SIEMENS

EtherNet/IP Gateway
Hardware + Software

System manual

www.siemens.com/icgs-sios

Siemens Industry Online Support

Industrial Commu-nication Gateway Services

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 **DANGER**	**indicates that death or severe personal injury will result if proper precautions are not taken.**

 **WARNING**	**indicates that death or severe personal injury may result if proper precautions are not taken.**

 **CAUTION**	**indicates that minor personal injury can result if proper precautions are not taken.**

NOTICE	**indicates that property damage can result if proper precautions are not taken.**

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

Siemens AG
DI CS PA SPA
Postfach 48 48
90026 NÜRNBERG
Germany

Ⓟ 10/2023
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EntryID: 109818899

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit https://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under https://www.siemens.com/industrialsecurity.

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Table of contents

1 Overview

1.1 Personal data disclaimer

Siemens observes the principles of data protection, in particular the principle of data minimization (privacy by design). For this reason, the Station Gateway only processes / stores technical functional data (e.g. time stamps) and no personal data. If the user links this data with other data (e.g. shift plans) or stores personal data on the same medium (e.g. hard disk) and thus establishes a personal reference, the user must ensure compliance with data protection regulations.

1.2 Note of usage and misuse

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed. Please also refer the manual of the used hardware.

1.3 Prevention of misconfiguration

A misconfiguration of configured tags or the hardware properties can lead to malfunctions, including:

- Hardware not reachable
- Redundancy does not work
- Sporadic data loss
- Permanent data loss
- EIP hardware not reachable

To reduce this risk, a detailed signal loop test is highly recommended during commissioning.

Both the overlayed systems (like PCS 7 PLC and WinCC) and the underlaid systems (EtherNet/IP devices) must implement protections and interlocks to avoid damage of property or personal damage. These protections and interlocks must be done inside the single systems with the adequate configuration tool.

1.4 Disclaimer

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

This product fulfils the functionality, described in this document. Older releases of this document are invalid. Functionality, which is not described or explicit marked as ‘not supported’, is not supported by this product or software release.

It is possible that superior products (like PCS 7 or STEP7) provide a system standard functionality (like SFC). If this functionality isn’t handled inside this document, the system behavior of this library can differ from the superior system.

For more information about this topic, please contact function.blocks.industry@siemens.com.

1.5 System hardening

To increase the security of the plant, we recommend a system hardening of this system and all other systems. Due to a large variety of needs/requirements, it is not possible to suggest a concrete hardening strategy.

For this device, please refer to "PCS 7 Compendium Part F" (use the drop-down menu "Edition" to select the required PCS 7 version) and consider this with responsible and qualified personnel of your plant. System hardening requires a deep knowledge about the guidelines, environment and needs on site. Therefore, system hardening isn't covered by the service agreement. Please note that a wrong hardening configuration can impact the functionality.

1.6 Integrity of delivery

Please ensure the integrity of the delivered components. To ensure the integrity, we seal the packaging of hardware components and the storage volumes with the following seal:

Figure 1-1 Valid seals

Invalid seals can be identified by:

- The corners are damaged from the removal and replacement of the seal.
- A removed seal leaves a pattern on the underground.
  If the seal is placed again, that pattern is missing in the background.
- The seal was cut.

Figure 1-2 Invalid seals

NOTICE	**Please ensure that all components contain a valid seal.** If the seals are missing or broken, do not connect the device or data volume. In this case, please contact us.

1.7 Updates

Depending on the update cause (bug fixing, closing security issues, ...), the installation of the update should be considered. The availability of security updates should be checked permanently to ensure a proper and secure operation.

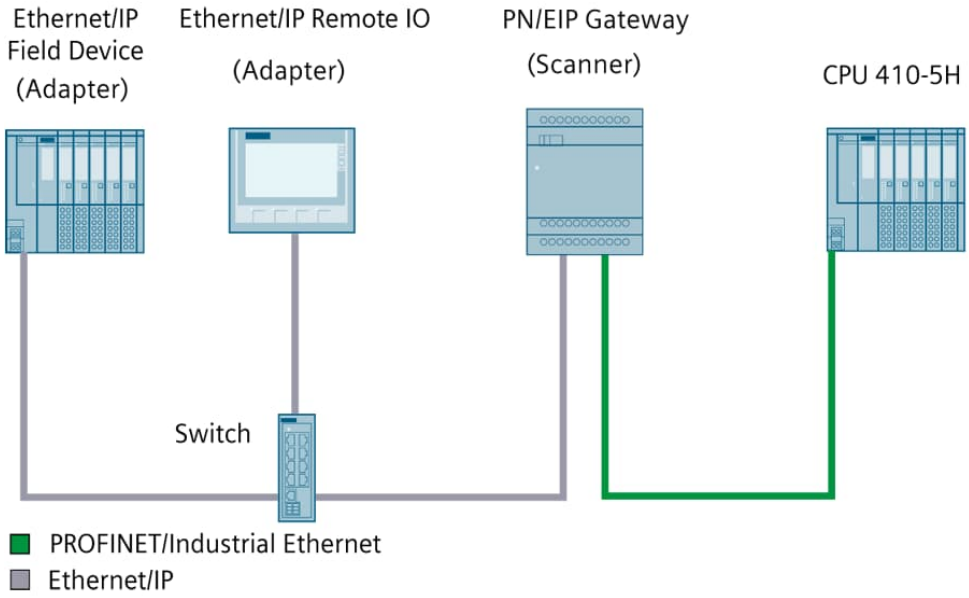
2 System overview

The following bundle provides communication between an S7-400 CPU with Profinet and an EtherNet/IP adapter (field device).

It consists of a driver library and a gateway for the communication between PROFINET and EtherNet/IP.

- The library is designed and released for a system compliant integration of the gateway into PCS 7.
- The gateway works as a PROFINET device and an EtherNet/IP scanner. This means that no additional scanner is required in the EtherNet/IP network.

Figure 2-1



9LA1110-6CG10-0AA0 EtherNet/IP Gateway Library for PCS 7 / Step7 with plant license.

9LA1110-6CG11-0AA0 EtherNet/IP Gateway Hardware (one piece). Only gateways, that are ordered by this order number are approved and covered by service&support.

3 Software- and hardware requirements and terms of use

3.1 License

The license is valid for the use of the library together with the HMS Anybus X-gateway delivered by Siemens and is bound to the serial number. For usage with hardware that was not sourced from Siemens there is no service, no support, no updates and no warranty. A license is required to use the library.

Licensing can be done by permanently having a USB dongle inserted or by installing a software license. The CodeMeter Runtime must be installed for both options.

3.2 Scope of delivery

The delivery of this bundle includes:

- HMS Anybus X-gateway PROFINET device / EtherNet/IP Scanner
- PCS 7 block library
- License dongle / SW license
- CodeMeter setup file

3.3 Scope of service

The support and maintenance services provided by Siemens to the customer include:

- troubleshooting
- updates and patches subject to availability
- general technical support relating to the integration and use of the acquired products.
- replacements/supplemental deliveries for defective hardware

Modifications including extensions and customizations of the software according to the specifications of the customer are not serviced, even if such modifications, extensions, and customizations are made by Siemens under a separate agreement. All services will exclusively be provided on a remote basis. In case of hardware deliveries, the customer ensures, that such spare parts are installed, commissioned, and tested by sufficiently qualified and trained personnel of the customer. Any support services in relation to installation, commissioning, and testing of spare parts at the customer’s premises can be ordered with Siemens following a separate offer by Siemens. The customer’s rights in case of defects deriving from the purchase agreement with Siemens remain unaffected.

The contract begins with the delivery of the product (software and/or hardware) purchased together with the services.

Support is provided by a uniform contact, Siemens Technical Support-Services . The Service & Support package provides support by e-mail only. To ensure that we can most quickly assign your support inquiries to one of our experts, it is preferable that you submit your inquiry using the link below. Support services are limited to

two (2) hours per case. We are happy to make an offer for inquiries taking longer than two hours through our “Technical Support Extended.”

Support inquiries through: http://www.siemens.com/automation/support-request

Software migration support to higher versions for the target system within the PCS 7 product line must be requested/ordered separately.

3.4 System requirements:

- EtherNet/IP Gateway and library delivered by Siemens

3.5 PCS 7 requirements:

- The library requires SIMATIC PCS 7 in version V9.0 SP3 (or newer)
- The blocks are executable in the CPU S7-41x.

3.6 Supported functionality

The library supports the control of HMS Anybus X-gateway (PROFINET device to Ethernet/IP Scanner) to communicate with Ethernet/IP adapter.
(For more information, see chapter 3.7 “Supported modules”.)

The library in combination with the gateway supports the following functionality:

- Communication between a S7-400 with PCS 7 and PROFINET via the HMS Anybus X-gateway (PROFINET device to Ethernet/IP Scanner) to Ethernet/IP adapters
- With one gateway the communication with up to 64 Ethernet/IP adapter can be realized. For all adapters together including statistics list and status- and control word max. 512Byte can be used in S7 HW Config. The limitation of the Ethernet/IP adapter and the amount of data is done by the gateway
- Diagnosis of the gateway via diagnosis blocks for the rack and module Level and blocks for statistics list and status- and control word.
- Use of the driver wizard
- Read and write bool values, analog values in integer or real, scaling of analog values, words like status and control words
- Converting function between little-endian and big-endian
- S1 redundancy
- Maintenance Station (Asset Management)

The following restrictions apply:

- No blocks for acyclic communication
- No CIR
- No MRP, S2 or R2 redundancy
- Not tested or approved for F-Systems or comparable safety-related functions

3.7 Supported modules

The following modules are supported:

Input modules

Table 3-1

Type	Version
RT Standard	Input 001 byte
	Input 002 byte
	Input 004 byte
	Input 008 byte
	Input 016 byte
	Input 032 byte
	Input 064 byte
	Input 128 byte
	Input 256 byte
	Input 512 byte

Input/Output modules

Table 3-2

Type	Version
RT Standard	Input/Output 001 byte
	Input/Output 002 byte
	Input/Output 004 byte
	Input/Output 008 byte
	Input/Output 016 byte
	Input/Output 032 byte
	Input/Output 064 byte
	Input/Output 128 byte
	Input/Output 256 byte
	Input/Output 512 byte

Other modules

Table 3-3

Type	Version
RT Standard	Empty slot

Output modules

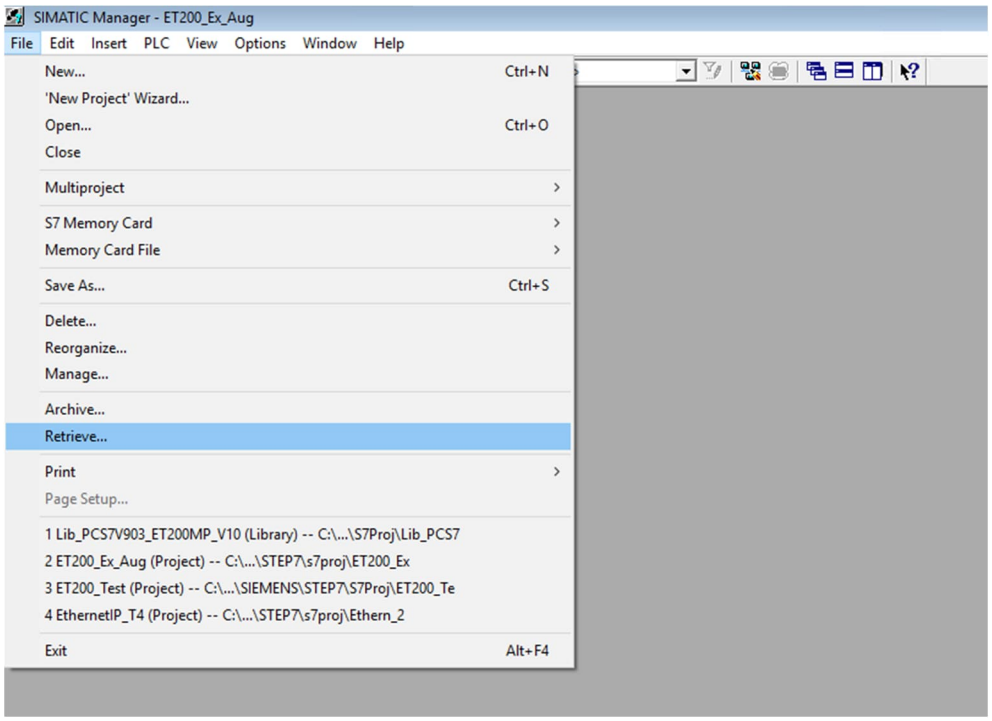
Table 3-4

Type	Version
RT Standard	Output 001 byte
	Output 002 byte
	Output 004 byte
	Output 008 byte
	Output 016 byte
	Output 032 byte
	Output 064 byte
	Output 128 byte
	Output 256 byte
	Output 512 byte

4 Installation of the library

4.1 PCS 7 block library

The driver blocks are supplied as an archived PCS 7 library with the file name **Lib_PCS7_XGW_PN_EIP_V10.zip**. In the library are folders for the supported PCS 7 versions.



The library is retrieved from the archive via the SIMATIC MANAGER.

The catalog **SIEMENS\STEP7\S7libs** is specified as the target directory.

After installation, the driver blocks are available in the block library. Please note, that text libraries for the message system need to be integrated as well.

To open the library in SIMATIC Manager, click **File > Open > Library** to access the function blocks and text libraries.

Figure 4-1

NOTE If the block numbers of the library are already in use and if you need the blocks in another number range, please contact our support.

4.2 Driver Wizard

Before you start to copy the files to the system, it is recommended to do a backup of the directory **SIEMENS\STEP7\S7data\Driver.** After the backup, please extract the file for your PCS 7 version (e.g. **PCS7_V903_XGW_PN_EIP_V10.zip** to **SIEMENS\STEP7\S7data\Driver**

Before you start to copy the files to the system, it is recommended to do a backup of the directory **SIEMENS\STEP7\S7BIN.** After the backup, please copy **DG_MVDI_V10.dll** to **SIEMENS\STEP7\S7BIN.**

4.3 Licensing

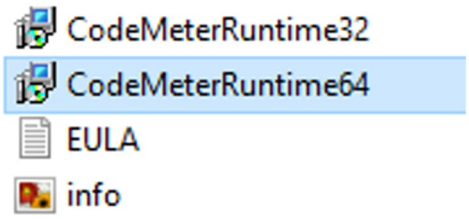
A license is required to use the library.

Licensing can be done by permanently having a USB dongle inserted or by installing a software license. The CodeMeter Runtime must be installed for both options.

4.3.1 Preparation

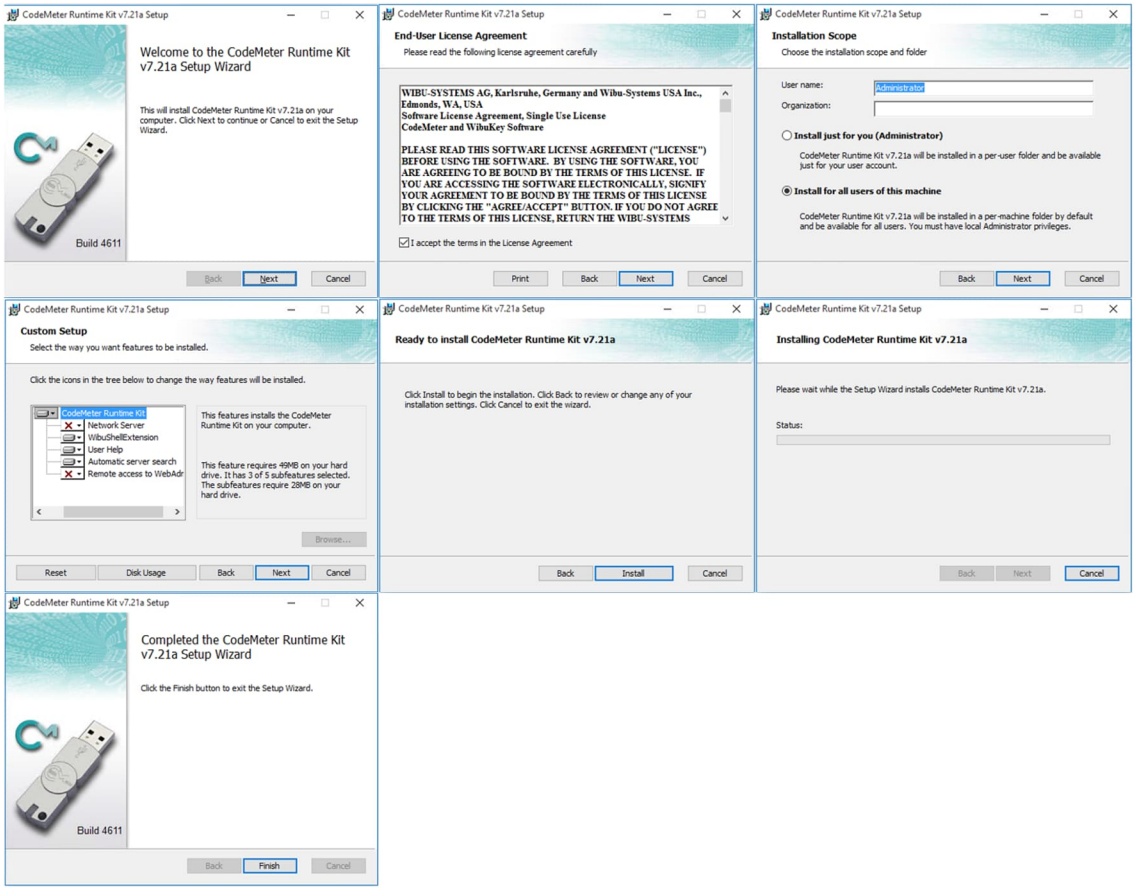
Choose the 32bit or 64bit version option according to your system.

