

Integration of Profinet for Track Supply with S7-300

TI9100-0075-EN

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1 Description of Structure and Function

For the Track Supply model 9100-111-3090901 (configurable version) an Ethernet interface with Profinet is additionally available.

A sample project for the communication with the Track Supply with Profinet is available for download at our website.

The sample project is implemented and tested with following hardware and software:

- Siemens Simatic Step7 V5.5 + SP4 K5.5.4.0
- Siemens CPU 314C-2 PN/DP V3.3
- HMS Anybus Communicator AB7013-C / V3.03

The GSDML-File for the Anybus Communicator is integrated in the sample project. It is additionally available at the manufacturer's homepage.

For the steps described below, administration rights for the programmer could be needed.

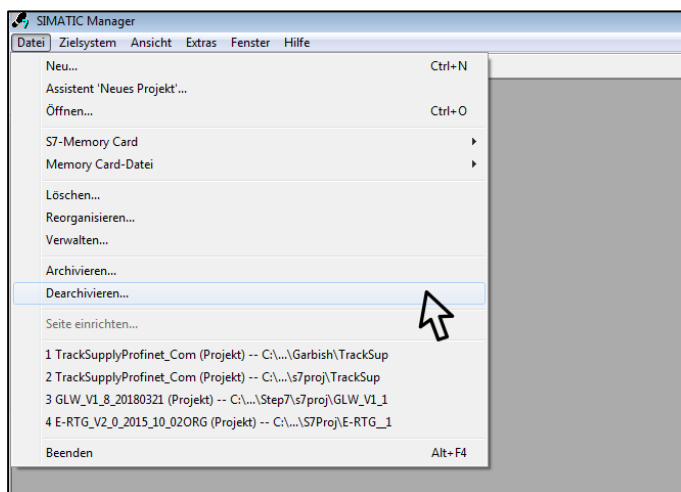
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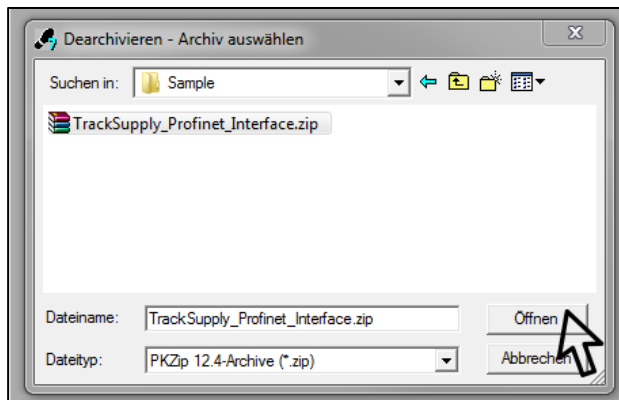
2 Manual for Integration of the Sample Project

2.1 Retrieving and Opening of the Sample Project

1. Open Siemens ,SIMATIC Manager‘.
2. Click ,File‘, choose ,Retrieve‘.



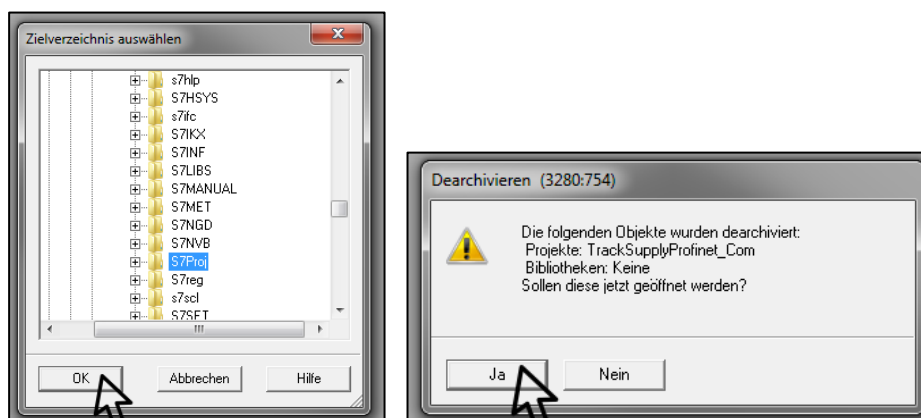
3. Choose the project archive (name can be different as of picture).
4. Click ,open‘.



