device files, etc.)

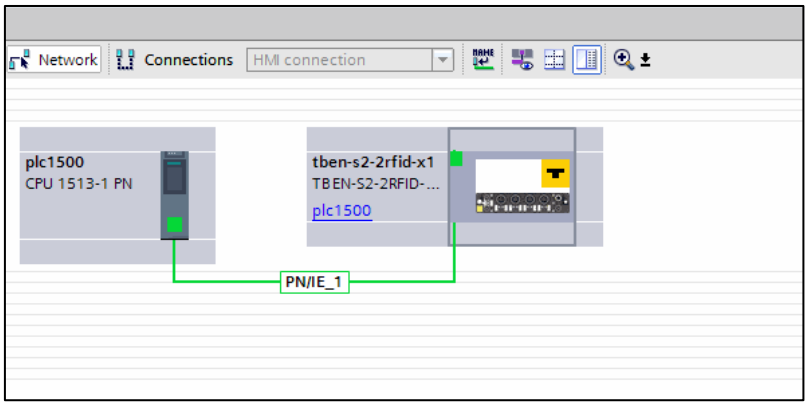
Vendor	Type	Revision	Comment
Siemens	TIA-Portal V15	Version V15 Update 4	
Siemens	TIA-Portal V16	Version V16 Update 1	

3. Example Application (Demo)

This is an example program to show the RFID bus mode of the TBEN-S2-2RFID-4DXP module on a Siemens PLC.