Figure 4-2



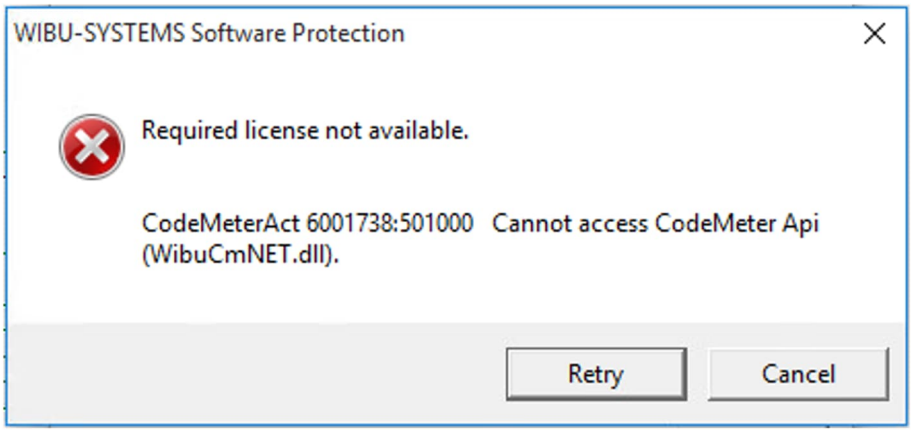
Then follow the setup wizard until the installation is complete.

Figure 4-3



If the library is not licensed, you may receive the following error message when compiling the CFC plans: “Required license not available”.

Figure 4-4



4.3.2 Licensing with USB dongle

If you ordered the USB dongle option, insert the USB dongle into the ES.

The CodeMeter Runtime will automatically detect the license on the dongle.

4.3.3 Licensing with software license

If you ordered the software licensing option, please proceed as following to install the licensing software:

- Copy the “WibuCmLIF” file from Siemens onto the ES.
- Create a “WibuCmRaC” file by double-clicking the “WibuCmLIF” file.
- Send the “WibuCmRaC” file back to Siemens.
- You will receive a “WibuCmRaU” file from Siemens.
- Copy the “WibuCmRaU” file onto the ES.
- Install the license by double-clicking the “WibuCmRaU” file.

The CodeMeter Runtime will automatically detect the installed license on the ES.

5 Gateway configuration

5.1 Gateway configuration

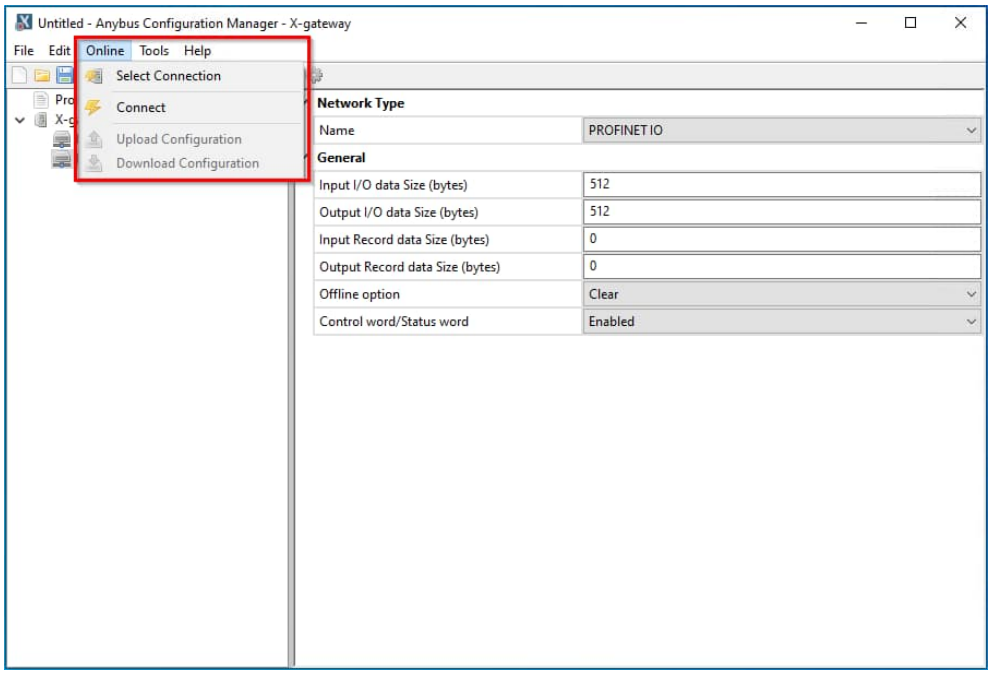
Anybus Configuration Manager – X-gateway

For the basic device configuration for both gateway sides the “Anybus Configuration Manager” tool is provided. This tool is available at https://www.anybus.com/. This tool establishes a connection via USB.

Connection setup

The access path and the connection setup or disconnection is provided via the online menu.

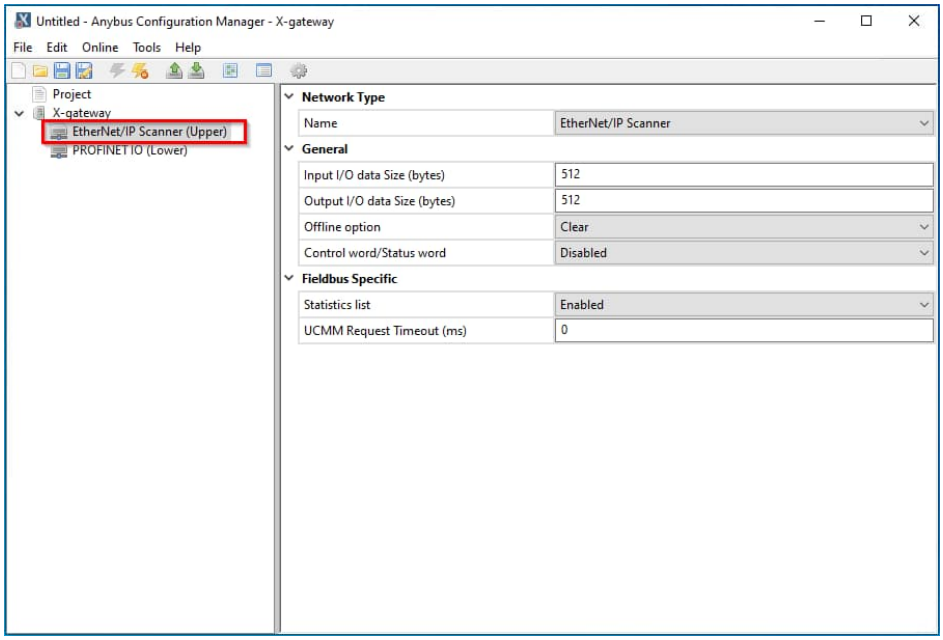
Figure 5-1



EtherNet/IP Scanner (Upper)

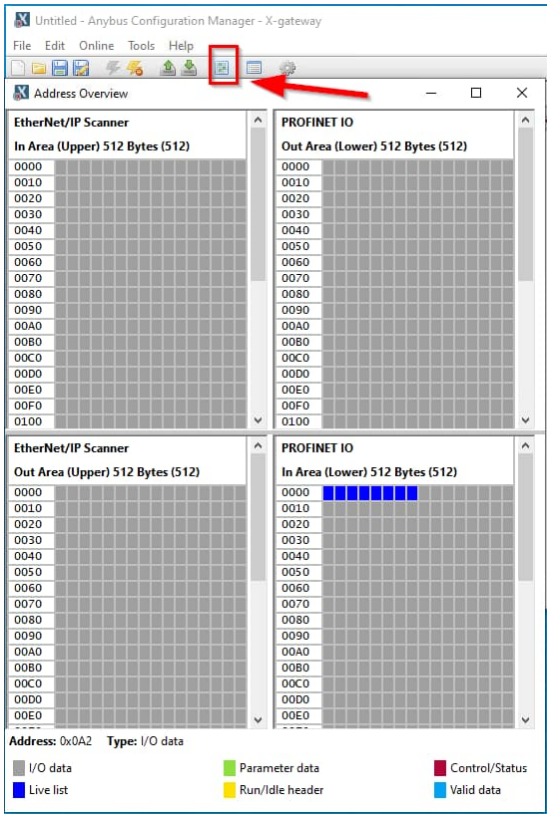
The upper side of the gateway must be set to Ethernet/IP Scanner. Other settings are to be set according to the requirements. If the evaluation of the statistics list is desired under PCS 7, this can also be activated. The XGwStList block can be used for the evaluation in PCS 7. Please find more information about the statistics list in the document “Network Guide - EtherNet/IP Scanner” with the title “X-Gateway Interface Addendum EtherNet/IP Scanner” in Anybus Files and Documentation at https://www.anybus.com/.

Figure 5-2



The data area for the configured areas can be queried via the address overview

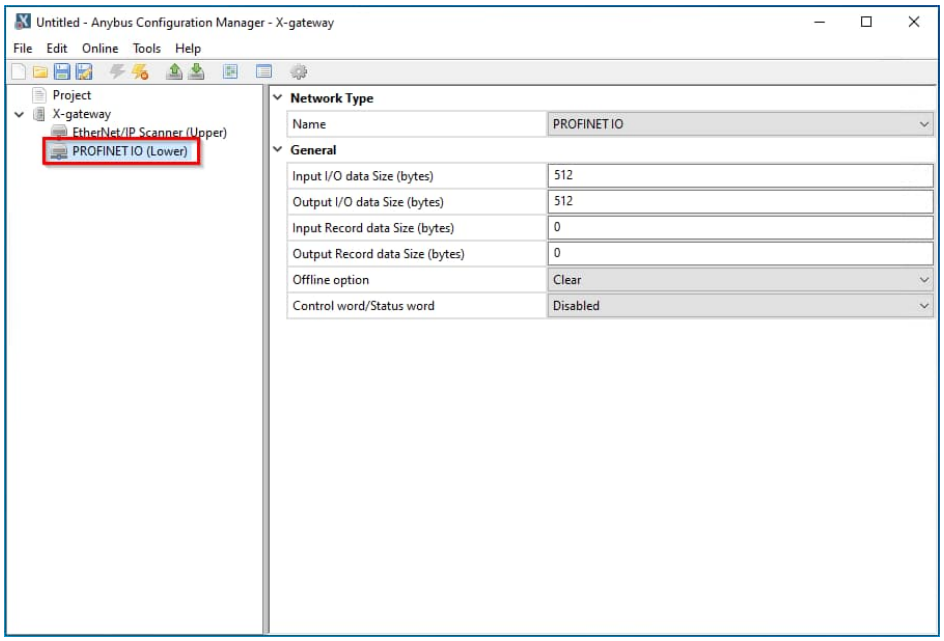
Figure 5-3



PROFINET IO (Lower)

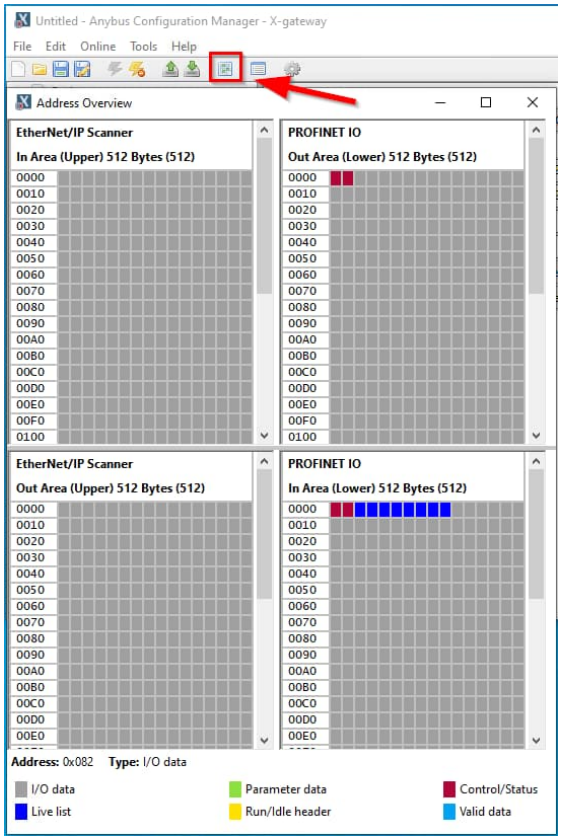
The lower side of the gateway must be set to PROFINET IO. Other settings are to be set according to the requirements. If the status word and the control word are to be used, this can also be activated here. The XGwWoIn/XGwWoOu block can be used for processing in PCS 7. Please find more information about the status word / control word list in the document “Network Guide - PROFINET IO” with the title ““X-gateway Interface Addendum Profinet IO Slave” in Anybus Files and Documentation at https://www.anybus.com/.

Figure 5-4



The data area for the configured areas can be queried via the address overview.

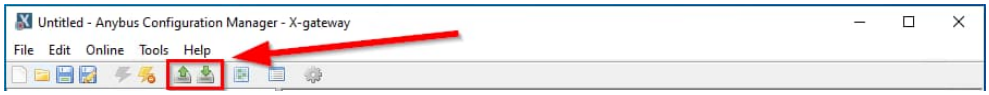
Figure 5-5



Configuration transfer

The buttons can be used to transfer the configuration to the device or to read it from the device.

Figure 5-6



5.2 Network configuration

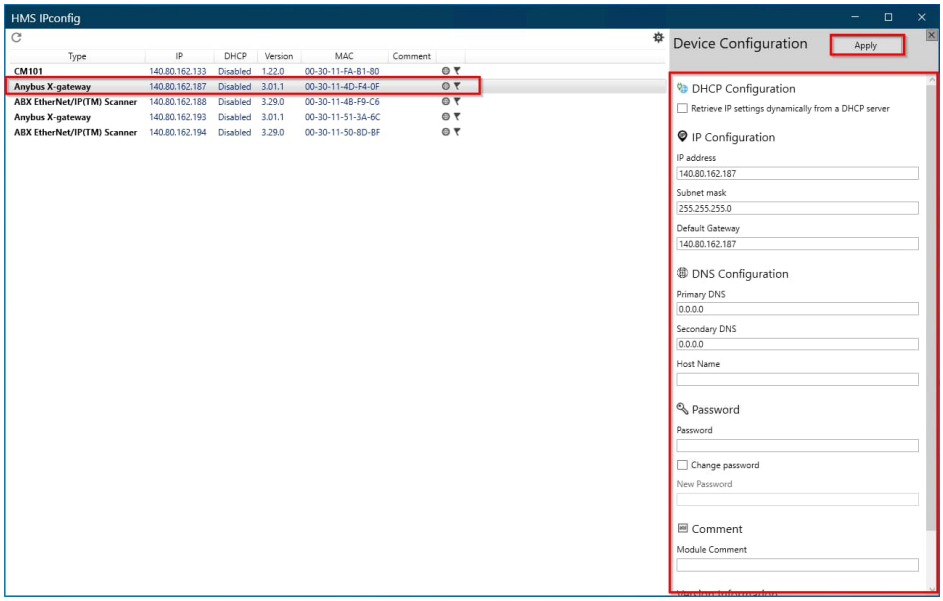
HMS IPconfig tool

For the network configuration for both gateway sides the “HMS IPconfig” tool is provided. This tool is available at https://www.anybus.com. This tool establishes a connection via the network.

Gateway configuration PROFINET Device (Slave)

The PROFINET side of the gateway is named “Anybus X-gateway” in the “HMS IPconfig” tool.