5. Select destination folder.
6. Click 'OK', then open the project.

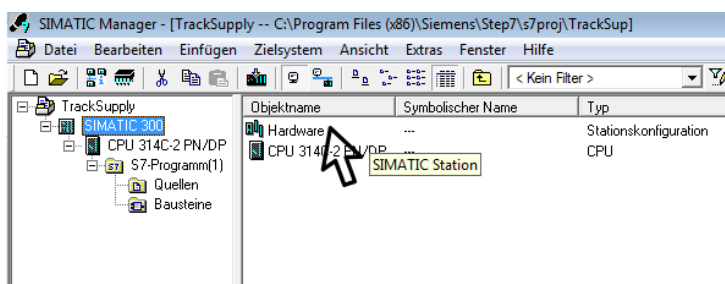
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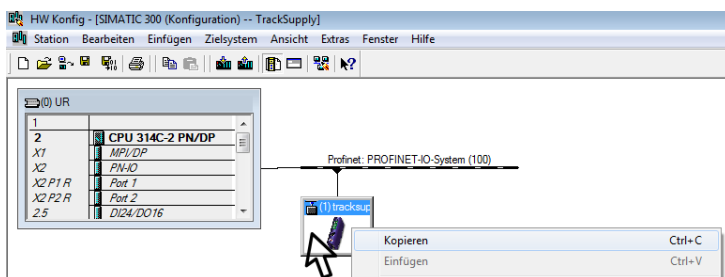


2.2 Integration into the Hardware Configuration of the Plant Project

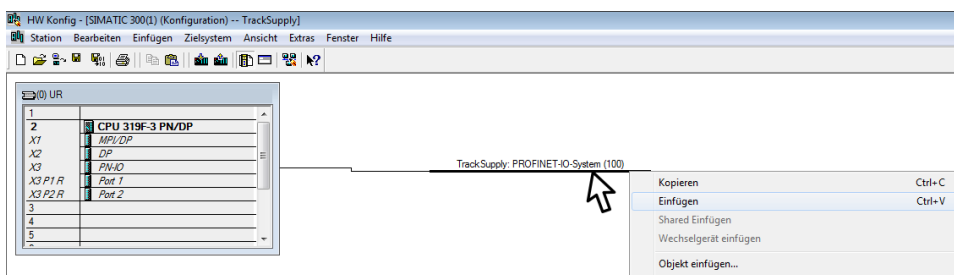
1. Open hardware configuration of plant project.
2. Open hardware configuration of sample project.



3. Right click Profinet-Device with the name ,tracksupply01', then click 'copy'.



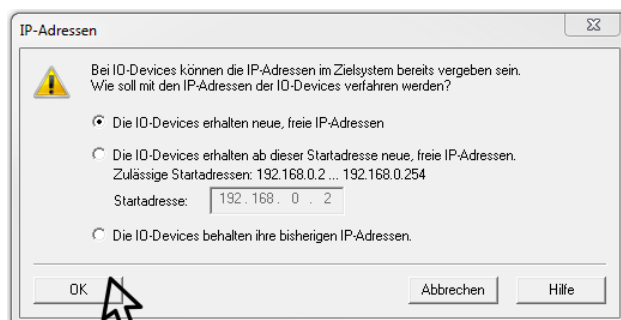
4. Right click Profinet-IO network in the hardware configuration of the plant project, then click ,paste'.



5. If necessary, adjust IP-Address in the automatically opened window. Confirm with ,OK'.

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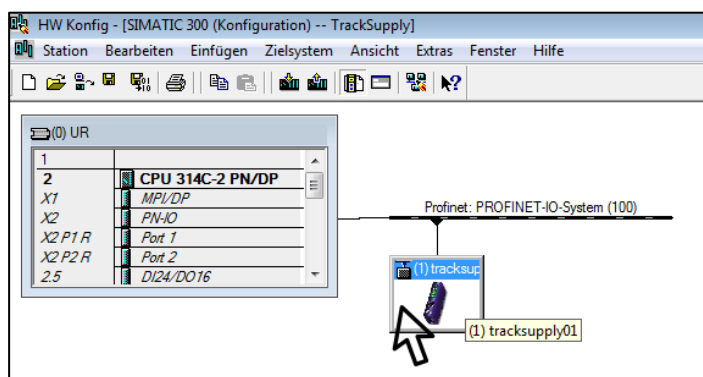
Note: If more than one Anybus Communicator are within the same Profinet network, the devices names (Standard: ,tracksupply01‘) and the devices IP-Addresses (Standard: 192.168.0.99) have to be set up uniquely and consistent in the plant project and directly in the Anybus communicator.

