VBG-EP1-KE5-D*

ASi-3 Gateway

Firmware Version 2.3

Manual







Your automation, our passion.

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1	Introd	uction	7
	1.1	Content of this Document	7
	1.2	Target Group, Personnel	7
	1.3	Symbols Used	8
	1.4	Intended Use	8
	1.5	General safety instructions	9
	1.6	Declaration of Conformity	9
2	Produ	ct Description	10
	2.1	Use and Application	10
	2.2	Indicators and Operating Elements	
	2.3	Dimensions	16
3	Install	ation	
	3.1	Electrical Connection	
	3.1.1	Interfaces and Connections	
	3.1.2	Connecting the AS-Interface and Supply Voltage	18
	3.1.3	Ethernet Connection	20
	3.1.4	Connection to Configuration Interface X3	21
	3.1.5	Micro SD Card	21
	3.2	Mounting and Dismounting	23
4	Comm	nissioning	26
	4.1	Addressing the AS-Interface	26
	4.2	PROFINET	26
	4.2.1	Preparation	
	4.2.	1.1 Configuration	27
	4.2.	1.2 Online Assignment of the Device Name	29
	4.2.	1.3 Factory Reset	
	4.2.	1.4 Configuration of the Gateway Slots	
	4.2.	1.5 Device Replacement Without Exchangeable Medium/Programming Units	37 20
	4.2.	Nodulos	
	4.2.2	VIUUUIES	44 ، ۸۸
	4.2. 19	2.1 Digital Data	44 46
	4.2	2.3 AS-Interface Diagnostic Information	
	4.2.	2.4 Command Interface	
	4.2.	2.5 Gateway Record Modules	54

	4.3	EtherNet/IP	56
	4.3.1	Preparation	
	4.3.2	Configuration	
	4.3	2.1 Connections and Assembly Objects	
	4.3	2.2 Configuration Parameters	
	4.3.3	Bit Assignment of the Process Data	
	4.3.4	EtherNet/IP Class 3 Objects	
5	Opera	tion	94
	5.1	Push Button	94
	5.2	Web Interface	96
	5.2.1	Login	
	5.2.2		
	524	AS-Internace	
	5.2	4.1 Events	
	5.2	4.2 Network Interfaces	111
	5.2	4.3 Firmware Update	
	5.2	4.5 Factory Settings	
	5.2	4.6 Restarting	114
	5.3	Configuration Interface X3	114
	5.4	REST API	115
6	Servio	ing and Overhaul	116
7	Annex	A: PROFINET Command Interface Commands and Data Layou	ut117
	7.1	Get Permanent Parameter	117
	7.2	Write Parameter	117
	7.3	Read Parameter	118
	7.4	Store Actual Parameters	118
	7.5	Store Actual Configuration	119
	7.6	Set Offline Mode	119
	7.7	Set Auto Address Enable	120
	7.8	Set Operation Mode	121
	7.9	Change Slave Address	121
	7.10	Set Permanent Configuration	122
	7.11	Get Permanent Configuration	122
	7.12	Read Actual Configuration	123
	7.13	Set LPS	124 、
	7.14	Get LPF	124

	7.15	Write Extended ID1 Code125
	7.16	Set Permanent Parameter126
	7.17	Get LPS126
	7.18	Get LAS127
	7.19	Get LDS128
	7.20	Get Flags128
	7.21	Set Data Exchange Active130
	7.22	Get Delta List130
	7.23	Get LCS131
	7.24	Get Auto Address Enable132
8	Annex	B: PROFINET Record Commands and Data Lavout
	8.1	Read IDI 0x01
	8.2	Write ODI 0x02
	8.3	Set Permanent Configuration 0x08135
	8.4	Get Permanent Parameter 0x04135
	8.5	Read Parameter 0x06136
	8.6	Set Permanent Configuration 0x08135
	8.7	Get Permanent Configuration 0x09137
	8.8	Read Actual Configuration 0x0B138
	8.9	Set LPS 0x0C138
	8.10	Get LPS 0x0D139
	8.11	Get LAS 0x0E
	8.12	Get LDS 0x0F141
	8.13	Get Flags 0x10141
	8.14	Set Operation Mode 0x11142
	8.15	Set Offline Mode 0x12143
	8.16	Set Data Exchange Active 0x13143
	8.17	Change Node Address 0x14144
	8.18	Set Auto Address Enable 0x15145
	8.19	Get Auto Address Enable 0x15146
	8.20	Get LPF 0x17
	8.21	Write ID1 Code 0x18147