3.1 Configuration (TIA-Portal V15 with the PLC 1513-1 PN)

3.1.1. Overview of the devices



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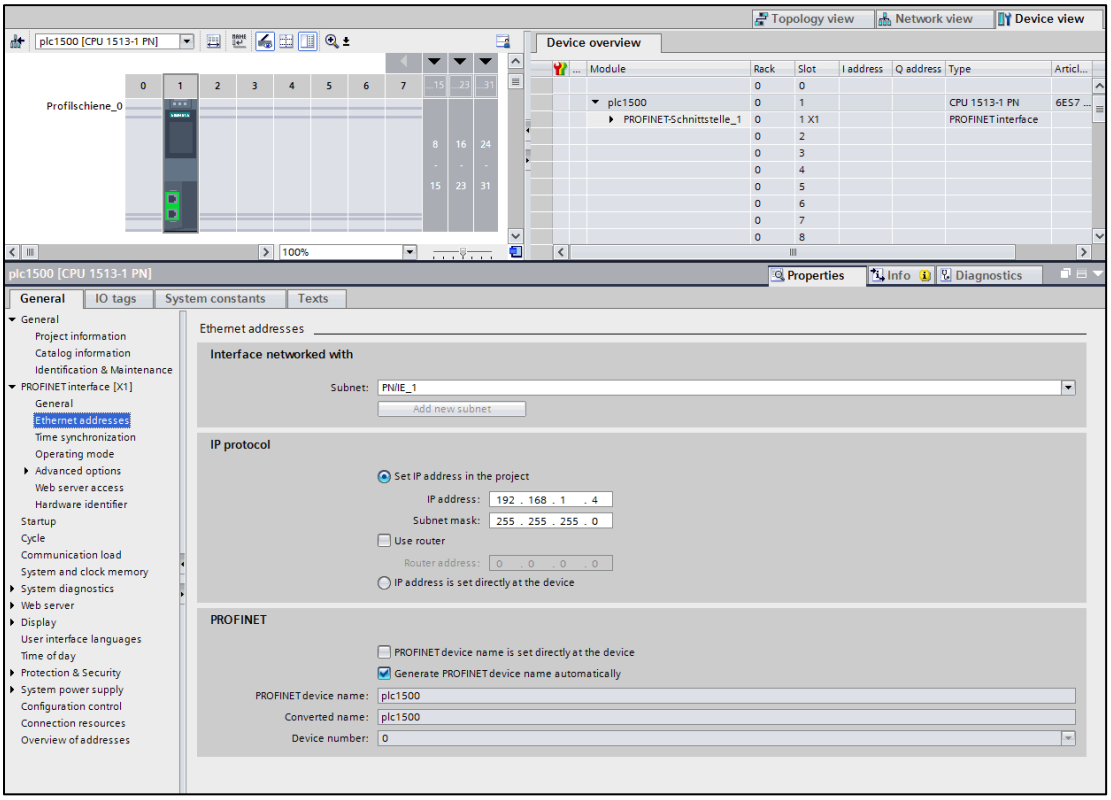
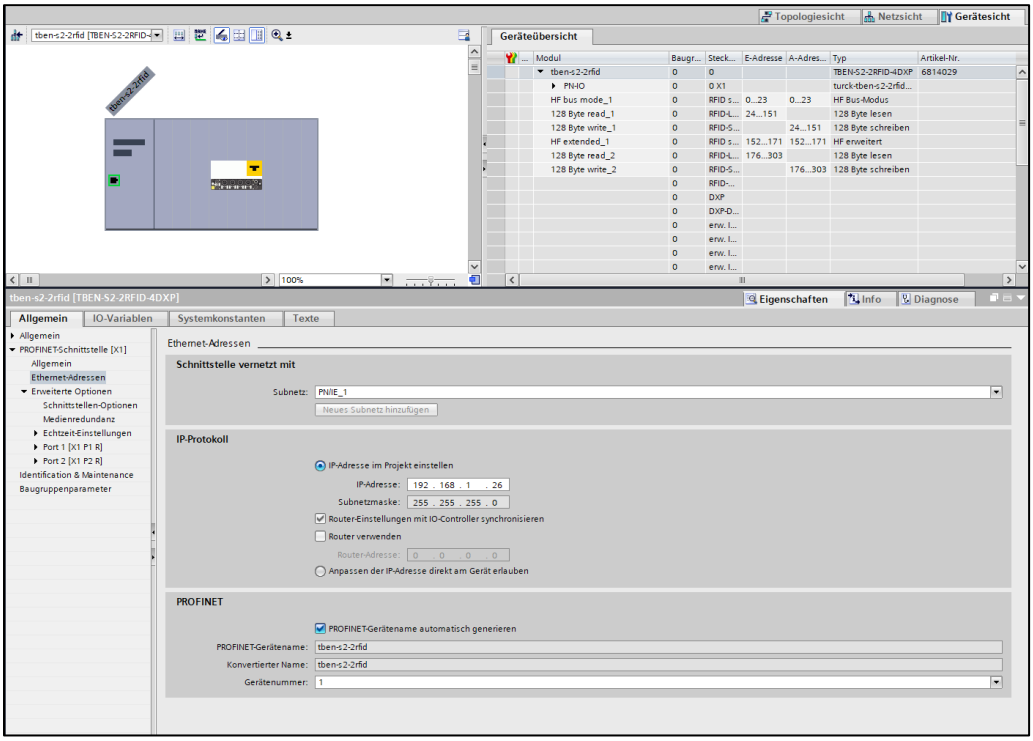
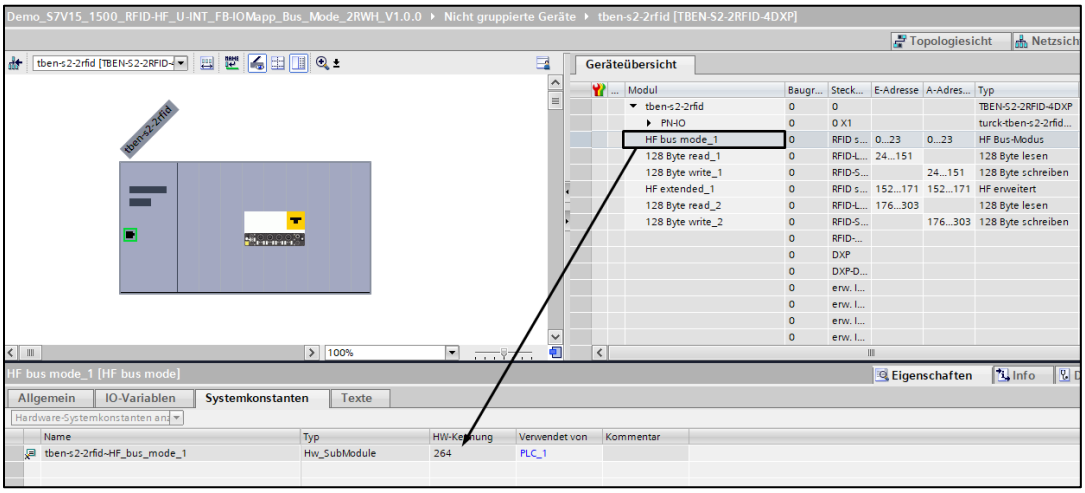
3.1.2. IP settings of the Siemens PLC