To change the Profinet Device name in the plant project:

1. Open hardware configuration of plant project.
2. Double click the desired device.
3. Change device name.
4. Confirm with 'OK'.

2.3 Customizing the I/O Addresses of the Anybus Communicators

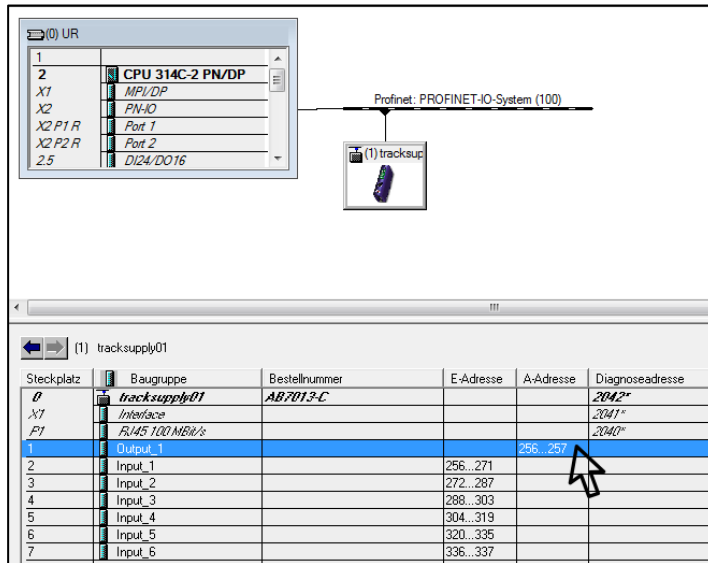
1. Open hardware configuration of plant project
2. Select ,tracksupply01‘



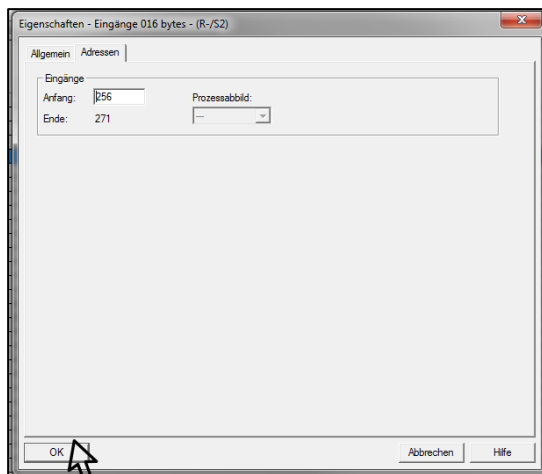
3. Double click the I/O-Card.

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4. Select 'address' and change the address.
5. Confirm with 'OK'.



6. Repeat step 3 to 5 for all 7 I/O Cards

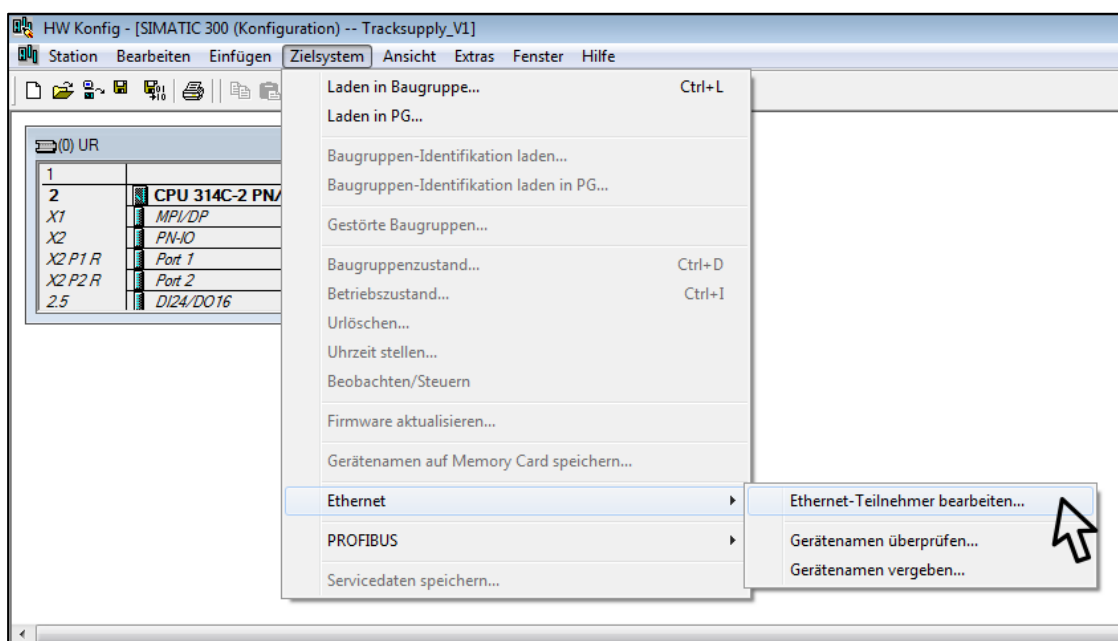
Note: The I/O Address range has to be uniquely!