Read AIDI 0x19	148
Write AODI 0x1A	149
Get Delta List 0x40	150
Get LCS 0x41	151
Write Parameter 0x42	152
Read Node Response to Write Parameter 0x42	152
Reset Node 0x43	153
Read Node Response to Reset Node 0x43	154
Select Node 0x44	155
Store Actual Parameters 0x45	155
Store Actual Configuration 0x46	156
	Read AIDI 0x19Write AODI 0x1AGet Delta List 0x40Get LCS 0x41Write Parameter 0x42Read Node Response to Write Parameter 0x42Reset Node 0x43Read Node Response to Reset Node 0x43Select Node 0x44Store Actual Parameters 0x45Store Actual Configuration 0x46



1 Introduction

1.1 Content of this Document

This document contains information required to use the product in the relevant phases of the product life cycle. This may include information on the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

Note

For full information on the product, refer to the further documentation on the Internet at www.pepperl-fuchs.com.



Note

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at www.pepperl-fuchs.com.

The documentation comprises the following parts:

- This document
- Datasheet

In addition, the documentation may comprise the following parts, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Instruction manual
- Functional safety manual
- Other documents

1.2 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

1.3 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.



Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.



Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols



Note

This symbol brings important information to your attention.



Action

1. This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

1.4 Intended Use

The VBG-EP1-KE5-D* is a gateway for one or two networks in accordance with AS-Interface Specification 3.0, Revision 6. The gateway is used to connect AS-Interface nodes to higher-level control systems.

Read through this manual carefully. Be sure to familiarize yourself with the gateway before mounting, connecting, and operating.

Operate the gateway only as described in this manual. Make sure that the device and the systems connected to the device work correctly.



Caution!

Equipment Protection

Use the device only as specified by the manufacturer. Otherwise, the protection provided by the device may be impaired.



1.5 General safety instructions

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Installation and commissioning of all devices may be performed only by trained and qualified personnel.

It is dangerous for the user to make changes and/or repairs. Additionally, doing so voids the warranty and excludes the manufacturer from any liability. In the event of any serious errors, stop using the device. Secure the device against unintended operation. To have the device repaired, return it to your local Pepperl+Fuchs representative or your sales center.



Note

Disposal

Electronic waste is dangerous. When disposing of the equipment, observe the current statutory requirements in the relevant country of use and local regulations.

1.6 Declaration of Conformity

This product was developed and manufactured in line with the applicable European standards and directives.



Note

A declaration of conformity can be requested from the manufacturer.

The product manufacturer, Pepperl+Fuchs Group, 68307 Mannheim, Germany, has a certified quality assurance system that conforms to ISO 9001.



2 Product Description

2.1 Use and Application

The VBG-EP1-KE5-D* is a gateway for one or two networks in accordance with AS-Interface Specification 3.0. The gateway is used to connect AS-Interface nodes to higher-level controllers. In each AS-Interface network, you can connect up to 31 nodes in the standard addressing mode or up to 62 nodes in the extended addressing mode. The nodes are usually connected to the flat cable via piercing technology. The network length can be up to 100 meters. The maximum length can be extended several times over by using repeaters and terminators. The design of the network is characterized by complete topological flexibility.

Product Versions

Name	Function
VBG-EP1-KE5-D.	Gateway for one network in accordance with AS-Interface Specifica- tion 3.0
VBG-EP1-KE5-DMD	Gateway for two networks in accordance with AS-Interface Specifica- tion 3.0



Note

The manual describes the VBG-EP1-KE5-DMD with the operation of two AS-Interface segments. The manual also applies to the VBG-EP1-KE5-D, which operates one ASi segment.



Special Product Features

Multiprotocol Function

 With the multiprotocol function, you can select EtherNet/IP or PROFINET as the protocol of the industrial network, depending on the application.
 The protocol can be changed using the push button.

Integrated Web Server

• The gateway has an integrated web server for module management, simple commissioning, and diagnostic purposes. The AS-Interface networks can be configured via a standard web browser. During operation, you can view and correct faults in the network, the gateway, and the connected nodes. This is done directly on the gateway or via remote maintenance with a corresponding connection.

Using the Gateway in a Switch Cabinet

 The gateway features degree of protection (IP20) and has a width of less than 40 mm, making it ideal for use in switch cabinets. The gateway is supplied either via AS-Interface from AS-Interface segment 1 or via AUX. Spring terminals are available as connection options for voltage supply and for connecting the AS-Interface networks. The terminals are numbered and color-coded to prevent wiring errors.

