Library for PROFINET data records

PROFINET

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1 Introduction

1.1 General

Overview

With the "LPNDR" block library, you receive function blocks with which you can read various device and status information from a PROFINET device and describe parameters.

The blocks use the functions "Read data record" and "Write data record".

Functions of the library

You can use the library blocks to perform the following functions:

- Reading the device information:
  - Information via the interface, e.g. IP and MAC address
  - Information about the device interface, e.g. status, medium, name
  - Information about the link status of the interfaces, e.g. link down, link up
  - Information about the role of the device in MRP, e.g. client, manager
  - Port statistics information, e.g. number of received bytes
- Readout of the MRP status
- Modification of the parameters of an analog input module of the ET 200SP at runtime, e.g. to enable and disable channel diagnostics.

The finished functions are freely customizable and can therefore be used universally.

Components of the library

The following table lists the function blocks of the library:

Table 1-1

Block	Description
LPNDR_ReadGlobalInfo	Reads general information about the device.
LPNDR_ReadMrpState	Returns the status of an MRP domain.
LPNDR_ReadWriteParameter	Reads and writes a parameter data record to an analog input module of the ET 200SP.

1.2 Mode of operation

Read and write data record

To implement the described functions, the library blocks use the system applications "Read data record (RDREC)" or "Write data record (WRREC)".

The table below shows you the exact assignment:

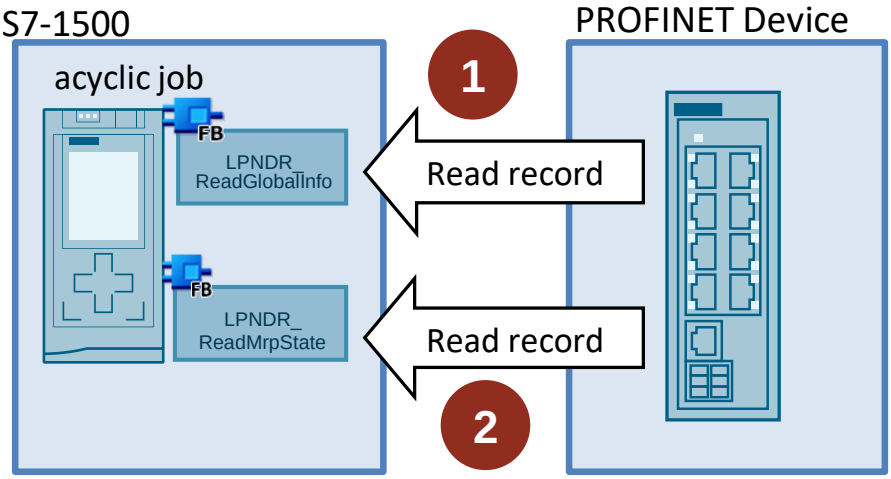
Table 1-2

Library block	System application
LPNDR_ReadGlobalInfo	Read data record
LPNDR_ReadMrpState	Read data record
LPNDR_ReadWriteParameter	Read and write data record

Schematic representation

The following figure shows a schematic representation of how the library blocks "LPNDR_ReadGlobalInfo" and "LPNDR_ReadMrpState" act:

Figure 1-1



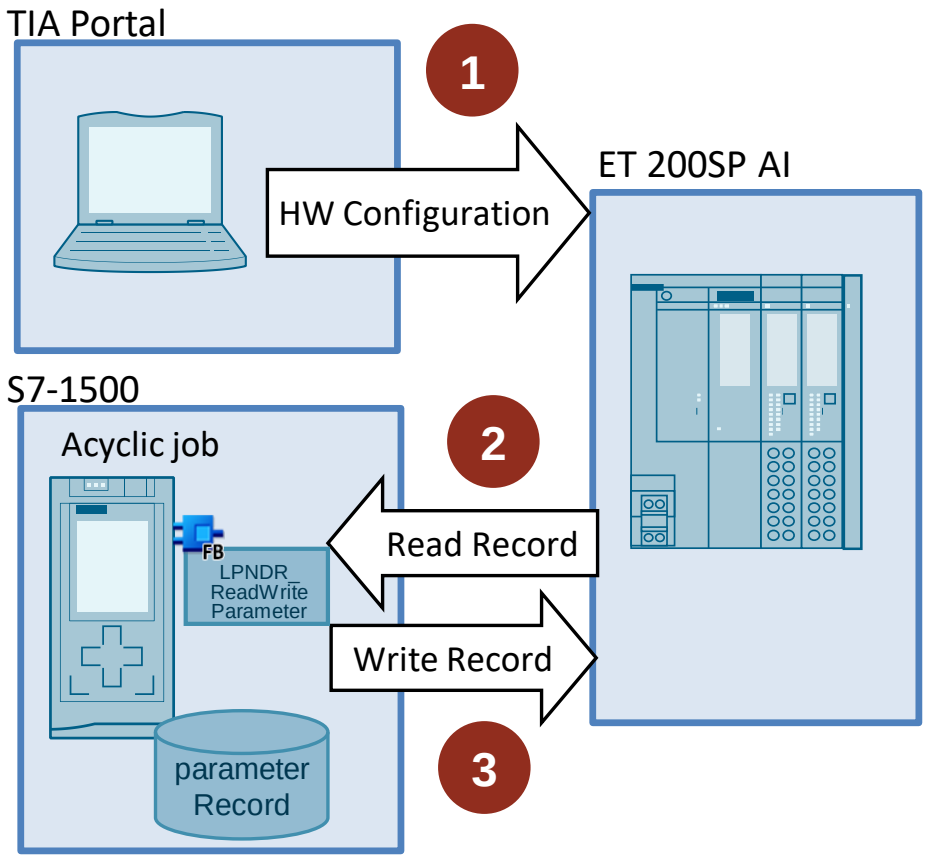
The following table explains the procedure:

Table 1-3

No.	Description
1.	The "LPNDR_ReadGlobalInfo" block uses the system application "Read data record" to read the data record with index 16#F841 from the referenced PROFINET device. The block provides all read data at its output.
2.	The block "LPNDR_ReadMrpState" uses the system application "Read data record" to read the data record with the index 16#8050 from the referenced PROFINET device. The block provides the MRP status information at its output.

The following figure shows a schematic representation of how the library block "LPNDR_ReadWriteParameter" acts:

Figure 1-2



The following table explains the procedure:

Table 1-4

No.	Description
1.	You parameterize the analog input module as usual in the TIA Portal and load the hardware configuration into the CPU.
2.	You have the option of reading the current parameter data record from the analog input module and saving it in a data area. The parameters are read with the system application "Read data record".
3.	You have the option of reconfiguring the analog input module in RUN mode. You can use the read parameter data record as a template, change values and reparameterize the analog input module with the modified parameter data set. The new parameters are transferred via the data record 128 with the system application "write data record".

NOTE The parameters set in the CPU with STEP 7 are not changed. After a restart, the parameters set with STEP 7 are valid again The parameters are checked by the analog input module for plausibility only after transmission.

NOTE The parameter data are structured according to a defined structure and differ between the analog input modules.

In order to simplify the parameterization, this library provides you with a collection of ready-made data structures for the common analog input modules (see Chapter 1.3).

1.3 Components used

Hardware

The library "LPNDR" can be used with all SIMATIC S7-1200 and S7-1500 CPUs. You can read the information from all devices that are PROFINET-capable.

Analog input modules

For the library block "LPNDR_ReadWriteParameter" you get a collection of ready-made data structures for the following analog input modules:

Table 1-5

Module	Part number	Version
AI 4xU/I 2-wire ST	6ES7134-6HD00-0BA1	From V1.1
AI 8xU BA	6ES7134-6FF00-0AA1	From V1.0
AI 4xRTD/TC 2-/3-/4-wire HF	6ES7134-6JD00-0CA1	From V2.0
AI Energy Meter 480VAC ST	6ES7134-6PA20-0BD0	From V4.0
AI 4xI 2-wire 4…20mA HART	6ES7134-6TD00-0CA1	From V1.0
AI 2xU/I 2-/4-wire HS	6ES7134-6HB00-0DA1	From V2.0
AI 2xU/I 2-/4-wire HF	6ES7134-6HB00-0CA1	From V2.0

NOTE The corresponding manuals can be found in Chapter 3.

Software

The library is valid for STEP 7 Basic V16 and higher.

2 Blocks of the library

2.1 Overview

The library "LPNDR" consists of the following blocks and data types.

Function blocks

The following table lists the function blocks of the library:

Table 2-1

Name	Description
LPNDR_ReadGlobalInfo	Reads general information about the device.
LPNDR_ReadMrpState	Returns the status of an MRP domain.
LPNDR_ReadWriteParameter	Allows the parameters of an AI module of the ET 200SP be changed during runtime.

Data types

The following table lists the data types of the library.