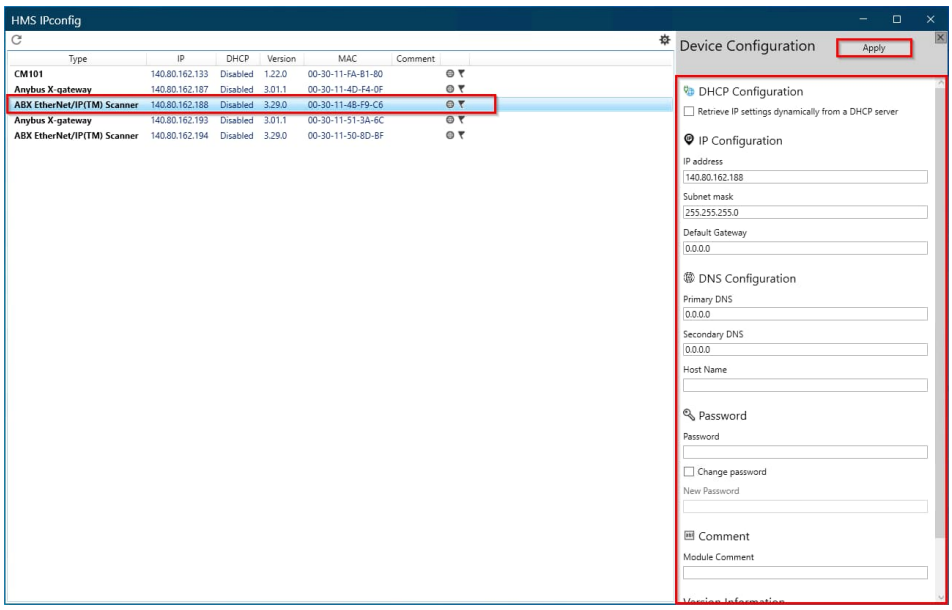
Figure 5-7



Gateway configuration EtherNet/IP scanner

The EtherNet/IP side of the gateway is named “ABX EtherNet/IP(TM) Scanner” in the “HMS IPconfig” tool.

Figure 5-8



5.3 Configuration of EtherNet/IP adapter via Scanlist

The connection to the EtherNet/IP adapters can be made in the scanlist of the gateway via the web server.

Web server of the EtherNet/IP scanner on the gateway

The web server can be called, for example, by using the button in the HMS IPconfig tool.

Figure 5-9

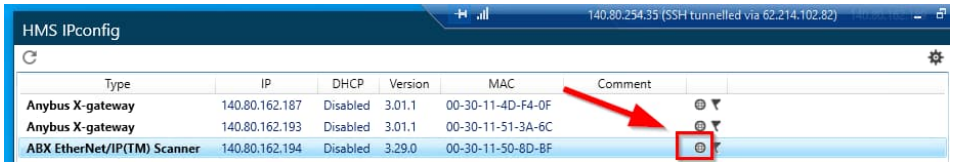
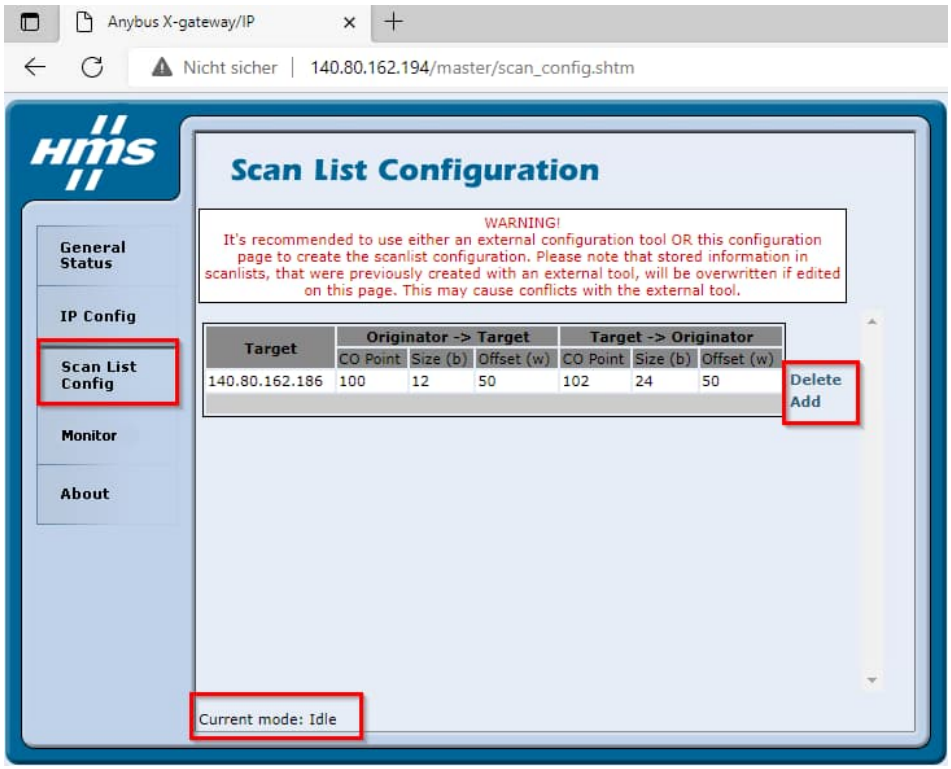


Figure 5-10



To edit the scan list, the gateway must be in idle mode. This can be controlled e.g., via the “Anybus Configuration Manager” or via the control word via PV_In3 of XGwWoIn. To use the control word, it must be activated and the XGwWoIn must be connected to the correct output area.

Figure 5-11

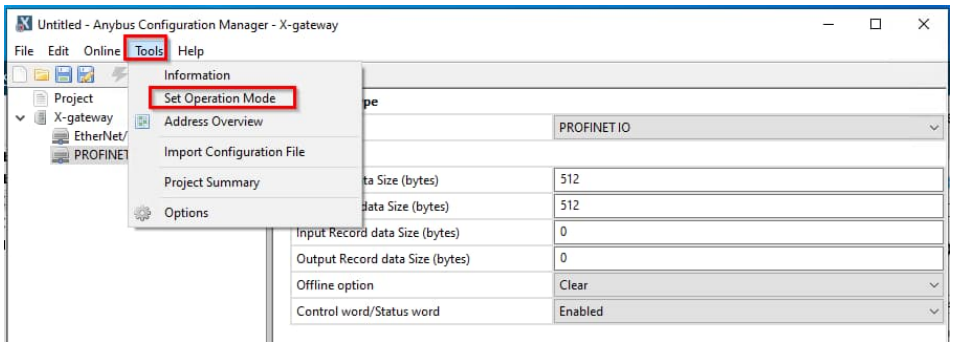
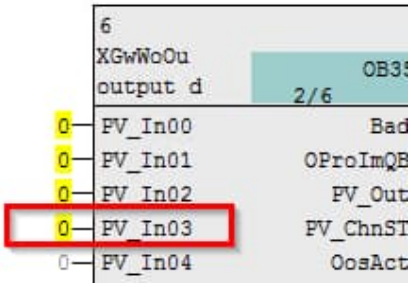
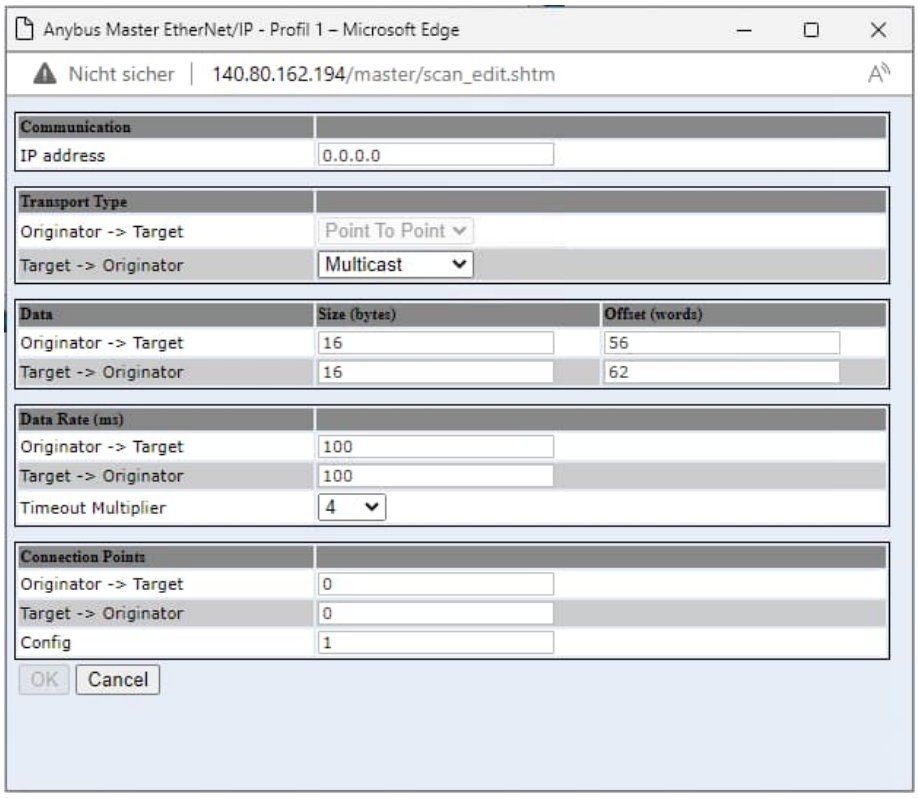


Figure 5-12



For information regarding the device specific parameters for the EtherNet/IP adapter, please contact the manufacturer of the field device (e.g., remote I/O or frequency converter).

Figure 5-13



6 SIMATIC MANAGER – Hardware configuration

6.1 GSDML-File

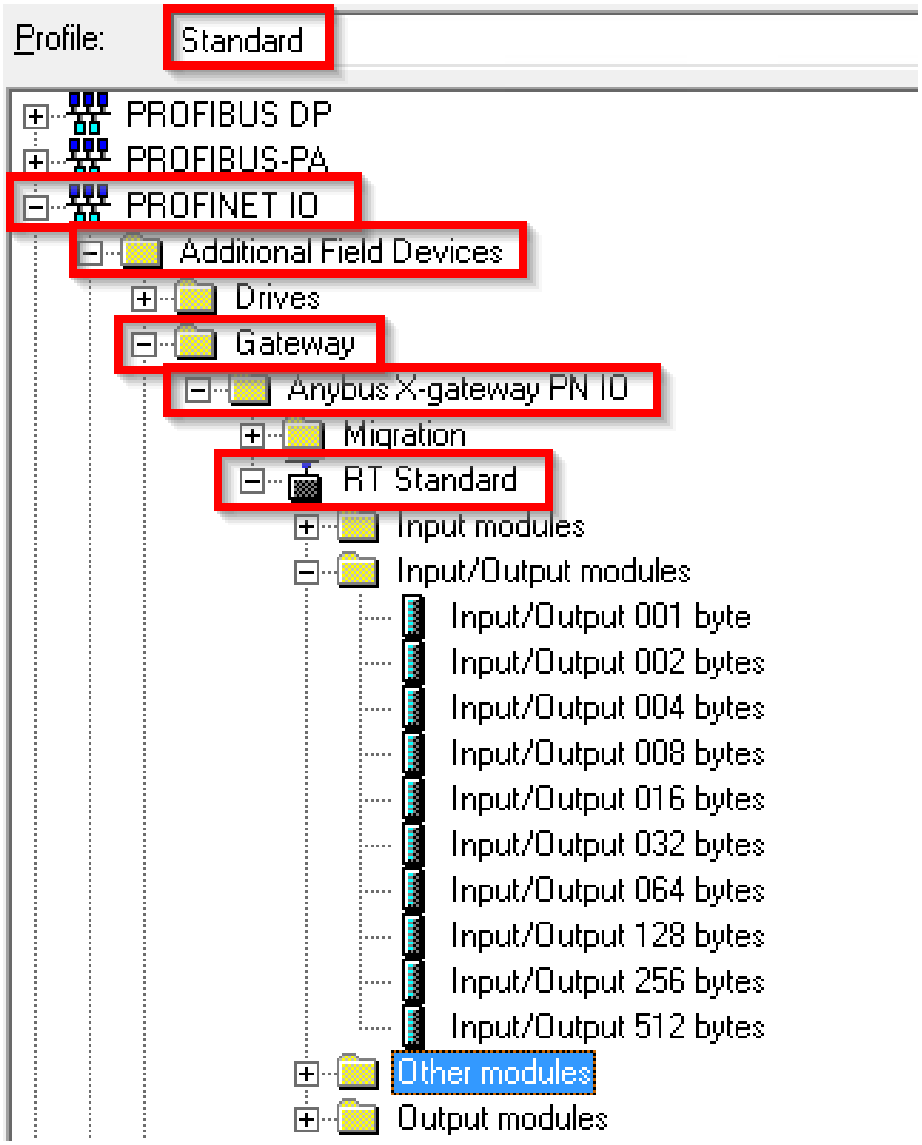
The following GSDML files is supported.
The supported file has to be installed via HW Config:

- GSDML-V2.3-HMS-ANYBUS_X_GATEWAY_PROFINET_IO-20161110.xml

The modules can be found within the HW-Catalog in the standard profile under:
PROFINET IO \ Additional Field Devices \ Gateway \ Anybus X-gateway PN IO \RT Standard\RT Standard

Please take note of the supported modules (see chapter 3.7 “Supported modules”).

Figure 6-1

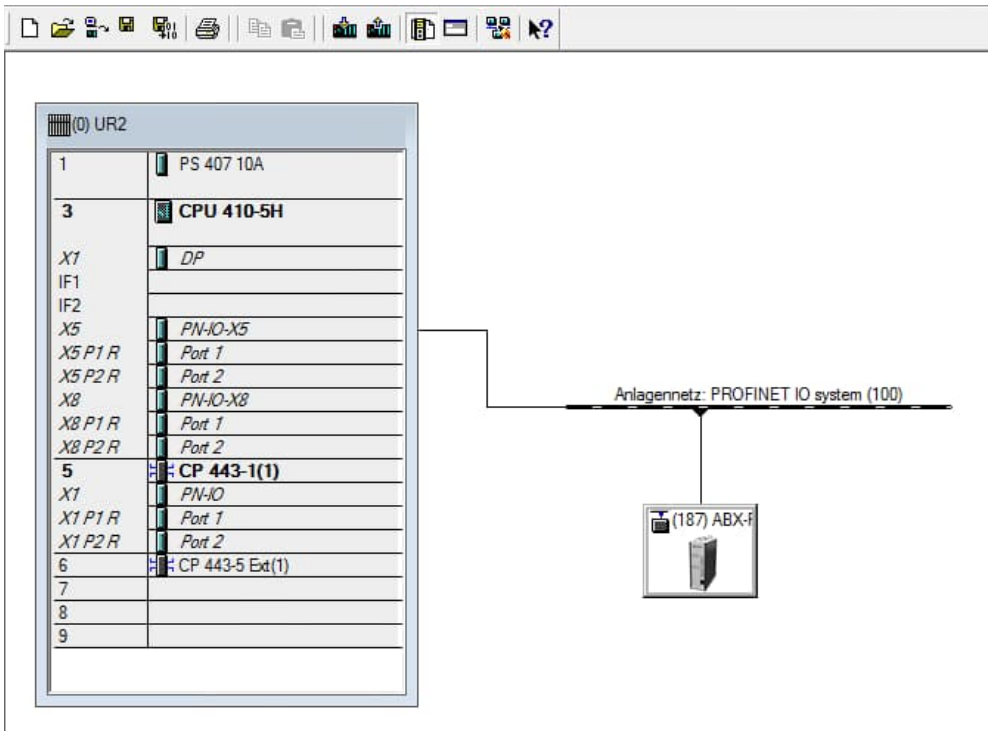


6.2 Configuration with HW Config

The devices can be installed directly to a single S7-400 CPU:

- Single S7-410 CPU (S1 redundancy):

Figure 6-2



When installing IO Modules into the HW Config, please take care that there is no address overlapping between different modules and that the first address of the input area of a module is the same as the first address of the output area of that module.

Example:

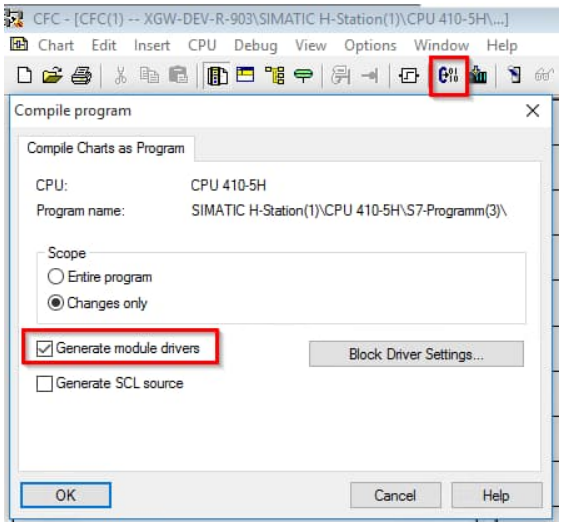
Figure 6-3

Slot	Module	Order number	I Address	Q address	Diagnostic Address
0	ABX-PRT-1	Anybus X-gateway			16350*
X1	Interface				16349*
P1	RJ45 100 MBit/s				16348*
1	Input/Output 512 bytes		704...1215	704...1215	
2					

7 Driver Wizard

The driver generator can be used as an additional option when compiling the CFC charts. This functionality is responsible, among other things, for automatic placement, configuration, and connection of diagnostic blocks.