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2.4 Assign IP-Address and Device Name to the Anybus Configurator

1. Connect the Anybus Communicator to 24V DC.
2. Connect your programming device directly via Ethernet with the Anybus communicator.
3. Open hardware configuration of plant project.
4. Select 'PLC' in upper bar.
5. Select 'Ethernet'.
6. Select 'Edit Ethernet Node'



7. Click 'Browse'.
8. Click 'Start'.
9. Select desired device based on MAC-Address (Printed on Anybus Communicator).
10. Confirm with 'OK'.
11. Adjust IP-Address and click 'Assign IP Configuration'.
12. Adjust device name and click 'assign name'.

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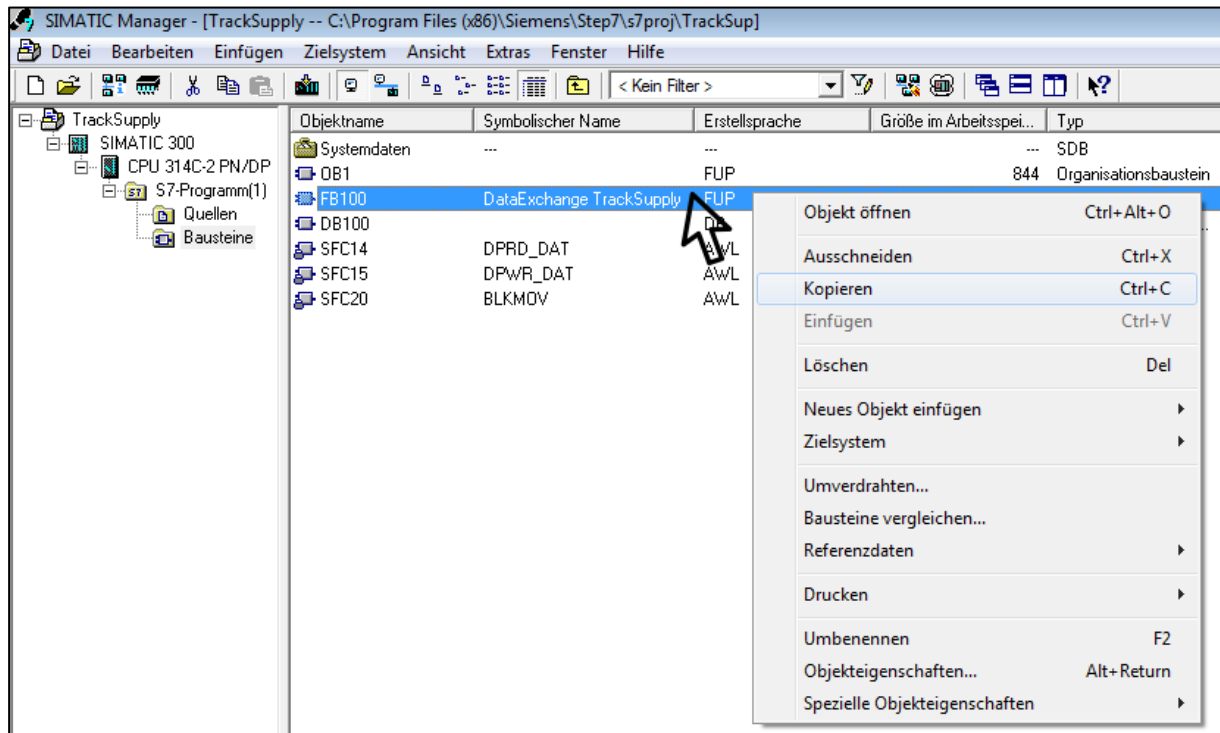
13. Repeat step 7 to 12 for every device you like to adjust.
14. Confirm with 'close'.