Table 2-2

Name	Used by	Description
LPNDR_ typeInterfaceInformation	LPNDR_ ReadGlobalInfo	Defines the variables for the information about the interface.
LPNDR_ typeMrpInformation		Defines the variables for the information about MRP.
LPNDR_ typePortInformation		Defines the variables for the information about a port.
LPNDR_ typePortLinkState		Defines the variables for the status of a port.
LPNDR_ typePortStatistic		Defines the variables for the statistics of a port.
LPNDR_ typeMRPRingState	LPNDR_ ReadMRPState	Defines the variables for the MRP states
LPNDR_ typeChannel0AI4xUI2wireSTand8xUBA	LPNDR_ ReadWriteParameter	Defines the structure for channel 0 of the modules: • AI 4xU/I 2-wire ST • AI 8xU BA
LPNDR_ typeChannel1toXAI4xUI2wireSTand8xUBA		Defines the structure for the other channels of the modules: • AI 4xU/I 2-wire ST • AI 8xU BA
LPNDR_ typeChannelAI4xRTD/TC234wireHF		Defines the structure for the channels of the modules: "AI 4xRTD/TC 2-/3-/4-wire HF".
LPNDR_ typeChannelEnergyMeter480VACST		Defines the structure for the channels of the module "AI Energy Meter 480VAC ST".
LPNDR_ typeChannelAI2xUI24wireHS		Defines the structure for the channels of the modules: "AI 2xU/I 2-/4-wire HS".

Name	Used by	Description
LPNDR_ typeChannelAI2xUI24wireHFV20		Defines the structure for the channels of the modules: "AI 2xU/I 2-/4-wire HF V2.0".
LPNDR_ typeChannelAI2xUI24wireHFV20SCALE		Defines the structure for the channels of the modules: "AI 2xU/I 2-/4-wire HF V2.0 SCALE".
LPNDR_ typeChannelAI4xI2wireHART		Defines the structure for the channels of the modules: "AI 4xI 2-wire 4…20mA HART".
LPNDR_ typeDataSetAI4xRTD/TC234wireHF		Defines the data record of the module "AI 4xRTD/TC 2-/3-/4-wire HF".
LPNDR_ typeDataSetAI4xUI2wireST		Defines the data record of the module "AI 4xU/I 2-wire ST"
LPNDR_ typeDataSetAI8xUBA		Defines the data record of the module "AI 8xU BA".
LPNDR_ typeDataSetEnergyMeter480VACST		Defines the data record of the module "AI Energy Meter 480VAC ST".
LPNDR_ typeDataSetAI2xUI42wireHS		Defines the data record of the module "AI 2xU/I 4-/2-wire HS".
LPNDR_ typeDataSetAI2xUI42wireHFV20		Defines the data record of the module "AI 2xU/I 4-/2-wire HF V2.0".
LPNDR_ typeDataSetAI2xUI42wireHFV20SCALE		Defines the data record of the module "AI 2xU/I 4-/2-wire HF V2.0 SCALE".
LPNDR_ typeDataSetAI4xI2wireHART		Defines the data record of the module: "AI 4xI 2-wire 4…20mA HART".

NOTE You will find the manuals for the analog input modules in chapter 3.

2.2 Reading the device information with "LPNDR_ReadGlobalInfo"

2.2.1 Description

General

The function module supports you in reading one of the following items of information from the PROFINET device:

- Information via the interface, e.g. IP and MAC address
- Information about the device interface, e.g. status, medium, name
- Information about the link status of the interfaces, e.g. link down, link up
- Information about the role of the device in MRP, e.g. client, manager
- Port statistics information, e.g. number of received bytes

The block provides all read information.

In order to read the information from the device, the block uses the function "read data record" and internally calls the system application "RDREC".

Available information in detail

The following table shows which information can be read in detail from the device.

Table 2-3

Information channel	Information content
Information on the interface	• MAC address • Station name • IP address • Subnet mask • Gateway address
Information on the port (portgranular)	• Portname • Medium • Link status • Data rate • Delay in the cable • MAC address of the partner • Station name of the partner • Portname of the partner
Information on MRP	• MRP role • MRP domain name
Information about link status (portgranular)	• Portname • Linkstatus
Port statistics information (portgranular)	• Incoming message frames • Outgoing message frames • Incoming, rejected message frames • Outgoing, rejected message frames • Incoming, faulty message frames • Outgoing, faulty message frames

2.2.2 Data types used

To structure the multitude of information, data types are used.

The following table shows you which data type is used for which information channel.