Integrated Network Switch

The integrated 2-channel Ethernet switch allows a line or ring topology to be set up in an
industrial Ethernet. The firmware of the gateway supports ring topologies. With a ring
topology, you can build a media-redundant network infrastructure. The gateway switches
to an alternative ring segment immediately if the connection is interrupted. Continued
operation is ensured after a network interruption.

System Overview



Figure 2.2 System overview

2.2 Indicators and Operating Elements

Indicators



Figure 2.3

Designation		Function	Description
Ethernet >	(1	Status of interface X1	Status of the connection to an Ethernet device at interface X1
Ethernet >	(2	Status of interface X2	Status of the connection to an Ethernet device at interface X2
Service E	thernet X3	Configuration inter- face	Interface for configuring the gateway
SD card s	lot	Storage medium	For storage medium with configuration data
BFINS		Bus error I Network status	Status of the process data exchange with the fieldbus controller
SFIMS		System error I Gate- way status	Status of the system
Button function		Configuration storage status	Status of the storage of the current configura- tion
Memory		Memory status	Internal memory status, SD card
AUX		Supply voltage status	Status of gateway supply voltage
ASi line 1	ASi Power	Status of ASi 1 power supply	Status of the power supply of ASi network 1
	Config OK	Status of ASi 1 config- uration	Status of the configuration of ASi network 1
ASi line 2	ASi Power	Status of ASi 2 power supply	Status of the power supply of ASi network 2
	Config OK	Status of ASi 2 config- uration	Status of the configuration of ASi network 2

Status Indicator for Interface X1/X2/X3

Status	Description	
	Gateway is de-energized No network link to other Ethernet devices detected	
	Network communication active: Ethernet device detected	1
	Packet exchange with other EtherNet/IP gateways Network communication active: Network link to another Ethernet device detected	1
Table 2.1	Ethernet X1, Ethernet X2, Service Ethernet X3	

Status Indicator for Bus Errors, PROFINET Network Status

Status	Description
	Gateway is de-energized
	PROFINET communication with IO controller Connection established and data exchanged
	PROFINET communication with the IO controller has been interrupted
	No PROFINET communication with IO controller

Table 2.2 BF I NS

Status Indicator for Bus Errors, EtherNet/IP Network Status

Status	Description
-	Gateway is de-energized Gateway does not have an IP address
	CIP connection (connection to scanner) established
\mathbf{H}	IP address configured There is no CIP connection
	Conflict with IP address detected
	CIP connection interrupted
Table 2.3	BFINS

Status Indicator for System Errors

Status	Description
-	Gateway is de-energized
	Gateway is ready and working correctly
	After switching on, "factory reset" mode is displayed
	An unrecoverable error has been detected
	A recoverable error has been detected
	Indicator check on startup
Table 2.4	SFIMS

Function Indicator for Push Button

Status	Description
-	Gateway is de-energized Push button not working
•	Function is locked
•	Push button working
Table 2.5	Button

Status Indicator for Memory

Status	Description
-	Gateway is de-energized No SD card present
	Saved configuration matches system configuration
	Configuration is saved
	The contents of the internal and external memory are inconsistent.
	Configuration failed to save (write problems, access problems, faulty configuration memory, teach-in failed)

Table 2.6 Memory

Status Indicator for Supply Voltage

Status	Description
-	No AUX auxiliary power supply available
	AUX auxiliary power supply available
Table 2.7	AUX

Status Indicator for ASi 1/2 Power Supply

Status	Description
-	System is off ASi network is not powered ASi network is not present
•	ASi network is powered
	Configuration successfully saved via the button (flashes for five seconds)
	Short circuit to ground detected
	ASi network is selected for teach-in
	Error while saving the configuration via the button (flashes for five seconds)
Table 2.8	ASi Power

Status Indicator for Configuration of ASi 1/2

Status	Description
-	System is off No ASi nodes present
•	ASi communication in protected mode, configuration matches specification
*	ASi communication active in configuration mode, no configuration preset defined Teach-in via button successful (flashes for five seconds)
-	Diagnostic request present (gateway in LPF)
	ASi network is selected for teach-in via button



Status	Description
	Configuration of ASi network inconsistent in protected mode (missing or unexpected node)
	Configuration of ASi network inconsistent in configuration mode (flashes alternately)
;	Teach-in (flashes for five seconds)

Table 2.9 Config OK

Status Indicator for Device Identification

Status	Description
	All LEDs except Ethernet X1 – X3 LEDs flash to identify the device in PROFINET mode
	All LEDs except Ethernet X1 – X3 LEDs flash at approximately 4 Hz to identify the device in EtherNet/IP mode
	All LEDs except Ethernet X1 – X3 LEDs flash at approximately 2 Hz to check the LED function

Table 2.10 Device identification

Operating Elements



Figure 2.4

Designation	Description
Push button	Save the configuration, change the network protocol, or perform a factory reset for the gateway. See chapter 5.1.