3.1.3. PN settings of the TBEN-S2-2RFID-4DXP



3.1.4. HW identification of the SUB modules

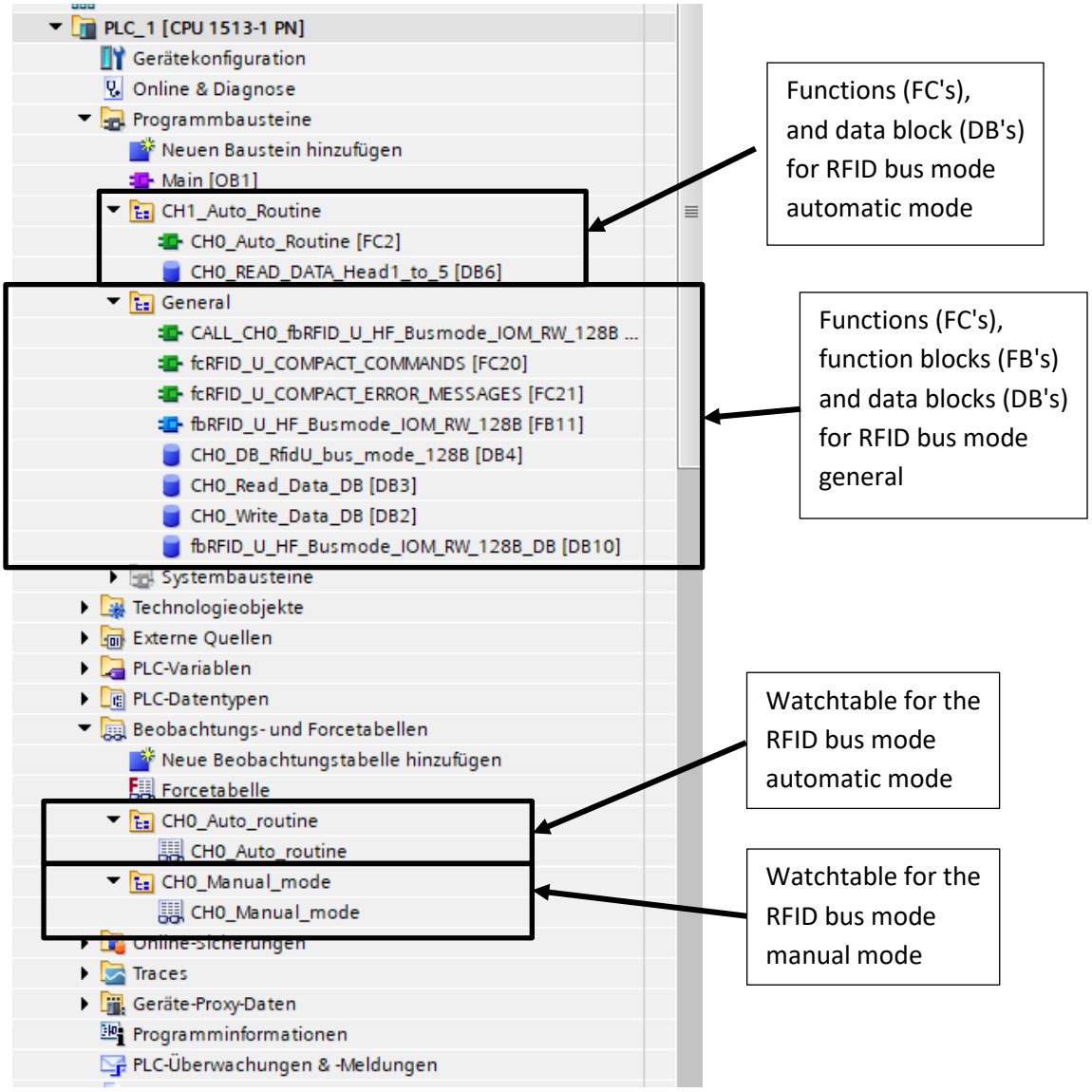


- Each SUB module has its own HW identifier
  For the demo program the following identifiers are given:
  - HF bus mode_1 = “264”; 016 Byte read_1 = “266”; 016Byte write_1 = “267”
  - HF extended_1 = “268”; 128 Byte read_2 = “269”; 128 Byte write_2 = “270”
- The HW identification of the individual SUB modules is required for the function blocks in the program.