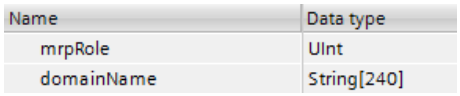
Table 2-4

Name	Description
LPNDR_typeInterfaceInformation	Defines the variables for the information about the interface.
LPNDR_typeMrpInformation	Defines the variables for the information about MRP.
LPNDR_typePortInformation	Defines the variables for the information about a port.
LPNDR_typePortLinkState	Defines the variables for the status of a port.
LPNDR_typePortStatistic	Defines the variables for the statistics of a port.

LPNDR_typeMrpInformation

The data type "LPNDR_typeMrpInformation" includes all variables that are determined with regard to MRP.

Figure 2-1



In detail, these are the following variables:

Table 2-5

Variable	Description
mrpRole	MRP role
domainName	Domain name

Which MRP role the device occupies is coded by the value of the variable "mrpRole".

The following table shows you this coding:

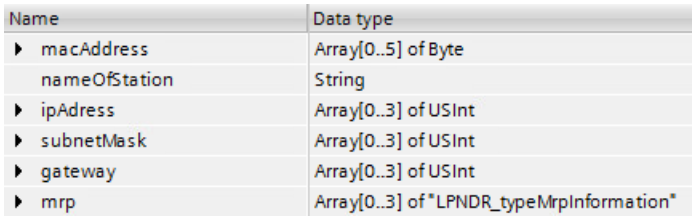
Table 2-6

Value of "mrpRole"	MRP role
0	MRP is disabled
1	Device is MRP client
2	Device is MRP manager
3	Device is MRP manager (auto)

LPNDR_typeInterfaceInformation

The data type "LPNDR_typeInterfaceInformation" includes all variables that are determined via the interface.

Figure 2-2



Name	Data type
macAddress	Array[0..5] of Byte
nameOfStation	String
ipAdress	Array[0..3] of USInt
subnetMask	Array[0..3] of USInt
gateway	Array[0..3] of USInt
mrp	Array[0..3] of "LPNDR_typeMrpInformation"

In detail, these are the following variables:

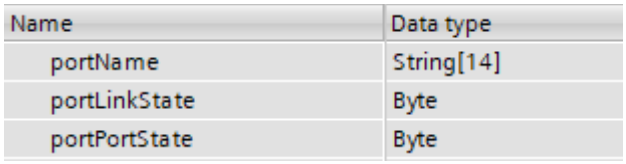
Table 2-7

Variable	Description
macAddress	MAC address
nameOfStation	Station name
ipAddress	IP address
subnetMasc	Subnet mask
gateway	Gateway
mrp	MRP roles and domain names

LPNDR_typePortLinkState

The data type "LPNDR_typePortLinkState" includes all variables that are determined by the link status of the port.

Figure 2-3



Name	Data type
portName	String[14]
portLinkState	Byte
portPortState	Byte

In detail, these are the following variables:

Table 2-8

Variable	Description
portName	Portname
portLinkState	Link status

Which link status the port has is coded by the value of the variable "portLinkState".

The following table shows you this coding:

Table 2-9

Value of "portLinkState"	Link status
1	Link is up
2	Link is down
3	Port is in "testing" status
4	Link status is unknown
5	Port is in "demand" mode
6	Link status is not available
7	Port status is "LowerLayerDown"

Which port status the port has is coded by the value of the variable "portPortState".

The following table shows you this coding:

Table 2-10

Value of "portPortState"	Link status
1	Port is in state "Disabled/ Discarding"
2	Port is in state "Blocking"
3	Port is in state „Listening“
4	Port is in state "Learning"
5	Port is in state "Forwarding"
6	Port is in state "Broken"
7	reserved

LPNDR_typePortInformation

The data type "LPNDR_typePortInformation" includes all variables that are determined via the port.

Figure 2-4

Name	Data type
numbersOfPeers	Byte
lineDelay	UDInt
▸ peerMacAdress	Array[0..5] of Byte
peerNameofStation	String
peerPortName	String[14]
dataRate	String[5]
mediaType	USInt
▸ portDiagnostic	"LPNDR_typePortLinkState"

In detail, these are the following variables:

Table 2-11

Variable	Description
numbersOfPeers	Number of partners
lineDelay	Cable delay in nsec
peerMacAddress	MAC address of the partner
peerNameOfStation	Station name of the partner
peerPortName	Portname of the partner
dataRate	Data rate in bit/s
mediaType	Type of transmission medium
portDiagnostic	Link/ Port status and port name

Which transmission medium is used is coded by the value of the variable "mediaType".