2.5 Insert the Function Blocks

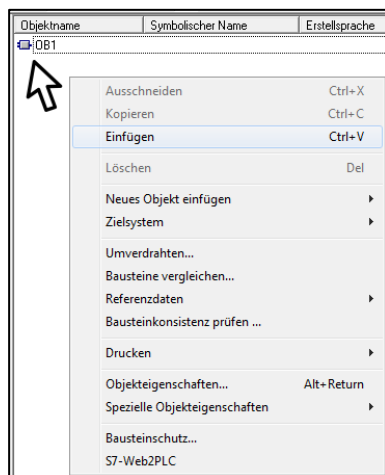
1. Open the block folder of the plant project.
2. Open the block folder of the sample project.
3. Right click on function block 'FB100', click 'copy'.

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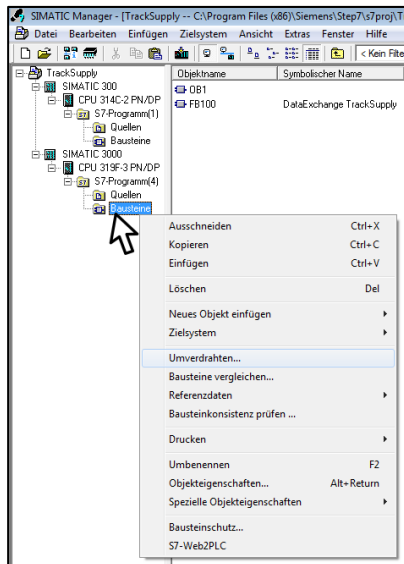
4. Insert the function block 'FB100' into the block folder of the plant project.



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5. If the number of the block is already in use, change it:
 - a. Right click on block folder
 - b. Select ,Rewire‘



- c. At ,Old address‘ type ,FB100‘
- d. At ,New address‘ type in the desired new name of the function block (e.g. ,FB345‘).
- e. Confirm with ,OK‘



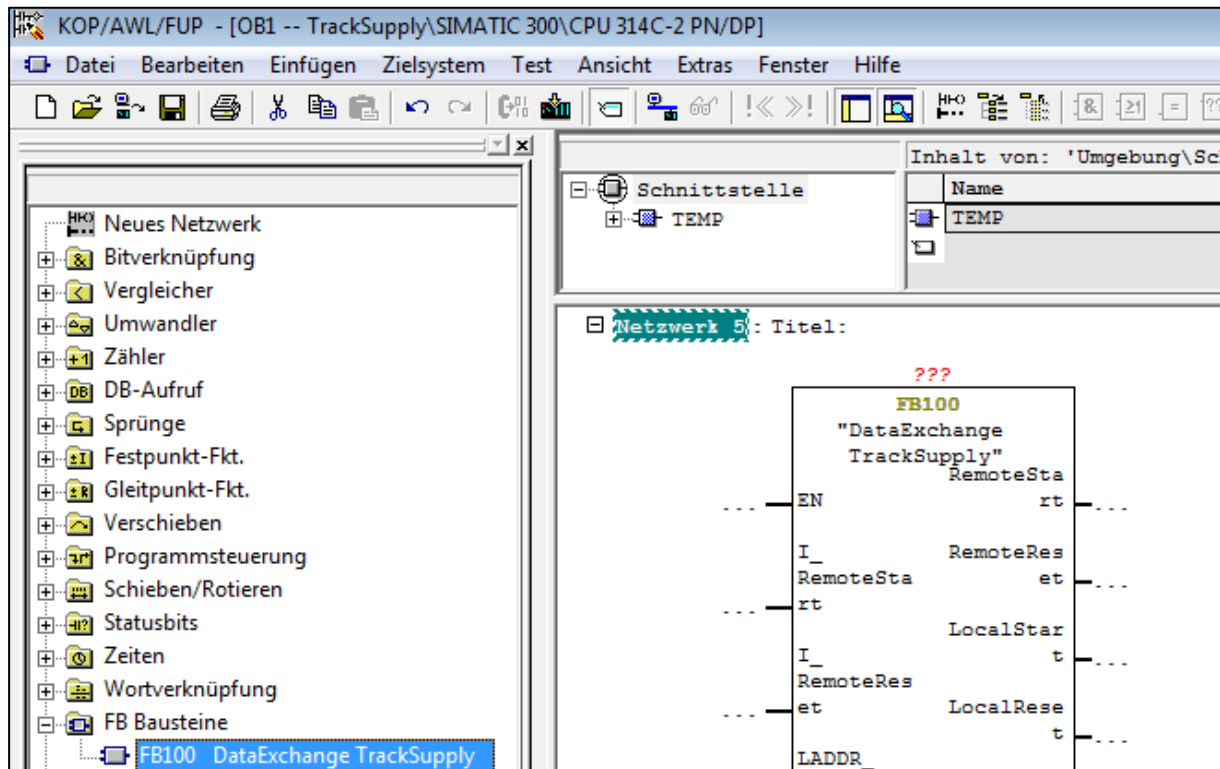
6. If the system functions 'SFC14', 'SFC15' and ,SFC20' are not already in use in the plant project, repeat step 3 and 4 with these 3 functions.