3.2 Description of the function

3.2.1. RFID bus mode

3.2.1.1 General overview

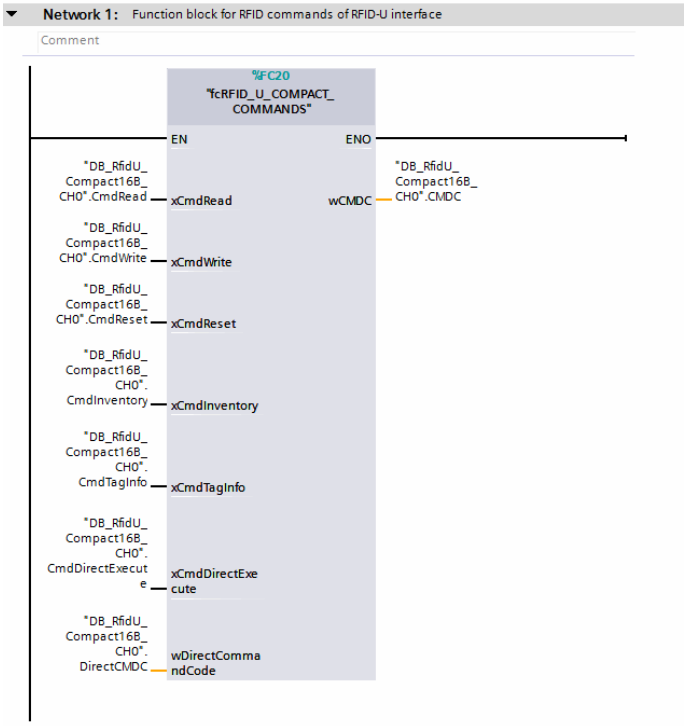


3.2.1.2 Short description of the blocks

3.2.1.2.1 fbRFID_U_HF_Busmode_IOM_RW_128B (FB11)

The FC1 is the main machining module. The other modules are called from this block.

Network1: Call “fcRFID_U_COMPACT_COMMANDS (FC20)”

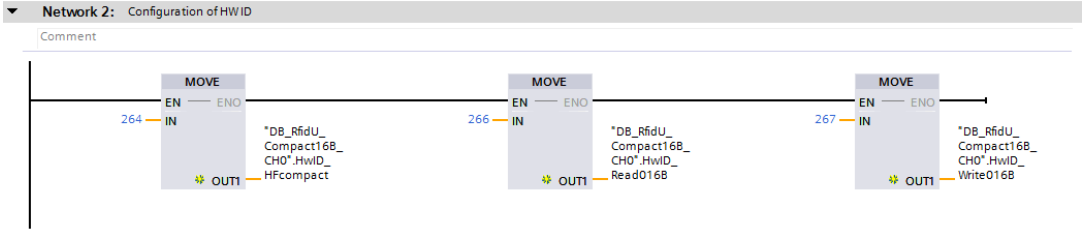


The FC 20 is the function block for the RFID commands. In this module the commands are handled.