2.3 Dimensions





3 Installation

3.1 Electrical Connection



Warning!

Electrical short caused by moisture

If the switch cabinet or switch box is not sufficiently sealed, this can lead to the loss of the specified degree of protection and the device function.



Note

Temperature Range of the Cable

The maximum operating temperature of the cables connected to the gateway must be at least 85 $^{\circ}\text{C}.$

Wire Gauge

The following wire gauges can be used with the gateway.

Open stranded wire: Core cross section 0.2 mm ² 2.5 mm ² Insulation stripping length L = 10 mm	
Cable end sleeve: Core cross section 0.2 mm ² 1.5 mm ² Insulation stripping length L = 10 mm	

3.1.1 Interfaces and Connections

Block Diagram



Figure 3.1

Connection	Designation	Description	Physical
X1	ETH1	Ethernet 1 for connection of fieldbus	RJ45 plug
X2	ETH2	Ethernet 2 for connection of fieldbus	RJ45 plug
Х3	Service	Service interface for connecting service units	RJ45 plug
AUX	Power	Connection of auxiliary power supply	Terminal block
ASi 1	ASi Line 1	Connection for ASi segment 1	Terminal block
ASi 2	ASi Line 2	Connection for ASi segment 2	Terminal block

3.1.2 Connecting the AS-Interface and Supply Voltage



Figure 3.2

Terminal Blocks

The gateway has three terminal blocks for looping-through the ASi1, ASi2, and AUX lines. Each pair of terminals is bridged in the terminal block. This ensures the connection is retained even if the terminal block is disconnected from the gateway.

The bridges in the terminal blocks are designed for a current of 8 A and a core cross section $\geq 1 \mbox{ mm}^2.$

Connection	Designation	Description
24 23	AUX +	AS-Interface gateway supply voltage Optional and redundant
22 21	AUX -	
14 13	ASi 2 +	AS-Interface segment 2 connection
12 11	ASi 2 -	
04 03	ASi 1 +	AS-Interface segment 1 connection
02 01	ASi 1 -	

Assignment



If a corresponding voltage supply is connected, the device is automatically supplied via AUX. The AS-Interface segments each require their own compatible voltage supply. If there is no voltage supply connected via AUX, or if there is not sufficient voltage, the gateway is supplied via ASi 1.

You can use the AUX connection to provide auxiliary energy for connected nodes.

Note

Do not connect AS-Interface nodes or repeaters to the black AUX cable.

Do not connect any other AS-Interface gateways to the yellow ASi cable.



Warning!

The use of incorrect power supply units may lead to malfunctions.

Only supply the device via an AS-Interface power supply with integrated data decoupling that meets the requirements for safety extra-low protective voltage (SELV) or protective extra-low voltage (PELV).

Use a Class III, SELV or PELV power supply.



Releasing the Terminal Blocks



Figure 3.3 Releasing the terminal blocks

- 1. Insert a suitable screwdriver into the orange retaining clip until the blade is flush with the retaining clip of the DIN mounting rail.
- 2. Push the screwdriver outward to release the orange retaining clip.

 \rightarrow The terminal blocks are loosened.

3. Remove the terminal blocks.



AS-Interface Network Cable Connection

Cable type	Designation	Sheath color	Diagram
Yellow AS-Interface flat cable	ASi +	Brown	ASi - ASi +
Black AUX flat cable	ASi -	Blue	
Yellow AS-Interface round cable	ASi +	Brown	ASi - ASi +
black AOX round cable	ASi -	Blue	

3.1.3 Ethernet Connection

The Ethernet interface for the fieldbus consists of two RJ45 sockets. The Ethernet interface corresponds to the IEEE 802.3 standard. To enable operation in a "daisy chain" series connection, terminals X1 and X2 are connected via an internal Ethernet switch.



Caution!

Area of application

Only connect the device to an internal Ethernet network. The device must not leave this network. Do **not** connect the device to the telecommunications network.



Figure 3.4

Assignment

Connection	Designation	Description
X1	ETH1	Ethernet connection 1 RJ45
X2	ETH2	Ethernet connection 2 RJ45



3.1.4 Connection to Configuration Interface X3

Configuration interface X3 consists of an RJ45 socket. The interface is used for service and diagnostic operations. You can connect your PC to the gateway via this interface. Additional information see chapter 5.3.