Figure 7-1



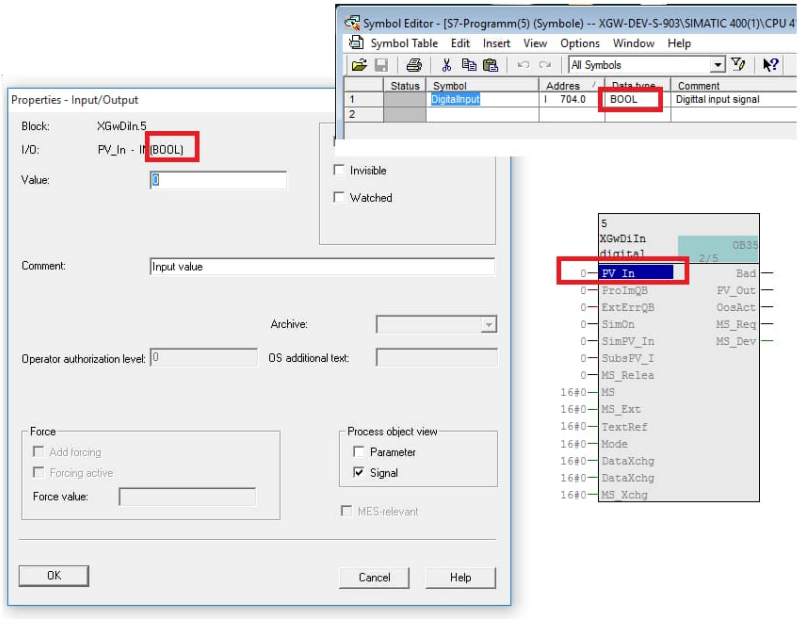
Please note that you can also configure the blocks manually.

In any case, a detailed test is recommended before operation.

To verify the result of the driver generator, please check against the block description, mode description and the settings in the hardware configuration.

If you use the driver generator, it is recommended to create a symbol for each signal in each Module. To define the signal with the correct data type it is necessary to do it in the symbol table. In the properties of the block parameter, you can see the needed symbol type for the different block types.

Figure 7-2



8 Function Blocks

8.1 Function Block XGwMod

8.1.1 Description (of FB XGwMod)

FB-Number

FB6020

Family

@System

Application

The block XGwMod monitors the virtual X-gateway. This block handles the evaluation for the different states of the virtual modules and is the communication bridge between the channel blocks and the diagnostic block (**OB_DIAG1_PN** from the APL) of the gateway.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

8.1.2 I/Os (of FB XGwMod)

Input parameters

Table 8-1

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
SUBN1_ID	ID of Primary Subnet	BYTE	16#FF
SUBN2_ID	ID of Redundant Subnet	BYTE	16#FF
LINK_ADR	Adress of Link	BYTE	16#00
PADP_ADR	Adress PA Device	BYTE	16#00
DS_act	Evaluation Data State active	BOOL	0
DS	Data State	BYTE	16#00
MS	Maintenance State	DWORD	16#00000000
MS_REQ	Maintenance Release Request	BOOL	0
EV_ID1	Event ID 1	DWORD	16#00000002
EV_ID2	Event ID 2	DWORD	16#00000003
EV_ID3	Event ID 3	DWORD	16#00000004
EN_MSG	1=Enable Alarm	BOOL	1
FEATURE	Reserve	DWORD	16#00000000
PORT_ERR	Port error	STRUCT	
PORT_ERR.PORT1_ERR	Port 1 error	BOOL	0
PORT_ERR.PORT2_ERR	Port 2 error	BOOL	0
PORT_ERR.MAINT_DEM	Maintenance demand	BOOL	0
PORT_ERR.MAINT_REQ	Maintenace request	BOOL	0

I/O (parameter)	Meaning	Data type	Default
PORT_ERR.RESRV0	Reserve	BOOL	0
PORT_ERR.RESRV1	Reserve	BOOL	0
PORT_ERR.RESRV2	Reserve	BOOL	0
PORT_ERR.RESRV3	Reserve	BOOL	0
PORT_ERR.PN_ REDUNDANCY_LEVEL	PN Redundancy level - S1=1, S2=2, R1=4, R2=8	BYTE	16#00

Output parameters

Table 8-2

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
QERR	QERR	BOOL	1=Runtime Error
QRACKF	QRACKF	BOOL	1=higher-level error
O_MS	O_MS	DWORD	Maintenance State
CH_EXIST	CH_EXIST	DWORD	Channel exist
CH_OK	CH_OK	DWORD	Channel OK
CH_ACTIVE	CH_ACTIVE	DWORD	Channel active
EXT_STAT	EXT_STAT	DWORD	Maintenance Release - Extended Status
EXT_STAT_A	EXT_STAT_A	DWORD	Extended Status - Application
OMODE_00	OMODE_00	DWORD	Mode Channel 0
DXCHG_00	DXCHG_00	DWORD	Bidirectional data exchange Channel 0
DXCHG1_00	DXCHG1_00	DWORD	Bidirectional data exchange Channel 0
MS_XCHG_00	MS_XCHG_00	DWORD	MS exchange Channel 0
EN_RST_DIAG	EN_RST_DIAG	BOOL	Reset Enable
Error	Error	BOOL	Message Error Active
Warning	Warning	BOOL	Message Warning Active
Overload	Overload	BOOL	Message Overload Warning Active
Error_Rst	Error_Rst	BOOL	Message Error Reset Active
Warning_Rst	Warning_Rst	BOOL	Message Warning Reset Active
Overload_Rst	Overload_Rst	BOOL	Message Overload Warning Reset Active
MSGSTAT1	MSGSTAT1	WORD	Message Failure1
MSGSTAT2	MSGSTAT2	WORD	Message Failure2
MSGSTAT3	MSGSTAT3	WORD	Message Failure3
MSG_ACK1	MSG_ACK1	WORD	Message Acknowledged 1
MSG_ACK2	MSG_ACK2	WORD	Message Acknowledged 2
MSG_ACK3	MSG_ACK3	WORD	Message Acknowledged 3
QMSGER3	QMSGER3	BOOL	1=Message ERROR

In/Out parameters

Table 8-3

I/O (parameter)	Meaning	Data type	Default
DIAG_RST	Reset of Diag Values	BOOL	0
RAC_DIAG		STRUCT	
RAC_DIAG.SUBN1_ID	ID of Primary Subnet	BYTE	16#00
RAC_DIAG.SUBN2_ID	ID of Redundant Subnet	BYTE	16#00
RAC_DIAG.RACK_NO	Rack Number	BYTE	16#00
RAC_DIAG.SUBN_TYP	1=External PN-Interface	BOOL	0
RAC_DIAG.SUBN1ERR	1=Slave 1 Failure	BOOL	0
RAC_DIAG.SUBN2ERR	1=Slave 2 Failure	BOOL	0
RAC_DIAG.SUBN1ACT	1=Slave 1 Active	BOOL	0
RAC_DIAG.SUBN2ACT	1=Slave 2 Active	BOOL	0
RAC_DIAG.RACK_ERR	1=Rack Error	BOOL	0
RAC_DIAG.V1_MODE	DP: 1= DPV1 - Mode ; PN: Not used	BOOL	0
CPU_DIAG		STRUCT	
CPU_DIAG.H_MODE	1= H-System	BOOL	0
CPU_DIAG.V1_MODE	DP: 1= CPU DP V1 Mode ; PN: Not used	BOOL	0
CPU_DIAG.CPU_ERR0	1=CPU Error in Rack0	BOOL	0
CPU_DIAG.CPU_ERR1	1=CPU Error in Rack1	BOOL	0
CPU_DIAG.OB1_TIME	OB1_TIME_TCK	DINT	0
CPU_DIAG.OB_S		STRUCT	
CPU_DIAG.OB_S.NUM_CNT	Counter Startinfo OB_NR	INT	0
CPU_DIAG.OB_S.NUM_01	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_02	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_03	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_04	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_05	Startinfo OB_NO	BYTE	16#00

I/O (parameter)	Meaning	Data type	Default
CPU_DIAG.OB_S.NUM_06	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_07	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_08	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_09	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_10	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_11	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_12	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_13	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_14	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_15	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_S.NUM_16	Startinfo OB_NO	BYTE	16#00
CPU_DIAG.OB_72		STRUCT	
CPU_DIAG.OB_72.TOP_SI		STRUCT	
CPU_DIAG.OB_72.TOP_SI.EV_CLASS	Event class	BYTE	16#00
CPU_DIAG.OB_72.TOP_SI.EV_NUM	Event number	BYTE	16#00
CPU_DIAG.OB_72.TOP_SI.PRIORITY	Priority	BYTE	16#00
CPU_DIAG.OB_72.TOP_SI.NUM	OB-Number	BYTE	16#00
CPU_DIAG.OB_72.TOP_SI.TYP2_3	Reserved	BYTE	16#00
CPU_DIAG.OB_72.TOP_SI.TYP1	Reserved	BYTE	16#00
CPU_DIAG.OB_72.TOP_SI.ZI1	Reserved	WORD	16#0000
CPU_DIAG.OB_72.TOP_SI.ZI2_3	Reserved	DWORD	16#00000000
CPU_DIAG.OB_70		STRUCT	
CPU_DIAG.OB_70.TOP_SI		STRUCT	
CPU_DIAG.OB_70.TOP_SI.EV_CLASS	Event class	BYTE	16#00
CPU_DIAG.OB_70.TOP_SI.EV_NUM	Event number	BYTE	16#00
CPU_DIAG.OB_70.TOP_SI.PRIORITY	Priority	BYTE	16#00
CPU_DIAG.OB_70.TOP_SI.NUM	OB-Number	BYTE	16#00
CPU_DIAG.OB_70.TOP_SI.TYP2_3	Reserved	BYTE	16#00
CPU_DIAG.OB_70.TOP_SI.TYP1	Reserved	BYTE	16#00
CPU_DIAG.OB_70.TOP_SI.ZI1	Reserved	WORD	16#0000
CPU_DIAG.OB_70.TOP_SI.ZI2_3	Reserved	DWORD	16#00000000
CPU_DIAG.OB_70.SUBNET	SUBNET ID	BYTE	16#00
CPU_DIAG.OB_70.RACK	Rack Number	BYTE	16#00
CPU_DIAG.OB_70.STATUS	Status SFB 54	DWORD	16#00000000
CPU_DIAG.OB_82		STRUCT	

I/O (parameter)	Meaning	Data type	Default
CPU_DIAG.OB_82.TOP_SI		STRUCT	
CPU_DIAG.OB_82.TOP_SI.EV_CLASS	Event class	BYTE	16#00
CPU_DIAG.OB_82.TOP_SI.EV_NUM	Event number	BYTE	16#00
CPU_DIAG.OB_82.TOP_SI.PRIORITY	Priority	BYTE	16#00
CPU_DIAG.OB_82.TOP_SI.NUM	OB-Number	BYTE	16#00
CPU_DIAG.OB_82.TOP_SI.TYP2_3	Reserved	BYTE	16#00
CPU_DIAG.OB_82.TOP_SI.TYP1	Reserved	BYTE	16#00
CPU_DIAG.OB_82.TOP_SI.ZI1	Reserved	WORD	16#0000
CPU_DIAG.OB_82.TOP_SI.ZI2_3	Reserved	DWORD	16#00000000
CPU_DIAG.OB_82.SUBNET	SUBNET ID	BYTE	16#00
CPU_DIAG.OB_82.RACK	Rack Number	BYTE	16#00
CPU_DIAG.OB_82.SL_TYP	Slave-/Profiltyp	BYTE	16#00
CPU_DIAG.OB_82.A_INF	Alarm-Info-Type	BYTE	16#00
CPU_DIAG.OB_82.ET_CR_FL	ET-CR-Flags	BYTE	16#00
CPU_DIAG.OB_82.ET_ER_FL	ET-ER-Flags	BYTE	16#00
CPU_DIAG.OB_82.PNO_ID	PROFIBUS Ident Number	WORD	16#0000
CPU_DIAG.OB_82.AINFO		STRUCT	
CPU_DIAG.OB_82.AINFO.D_LENGTH	Data Length	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_TYP	Alarm Type	BYTE	16#00
CPU_DIAG.OB_82.AINFO.SLOT	Slot Number	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_SPEC	Alarm-Specifire	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_0	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_1	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_2	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_3	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_4	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_5	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_6	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_7	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_8	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_9	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_10	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_11	Alarm Information	BYTE	16#00

I/O (parameter)	Meaning	Data type	Default
CPU_DIAG.OB_82.AINFO.A_12	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_13	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_14	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_15	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_16	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_17	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_18	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_19	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_20	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_21	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_22	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_23	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_24	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_25	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_26	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_27	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_28	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_29	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_30	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_31	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_32	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_33	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_34	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_35	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_36	Alarm Information	BYTE	16#00

I/O (parameter)	Meaning	Data type	Default
CPU_DIAG.OB_82.AINFO.A_37	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_38	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_39	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_40	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_41	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_42	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_43	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_44	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_45	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_46	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_47	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_48	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_49	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_50	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_51	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_52	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_53	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_54	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_55	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_56	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_57	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_58	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.AINFO.A_59	Alarm Information	BYTE	16#00
CPU_DIAG.OB_82.STATUS	Status SFB 54	DWORD	16#00000000
CPU_DIAG.OB_83		STRUCT	
CPU_DIAG.OB_83.TOP_SI		STRUCT	

I/O (parameter)	Meaning	Data type	Default
CPU_DIAG.OB_83.TOP_SI.EV_CLASS	Event class	BYTE	16#00
CPU_DIAG.OB_83.TOP_SI.EV_NUM	Event number	BYTE	16#00
CPU_DIAG.OB_83.TOP_SI.PRIORITY	Priority	BYTE	16#00
CPU_DIAG.OB_83.TOP_SI.NUM	OB-Number	BYTE	16#00
CPU_DIAG.OB_83.TOP_SI.TYP2_3	Reserved	BYTE	16#00
CPU_DIAG.OB_83.TOP_SI.TYP1	Reserved	BYTE	16#00
CPU_DIAG.OB_83.TOP_SI.ZI1	Reserved	WORD	16#0000
CPU_DIAG.OB_83.TOP_SI.ZI2_3	Reserved	DWORD	16#00000000
CPU_DIAG.OB_83.SUBNET	SUBNET ID	BYTE	16#00
CPU_DIAG.OB_83.RACK	Rack Number	BYTE	16#00
CPU_DIAG.OB_83.SLOT	Slot Number	BYTE	16#00
CPU_DIAG.OB_83.STATUS	Status SFB 54	DWORD	16#00000000
CPU_DIAG.OB_85		STRUCT	
CPU_DIAG.OB_85.TOP_SI		STRUCT	
CPU_DIAG.OB_85.TOP_SI.EV_CLASS	Event class	BYTE	16#00
CPU_DIAG.OB_85.TOP_SI.EV_NUM	Event number	BYTE	16#00
CPU_DIAG.OB_85.TOP_SI.PRIORITY	Priority	BYTE	16#00
CPU_DIAG.OB_85.TOP_SI.NUM	OB-Number	BYTE	16#00
CPU_DIAG.OB_85.TOP_SI.TYP2_3	Reserved	BYTE	16#00
CPU_DIAG.OB_85.TOP_SI.TYP1	Reserved	BYTE	16#00
CPU_DIAG.OB_85.TOP_SI.ZI1	Reserved	WORD	16#0000
CPU_DIAG.OB_85.TOP_SI.ZI2_3	Reserved	DWORD	16#00000000
CPU_DIAG.OB_85.SUBNET	SUBNET ID	BYTE	16#00
CPU_DIAG.OB_85.RACK	Rack Number	BYTE	16#00
CPU_DIAG.OB_85.SLOT	Slot Number	BYTE	16#00
CPU_DIAG.OB_85.STATUS	Status SFB 54	DWORD	16#00000000
CPU_DIAG.OB_86		STRUCT	
CPU_DIAG.OB_86.TOP_SI		STRUCT	
CPU_DIAG.OB_86.TOP_SI.EV_CLASS	Event class	BYTE	16#00
CPU_DIAG.OB_86.TOP_SI.EV_NUM	Event number	BYTE	16#00
CPU_DIAG.OB_86.TOP_SI.PRIORITY	Priority	BYTE	16#00
CPU_DIAG.OB_86.TOP_SI.NUM	OB-Number	BYTE	16#00
CPU_DIAG.OB_86.TOP_SI.TYP2_3	Reserved	BYTE	16#00
CPU_DIAG.OB_86.TOP_SI.TYP1	Reserved	BYTE	16#00
CPU_DIAG.OB_86.TOP_SI.ZI1	Reserved	WORD	16#0000
CPU_DIAG.OB_86.TOP_SI.ZI2_3	Reserved	DWORD	16#00000000
CPU_DIAG.OB_86.SUBNET	SUBNET ID	BYTE	16#00
CPU_DIAG.OB_86.RACK	Rack Number	BYTE	16#00
CPU_DIAG.OB_86.STATUS	Status SFB 54	DWORD	16#00000000
CPU_DIAG.OB_81		STRUCT	
CPU_DIAG.OB_81.TOP_SI		STRUCT	
CPU_DIAG.OB_81.TOP_SI.EV_CLASS	Event class	BYTE	16#00
CPU_DIAG.OB_81.TOP_SI.EV_NUM	Event number	BYTE	16#00

I/O (parameter)	Meaning	Data type	Default
CPU_DIAG.OB_81.TOP_SI.PRIORITY	Priority	BYTE	16#00
CPU_DIAG.OB_81.TOP_SI.NUM	OB-Number	BYTE	16#00
CPU_DIAG.OB_81.TOP_SI.TYP2_3	Reserved	BYTE	16#00
CPU_DIAG.OB_81.TOP_SI.TYP1	Reserved	BYTE	16#00
CPU_DIAG.OB_81.TOP_SI.ZI1	Reserved	WORD	16#0000
CPU_DIAG.OB_81.TOP_SI.ZI2_3	Reserved	DWORD	16#00000000

Additional information

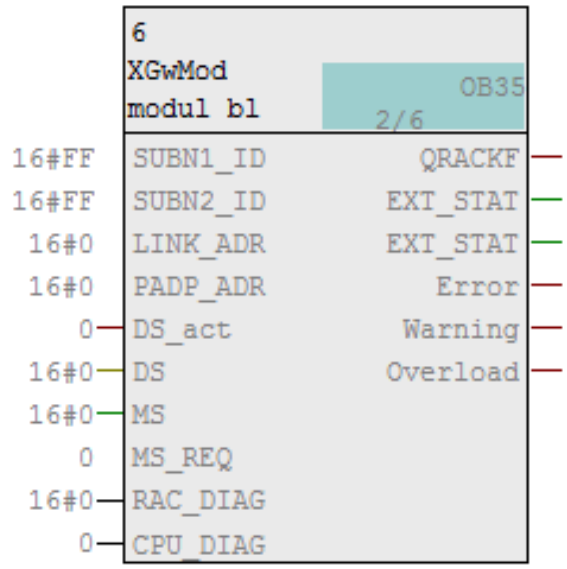
This block does not offer messaging.