Detail of the FC20

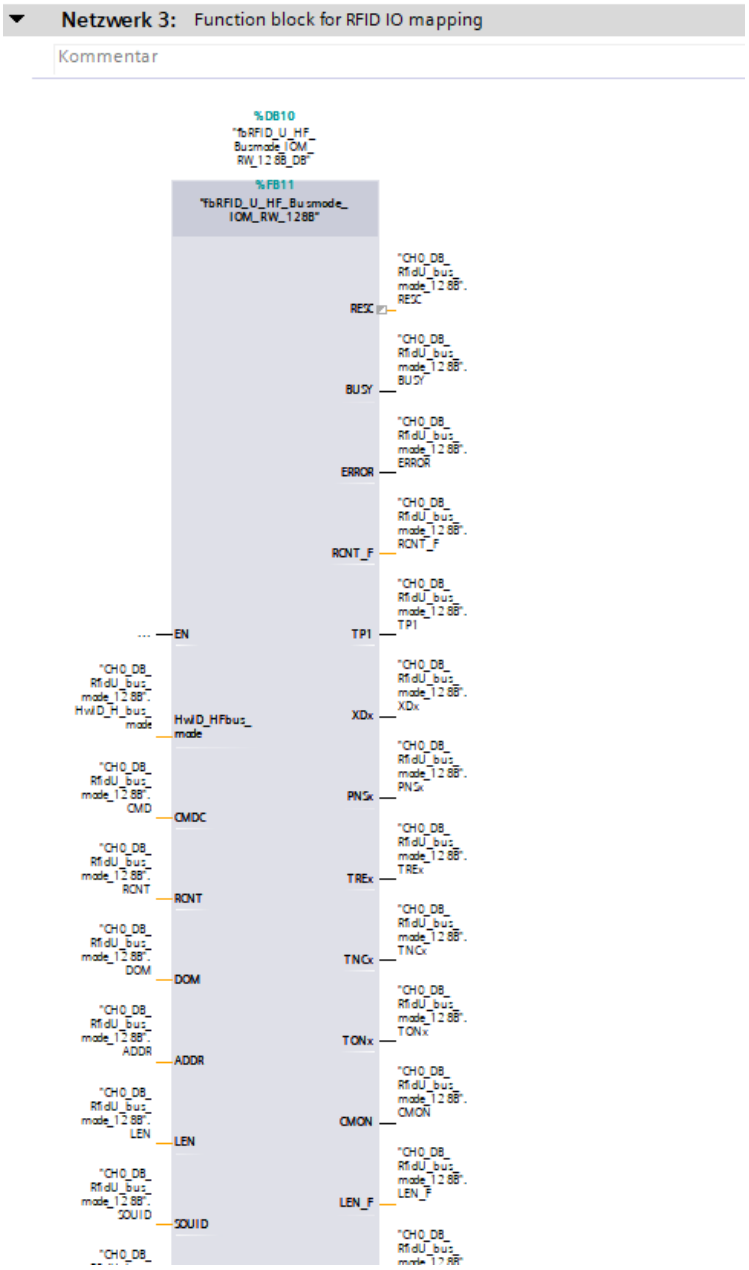
```
// Program:
IF #xCmdRead AND NOT #xCmdWrite AND NOT #xCmdInventory AND NOT #xCmdTagInfo AND NOT #xCmdReset AND NOT  #xCmdDirectExecute THEN
    #wCMDC := 16#0002;  //command read
ELSIF #xCmdWrite AND NOT #xCmdRead AND NOT #xCmdInventory AND NOT #xCmdTagInfo AND NOT #xCmdReset AND NOT  #xCmdDirectExecute THEN
    #wCMDC := 16#0004; //command write
ELSIF #xCmdInventory AND NOT #xCmdWrite AND NOT #xCmdRead AND NOT #xCmdTagInfo AND NOT #xCmdReset AND NOT  #xCmdDirectExecute THEN
    #wCMDC := 16#0001; //command inventory
ELSIF #xCmdTagInfo AND NOT #xCmdWrite AND NOT #xCmdInventory AND NOT #xCmdRead AND NOT #xCmdReset AND NOT  #xCmdDirectExecute THEN
    #wCMDC := 16#0050; //command taginfo
ELSIF #xCmdReset AND NOT #xCmdWrite AND NOT #xCmdInventory AND NOT #xCmdTagInfo AND NOT #xCmdRead AND NOT  #xCmdDirectExecute THEN
    #wCMDC := 16#8000; //command reset
ELSIF #xCmdDirectExecute AND NOT #xCmdWrite AND NOT #xCmdInventory AND NOT #xCmdTagInfo AND NOT #xCmdReset AND NOT  #xCmdRead THEN
    #wCMDC := #wDirectCommandCode; //command directcommandcode
END_IF;
```

Network2: Configuration of HW identifier



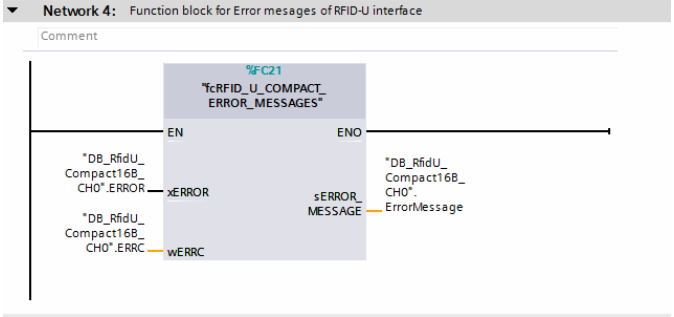
In this network the HW ID's are assigned to the block. The HW ID's are to be taken from the hardware configuration, see under point 3.1.4.