3.1.5 Micro SD Card



Figure 3.6

The configuration is automatically stored on an inserted micro SD card and can be overwritten if necessary. For more information on use, see chapter 5.2.4.4.



Note

The device can be operated without a micro SD card.



Warning!

Data Loss

The micro SD card must only be inserted and removed in a de-energized state.

The micro SD card must not be removed when the memory LED is flashing, otherwise data on the micro SD card may be lost.



Specification

- Format: microSD, 11 mm x 15 mm x 1 mm
- Type: SD, SDHC, SDXC
- Supply voltage: 3.3 V
- Speed modes used: SDR12, SDR25

We recommend using the Pepperl+Fuchs MICRO-SD-CARD-KINGSTON. You can find this SD card on our website at pepperl-fuchs.com.

Configuration via Micro SD Card

The micro SD card must be formatted in the "FAT32" file format. You can format the micro SD card using the web interface.

The gateway automatically stores its configuration data on an empty inserted micro SD card and updates it if necessary. If the device is replaced, the SD card can be removed from the old gateway and inserted into the new gateway. A gateway without configuration data automatically adopts valid configuration data from an inserted micro SD card as the target configuration.



Note

If the configuration data on the micro SD card and the gateway do not match, the "Memory" LED lights up red. The configuration data is not copied automatically. You can resolve the conflict in the web interface.

A micro SD card is not included in the scope of delivery for the gateway.



Inserting and Removing a Micro SD Card

1. Inserting the card:



Figure 3.7

2. With the contacts facing up, slide the micro SD card into the SD card slot until it engages. The contacts should be facing the button.

3. Removing the card:

- 4. Push the inserted card into the SD card slot.
 - \mapsto The release mechanism pushes the card out of the card slot.
 - \rightarrow You can then carefully remove the card.





Caution!

File System Corruption

Do not remove the micro SD card while the "Memory" LED lights up yellow to indicate an active write operation. Otherwise, the file system of the gateway may be corrupted.

See chapter 2.2.

3.2 Mounting and Dismounting

- · Mount the gateway in the switch cabinet.
- Mount the gateway on a 35 mm DIN rail in accordance with DIN/EN 50022.

Heat Dissipation

The gateway has ventilation slots on the top and bottom of the enclosure. When the enclosure is properly installed, these ventilation slots allow air to circulate, which cools the inside of the device.

To allow air to circulate, observe the following conditions:

- Place the device vertically in the switch cabinet. Cold air is supplied from below and warm air can escape from above.
- Observe the minimum upper and lower distances; see figure.
- You can mount several devices side by side; see figure.

Warning!

Overheating

Do not close the ventilation slots. Do not cover the ventilation slots.



Figure 3.8 Minimum distances



Caution!

Ambient conditions

Observe the following conditions when mounting the device:

Pollution degree 2, max. height 5000 m ASL, max. humidity 95 %, without condensation.

Only use the device indoors.

To protect the device from mechanical hazards, fire hazards, or electrical hazards, place it in an external enclosure or in a switch cabinet.



Caution!

Damage to the gateway

Always cover the gateway when drilling above the device. To prevent a short circuit, do not allow metal chips or other particles to enter the enclosure through the ventilation openings.



Mounting in the Switch Cabinet

- 1. Place the gateway on the top edge of the DIN mounting rail. (1)
- 2. Press the gateway on the bottom edge of the DIN mounting rail. (2)





 \Box The gateway snaps onto the DIN mounting rail.





Dismounting

1. Insert a screwdriver into the retaining $\operatorname{clip}(1)$ on the bottom edge.



Figure 3.10

- 2. Push down on the retaining clip with the screwdriver. (2)
- Press the top edge of the gateway against the DIN mounting rail. ③
 → Remove the gateway from the front.

4 Commissioning

4.1 Addressing the AS-Interface

Each AS-Interface node requires a unique address for unique identification in the AS-Interface network. This address can be assigned differently.

Note

Make sure that each AS-Interface node has a unique AS-Interface address. Assigning multiple nodes to a single AS-Interface address causes the relevant AS-Interface network to malfunction.

Make sure that no AS-Interface node uses the address 0.

You can address the AS-Interface node with the VBP-HH1-V3.0-KIT AS-Interface handheld programming device.

4.2 **PROFINET**

Note

The gateway starts in PROFINET mode when it is delivered. You can identify the current mode by the SF LED.