8.1.3 Message texts and associated values (of FB XGwMod)

The gateway is configured with virtual modules without specific diagnostic information. The messages for the gateway are made by **OB_DIAG1_PN** from the APL. For more information, please follow the APL manual or the F1 online help of this block.

8.1.4 Block diagram (of FB XGwMod)

Figure 8-1



8.2 Function lock XGwStList

8.2.1 Description (of FB XGwStList)

FB-Number

FB6021

Family

Channel

Application

The block is used for the following applications:

- Signal processing of the statistics list of the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.

How it works

The block cyclically processes all channel-specific signal functions of statistics list.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is also installed automatically in the startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following occurs automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the input channel with the PV_In input parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Status word allocation for Status parameter

This block does not have the Status parameter.

8.2.2 Modes (of FB XGwStList)

This block does not have any modes.

8.2.3 Functions (of FB XGwStList)

The functions for this block are listed below.

Obtaining the standard value

The digital values of the process image (partition) are output at the PV_Out with the signal status 16#80.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually. The module-specific identifier is 16#42.

Holding the last value if raw value is invalid

If the block is to hold the most recent valid value when the raw value is invalid, you must activate this function at the Feature Bit. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output substitute value if raw value is invalid

If the block is to output a substitute value (SubsPV_In) when the raw value is invalid, you must activate this function at the Feature Bit “Output substitute value if raw value is invalid”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output of invalid value if raw value is invalid

If the block is to output an invalid value (PV_Out = PV_In), you must activate this function at the Feature Bit “Output invalid raw value”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

This function is pre-selected.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Signal status for PCS 7 channel blocks

The block provides the standard function “Forming and outputting the signal status for PCS 7 channel blocks”. (For more information, see chapter 10.2.3 “Signal status for PCS 7 channel blocks”.)

Simulating signals

The block provides the standard function “Simulating signals”.
(For more information, see chapter 10.2.1 “Simulating signals”.)

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

The following functionality is available for this block at the relevant bits:

Table 8-4

Bit	Function
27	Do not evaluate the first run of the diagnostic blocks *
28	Output invalid raw value *
29	Output substitute value if raw value is invalid *
30	Outputting last valid value if raw value is invalid *

8.2.4 Error handling (of FB XGwStList)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1.

Higher-level error / invalid measuring range

A higher-level error is output (output parameter ModErr = 1) if either:

- the signal status in the High Word of input parameter Mode takes the value 16#40, or
- there is an invalid measuring type in the Low Word of the input parameter Mode.

8.2.5 Messaging (of FB XGwStList)

This block does not offer messaging.

8.2.6 I/Os (of FB XGwStList)

Input parameters

Table 8-5

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PZDIn1	Input word	WORD	16#00
PZDIn2	Input word	WORD	16#00
PZDIn3	Input word	WORD	16#00
PZDIn4	Input word	WORD	16#00
ChValueAct	reserved	BYTE	16#00

I/O (parameter)	Meaning	Data type	Default
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	Reserved	BOOL	0
Feature.Bit26	Reserved	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	1 = Bad Value	BOOL	1
Feature.Bit29	1 = Substitute value	BOOL	0
Feature.Bit30	1 = Hold last value	BOOL	0
Feature.Bit31	Reserved	BOOL	0
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimConfCon	Simulation value No. of configured connections	STRUCT	
SimConfCon.Value	Value	REAL	0.0
SimConfCon.ST	Signal Status	BYTE	16#80
SimActCon	Simulation value No. of active connections	STRUCT	

I/O (parameter)	Meaning	Data type	Default
SimActCon.Value	Value	REAL	0.0
SimActCon.ST	Signal Status	BYTE	16#80
SimFaultCon	Simulation value No. of faulted connections	STRUCT	
SimFaultCon.Value	Value	REAL	0.0
SimFaultCon.ST	Signal Status	BYTE	16#80
SubsPV_In	Substitution value	BOOL	0
SelQB	1=Select Qualitybit from Processimage	BOOL	1
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	Flutter suppress time	INT	0

Output parameters

Table 8-6

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
ConfCon	No. of configured connections	STRUCT	
ConfCon.Value	Value	REAL	0.0
ConfCon.ST	Signal Status	BYTE	16#80
ActCon	No. of active connections	STRUCT	
ActCon.Value	Value	REAL	0.0
ActCon.ST	Signal Status	BYTE	16#80
FaultCon	No. of faulted connections	STRUCT	
FaultCon.Value	Value	REAL	0.0
FaultCon.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1

I/O (parameter)	Meaning	Data type	Default
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

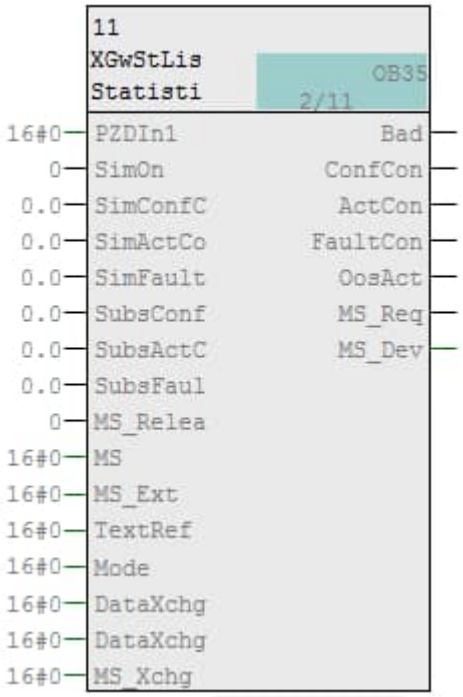
In/Out parameters

Table 8-7

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.2.7 Block diagram (of FB XGwStList)

Figure 8-2



8.3 Function Block XGwDiIn

8.3.1 Description (of FB XGwDiIn)

FB-Number

FB6005

Family

Channel

Application

The block is used for the following applications:

- Signal processing of a digital input value from an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.

How it works

The block cyclically processes all channel-specific signal functions of a digital input signal.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is also installed automatically in the startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following occurs automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the input channel with the PV_In input parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Status word allocation for Status parameter

This block does not have the Status parameter.

8.3.2 Modes (of FB XGwDiIn)

This block does not have any modes.

8.3.3 Functions (of FB XGwDiIn)

The functions for this block are listed below.

Obtaining the standard value

The digital values of the process image (partition) are output at the PV_Out with the signal status 16#80.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually. The module-specific identifier is 16#42.

Holding the last value if raw value is invalid

If the block is to hold the most recent valid value when the raw value is invalid, you must activate this function at the Feature Bit. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output substitute value if raw value is invalid

If the block is to output a substitute value (SubsPV_In) when the raw value is invalid, you must activate this function at the Feature Bit “Output substitute value if raw value is invalid”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output of invalid value if raw value is invalid

If the block is to output an invalid value (PV_Out = PV_In), you must activate this function at the Feature Bit “Output invalid raw value”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

This function is pre-selected.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Signal status for PCS 7 channel blocks

The block provides the standard function “Forming and outputting the signal status for PCS 7 channel blocks”. (For more information, see chapter 10.2.3 “Signal status for PCS 7 channel blocks”.)

Simulating signals

The block provides the standard function “Simulating signals”.
(For more information, see chapter 10.2.1 “Simulating signals”.)

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

The following functionality is available for this block at the relevant bits:

Table 8-8

Bit	Function
27	Do not evaluate the first run of the diagnostic blocks *
28	Output invalid raw value *
29	Output substitute value if raw value is invalid *
30	Outputting last valid value if raw value is invalid *

8.3.4 Error handling (of FB XGwDiIn)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The Status information Bit from ProImQB is only processed if SelQB is set to TRUE. A FALSE at ProImQB or a user defined error at ExtErrQb causes a Bad signal. The evaluation of the parameters ProImQB and ExtErrQb can be activated or deactivated by SelQB.

Higher-level error / invalid measuring range

A higher-level error is output (output parameter ModErr = 1) if either:

- the signal status in the High Word of input parameter Mode takes the value 16#40, or
- there is an invalid measuring type in the Low Word of the input parameter Mode.

8.3.5 Messaging (of FB XGwDiIn)

This block does not offer messaging.

8.3.6 I/Os (of FB XGwDiIn)

Input parameters

Table 8-9

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In	Input value	BOOL	0
ProImQB	Qualitybit from Process image	BOOL	0
ExtErrQB	external error	BOOL	0
ChValueAct	reserved	BYTE	16#00
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	Reserved	BOOL	0
Feature.Bit26	Reserved	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	1 = Bad Value	BOOL	1
Feature.Bit29	1 = Substitute value	BOOL	0
Feature.Bit30	1 = Hold last value	BOOL	0
Feature.Bit31	Reserved	BOOL	0

I/O (parameter)	Meaning	Data type	Default
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	
SimPV_In.Value	Value	BOOL	0
SimPV_In.ST	Signal Status	BYTE	16#80
SubsPV_In	Substitution value	BOOL	0
SelQB	1=Select Qualitybit from Processimage	BOOL	1
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	Flutter suppress time	INT	0

Output parameters

Table 8-10

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
PV_Out	Process value incl. ST	STRUCT	
PV_Out.Value	Value	BOOL	0
PV_Out.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0

I/O (parameter)	Meaning	Data type	Default
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

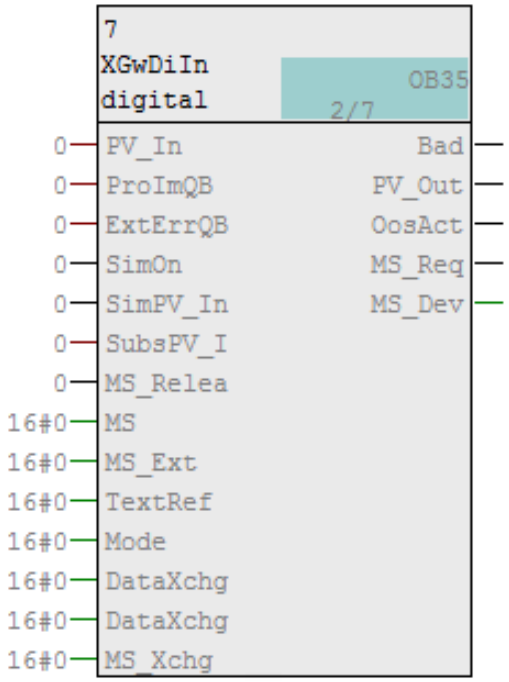
In/Out parameters

Table 8-11

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.3.7 Block diagram (of FB XGwDiIn)

Figure 8-3



8.4 Function Block XGwDiOu

8.4.1 Description (of FB XGwDiOu)

FB-Number

FB6006

Family

Channel

Application

The block is used for the following applications:

- Signal processing of a digital output value to an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.

How it works

The cyclic block processes all channel-specific signal functions of a digital output module.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is installed automatically in startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following operations occur automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the output channel with the PV_Out output parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Status word allocation for Status parameter

This block does not have a Status parameter.

8.4.2 Modes (of FB XGwDiOu)

The block does not have any operating modes.

8.4.3 Functions (of FB XGwDiOu)

The functions for this block are listed below.

Forming a peripheral value

The digital value is written to the process image (partition). The signal status of the process value (PV_ChnST) is set to "good" (16#80).

Simulating signals

The block provides the standard function “Simulating signals”. (For more information, see chapter 10.2.1 “Simulating signals”.)

Keep last valid raw value

The block provides the standard function “Keep last valid raw value if input value is bad”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

If Feature.Bit31 is active and the input PV_In has bad quality (16#00 or 16#28) the output PV_Out keep their value and will not be updated.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)
The following functionality is available for this block at the relevant bits:

Table 8-12

Bit	Function
27	Do not evaluate the first run of the diagnostic blocks *
30	Outputting last valid value if raw value is invalid *
31	Keep last valid raw value if input value is bad *

8.4.4 Error handling (of FB XGwDiOu)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The quality information OProImQb is taken from the inverted Bad.Value. An ExtErrQb causes a Bad.Value and a FALSE at OProImQb.

Higher-level error / invalid measuring range

A higher-level error is displayed via output parameter ModErr = 1, if either

- the signal status in the High Word of input parameter Mode takes the value 16#40,
- or there is an invalid measuring type in the Low Word of the input parameter Mode.

8.4.5 Messaging (of FB XGwDiOu)

This block does not offer messaging.

8.4.6 I/Os (of FB XGwDiOu)

Input parameters

Table 8-13

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In	Process value incl. ST	STRUCT	
PV_In.Value	Value	BOOL	0
PV_In.ST	Signal Status	BYTE	16#80
ExtErrQB	external error	BOOL	0
Feature	Status of various features	STRUCT	
Feature.Bit0	1 = Start Value	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0

I/O (parameter)	Meaning	Data type	Default
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	Reserved	BOOL	0
Feature.Bit26	Reserved	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	Reserved	BOOL	0
Feature.Bit29	Reserved	BOOL	0
Feature.Bit30	1 = Output de-energize value at a block-external simulation	BOOL	1
Feature.Bit31	1 = Keep last valid raw value if input value is bad	BOOL	0
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	
SimPV_In.Value	Value	BOOL	0
SimPV_In.ST	Signal Status	BYTE	16#80
StartVal	Start value	BOOL	0
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	flutter suppress time	INT	0

Output parameters

Table 8-14

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
OProImQB	Qualitybit to Process image	BOOL	0
PV_Out	Output value	BOOL	0
PV_ChnST	State of output value	STRUCT	
PV_ChnST.Value	Value	BOOL	0
PV_ChnST.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

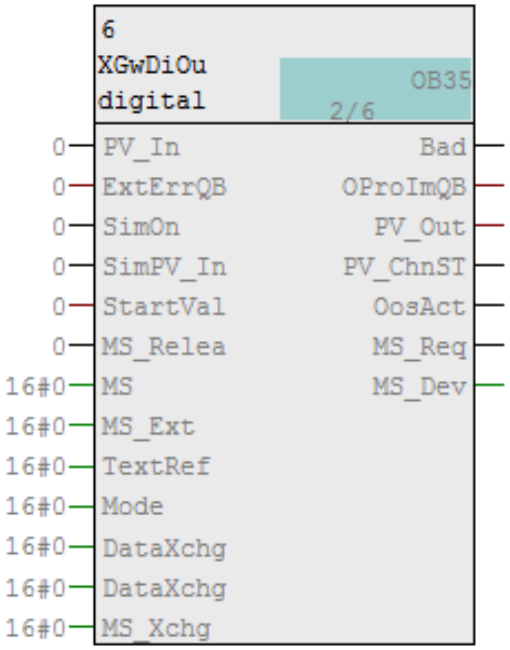
In/Out parameters

Table 8-15

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and Mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.4.7 Block diagram (of FB XGwDiOu)

Figure 8-4



8.5 Function Block XGwWoIn

8.5.1 Description (of FB XGwWoIn)

FB-Number

FB6011

Family

Channel

Application

The block is used for the following applications:

- Signal processing of an input value word (e.g., status word) from an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.
- Signal processing of the status word of the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.

How it works

The block cyclically processes all channel-specific signal functions of a digital input word signal. The 16 bits of the input parameter PV_In are separated to the 16 output parameter PV_Out00 .. PV_Out15.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is also installed automatically in the startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following occurs automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the input channel with the PV_In input parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Status word allocation for Status parameter

This block does not have the Status parameter.

8.5.2 Modes (of FB XGwWoIn)

This block does not have any modes.

8.5.3 Functions (of FB XGwWoIn)

The functions for this block are listed below.

Bit swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the bit alignment can be adjusted with Feature.Bit 25.