The following table shows you this coding:

Table 2-12

Value of "mediaType"	Transmission medium
0	Unknown
1	Copper cable
2	Fiber-optic cable
3	Mobile phone

LPNDR_typePortStatistic

The data type "LPNDR_typePortStatistic" includes all variables that are determined via the port statistics.

Figure 2-5

Name	Data type
inOctets	DWord
outOctets	DWord
inDiscards	DWord
outDiscards	DWord
inErrors	DWord
outErrors	DWord

In detail, these are the following variables:

Table 2-13

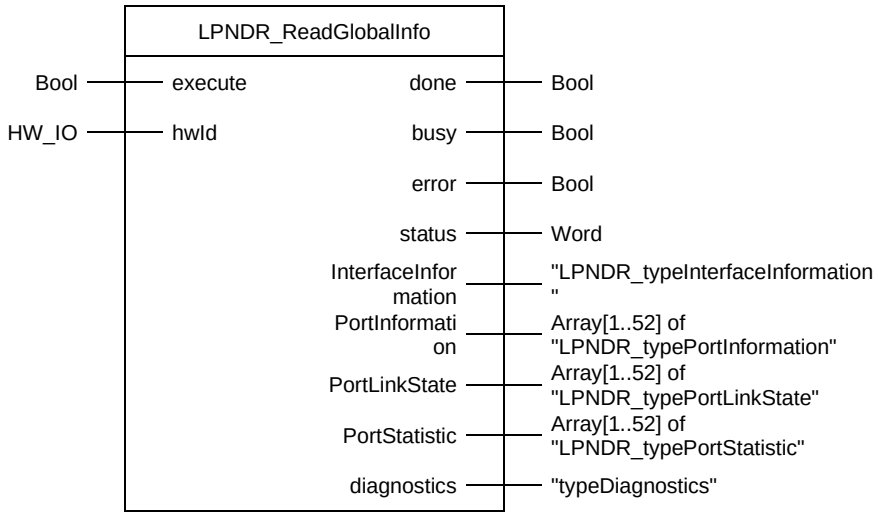
Variable	Description
inOctets	Number of incoming message frames
outOctets	Number of outgoing message frames
inDiscards	Number of incoming, rejected message frames
outDiscards	Number of outgoing, rejected message frames
inErrors	Number of incoming, faulty message frames
outErrors	Number of outgoing, faulty message frames

2.2.3 Block call and parameter description

Block call

The following figure shows the call interface of FB "LPNDR_ReadGlobalInfo". The table describes the parameters of the function block.

Figure 2-6: LPNDR_ReadGlobalInfo



Parameter description

The table below describes the parameters of the function block.

Table 2-14: Parameter of LPNDR_ReadGlobalInfo

Name	P-Type	Data Type	Comment
execute	IN	Bool	Rising edge starts action once
hwId	IN	HW_IO	hwid of the device to be read out
done	OUT	Bool	TRUE: Commanded functionality has been completed successfully
busy	OUT	Bool	TRUE: FB is not finished and new output values can be expected
error	OUT	Bool	TRUE: An error occurred during the execution of the FB
status	OUT	Word	16#0000 - 16#7FFF: Status of the FB, 16#8000 - 16#FFFF: Error identification
InterfaceInformation	OUT	"LPNDR_typeInterfaceInformation"	Table 2-7
PortInformation	OUT	Array[1..52] of "LPNDR_typePortInformation"	Table 2-11

Name	P-Type	Data Type	Comment
PortLinkState	OUT	Array[1..52] of "LPNDR_typePortLinkState"	Table 2-8
PortStatistic	OUT	Array[1..52] of "LPNDR_typePortStatistic"	Table 2-13
diagnostics	OUT	"typeDiagnostics"	Diagnostics information of FB (optional)

Use a global data block for the declaration of the target area. Create a variable with the required data type.

Status and error display

The outputs "done", "error" and "status" remain set after completing the job or in case of an error as long as "execute" is set or for one cycle.

The following table shows the meaning of the output parameter "status".

Table 2-15

Status	Meaning
16#0000	Order completed successfully.
16#8xxx	The module RDREC throws an error. The meaning of the status can be found in the online help of STEP 7.

A more detailed diagnosis can be obtained via the "diagnostics" output.

2.2.4 Operation

You start the reading process with a positive edge at the "execute" input.

The block "LPNDR_ReadGlobalInfo" works asynchronously, i.e. the processing extends over several PLC cycles.

As long as no valid response data has arrived, this is signaled via the parameter "busy".