4.2.1 Preparation

GSDML file

The prerequisite for commissioning is an installed GSDML for this gateway.

You can download this file from our website at https://www.pepperl-fuchs.com.

MAC Addresses

The MAC address at the Ethernet level is used to uniquely identify the gateway. This address is unique and cannot be changed by the user. The MAC address is printed on the module.

Example

The configuration is described using the example of the gateway for two VBG-EP1-KE5-DMD AS-Interface networks. For the gateway for a VBG-EP1-KE5-D AS-Interface network, the configuration is carried out with some minor differences, e.g., differences in labeling.



4.2.1.1

Note

Configuration

The configuration and commissioning process for the modules described over the following pages was performed using the TIA Portal V 14 engineering software from SIEMENS. When using a programmable logic controller from a different controller provider, please refer to the corresponding documentation.



Integration of the Gateway in the TIA Portal

1. Install the GSDML file for the required gateway in the TIA Portal. A GSDML file is available for block mapping. With block mapping, the digital data of the AS-Interface nodes is transferred to the PLC in its entirety in one data field as a block. Areas with a non-existent AS-Interface node address are filled with zeros.

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Portal View	m Devices & ne			The project 1515F_EP1-KE5_V16 was s	

Figure 4.1 Hardware catalog

- 2. Select the new device in the hardware catalog. Add the device to the PROFINET connection.
- 3. Select the appropriate PROFINET controller.
- 4. Select the Ethernet port with the right mouse button and enable the properties. Assign a suitable IP address and the PROFINET device name.

injecturee E i	1515F_EP1-KE5_V16 → Devi	ces & networks			
Devices			F Topology view	Network view	evice view
₩	Network Connections H IO system: PLC	M connection	Network overview	Connections Type	•
Add new device Devices & networks Devices & networks Ungrouped devices Cungrouped device	PLC_1 CPU 1515F-2 PN	Gateway P1-VES-D	Port_2 Port PROFINETS-chritstell PROFINET interface CSD device_1 GSD device ASi-3-Gateway VBG-EP1-KES-DMD - BI Interface submodule ASi-3-Gateway		
Cross-device functions	< Ⅲ > 75%	💽 — 🐖 🔳	<	ш]	>
Em Documentation settings Cardinages & resources Cardina control interface Online access Card Reader/USB memory Details view	General IO tags Sy General Ethemet addresses Ethemet addresses Advanced options Interface options Media redundancy Real time settings Port 1 [X1 P1 R] Port 2 [X1 P2 R]	Stem constants Texts Ethernet addresses Interface networked with Subr IP protocol IP addre Subnet ma Router addre	het: PN/IE_1 Add new subn 192 . 168 . 178 . 192 . 255 . 255 . Synchronize router Use router 0 . 0 . 0 . 0	et	
Name		PROFINET PROFINET device par	Generate PROFINE	Tdevice name automatically	
Portal view Dverview	Devices & ne	Thorner device har	International In	project 1515F_EP1-KE5_V16 wa	s s

The assignment of unique PROFINET device names is absolutely necessary for the internal organization of the PROFINET network.



4.2.1.2 Online Assignment of the Device Name

Each module must have a device name so that each node in the PROFINET network can be assigned an IP address. A node search displays all PROFINET devices that have been found. The MAC address at the Ethernet level is used to uniquely identify the gateway. This is unique and cannot be changed by the user. The MAC address is printed on the module. Using the MAC address, each device can be found in the list of available nodes and assigned a device name.



Assigning Device Names

- 1. Connect the gateway to the PROFINET network.
- 2. Open the dialog Accessible devices dialog via the main menu "Online -> Accessible devices ..."

Siemens - D:Vautomatisie	Online Ontions Tools Window Help	_V16					-
ject Ealt view insert	Go online	Ctrl+K	line 🔊 Go offline 🕌 👖		Totally In	Itegrated Auton	nation PORTA
Project tree	So offine	Ctrl+M	Norks				. # # ×
Devices	I Simulation	•	6	Topology view	Network view	w Device	view
ĨŇ	Stop runtime/simulation		on 💌 🎽 📘	Network overview	Connection	IS	4)
ISISF_EPI-KES_V16 Add new device Devices & networks Devices & networks	Download to device Extended download to device Download and reset FLC program Download user program to MemoryCard Snapshot of the actual values Load snapshots as actual values Load start values as actual values Upload from device (software) Upload from device (software) Upload from device Hardware detection	Ctrl+L nd software)	TIO-System (100)	Porte Port Port Port Solution GSD device_1 A5i-3-Gatew Interface Solution Properties	Ty 2 Po FSchnittstell PR GS ay VE submodule AS III III Q. D	pe Int OPFINET interface SD device IG-EP1-KE5-DMD - E I-3-Gateway iagnostics	31 S
Log Online access Card Reader/USB memo	Accessible devices	Ctrl+U Ctrl+Shift+E Ctrl+Shift+Q	rface networked with Subne	t: PN/IE_1 Add new subne	at j		
	M Unline & diagnostics		irotocol IP addres: Subnet masi	 1921681781 2552552550 Synchronize router Use router 	5 settings with IO c	ontroller	
Details view		PRC	Router addres:	5- 0 0 0			
				Generate PROFINE	Edevice name aut	tomatically	