Byte swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the byte alignment can be adjusted with Feature.Bit 26.

Obtaining the standard value

The digital values of the process image (partition) are output at the PV_Out with the signal status 16#80.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually. The module-specific identifier is 16#42.

Holding the last value if raw value is invalid

If the block is to hold the most recent valid value when the raw value is invalid, you must activate this function at the Feature Bit. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output substitute value if raw value is invalid

If the block is to output a substitute value (SubsPV_In) when the raw value is invalid, you must activate this function at the Feature Bit “Output substitute value if raw value is invalid”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output of invalid value if raw value is invalid

If the block is to output an invalid value (PV_Out = PV_In), you must activate this function at the Feature Bit “Output invalid raw value”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

This function is pre-selected.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Signal status for PCS 7 channel blocks

The block provides the standard function “Forming and outputting the signal status for PCS 7 channel blocks”. (For more information, see chapter 10.2.3 “Signal status for PCS 7 channel blocks”.)

Simulating signals

The block provides the standard function “Simulating signals”.
(For more information, see chapter 10.2.1 “Simulating signals”.)

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

The following functionality is available for this block at the relevant bits:

Table 8-16

Bit	Function
25	Bit swap on
26	Byte swap on
27	Do not evaluate the first run of the diagnostic blocks *
28	Output invalid raw value *
29	Output substitute value if raw value is invalid *
30	Outputting last valid value if raw value is invalid *

8.5.4 Error handling (of FB XGwWoIn)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The Status information Bit from ProImQB is only processed if SelQB is set to TRUE. A FALSE at ProImQB or a user defined error at ExtErrQb causes a Bad signal. The

evaluation of the parameters ProImQB and ExtErrQb can be activated or deactivated by SelQB.

Higher-level error / invalid measuring range

A higher-level error is output (output parameter ModErr = 1) if either:

- the signal status in the High Word of input parameter Mode takes the value 16#40, or
- there is an invalid measuring type in the Low Word of the input parameter Mode.

8.5.5 Messaging (of FB XGwWoIn)

This block does not offer messaging.

8.5.6 I/Os (of FB XGwWoIn)

Input parameters

Table 8-17

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In	Input word	WORD	16#0000
ProImQB	Qualitybit from Process image	BOOL	0
ExtErrQB	external error	BOOL	0
ChValueAct	reserved	BYTE	16#00
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0

I/O (parameter)	Meaning	Data type	Default
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	1 = Bit Swap on	BOOL	0
Feature.Bit26	1 = Byte Swap on	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	1 = Bad Value	BOOL	1
Feature.Bit29	1 = Substitute value	BOOL	0
Feature.Bit30	1 = Hold last value	BOOL	0
Feature.Bit31	Reserved	BOOL	0
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	
SimPV_In.Value00	Bit 00	BOOL	0
SimPV_In.Value01	Bit 01	BOOL	0
SimPV_In.Value02	Bit 02	BOOL	0
SimPV_In.Value03	Bit 03	BOOL	0
SimPV_In.Value04	Bit 04	BOOL	0
SimPV_In.Value05	Bit 05	BOOL	0
SimPV_In.Value06	Bit 06	BOOL	0
SimPV_In.Value07	Bit 07	BOOL	0
SimPV_In.Value08	Bit 08	BOOL	0
SimPV_In.Value09	Bit 09	BOOL	0
SimPV_In.Value10	Bit 10	BOOL	0
SimPV_In.Value11	Bit 11	BOOL	0
SimPV_In.Value12	Bit 12	BOOL	0
SimPV_In.Value13	Bit 13	BOOL	0
SimPV_In.Value14	Bit 14	BOOL	0
SimPV_In.Value15	Bit 15	BOOL	0
SimPV_In.ST	Signal Status	BYTE	16#00
SubsPV_In	Substitution value	STRUCT	
SubsPV_In.Value00	Bit 00	BOOL	0
SubsPV_In.Value01	Bit 01	BOOL	0
SubsPV_In.Value02	Bit 02	BOOL	0
SubsPV_In.Value03	Bit 03	BOOL	0
SubsPV_In.Value04	Bit 04	BOOL	0
SubsPV_In.Value05	Bit 05	BOOL	0
SubsPV_In.Value06	Bit 06	BOOL	0
SubsPV_In.Value07	Bit 07	BOOL	0

I/O (parameter)	Meaning	Data type	Default
SubsPV_In.Value08	Bit 08	BOOL	0
SubsPV_In.Value09	Bit 09	BOOL	0
SubsPV_In.Value10	Bit 10	BOOL	0
SubsPV_In.Value11	Bit 11	BOOL	0
SubsPV_In.Value12	Bit 12	BOOL	0
SubsPV_In.Value13	Bit 13	BOOL	0
SubsPV_In.Value14	Bit 14	BOOL	0
SubsPV_In.Value15	Bit 15	BOOL	0
SubsPV_In.ST	Signal Status	BYTE	16#00
SelQB	1=Select Qualitybit from Processimage	BOOL	1
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	Flutter suppress time	INT	0

Output parameters

Table 8-18

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
PV_Out00	Process value incl. ST	STRUCT	
PV_Out00.Value	Value	BOOL	0
PV_Out00.ST	Signal Status	BYTE	16#80
PV_Out01	Process value incl. ST	STRUCT	
PV_Out01.Value	Value	BOOL	0
PV_Out01.ST	Signal Status	BYTE	16#80
PV_Out02	Process value incl. ST	STRUCT	
PV_Out02.Value	Value	BOOL	0
PV_Out02.ST	Signal Status	BYTE	16#80
PV_Out03	Process value incl. ST	STRUCT	
PV_Out03.Value	Value	BOOL	0
PV_Out03.ST	Signal Status	BYTE	16#80
PV_Out04	Process value incl. ST	STRUCT	
PV_Out04.Value	Value	BOOL	0

I/O (parameter)	Meaning	Data type	Default
PV_Out04.ST	Signal Status	BYTE	16#80
PV_Out05	Process value incl. ST	STRUCT	
PV_Out05.Value	Value	BOOL	0
PV_Out05.ST	Signal Status	BYTE	16#80
PV_Out06	Process value incl. ST	STRUCT	
PV_Out06.Value	Value	BOOL	0
PV_Out06.ST	Signal Status	BYTE	16#80
PV_Out07	Process value incl. ST	STRUCT	
PV_Out07.Value	Value	BOOL	0
PV_Out07.ST	Signal Status	BYTE	16#80
PV_Out08	Process value incl. ST	STRUCT	
PV_Out08.Value	Value	BOOL	0
PV_Out08.ST	Signal Status	BYTE	16#80
PV_Out09	Process value incl. ST	STRUCT	
PV_Out09.Value	Value	BOOL	0
PV_Out09.ST	Signal Status	BYTE	16#80
PV_Out10	Process value incl. ST	STRUCT	
PV_Out10.Value	Value	BOOL	0
PV_Out10.ST	Signal Status	BYTE	16#80
PV_Out11	Process value incl. ST	STRUCT	
PV_Out11.Value	Value	BOOL	0
PV_Out11.ST	Signal Status	BYTE	16#80
PV_Out12	Process value incl. ST	STRUCT	
PV_Out12.Value	Value	BOOL	0
PV_Out12.ST	Signal Status	BYTE	16#80
PV_Out13	Process value incl. ST	STRUCT	
PV_Out13.Value	Value	BOOL	0
PV_Out13.ST	Signal Status	BYTE	16#80
PV_Out14	Process value incl. ST	STRUCT	
PV_Out14.Value	Value	BOOL	0
PV_Out14.ST	Signal Status	BYTE	16#80
PV_Out15	Process value incl. ST	STRUCT	
PV_Out15.Value	Value	BOOL	0
PV_Out15.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	

I/O (parameter)	Meaning	Data type	Default
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

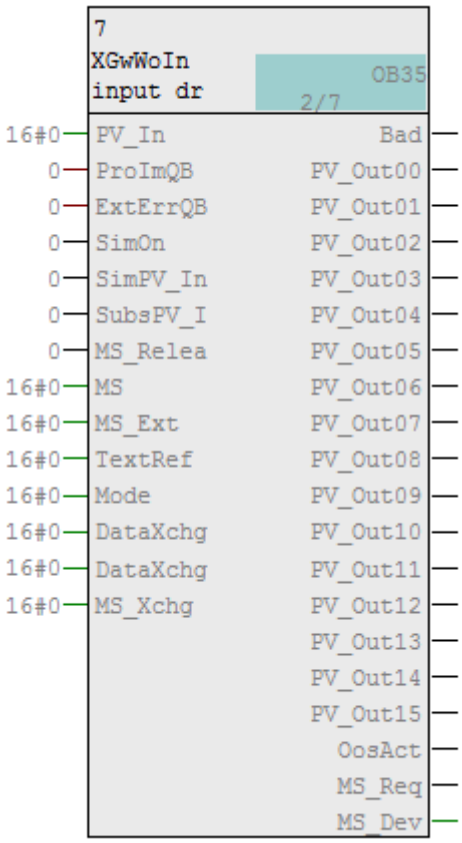
In/Out parameters

Table 8-19

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.5.7 Block diagram (of FB XGwWoIn)

Figure 8-5



8.6 Function Block XGwWoOu

8.6.1 Description (of FB XGwWoOu)

FB-Number

FB6006

Family

Channel

Application

The block is used for the following applications:

- Signal processing of an output value word to an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.
- Signal processing of the control word of the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.

How it works

The cyclic block processes all channel-specific signal functions of a digital output word signal.

The 16 input parameter PV_In00 .. PV_In15 are combined to the output parameter PV_Out.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is installed automatically in startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following operations occur automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the output channel with the PV_Out output parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Status word allocation for Status parameter

This block does not have a Status parameter.

8.6.2 Modes (of FB XGwWoOu)

The block does not have any operating modes.

8.6.3 Functions (of FB XGwWoOu)

The functions for this block are listed below.

Bit swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the bit alignment can be adjusted with Feature.Bit 25.

Byte swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the byte alignment can be adjusted with Feature.Bit 26.

Forming a peripheral value

The digital value is written to the process image (partition). The signal status of the process value (PV_ChnST) is set to "good" (16#80).

Simulating signals

The block provides the standard function “Simulating signals”. (For more information, see chapter 10.2.1 “Simulating signals”.)

Keep last valid raw value

The block provides the standard function “Keep last valid raw value if input value is bad”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

If Feature.Bit31 is active and the input PV_In has bad quality (16#00 or 16#28) the output PV_Out keep their value and will not be updated.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)
The following functionality is available for this block at the relevant bits:

Table 8-20

Bit	Function
25	Bit swap on
26	Byte swap on
27	Do not evaluate the first run of the diagnostic blocks *
30	Outputting last valid value if raw value is invalid *
31	Keep last valid raw value if input value is bad *

8.6.4 Error handling (of FB XGwWoOu)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The quality information OProImQb is taken from the inverted Bad.Value. An ExtErrQb causes a Bad.Value and a FALSE at OProImQb.

Higher-level error / invalid measuring range

A higher-level error is displayed via output parameter ModErr = 1, if either

- the signal status in the High Word of input parameter Mode takes the value 16#40,
- or there is an invalid measuring type in the Low Word of the input parameter Mode.

8.6.5 Messaging (of FB XGwWoOu)

This block does not offer messaging.

8.6.6 I/Os (of FB XGwWoOu)

Input parameters

Table 8-21

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In00	Process value incl. ST	STRUCT	
PV_In00.Value	Value	BOOL	0
PV_In00.ST	Signal Status	BYTE	16#80
PV_In01	Process value incl. ST	STRUCT	

I/O (parameter)	Meaning	Data type	Default
PV_In01.Value	Value	BOOL	0
PV_In01.ST	Signal Status	BYTE	16#80
PV_In02	Process value incl. ST	STRUCT	
PV_In02.Value	Value	BOOL	0
PV_In02.ST	Signal Status	BYTE	16#80
PV_In03	Process value incl. ST	STRUCT	
PV_In03.Value	Value	BOOL	0
PV_In03.ST	Signal Status	BYTE	16#80
PV_In04	Process value incl. ST	STRUCT	
PV_In04.Value	Value	BOOL	0
PV_In04.ST	Signal Status	BYTE	16#80
PV_In05	Process value incl. ST	STRUCT	
PV_In05.Value	Value	BOOL	0
PV_In05.ST	Signal Status	BYTE	16#80
PV_In06	Process value incl. ST	STRUCT	
PV_In06.Value	Value	BOOL	0
PV_In06.ST	Signal Status	BYTE	16#80
PV_In07	Process value incl. ST	STRUCT	
PV_In07.Value	Value	BOOL	0
PV_In07.ST	Signal Status	BYTE	16#80
PV_In08	Process value incl. ST	STRUCT	
PV_In08.Value	Value	BOOL	0
PV_In08.ST	Signal Status	BYTE	16#80
PV_In09	Process value incl. ST	STRUCT	
PV_In09.Value	Value	BOOL	0
PV_In09.ST	Signal Status	BYTE	16#80
PV_In10	Process value incl. ST	STRUCT	
PV_In10.Value	Value	BOOL	0
PV_In10.ST	Signal Status	BYTE	16#80
PV_In11	Process value incl. ST	STRUCT	
PV_In11.Value	Value	BOOL	0
PV_In11.ST	Signal Status	BYTE	16#80
PV_In12	Process value incl. ST	STRUCT	
PV_In12.Value	Value	BOOL	0
PV_In12.ST	Signal Status	BYTE	16#80
PV_In13	Process value incl. ST	STRUCT	
PV_In13.Value	Value	BOOL	0
PV_In13.ST	Signal Status	BYTE	16#80
PV_In14	Process value incl. ST	STRUCT	
PV_In14.Value	Value	BOOL	0
PV_In14.ST	Signal Status	BYTE	16#80
PV_In15	Process value incl. ST	STRUCT	
PV_In15.Value	Value	BOOL	0

I/O (parameter)	Meaning	Data type	Default
PV_In15.ST	Signal Status	BYTE	16#80
ExtErrQB	external error	BOOL	0
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	1 = Bit Swap on	BOOL	0
Feature.Bit26	1 = Byte Swap on	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	Reserved	BOOL	0
Feature.Bit29	Reserved	BOOL	0
Feature.Bit30	1 = Output de-energize value at a block-external simulation	BOOL	1
Feature.Bit31	1 = Keep last valid raw value if input value is bad	BOOL	0
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	
SimPV_In.Value00	Bit 00	BOOL	0

I/O (parameter)	Meaning	Data type	Default
SimPV_In.Value01	Bit 01	BOOL	0
SimPV_In.Value02	Bit 02	BOOL	0
SimPV_In.Value03	Bit 03	BOOL	0
SimPV_In.Value04	Bit 04	BOOL	0
SimPV_In.Value05	Bit 05	BOOL	0
SimPV_In.Value06	Bit 06	BOOL	0
SimPV_In.Value07	Bit 07	BOOL	0
SimPV_In.Value08	Bit 08	BOOL	0
SimPV_In.Value09	Bit 09	BOOL	0
SimPV_In.Value10	Bit 10	BOOL	0
SimPV_In.Value11	Bit 11	BOOL	0
SimPV_In.Value12	Bit 12	BOOL	0
SimPV_In.Value13	Bit 13	BOOL	0
SimPV_In.Value14	Bit 14	BOOL	0
SimPV_In.Value15	Bit 15	BOOL	0
SimPV_In.ST	Signal Status	BYTE	16#00
StartVal	Start value	BOOL	0
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	flutter suppress time	INT	0

Output parameters

Table 8-22

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
OProImQB	Qualitybit to Process image	BOOL	0
PV_Out	Output value	WORD	16#0000
PV_ChnST	State of output value	STRUCT	
PV_ChnST.Value	Value	WORD	16#0000
PV_ChnST.ST	Signal Status	BYTE	16#00
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80

I/O (parameter)	Meaning	Data type	Default
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

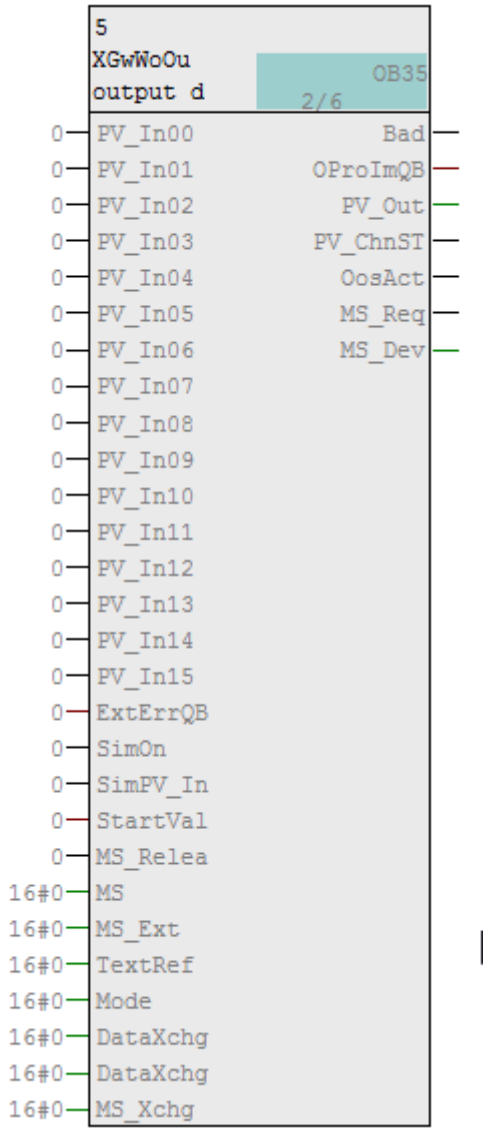
In/Out parameters

Table 8-23

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and Mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.6.7 Block diagram (of FB XGwWoOu)

Figure 8-6



8.7 Function Block XGwRAnIn

8.7.1 Description (of FB XGwRAnIn)

FB-Number

FB6008

Family

Channel

Application

The block is used for the following applications:

- Signal processing of an analog real input value in from an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.