Network 3: Call “fbRFID_U_HF_Busmode_IOM_RW_128B (FB11)”



In the block FB11 takes place the data exchange to the TBEN-S2-2RFID-4DXP module.

Network 4: Call “fcRFID_U_COMPACT_ERROR_MESSAGES (FC21)”



The FC21 converd the error code in to text message.

3.2.1.3 Overview of watchtable “RFID_U_HF_Busmode _Ch0”

Configuration the HW identifier

// RFID-U interface - Configuration with HWID - Channel 0					
"DB_RfidU_Compact16B_CH0".HwID_HFcompact	DEC	264			Hardware ID of compact module
"DB_RfidU_Compact16B_CH0".HwID_Read016B	DEC	266			Hardware ID of 16 byte read module (possible variants 8, 16, 32, 64, 128 byte)
"DB_RfidU_Compact16B_CH0".HwID_Write016B	DEC	267			Hardware ID of 16 byte write module (possible variants 8, 16, 32, 64, 128 byte)

Manual commands from the function block “fcRFID_U_ HF_Busmode _COMMANDS (FC20)”

// RFID-U interface - Manual commands with function block					
"DB_RfidU_Compact16B_CH0".CmdInventory	Bool	FALSE	FALSE		
"DB_RfidU_Compact16B_CH0".CmdRead	Bool	FALSE	FALSE		
"DB_RfidU_Compact16B_CH0".CmdWrite	Bool	FALSE	FALSE		
"DB_RfidU_Compact16B_CH0".CmdTagInfo	Bool	FALSE	FALSE		
"DB_RfidU_Compact16B_CH0".CmdDirectExecute	Bool	FALSE	FALSE		
"DB_RfidU_Compact16B_CH0".DirectCMDC	Hex	16#0000	16#0000		
"DB_RfidU_Compact16B_CH0".CmdReset	Bool	FALSE	FALSE		

RFID-U interface - HF_Busmode - IO mapping - Control and Status - Output

// RFID-U interface - Function block for IO mapping - Channel 0 - Status and Controlls					
"CH0_DB_RfidU_bus_mode_128B".CMD	Hex	16#0000			Command code (CMDC)
"CH0_DB_RfidU_bus_mode_128B".RCNT	Hex	16#00			Loop counter for rapid processing (RCNT)
"CH0_DB_RfidU_bus_mode_128B".DOM	Hex	16#00			Memory area (DOM) - only available with ...
"CH0_DB_RfidU_bus_mode_128B".ADDR	Hex	16#0000_0000			Start address (ADDR)
"CH0_DB_RfidU_bus_mode_128B".LEN	Hex	16#0000			Length (LEN)
"CH0_DB_RfidU_bus_mode_128B".SOUID	Hex	16#00			Length UID/EPC (SOUID)
"CH0_DB_RfidU_bus_mode_128B".TOUT	Hex	16#0000			Timeout (TOUT)
"CH0_DB_RfidU_bus_mode_128B".RFN	Hex	16#00			Read fragment number (RFN)
"CH0_DB_RfidU_bus_mode_128B".WFN	Hex	16#00			Write fragment number (WFN)
"CH0_DB_RfidU_bus_mode_128B".ANTIN	Hex	16#00			