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2.6 Call of 'FB100' in the Plant Project

1. Open the desired position to execute the function block inside of the plant project (in picture e.g. OB1 - Network 5).
2. Insert the function block with Drag & Drop from the 'Overview' of the 'Program Elements' (left margin).
(If 'Overview' of the 'Program Elements' is not shown, press <CTRL+K>).



3. Assign a free Data Block (at '???' e.g. 'DB100') or change to 'Multiple Instance Call'.
4. Wire the 'LADDR...' Inputs according to changes made in chapter 2.3
LADDR_Input_1 belongs to 'Input_1' etc.

Note: The value has to be in hexadecimal!

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3 Description of software interface

3.1 Table of Variables

Declaration	Name	Type	Comment
Input	I_RemoteStart	BOOL	Remote start signal
Input	I_RemoteReset	BOOL	Remote reset signal
Input	LADDR_Input_1	WORD	Peripheral starting-address for function DPRD_DAT of input_1
Input	LADDR_Input_2	WORD	Peripheral starting-address for function DPRD_DAT of input_2
Input	LADDR_Input_3	WORD	Peripheral starting-address for function DPRD_DAT of input_3
Input	LADDR_Input_4	WORD	Peripheral starting-address for function DPRD_DAT of input_4
Input	LADDR_Input_5	WORD	Peripheral starting-address for function DPRD_DAT of input_5
Input	LADDR_Input_6	WORD	Peripheral starting-address for function DPRD_DAT of input_6
Input	LADDR_Output_1	WORD	Peripheral starting-address for function DPWR_DAT of output_1
Output	RemoteStart	BOOL	Feedback from remote start signal
Output	RemoteReset	BOOL	Feedback from remote reset signal
Output	LocalStart	BOOL	Feedback from local start signal
Output	LocalReset	BOOL	Feedback from local reset signal
Output	DIP1	BOOL	Feedback DIP-Switch 1 on TSCB
Output	DIP2	BOOL	Feedback DIP-Switch 2 on TSCB
Output	DIP3	BOOL	Feedback DIP-Switch 3 on TSCB
Output	DIP4	BOOL	Feedback DIP-Switch 4 on TSCB
Output	OVERLOAD_WARNING	BOOL	
Output	OVERTEMP_WARNING	BOOL	
Output	RTC_WARNING	BOOL	
Output	TUNING_WARNING	BOOL	
Output	INITIALISE_STATE	BOOL	
Output	STANDBY_STATE	BOOL	
Output	BOOT_STATE	BOOL	
Output	RUN_STATE	BOOL	
Output	ERROR_STATE	BOOL	
Output	SUSPENDED_STATE	BOOL	
Output	SHUTDOWN_STATE	BOOL	
Output	DS1820_Temp1	INT	Temperature in [°C]
Output	DS1820_Temp2	INT	Temperature in [°C]
Output	NTC_Temp1	INT	Temperature in [°C]
Output	NTC_Temp2	INT	Temperature in [°C]
Output	Query_Count	INT	Number of requests from ABC to TSCB