How it works

The block cyclically processes all channel-specific signal functions of an analog input module.

It reads a raw analog value from the process image (partition) and converts it to its physical value or calculates a percentage value based on this raw value. Use the status at input parameter Mode to define the format of the raw value and how it is processed.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is also installed automatically in the startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following occurs automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the input channel with the PV_In input parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Startup characteristics

The accept value delay is started when CountLim ≠ 0.

Quality code (for modules ending with “QI”)

The quality code is read from the process image and has two states: “Good” or “Bad”.

Status word allocation for Status parameter

This block does not have the Status parameter.

8.7.2 Modes (of FB XGwAnIn)

This block does not have any modes.

8.7.3 Functions (of FB XGwRAnIn)

The functions for this block are listed below.

Bit swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the bit alignment can be adjusted with Feature.Bit 25.

Byte swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the byte alignment can be adjusted with Feature.Bit 26.

Forming a peripheral value

The digital value is written to the process image (partition). The signal status of the process value (PV_ChnST) is set to "good" (16#80).

Simulating signals

The block provides the standard function “Simulating signals”. (For more information, see chapter 10.2.1 “Simulating signals”.)

Keep last valid raw value

The block provides the standard function “Keep last valid raw value if input value is bad”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

If Feature.Bit31 is active and the input PV_In has bad quality (16#00 or 16#28) the output PV_Out keep their value and will not be updated.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)
The following functionality is available for this block at the relevant bits:

Table 8-24

Bit	Function
25	Bit swap on
26	Byte swap on
27	Do not evaluate the first run of the diagnostic blocks *
28	Outputting as substitute value if raw value is invalid *
29	Outputting last valid value if raw value is invalid *
30	Keep last valid raw value if input value is bad *

8.7.4 Error handling (of FB XGwRAnIn)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The Status information Bit from ProImQB is only processed if SelQB is set to TRUE. A FALSE at ProImQB or a user defined error at ExtErrQb causes a Bad signal. The evaluation of the parameters ProImQB and ExtErrQb can be activated or deactivated by SelQB.

Higher-level error / invalid measuring range

A higher-level error is output (output parameter ModErr = 1) if either:

- the signal status in the High Word of input parameter Mode takes the value 16#40, or
- there is an invalid measuring type in the Low Word of the input parameter Mode.

8.7.5 Messaging (of FB XGwRAnIn)

This block does not offer messaging.

8.7.6 I/Os (of FB XGwRAnIn)

Input parameters

Table 8-25

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In	Input value	REAL	0.0
ProImQB	Qualitybit from Process image	BOOL	0
ExtErrQB	external error	BOOL	0
ChValueAct	reserved	BYTE	16#00
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	1 = Bit Swap on	BOOL	0
Feature.Bit26	1 = Byte Swap on	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	1 = Bad Value	BOOL	1
Feature.Bit29	1 = Substitute value	BOOL	0
Feature.Bit30	1 = Hold last value	BOOL	0
Feature.Bit31	Reserved	BOOL	0

I/O (parameter)	Meaning	Data type	Default
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	
SimPV_In.Value	Value	REAL	0.0
SimPV_In.ST	Signal Status	BYTE	16#80
SubsPV_In	Substitution value	REAL	0.0
SelQB	1=Select Qualitybit from Process image	BOOL	1
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	Flutter suppress time	INT	0

Output parameters

Table 8-26

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
PV_Out	Process value incl. ST	STRUCT	
PV_Out.Value	Value	REAL	0.0
PV_Out.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80

I/O (parameter)	Meaning	Data type	Default
MS_Dev	Maintenance State	DWORD	16#00000000

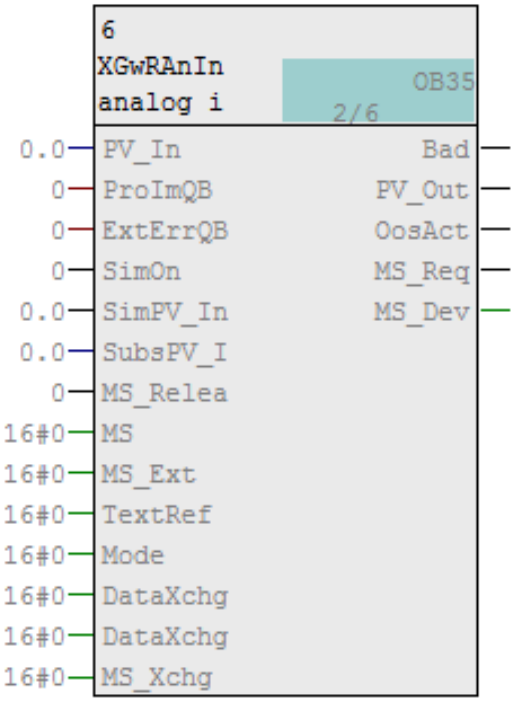
In/Out parameters

Table 8-27

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.7.7 Block diagram (of FB XGwRAnIn)

Figure 8-7



8.8 Function Block XGwRAnOu

8.8.1 Description (of FB XGwRAnOu)

FB-Number

FB6013

Family

Channel

Application

The block is used for the following applications:

- Signal processing of an analog real output value in to an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.

How it works

The block outputs the process value as analog raw value for a process image (partition). Use the Mode in/out parameter to define how the raw value is to be obtained.

The current raw value is always output to the process image (partition).

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is also installed automatically in the startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following occurs automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the input channel with the PV_Out output parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Startup characteristics

Use the Feature Bit Set startup characteristics to define the startup characteristics of this block. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Status word allocation for Status parameter

This block does not have the Status parameter.

8.8.2 Modes (of FB XGwRAnOu)

This block does not have any modes.

8.8.3 Functions (of FB XGwRAnOu)

The functions for this block are listed below.

Bit swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the bit alignment can be adjusted with Feature.Bit 25.

Byte swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the byte alignment can be adjusted with Feature.Bit 26.

Forming a peripheral value

The digital value is written to the process image (partition). The signal status of the process value (PV_ChnST) is set to "good" (16#80).

Simulating signals

The block provides the standard function “Simulating signals”. (For more information, see chapter 10.2.1 “Simulating signals”.)

Keep last valid raw value

The block provides the standard function “Keep last valid raw value if input value is bad”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

If Feature.Bit31 is active and the input PV_In has bad quality (16#00 or 16#28) the output PV_Out keep their value and will not be updated.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)
The following functionality is available for this block at the relevant bits:

Table 8-28

Bit	Function
25	Bit swap on
26	Byte swap on
27	Do not evaluate the first run of the diagnostic blocks *
30	Outputting last valid value if raw value is invalid *
31	Keep last valid raw value if input value is bad *

8.8.4 Error handling (of FB XGwRAnOu)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The quality information OProImQb is taken from the inverted Bad.Value. An ExtErrQb causes a Bad.Value and a FALSE at OProImQb.

Higher-level error / invalid measuring range

A higher-level error is displayed via output parameter ModErr = 1, if either

- the signal status in the High Word of input parameter Mode takes the value 16#40,
- or there is an invalid measuring type in the Low Word of the input parameter Mode.

8.8.5 Messaging (of FB XGwRAnOu)

This block does not offer messaging.

8.8.6 I/Os (of FB XGwRAnOu)

Input parameters

Table 8-29

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In	Process value incl. ST	STRUCT	

I/O (parameter)	Meaning	Data type	Default
PV_In.Value	Value	REAL	0.0
PV_In.ST	Signal Status	BYTE	16#80
ExtErrQB	external error	BOOL	0
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	1 = Bit Swap on	BOOL	0
Feature.Bit26	1 = Byte Swap on	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	Reserved	BOOL	0
Feature.Bit29	Reserved	BOOL	0
Feature.Bit30	1 = Output de-energize value at a block-external simulation	BOOL	1
Feature.Bit31	1 = Keep last valid raw value if input value is bad	BOOL	0
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	

I/O (parameter)	Meaning	Data type	Default
SimPV_In.Value	Value	REAL	0.0
SimPV_In.ST	Signal Status	BYTE	16#80
StartVal	Start value	REAL	0.0
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	flutter suppress time	INT	0

Output parameters

Table 8-30

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
OProImQB	Qualitybit to Process image	BOOL	0
PV_Out	Output value	REAL	0.0
PV_ChnST	State of output value	STRUCT	
PV_ChnST.Value	Value	REAL	0.0
PV_ChnST.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

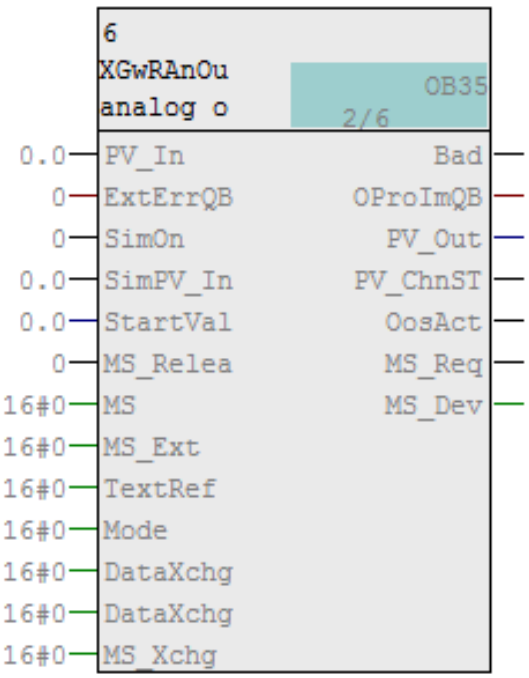
In/Out parameters

Table 8-31

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and Mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.8.7 Block diagram (of FB XGwRAnOu)

Figure 8-8



8.9 Function Block XGwlAnIn

8.9.1 Description (of FB XGwlAnIn)

FB-Number

FB6013

Family

Channel

Application

The block is used for the following applications:

- Signal processing of an analog integer input value in from an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.
- Reading value without scaling
- Reading value with linear scaling

How it works

The block cyclically processes all channel-specific signal functions of an analog input module.

- It reads a raw analog value from the process image (partition) and converts it to its physical value or calculates a percentage value based on this raw value.
- It reads an integer value from the process image (partition) and converts it to real value.

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is also installed automatically in the startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following occurs automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the input channel with the PV_In input parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Status word allocation for Status parameter

This block does not have the Status parameter.

8.9.2 Modes (of FB XGwAnIn)

This block does not have any modes.

8.9.3 Functions (of FB XGwIAnIn)

The functions for this block are listed below.

Checking the raw value (scaling)

The nominal range sets the range for converting analog signals into digital values (raw values), depending on the measuring type and the range of the analog input module. The range of the raw value is defined with +/- 27648 at the PV_Scale.High and PV_Scale.Low. If necessary, the range of the raw value can be changed. The nominal range must be defined manually at the input parameters Scale.High and Scale.Low (e.g., 4mA..20mA, 0V..10V, 0%..100%). The scaling is done linearly.

This includes an overshoot/undershoot range within which an analog signal can still be converted to a digital value. This range must be defined at the input parameter HighLimit and LowLimit. A rough guideline could be 18.5% of the nominal value is defined in relation to the nominal range. Outside this range an overflow or underflow occurs and output parameter Bad = 1 is set.

- Output parameter PV_LoAct = 1 is set if the value is outside the nominal low range.
- Output parameter PV_HiAct = 1 is set if the value is outside the nominal high range.

NAMUR limit checking (with modules of 4 to 20 mA)

If the measured current is less than 3.6 mA as LowLimit or greater than 21mA as HighLimit (defined by NAMUR).

Reading an integer (without scaling)

If an integer is to be read out without scaling, the following parameters are to be used.

- PV_Scale.High = +27648
- PV_Scale.Low = -27648
- Scale.Low = +27648
- Scale.Low = -27648
- HighLimit = +27648
- LowLimit = -27648

Bit swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the bit alignment can be adjusted with Feature.Bit 25.

Byte swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the byte alignment can be adjusted with Feature.Bit 26.

Holding the last value if raw value is invalid

If the block is to hold the most recent valid value when the raw value is invalid, you must activate this function at the Feature Bit. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output substitute value if raw value is invalid

If the block is to output a substitute value (SubsPV_In) when the raw value is invalid, you must activate this function at the Feature Bit “Output substitute value if raw value is invalid”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

Output of invalid value if raw value is invalid

If the block is to output an invalid value (PV_Out = PV_In), you must activate this function at the Feature Bit “Output invalid raw value”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

This function is pre-selected.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Signal status for PCS 7 channel blocks

The block provides the standard function “Forming and outputting the signal status for PCS 7 channel blocks”. (For more information, see chapter 10.2.3 “Signal status for PCS 7 channel blocks”.)

Simulating signals

The block provides the standard function “Simulating signals”.
(For more information, see chapter 10.2.1 “Simulating signals”.)

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in

the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

The following functionality is available for this block at the relevant bits:

Table 8-32

Bit	Function
25	Bit swap on
26	Byte swap on
27	Do not evaluate the first run of the diagnostic blocks *
30	Outputting last valid value if raw value is invalid *
31	Keep last valid raw value if input value is bad *

8.9.4 Error handling (of FB XGwlAnIn)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The Status information Bit from ProImQB is only processed if SelQB is set to TRUE. A FALSE at ProImQB or a user defined error at ExtErrQb causes a Bad signal. The evaluation of the parameters ProImQB and ExtErrQb can be activated or deactivated by SelQB.

Higher-level error / invalid measuring range

A higher-level error is output (output parameter ModErr = 1) if either:

- the signal status in the High Word of input parameter Mode takes the value 16#40, or
- there is an invalid measuring type in the Low Word of the input parameter Mode.

8.9.5 Messaging (of FB XGwlAnIn)

This block does not offer messaging.

8.9.6 I/Os (of FB XGwlAnIn)

Input parameters

Table 8-33

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In	Input value	REAL	0.0

I/O (parameter)	Meaning	Data type	Default
ProImQB	Qualitybit from Process image	BOOL	0
ExtErrQB	external error	BOOL	0
ChValueAct	reserved	BYTE	16#00
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	1 = Bit Swap on	BOOL	0
Feature.Bit26	1 = Byte Swap on	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	1 = Bad Value	BOOL	1
Feature.Bit29	1 = Substitute value	BOOL	0
Feature.Bit30	1 = Hold last value	BOOL	0
Feature.Bit31	Reserved	BOOL	0
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	
SimPV_In.Value	Value	REAL	0.0
SimPV_In.ST	Signal Status	BYTE	16#80

I/O (parameter)	Meaning	Data type	Default
SubsPV_In	Substitution value	REAL	0.0
SelQB	1=Select Qualitybit from Process image	BOOL	1
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	Flutter suppress time	INT	0

Output parameters

Table 8-34

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
PV_Out	Process value incl. ST	STRUCT	
PV_Out.Value	Value	REAL	0.0
PV_Out.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

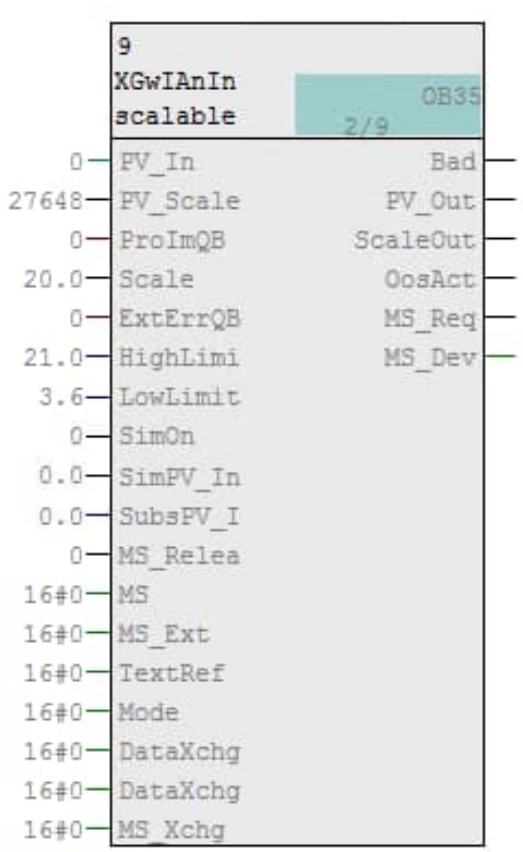
In/Out parameters

Table 8-35

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.9.7 Block diagram (of FB XGwIAnIn)

Figure 8-9



8.10 Function Block XGwlAnOu

8.10.1 Description (of FB XGwlAnOu)

FB-Number

FB6014

Family

Channel

Application

The block is used for the following applications:

- Signal processing of an analog real output value in to an EIP Adapter transferred by the HMS Anybus X-gw (Profinet Device to Ethernet/IP) Scanner.
- Writing value without scaling
- Writing value with linear scaling

How it works

- The block outputs the process value as analog raw value for a process image (partition).
- The block outputs the process value as integer value for a process image (partition).