Figure 4.3

3. Select the new gateway based on the MAC address. Typically, the IP address 0.0.0.0 or the MAC address will be shown.

ccessible devices	Accessible nodes of th	Type of the PG/PC interfa PG/PC interfa e selected interface:	ace: 🖳 PN/IE ace: 🚾 Realtek I	USB GbE Family Contro	ller 💌 🐑 💽
	Device	Device type	Interface type	Address	MAC address
	Accessible device	PF ASi Gateway	ISO	00-0D-81-0C-63	00-0D-81-0C-63-C0
Flash LED	plc_1515f	CPU 1515F-2 PN	PN/IE	192.168.178.19	28-63-36-8A-FF-D5
Online status informatio	in:			🗌 Display only e	<u>S</u> tart search rror messages
Found accessible d	evice Accessible device				^
Scan completed. 2	devices found.				
Scan and information Detrieving device in	on retrieval completed.				
preserving device in					Show <u>C</u> ancel

Figure 4.4

4. Click on the "Show" button.



Тір

If the gateway does not appear in the list of accessible devices on the network, check your firewall settings.

5. Assign the selected PROFINET device name to the gateway.



Project Edit View Insert Online Option	s Tools Window Help	🖉 Go anline 💋 Go affli	ne 🛃 🖪 🖪 🗶		Search in project>	Totally Integrated Au	itomation PORTAL
Floject dee ut w							
Devices	▼ Diagnostics General	Acsign PROFINET device name					
 1515F_EP14E5_V16 Online access Online access Intel(I0) Ethernet Connection (S). 40 TerreWiver VP1 Adapter Paltek USB GbE Family Controlle Diplay more information Diplay more information Diplay more information Diplay constrained excessible devices Online & diponotics Card Readen/USB memory 	 Functions Assign IP address Assign FROFINET device na Reset to factory settings 	Configured PROFINET device PROFINET device name: PRF ASI Gateway Device filter Only show devices of the same type Only show devices of the same type Only show devices with bad parameter settings Only show devices without names					10015 (ili) 1955 🖵 Libraries 🛛 Add-ins
		IP address	MAC address	Device	PROFINET device name	Status	
< m ≥ ✓ Details view		<			III		
					flashes Up	date list Assign name	
Name							
					© Properties	1. Info (i) Diagnostics	×
					Stroperates	Stine S Diagnostics	

Figure 4.5

6. Press the "Assign name" button

 \mapsto The status reports the successfully assigned name.

4.2.1.3 Factory Reset



Factory Reset

- **1.** Connect the gateway to the PROFINET network.
- 2. Open the Accessible Nodes dialog via the main menu "Online -> Accessible nodes..."



Figure 4.6

3. Select the gateway you want to reset.



	Accessible nodes of th	Type of the PG/PC interfa PG/PC interfa	ace: WPN/IE ace: WW Realtek I	JSB GbE Family Control	ler 💌 🔊 🖸
_	Device	Device type	Interface type	Address	MAC address
	Accessible device	PE ASi Gateway	ISO	00-00-81-00-63-	00-00-81-00-63-00
Flash LED	plc_1515f	CPU 1515F-2 PN	PN/IE	192.168.178.19	28-63-36-8A-FF-D5
Dnline status informat Found accessible Scan completed. Scan and informa Retrieving device	ion: device Accessible device 2 devices found. tion retrieval completed. information			🗌 Display only er	Start search ror messages

Figure 4.7

4. Click on the "Show" button.



Tip

If the gateway does not appear in the list of accessible nodes on the network, check your firewall settings.

- 5. Open the "Reset to factory settings" sub-menu.
- 6. Select whether the I&M data should be deleted or retained.
- 7. Click the "Reset" button and confirm the reset.



Figure 4.8

 \mapsto The gateway is reset.