RFID-U interface - HF_Busmode - IO mapping - Control and Status – Input

// RFID-U interface - Function block for IO mapping - Channel 0 - Feedback					
"CH0_DB_RfidU_bus_mode_128B".RESC	DEZ	0			Response code (RESC)
"CH0_DB_RfidU_bus_mode_128B".BUSY	BOOL	FALSE			Busy
"CH0_DB_RfidU_bus_mode_128B".ERROR	BOOL	FALSE			Error
"CH0_DB_RfidU_bus_mode_128B".ERRC	Hex	16#0000			Error code (ERRC)
"CH0_DB_RfidU_bus_mode_128B".ErrorMessage	String	'No RFID error'			
"CH0_DB_RfidU_bus_mode_128B".RCNT_F	Hex	16#00			Loop counter for rapid processing (RCNT)
"CH0_DB_RfidU_bus_mode_128B".TP1	BOOL	TRUE			TAG present
"CH0_DB_RfidU_bus_mode_128B".XDx	BOOL	FALSE			Busmode parameter
"CH0_DB_RfidU_bus_mode_128B".PNSx	BOOL	FALSE			Busmode parameter
"CH0_DB_RfidU_bus_mode_128B".TREx	BOOL	FALSE			Transreceiver Error (Address error (Busmo...
"CH0_DB_RfidU_bus_mode_128B".TNCx	BOOL	FALSE			Transreciver conected / 0 = conected / 1 = ...
"CH0_DB_RfidU_bus_mode_128B".TONx	BOOL	TRUE			Transreciver on / 1 = ON / 0 = OFF
"CH0_DB_RfidU_bus_mode_128B".CMON	BOOL	FALSE			Continuous Mode / 0 = not aktive / 1 = akt...
"CH0_DB_RfidU_bus_mode_128B".LEN_F	Hex	16#0008			Length (LEN) Output
"CH0_DB_RfidU_bus_mode_128B".TCNT	Hex	16#000B			TAG counter (TCNT)
"CH0_DB_RfidU_bus_mode_128B".BYFI	Hex	16#0000			Data available (BYFI)
"CH0_DB_RfidU_bus_mode_128B".RFN_F	Hex	16#80			Read fragment number (RFN)
"CH0_DB_RfidU_bus_mode_128B".WFN_F	Hex	16#80			Write fragment number (WFN)
"CH0_DB_RfidU_bus_mode_128B".TP_ALL	Hex	16#0000_001F			

RFID-U interface - HF_Busmode - IO mapping – Write data (128B)

// RFID-U interface - Function block for IO mapping - Channel 0 - Write data (TX data)					
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[0]	DEC	0	44		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[1]	DEC	0	44		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[2]	DEC	0	44		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[3]	DEC	0	44		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[4]	DEC	0	44		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[5]	DEC	0	44		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[6]	DEC	0	44		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[7]	DEC	0	8		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[8]	DEC	0	9		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[9]	DEC	0	10		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[10]	DEC	0	11		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[11]	DEC	0	12		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[12]	DEC	0	13		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[13]	DEC	0	14		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[14]	DEC	0	1		Buffer for write data 16 byte
"DB_RfidU_Compact16B_CH0".WriteDataBuffer16B[15]	DEC	0	11		Buffer for write data 16 byte

RFID-U interface - HF_Busmode - IO mapping – Read data (128B)

// RFID-U interface - Function block for IO mapping - Channel 0 - Read Data (RX data)

"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[0]	DEC	224		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[1]	DEC	4		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[2]	DEC	1		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[3]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[4]	DEC	11		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[5]	DEC	174		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[6]	DEC	30		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[7]	DEC	137		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[8]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[9]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[10]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[11]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[12]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[13]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[14]	DEC	0		Buffer for read data 16 byte
"DB_RfidU_Compact16B_CH0".ReadDataBuffer16B[15]	DEC	0		Buffer for read data 16 byte

// RFID-U interface - Function block for IO mapping - Channel 0 - Read Data (RX data)

"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[0]	DEC	224		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[1]	DEC	8		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[2]	DEC	1		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[3]	DEC	72		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[4]	DEC	96		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[5]	DEC	228		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[6]	DEC	83		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[7]	DEC	189		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[8]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[9]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[10]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[11]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[12]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[13]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[14]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[15]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[16]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[17]	DEC	0		Buffer for read data 128 byte
"DB_RfidU_Extended128B_CH1".ReadDataBuffer128B[18]	DEC	0		Buffer for read data 128 byte

3.3 Operation Manual

See http://pdb2.turck.de/repo/media/_en/Anlagen/d500064.pdf

3.4 Error description

See http://pdb2.turck.de/repo/media/_en/Anlagen/d500064.pdf