The current value is always output to the process image (partition).

Address range

If the used module has an area for inputs and outputs, the start address must be the same in the hardware configuration.

Configuration

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is also installed automatically in the startup OB (OB100).

When the CFC function "Generate module drivers" is used, the following occurs automatically:

- The in/out parameter Mode is interconnected to the OMode_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg is interconnected to the DataXchg1_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter DataXchg1 is interconnected to the DataXchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The in/out parameter MS_Xchg is interconnected to the MS_Xchg_00 output parameter of the MOD block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.
- The MS parameter is interconnected to the O_MS output parameter of the diagnostics block. Since the modules and channels are virtual, the diagnostic modules can only evaluate and act at the device level.

Connect the symbol generated in HW Config (symbol table) for the input channel with the PV_Out output parameter.

NOTE If you are not using the CFC function "Generate module drivers" you must set the in/out parameter Mode manually.

Quality code (if it was configured manually)

If the process image (partition) also contains the value status (status bit) of the digital input channel, the corresponding symbol can be connected manually with the ProImQB and the input SELQB must be set on 1. The block interprets a 1 at ProImQB as “Good” and a 0 as “Bad”.

Status word allocation for Status parameter

This block does not have the Status parameter.

8.10.2 Modes (of FB XGwIAnOu)

This block does not have any modes.

8.10.3 Functions (of FB XGwIAnOu)

The functions for this block are listed below.

Forming a peripheral value

The digital value is written to the process image (partition). The signal status of the process value (PV_ChnST) is set to "good" (16#80).

Simulating signals

The block provides the standard function “Simulating signals”. (For more information, see chapter 10.2.1 “Simulating signals”.)

Keep last valid raw value

The block provides the standard function “Keep last valid raw value if input value is bad”. (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)

If Feature.Bit31 is active and the input PV_In has bad quality (16#00 or 16#28) the output PV_Out keep their value and will not be updated.

Bit swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the bit alignment can be adjusted with Feature.Bit 25.

Byte swap

If the data alignment (e.g., little-endian and big-endian) of the field device and PCS 7 are different, the byte alignment can be adjusted with Feature.Bit 26.

Flutter suppression

This function is not available in this concept of virtual modules and virtual channels.

Configurable reactions using the Feature parameter

You can find an overview of all reactions provided by the Feature parameter in the configurable functions using the Feature I/O.

* (For more information, see chapter 10.2.5 “Configurable reactions using the Feature parameter”.)
The following functionality is available for this block at the relevant bits:

Table 8-36

Bit	Function
25	Bit swap on
26	Byte swap on
27	Do not evaluate the first run of the diagnostic blocks *
30	Outputting last valid value if raw value is invalid *
31	Keep last valid raw value if input value is bad *

8.10.4 Error handling (of FB XGwlAnOu)

Error handling

Refer to the section “Error handling” in the basic instructions for the error handling of all blocks. (For more information, see chapter 10.2.4 “Error handling”.)

The following errors can be displayed for this block:

- Channel error
- Higher-level error
- Invalid measuring range

Channel error

At the output parameter Bad, channel errors are displayed with 1. The quality information OProImQb is taken from the inverted Bad.Value. An ExtErrQb causes a Bad.Value and a FALSE at OProImQb.

Higher-level error / invalid measuring range

A higher-level error is output (output parameter ModErr = 1 and Bad = 1) if either:

- the signal status in the High Word of input parameter Mode takes the value 16#40, or
- there is an invalid measuring type in the Low Word of the input parameter Mode.

8.10.5 Messaging (of FB XGwlAnOu)

This block does not offer messaging.

8.10.6 I/Os (of FB XGwlAnOu)

Input parameters

Table 8-37

I/O (parameter)	Meaning	Data type	Default
EN		BOOL	1
PV_In	Process value incl. ST	STRUCT	
PV_In.Value	Value	REAL	0.0
PV_In.ST	Signal Status	BYTE	16#80
ExtErrQB	external error	BOOL	0

I/O (parameter)	Meaning	Data type	Default
Feature	Status of various features	STRUCT	
Feature.Bit0	Reserved	BOOL	0
Feature.Bit1	Reserved	BOOL	0
Feature.Bit2	Reserved	BOOL	0
Feature.Bit3	Reserved	BOOL	0
Feature.Bit4	Reserved	BOOL	0
Feature.Bit5	Reserved	BOOL	0
Feature.Bit6	Reserved	BOOL	0
Feature.Bit7	Reserved	BOOL	0
Feature.Bit8	Reserved	BOOL	0
Feature.Bit9	Reserved	BOOL	0
Feature.Bit10	Reserved	BOOL	0
Feature.Bit11	Reserved	BOOL	0
Feature.Bit12	Reserved	BOOL	0
Feature.Bit13	Reserved	BOOL	0
Feature.Bit14	Reserved	BOOL	0
Feature.Bit15	Reserved	BOOL	0
Feature.Bit16	Reserved	BOOL	0
Feature.Bit17	Reserved	BOOL	0
Feature.Bit18	Reserved	BOOL	0
Feature.Bit19	Reserved	BOOL	0
Feature.Bit20	Reserved	BOOL	0
Feature.Bit21	Reserved	BOOL	0
Feature.Bit22	Reserved	BOOL	0
Feature.Bit23	Reserved	BOOL	0
Feature.Bit24	Reserved	BOOL	0
Feature.Bit25	1 = Bit Swap on	BOOL	0
Feature.Bit26	1 = Byte Swap on	BOOL	0
Feature.Bit27	1 = do not evaluate the first run of the diagnostic blocks	BOOL	0
Feature.Bit28	Reserved	BOOL	0
Feature.Bit29	Reserved	BOOL	0
Feature.Bit30	1 = Output de-energize value at a block-external simulation	BOOL	1
Feature.Bit31	1 = Keep last valid raw value if input value is bad	BOOL	0
SimOn	1=Simulation active	STRUCT	
SimOn.Value	Value	BOOL	0
SimOn.ST	Signal Status	BYTE	16#80
SimPV_In	Simulation value	STRUCT	
SimPV_In.Value	Value	REAL	0.0
SimPV_In.ST	Signal Status	BYTE	16#80
StartVal	Start value	REAL	0.0

I/O (parameter)	Meaning	Data type	Default
MS_Release	Maintenance release	STRUCT	
MS_Release.Value	Value	BOOL	0
MS_Release.ST	Signal Status	BYTE	16#80
MS	Maintenance state	DWORD	16#00000000
MS_Ext	External Maintenance state	DWORD	16#00000000
TextRef	Text reference external messages	WORD	16#0000
FlutEn	1=Flutter suppress enable	BOOL	0
FlutTmIn	flutter suppress time	INT	0

Output parameters

Table 8-38

I/O (parameter)	Meaning	Data type	Default
ENO		BOOL	0
Bad	1=Bad process value	STRUCT	
Bad.Value	Value	BOOL	0
Bad.ST	Signal Status	BYTE	16#80
OProImQB	Qualitybit to Process image	BOOL	0
PV_Out	Output value	REAL	0.0
PV_ChnST	State of output value	STRUCT	
PV_ChnST.Value	Value	REAL	0.0
PV_ChnST.ST	Signal Status	BYTE	16#80
SimAct	1=Simulation active	STRUCT	
SimAct.Value	Value	BOOL	0
SimAct.ST	Signal Status	BYTE	16#80
ModErr	1=Higher level failure	STRUCT	
ModErr.Value	Value	BOOL	0
ModErr.ST	Signal Status	BYTE	16#80
ErrorNum	Parameter error	INT	-1
OosAct	Field device out of service, maintenance in progress	STRUCT	
OosAct.Value	Value	BOOL	0
OosAct.ST	Signal Status	BYTE	16#80
MS_Req	Maintenance request	STRUCT	
MS_Req.Value	Value	BOOL	0
MS_Req.ST	Signal Status	BYTE	16#80
MS_Dev	Maintenance State	DWORD	16#00000000

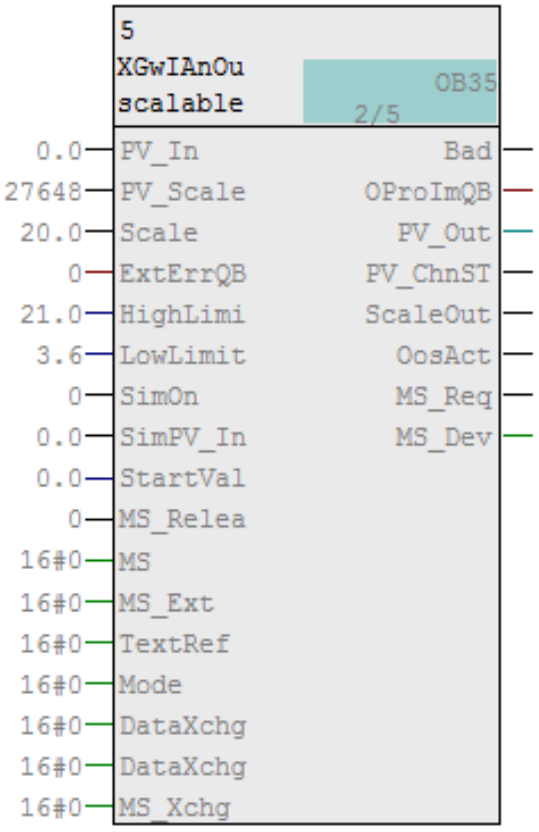
In/Out parameters

Table 8-39

I/O (parameter)	Meaning	Data type	Default
Mode	Quality and Mode	DWORD	16#00000000
DataXchg	Data exchange	DWORD	16#00000000
DataXchg1	Data exchange	DWORD	16#00000000
MS_Xchg	Maintenance State exchange	DWORD	16#00000000

8.10.7 Block diagram (of FB XGwIAnOu)

Figure 8-10



9 Maintenance Station (Asset Management)

You can find a full description of the PCS 7 Maintenance Station (Asset Management) in the PCS 7 documentation.

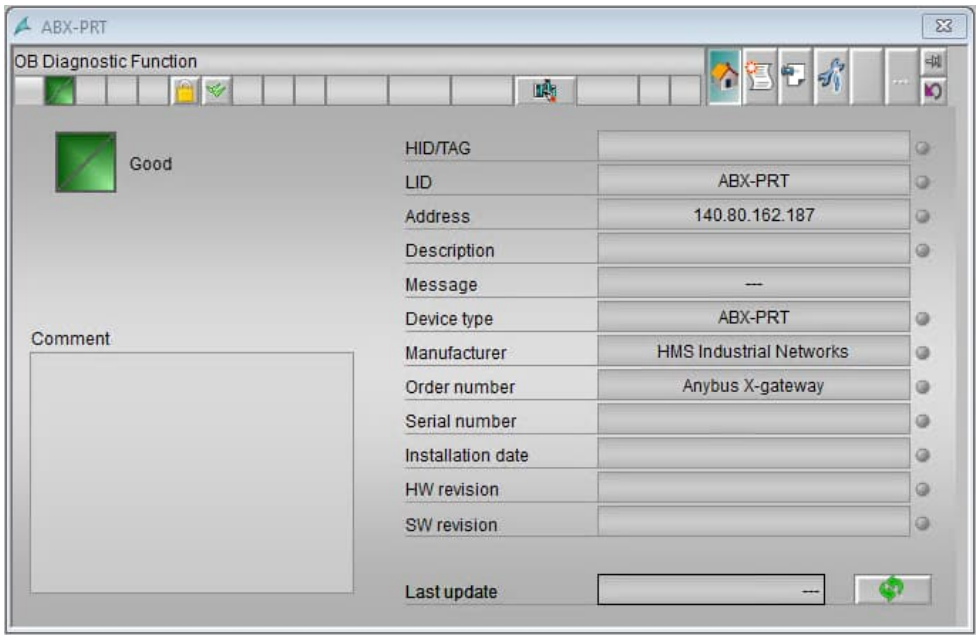
The faceplates will be installed automatically via the normal PCS 7 Asset Management functionality.

The maintenance diagnosis is available for on the device level. Because of the concept of virtual modules there is no diagnosis information on module level.

The following pictures shows maintenance on the device level:

Figure 9-1

Figure 9-2



10 Appendix

The library requires SIMATIC PCS 7 in version V9.0 SP3 (or newer).

The links in the appendix of this manual link to manuals or chapters in the manuals of SIMATIC PCS 7 in the Version 9.0 SP3.

To switch to a newer version of the manual, click on the link for the manual and select the required version in the drop-down list “Edition” in the upper left corner.

To find the respective chapter, open the manual and use the “Search” functionality on the left side.

10.1 Appendix (system blocks)

10.1.1 Status displays - Maintenance status MS

The chapter “Maintenance status MS” is available in the following manual:

- SIMATIC Process Control System PCS 7 Basis Library (V9.0 SP3)
  https://support.industry.siemens.com/cs/ww/en/view/109781590
  (Page 536)

It describes the layout of the maintenance status MS (DWORD).

10.1.2 Message Classes

The chapter “Message classes” is available in the following manual:

- SIMATIC Process Control System PCS 7 Basis Library (V9.0 SP3)
  https://support.industry.siemens.com/cs/ww/en/view/109781590
  (Page 535)

It describes that message classes are used to group messages according to their cause and which message classes are used in the SIMATIC process control system.

10.2 Appendix (channel blocks)

10.2.1 Simulating signals

The chapter “Simulating signals” is available in the following manual:

- SIMATIC Process Control System PCS 7 Advanced Process Library (V9.0 SP3)”
  https://support.industry.siemens.com/cs/ww/en/view/109781589)
  (Page 59)

10.2.2 Flutter suppression

The chapter “Flutter suppression for channel blocks” is available in the following manual:

- SIMATIC Process Control System PCS 7 Advanced Process Library (V9.0 SP3)”
  https://support.industry.siemens.com/cs/ww/en/view/109781589)
  (Page 68)

10.2.3 Signal status for PCS 7 channel blocks

The chapter "Forming and outputting the signal status for PCS 7 channel blocks" is available in the following manual:

- SIMATIC Process Control System PCS 7 Advanced Process Library (V9.0 SP3)" https://support.industry.siemens.com/cs/ww/en/view/109781589) (Page 120)

10.2.4 Error handling

The chapter "Error handling" is available in the following manual:

- SIMATIC Process Control System PCS 7 Advanced Process Library (V9.0 SP3)" https://support.industry.siemens.com/cs/ww/en/view/109781589) (Page 121)

10.2.5 Configurable reactions using the Feature parameter

The chapter "Configurable response using the Feature I/O" is available in the following manual:

- SIMATIC Process Control System PCS 7 Advanced Process Library (V9.0 SP3)" https://support.industry.siemens.com/cs/ww/en/view/109781589) (Page 133)

Table 10-1 Feature parameter (excerpt)

Bit number	Meaning	Page
25	Bit swap on (changing bit order)	
26	Byte swap on (changing byte order)	
27	Do not evaluate the first run of the diagnostic blocks	196
28	Output invalid raw value	178
29	Output substitute value if raw value is invalid	153
30	Outputting a de-energized value for block-external simulation Outputting last valid value if raw value is invalid	152 158
31	Keep last valid raw value if input value is bad	197

10.2.6 Information on using channel blocks

The chapter "Information on using channel blocks" is available in the following manual:

- SIMATIC Process Control System PCS 7 Advanced Process Library (V9.0 SP3)" https://support.industry.siemens.com/cs/ww/en/view/109781589) (Page 2119)

10.2.7 Block Overview

Table 10-2

Block	Reference
XGwMod	Chapter 8.1
XGwStList	Chapter 8.1
XGwDiIn	Chapter 8.3
XGwDiOu	Chapter 8.4
XGwWoIn	Chapter 8.5
XGwWoOu	Chapter 8.6
XGwRAnIn	Chapter 8.7
XGwRAnOu	Chapter 8.8
XGwIAnIn	Chapter 8.9
XGwIAnOu	Chapter 8.10
Fill	Internal usage
RDSYSST	Internal usage
WR_USMSG	Internal usage
RD_SINFO	Internal usage
SWAP_W	Internal usage
BLKMOV	Internal usage
TON	Internal usage
ALARM_8P	Internal usage
RDREC	Internal usage

11 Contact Information

Should you have any questions concerning the software application, please refer to the Industry Sector Technical Support.

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Thank you for using one of the above-mentioned contacts to ensure your inquiry is registered and can be processed.