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Reading Out the IP Address of the PROFINET Interface in the User Program

S7-1500 CPU / STEP 7 V12 SP1 Upd 2 (TIA Portal)

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The functions and solutions described in this article confine themselves to the realization of the automation task predominantly. Please take into account furthermore that corresponding protective measures have to be taken up in the context of Industrial Security when connecting your equipment to other parts of the plant, the enterprise network or the Internet. Further information can be found under the Content-ID 50203404.

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1 Introduction

This entry shows how to read out the following parameters of the PROFINET interface of a S7-1500 CPU in the user program.

- IP address
- Subnet mask
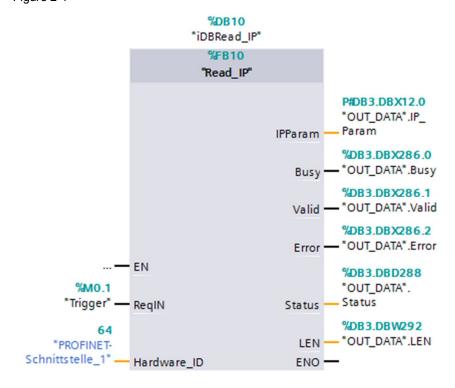- Standard gateway
- MAC address
- PROFINET device name

You read out the parameters using the system function block SFB52 "RDREC".

The sample program supplied in this entry includes the function block FB10 "Read_IP". The FB10 "Read_IP" internally calls the SFB52 "RDREC" to read out the above-named parameters of the PROFINET interface of a S7-1500 CPU.

2 FB10 "Read_IP"

Overview

The FB10 "Read_IP" is called cyclically in OB1 "Main".

Figure 2-1

Input parameters

FB10 "Read_IP" has the following input parameters.

Table 2-1

Input parameters	Data type	Description
ReqIN	Boolean	A positive edge at the ReqIN input starts the job to read the address parameters.
Hardware_ID	Word	Hardware ID of the PROFINET interface of the S7-1500 CPU **Note** • The hardware ID is in the device configuration of the S7-1500 CPU in the PROFINET interface properties. • The hardware ID is also available in the Default tag table as system constant of the Hw_Interface data type.

Output parameters

FB10 "Read_IP" has the following output parameters.

Table 2-2

Output parameters	Data type	Description
IPParam	Struct	In the "IPParam" data structure the read-out parameters of the PROFINET interface of the S7-1500 CPU are saved.
Busy	Bool	BUSY=1 The read procedure has not yet finished.
Valid	Bool	New data record has been received and the read-out address parameters are valid.
Error	Bool	ERROR=1 An error has occurred in the read procedure.
Status	DWord	Block status and error information.
LEN	UInt	Length of read data record

2.1 Structure of the "IPParam" data structure

Table 2-3 shows the structure of the "IPParam" data structure.

Table 2-3

„IPParam" data structure	Data type	Description
IPAddress	Array [0..3] of USInt	IP address of the PROFINET interface of the S7-1500 CPU
SubnetMask	Array [0..3] of USInt	Subnet mask of the PROFINET interface of the S7-1500 CPU
StandardGateway	Array [0..3] of USInt	IP address of the configured standard gateway
MACAddress	Array [0..5] of USInt	MAC address of the PROFINET interface of the S7-1500 CPU
PNName	String	PROFINET device name of the S7-1500 CPU

2.2 Structure of the data block DB2 "OUT_DATA"

In this example the read-out parameters are stored in the "IPParam" data structure in the data block DB2 "OUT_DATA".

Table 2-4

"IPParam" data structure	Data type	Address in DB2 "OUT_DATA"
IPAddress	Array [0..3] of USInt	0.0
SubnetMask	Array [0..3] of USInt	4.0
StandardGateway	Array [0..3] of USInt	8.0
MACAddress	Array [0..5] of USInt	12.0
PNName	String	18.0

3 SFB52 "RDREC"

The FB10 "Read_IP" internally calls the system function block SFB52 "RDREC" for reading a data record. The system function block SFB52 "RDRDC" is located in the "Instructions" task card in the "Advanced Instructions > Distributed IO" palette.

Input parameters

SFB52 "RDREC" has the following input parameters.

Table 3-1

Input parameters	Data type	Description
REQ	Boolean	REQ=1 Perform data record transfer
ID	HW_IO	Hardware ID of the hardware component **Note** • The number will be assigned automatically and is stored in the properties of the component or of the interface in the hardware configuration. • In this example the parameter ID is assigned the value that is specified at the input parameter "Hardware-ID" of FB10 "Read_IP".
INDEX	WORD	Data record number **Note** In this example the data record number w#16#8080 is read out.
MLEN	BYTE, UINT, USINT	Maximum length in bytes of the data record data to be read.
RECORD	Version	Target area for the data record read **Note** The structure of the target area for the read data record is described in the section.

Output parameters

SFB52 "RDREC" has the following output parameters.

Table 3-2

Output parameters	Data type	Description
VALID	Boolean	New data record has been received and is valid.
BUSY	Boolean	BUSY=1 The read procedure has not yet finished.
ERROR	Boolean	ERROR=1 An error has occurred in the read procedure.
STATUS	DWord	Block status and error information.
LEN	UInt	Length of data record data read

3.1 Structure of the Target Area for the Data Record Read

The data record read includes the address parameters of the PROFINET interface of the S7-1500 CPU. The address parameters are stored in the "PDInterfaceDataReal" data structure. The "PDInterfaceDataReal" data structure includes the converted PROFINET device names, the MAC address, IP address, subnet mask and the IP address of the standard gateway. Since the length of the PROFINET device name is dynamic and is at the beginning of the data structure, the position of the IP address, subnet mask and standard gateway must be calculated. This is done in FB10 "Read-IP" after the address parameter has been successfully read out with SFB52 "RDREC".

Table 3-3 shows the "PDInterfaceDataReal" data structure.

Table 3-3

Data structure "PDInterfaceDataReal"	Data type	Description
BlockType	UInt	BlockHeader
BlockLength	UInt	
BlockVersionHigh	USInt	
BlockVersionLow	USInt	
Data	Array [0..301] of byte	Length of the station name Station name MAC address IP address Subnet mask Standard gateway