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Declaration	Name	Type	Comment
Output	Response_Count	INT	Number of answers from TSCB to ABC
Output	Errorcode	INT	See manual
Output	E001	BOOL	Error phase loss
Output	E002	BOOL	Error IGBT
Output	E003	BOOL	Error internal current hardware limit
Output	E004	BOOL	Error ground fault
Output	E005	BOOL	Error door open
Output	E006	BOOL	Error no track current
Output	E007	BOOL	Error temperature high on sensor 1
Output	E008	BOOL	Error temperature high on sensor 2
Output	E009	BOOL	Error temperature sensor 1 defect
Output	E010	BOOL	Error temperature sensor 2 defect
Output	E011	BOOL	Error temperature high on heat sink sensor 1
Output	E012	BOOL	Error temperature high on heat sink sensor 2
Output	E013	BOOL	Error heat sink temperature sensor 1 short circuited
Output	E014	BOOL	Error heat sink temperature sensor 1 open circuited
Output	E015	BOOL	Error heat sink temperature sensor 2 short circuited
Output	E016	BOOL	Error heat sink temperature sensor 2 open circuited
Output	E017	BOOL	Error temperature switch 1 open circuited
Output	E018	BOOL	Error temperature switch 2 open circuited
Output	E019	BOOL	Error LCD
Output	E020	BOOL	Error output track voltage high
Output	E021	BOOL	Error output track current high
Output	E022	BOOL	Error output power high
Output	E023	BOOL	Error soft-start
Output	E024	BOOL	Error watchdog
Output	E025	BOOL	Error brownout
Output	E026	BOOL	Error track supply output open circuited
Output	E027	BOOL	Error DC bus voltage high
Output	E028	BOOL	Error DC bus voltage low
Output	E029	BOOL	Error internal current software limit
Output	E030	BOOL	Error DC bus voltage unstable
Output	E031	BOOL	Error inductance high
Output	E032	BOOL	Error inductance low
Output	E033	BOOL	Error 3.3V on board power supply failure
Output	E034	BOOL	Error 3.3V on board power supply failure
Output	E035	BOOL	Error 3.3V on board power supply failure
Output	E036	BOOL	Error 3.3V on board power supply failure
Output	E037	BOOL	Error 5V on board power supply failure

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Declaration	Name	Type	Comment
Output	E038	BOOL	Error 24V control board supply failure
Output	E039	BOOL	Error FPGA configuration
Output	E040	BOOL	Error FPGA SPI bus
Output	E041	BOOL	Error invalid output voltage measurement
Output	E042	BOOL	Error invalid output current measurement
Output	E043	BOOL	Error invalid internal current measurement
Output	E044	BOOL	Error oscillator
Output	E045	BOOL	Error FPGA software
Output	E046	BOOL	Error zone controller 1
Output	E047	BOOL	Error zone controller 2
Output	E048	BOOL	Error DIP switcher
Output	E049	BOOL	Error output peak power high
Output	ret_val_input_1	INT	Error-code from function DPRD_DAT for input_1
Output	ret_val_input_2	INT	Error-code from function DPRD_DAT for input_2
Output	ret_val_input_3	INT	Error-code from function DPRD_DAT for input_3
Output	ret_val_input_4	INT	Error-code from function DPRD_DAT for input_4
Output	ret_val_input_5	INT	Error-code from function DPRD_DAT for input_5
Output	ret_val_input_6	INT	Error-code from function DPRD_DAT for input_6
Output	ret_val_output_1	INT	Error-code from function DPWR_DAT for output_1

3.2 Description of Diagnostic Data

The function block has 9 output variables describing the current status of the data communication from the Track Supply over the Anybus communicator to the PLC.

For the serial connection from Track Supply to Anybus communicator:

- ,Query_Count': Number of requests from ABC to TSCB
- ,Response_Count': Number of answers from TSCB to ABC

For the Profinet connection from Anybus communicator to the PLC:

- ,ret_val_input_1' to ,ret_val_input_6': Return value ,RET_VAL' of function SFC 14 „DPRD_DAT“
- ,ret_val_output_1': Return value ,RET_VAL' of function SFC 15 „DPWR_DAT“