The value "1" of the output parameter "done" shows that the transfer has been successfully completed and that the data is now consistent on the outputs.

2.3 Readout of the MRP status with "LPNDR_ReadMRPState"

2.3.1 Description

General

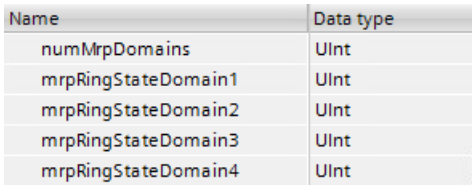
The function block helps you to determine the status of the MRP ring programmatically. The block reads the MRP information from the PROFINET device (MRP manager) and outputs the status.

In order to read the information, the block uses the function "Read data record" and internally calls the system application "RDREC".

2.3.2 Data types used

To display the ring states for up to four MRP domains, the device uses the user-defined data type "LPNDR_typeMrpRingState":

Abbildung 2-7



In detail, these are the following variables:

Tabelle 2-16

Variable	Description
numMrpDomains	Number of MRP domains
mrpRingStateDomain<x>	State of the ring of the MRP domain

The state of the ring is encoded by the value of the variable "mrpRingStateDomain<x>".

The following table shows you this encoding:

Tabelle 2-17

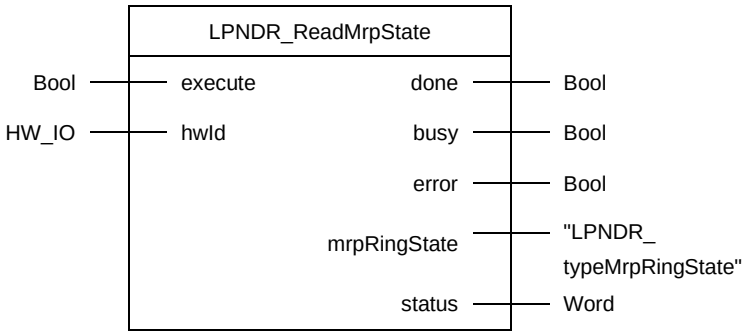
Value of "mrpRingStateDomain<y>"	Ring state
0	Open ring
1	Closed ring

2.3.3 Block call and parameter description

Block call

The following figure shows the call interface of FB "LPNDR_ReadMRPState". The table describes the parameters of the function block.

Figure 2-8



Parameter description

The table below describes the parameters of the function block.

Table 2-18

Name	P type	Data type	Comment
execute	IN	Bool	Read data record.
hwId	IN	HW_IO	Hardware ID of an interface of the PROFINET device.
busy	OUT	Bool	Order is being processed.
done	OUT	Bool	Order completed successfully.
error	OUT	Bool	An error has occurred.
mrpRingState	OUT	UInt	State of the MRP ring.
status	OUT	Word	Specifies the error.

Status and error display

The outputs "done", "error" and "status" remain set after completing the job or in case of an error as long as "execute" is set or for one cycle.

The following table shows the meaning of the output parameter "status".

Table 2-19

Status	Meaning
16#0000	Order completed successfully.
16#5000	The referenced module is not MRP manager or MRP manager (auto).
16#5001	There are several MRP instances.
16#5002	The version of the read data block is unknown.
16#8xxx	The module RDREC throws an error. The meaning of the status can be found in the online help of STEP 7.

2.3.4 Operation

You start the reading process with a positive edge at the "execute" input.

The block "LPNDR_ReadMRPState" works asynchronously, i.e. the processing extends over several PLC cycles.

As long as no valid response data has arrived, this is signaled via the parameter "busy".

The value "1" of the output parameter "done" shows that the transfer has been carried out successfully and that the data is now consistent with the parameter "mrpRingState".

2.4 Parameterization with "LPNDR_ReadWriteParameter"

2.4.1 Description

If you want to modify the parameters of the analog input module at runtime, you must write a special parameter data record in the module. The function block supports you in the following points:

- You want to read and save the current parameters from the analog input module.
- You want to write new or modified parameters to the analog input module.

NOTE If you re-parameterize the analog input module at runtime, the parameters set with STEP 7 are not changed in the CPU. After a restart, the parameters set with STEP 7 are valid again. The parameters are checked by the analog input module for plausibility only after transmission.

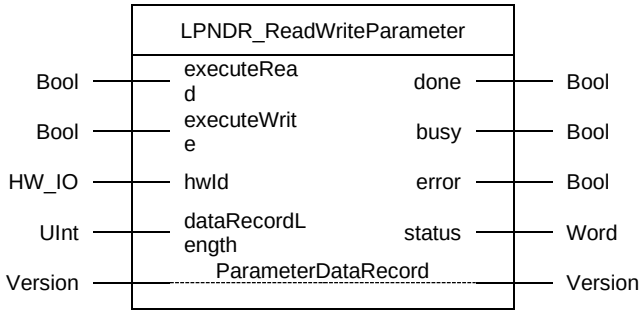
In order to read out and overwrite the configured parameter data from an analog input module, the block uses the functions "Read data record" and "Write data record" Internally, the function module calls the system applications "RDREC" and "WRREC" for this purpose.

2.4.2 Block call and parameter description

Block call

The following figure shows the call interface of FB "LPNDR_ReadWriteParameter". The table describes the parameters of the function block.

Figure 2-9



Parameter description

The table below describes the parameters of the function block.

Table 2-20

Name	P type	Data type	Comment
executeRead	IN	Bool	Read parameter data record.
executeWrite	IN	Bool	Write parameter data record.
hwId	IN	HW_IO	Hardware ID of the PROFINET device.
dataRecordLength	IN	UInt	See Table 2-21.
done	OUT	Bool	Order completed successfully.
busy	OUT	Bool	Order is being processed.
error	OUT	Bool	An error has occurred.
status	OUT	Word	Specifies the error.
ParameterDataRecord	IN_OUT	Version	Source/destination area for the parameter.

Name	P type	Data type	Comment
			data to be read/written. You declare the target area with a data type that matches the referenced module (see Table 2-22).

The following table shows you the value you have to enter in the "dataRecordLength" parameter. The length depends on the referenced analog input module.

Table 2-21

Module	Value of "dataRecordLength"
AI 4xU/I 2-wire ST	74
AI 8xU BA	146
AI 4xRTD/TC 2-/3-/4-wire HF	90
AI Energy Meter 480VAC ST	74
AI 4xI 2-wire 4…20mA HART	42
AI 2xU/I 2-/4-wire HS	30
AI 2 X U/I 2-, 4-WIRE HF V2.0	46
AI 2 X U/I 2-, 4-WIRE HF V2.0 SCALE	78

The following table shows which data type you must specify in the "ParameterDataRecord" parameter depending on the referenced analog input module:

Table 2-22

Information	Data type to "DataRecord"
AI 4xRTD/TC 2-/3-/4-wire HF	LPNDR_typeDataSetAI4xRTD/TC234wireHF
AI 4xU/I 2-wire ST	LPNDR_typeDataSetAI4xUI2wireST
AI 8xU BA	LPNDR_typeDataSetAI8xUBA
AI Energy Meter 480VAC ST	LPNDR_typeDataSetEnergyMeter480VACST
AI 4xI 2-wire 4…20mA HART	LPNDR_typeDataSetAI4xI2wireHART
AI 2xU/I 2-/4-wire HS	LPNDR_typeDataSetAI2xUI42wireHS
AI 2 X U/I 2-, 4-WIRE HF V2.0	LPNDR_typeDataSetAI2xUI42wireFV20
AI 2 X U/I 2-, 4-WIRE HF V2.0SCALE	LPNDR_typeDataSetAI2xUI42wireFV20SCALE

Status and error display

The outputs "done", "error" and "status" remain set after completing the job or in case of an error as long as "executeRead" or "executeWrite" is set or for one cycle.

The following table shows the meaning of the output parameter "status".

Table 2-23

Status	Meaning
16#0000	Order completed successfully.
16#8xxx	The block "RDREC" or "WRREC" throws up an error. The meaning of the status can be found in the online help of STEP 7.

2.4.3 Operation

Read parameter

To determine which parameters are configured in the analog module, you can read them out as a first step. You start the reading process with a positive edge at the "executeRead" input.

The block "LPNDR_ReadWriteParameter" works asynchronously, i.e. the processing extends over several PLC cycles. As long as no valid response data has arrived, this is signaled via the parameter "busy".

The value "1" of the output parameter "done" shows that the transfer has been carried out successfully and that the data is now consistent with the "ParameterDataRecord" parameter.

Modify parameters

To modify the parameters in the analog module, you must adjust the parameter data set. As a basis, use the parameter data set that you just read. To do this, open the target area that you referenced in the output parameter "ParameterDataRecord" and go online. Modify the parameters according to your wishes, e.g. activate the diagnosis.

NOTE For a detailed description of the parameter data, refer to the manual of the analog input module (see Chapter 3)

Write parameters

You start the write process with a positive edge at the "executeWrite" input.

The block "LPNDR_ReadWriteParameter" works asynchronously, i.e. the processing extends over several PLC cycles. As long as no valid response data has arrived, this is signaled via the parameter "busy".

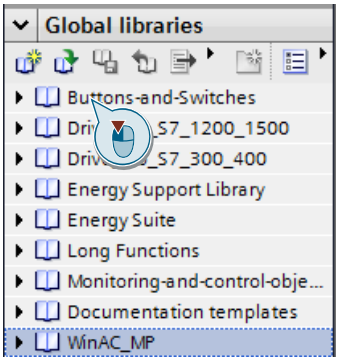
The value "1" of the output parameter "done" shows that the transfer was successful. The parameter data was written to the analog input module. You can now start a new read process. The result shows the parameters with the changed values

2.5 Integration into the User project

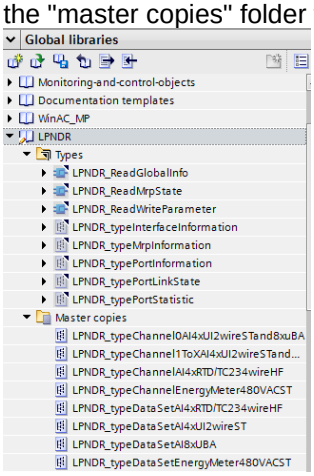
In this chapter you will learn how to integrate the library into your user project.

Integration of the block library

1. Extract the file "109753067_PNDataRecord_LIB_TIA_V23.zip" into a directory of your choice.
2. Open your TIA V16 project.
3. Change to the task card "Libraries".
4. Open the "Global libraries" pane.
5. Click on the "Open global library" icon and select the library "LPNDR.al16".



6. Drag and drop the desired block from the "Types" folder to the "Program blocks" folder. If you use the "LPNDR_ReadWriteParameter" block, drag the required data types for the analog input module parameter data structure from the "master copies" folder to the "data types" folder.



Integration of the blocks into the program

The following instructions show you how to integrate and parameterize the function block you require into your project.

1. Open the OB1 "Main" and call up the required function block.
2. A dialog is opened. Give the instance data block a name and, if necessary, assign a block number.
3. Click on "OK".
4. Supply the input and output parameters with values.
5. Define a variable in a global data block with the required data type as the variable type for the following target areas:
   - "ParameterDataRecord" of the FB "LPNDRReadWriteParameter"
6. Load your user program into the PLC.

NOTE The function blocks are designed for "optimized block access".

3 Appendix

3.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:

siemens.com/SupportRequest

SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

support.industry.siemens.com/cs/ww/en/sc/2067

3.2 Industry Mall

The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:
mall.industry.siemens.com

3.3 Links and Literature

Table 3-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the entry page for the application example https://support.industry.siemens.com/cs/ww/en/view/109753067
\3\	SIMATIC ET 200SP analog input module AI 4xU/I 2-wire ST https://support.industry.siemens.com/cs/ww/en/view/59753624
\4\	SIMATIC ET 200SP analog input module AI 8xU BA https://support.industry.siemens.com/cs/ww/en/view/109475182
\5\	SIMATIC ET 200SP analog input module AI 4xRTD/TC 2-/3-/4-wire HF https://support.industry.siemens.com/cs/ww/en/view/59753600
\6\	SIMATIC ET 200SP Analog Input Module AI Energy Meter 480VAC ST https://support.industry.siemens.com/cs/ww/en/view/109481117
\7\	SIMATIC ET 200SP analog input module AI 2xU/I 2-/4-wire HS https://support.industry.siemens.com/cs/ww/en/view/73108737
\8\	SIMATIC ET 200SP analog input module AI 2xU/I 2-/4-wire HF https://support.industry.siemens.com/cs/ww/en/view/89116945
\9\	SIMATIC ET 200SP analog Input Module AI 4xI 2-wire 4…20mA HART https://support.industry.siemens.com/cs/ww/en/view/109750608

3.4 Change documentation

Table 3-2

Version	Date	Modification
V1.0	01/2018	First version
V2.0	06/2019	Upgrade to V15.1
V2.1	11/2019	Adjustment of block "LPNDR_ReadGlobalInfo"
V2.2	12/2020	Optimization of block "LPNDR_ReadGlobalInfo"
V2.3	03/2024	• Support for up to four MRP domains for "LPNDR_ReadGlobalInfo" and "LPNDR_ReadMRPState" • Update to TIA Portal V19