4.2.1.4 Configuration of the Gateway Slots

Go to the device overview of the gateway.

Depending on the ASi nodes used and the required functions, different modules can be selected from the hardware catalog and added to the gateway configuration

The following modules are available:

- Digital data
- Analog data
- Command interface
- Diagnostic modules
- Gateway record module

For a detailed description of the function of these modules, see chapter 4.2.2.



Figure 4.9

Select at least one of the available modules and add it to any slot.

Note

You may have to set module parameters depending on which information module is used.



Setting the Start-Up Parameters

- **1.** Open the properties of the "Slot 0" slot.
- 2. Go to the module parameters.



Figure 4.10

3. You can set the start-up parameters of the available AS-Interface nodes in this window.


4.2.1.5 Device Replacement Without Exchangeable Medium/Programming Units

PROFINET IO devices that support the "Device replacement without exchangeable medium or programming unit" function can be replaced by identical devices in an existing PROFINET network. In such cases, the IO controller assigns the device name. To do so, it uses the configured topology and the neighborhoods determined by the IO devices. The AS-Interface gateways from Pepperl+Fuchs support the function for replacing devices without an exchangeable medium or programming unit.



Device Replacement

 Switch to the "Topology view" tab in the Editor. In the "Topology overview" table, "Any partner" is generally permitted as the partner port for each port.

2. Establish a connection between the appropriate Ethernet ports.

Mission D:Automatisierung\1515F_EP1 Project Edit View Insert Online Option ¹ ¹	I-KE5_V16\1515F_EP1-KE5_V16 Is Tools Window Help IS ± (≠± 등 🛄 🚺 🚆 🐺 💋 Go	online j	🖉 Go offline 🛔	n 🖪 🖪 🗶	= u) *		Totally Integ	_ □ × rated Automation PORTAL	
Project tree 🔲 🖣	1515F_EP1-KE5_V16 → Devices & n	etworks						_ # = × <	
Devices	12 🕂 📲 🖽 💷 🔍 ±				🚽 Topolog	y view	Network view	Device view	
1515F_EP1-KE5_V16 Add new device Devices & networks Devices & networks	PLC_1 CPU 1515F-2 PN	compar	íson	Asi-3 VBG- PLC	3-Gatewa EP1-KE5-I 1-	y) ≥ 200%	Port 2 [Ethermet interface.Ethermet p		
	Device / port S71500/ET200MP-Station_1 PLC_1 PLC_1 PDCFUNETschpittetalla_1	Slot	Partner station	Partner device	Partner interface	Partner port	Cable data	Libraries	
Details view	Port_1 Port_2 ProFINET-Schnittstelle_2 ProFINET-Schnittstelle_2	1 X1 P1 1 X1 P2 1 X2 1 X2 P1				Any partner Any partner		Add-ins	
Name	GSD device_1 ASi-3-Gateway	Slot 0			@ Prope	rties *i In	ifo i) & Diam		
Portal view Overview	Devices & ne 😟 Online & dia				311000	🔄 🤡 The PRO	FINET device name	*PN-KE5* w	

Figure 4.11

→ The port connection was successful if the corresponding port names are displayed in the "Topology overview" under "Partner port."

- **3.** Select the PROFINET IO controller and open the Properties.
- 4. Check whether the check box for "Support device replacement without exchangeable medium" is selected.



Note

If you also want to use the automatic assignment of the IP address and device name for preconfigured PROFINET devices, select the check box for "Permit overwriting of device names of all assigned IO devices."



roject tree 🛛 🛛	▲ 1515F_EP1-KE5_V16 PLC_1 [CPU 1515F-2 PN]	_ # = :
Devices		Topology view 🔒 Network view 🔐 Device view
	Image: Profilection e_0 Image: Profilection e_1 Image: Profile	Q Image: state
Common data		
Languages a resources Languages a resources Arrow for the face Antine access Card Reader/USB memory	General 10 tags System constants Tex General Advanced options Factivation Advanced options	ram if communication errors occur placement without exchangeable medium ng of device names of all assigned IO devices
	Operating mode	0

Figure 4.12

Note

A network topology is configured based on the connections between PROFINET ports on the individual devices. This can be reached via the "Port 0" slot of the PROFINET devices in use. Displaying all non-linked ports allows you to specify a suitable partner port in each case.

4.2.1.6 Watch and Force Tables

You can use watch and force tables to display and influence the status of process data.



Figure 4.13





Note

The digital process data are assigned to bytes; see chapter 4.2.2.1. Enter the corresponding byte for the process data that you want to display in the watch tables.

Displaying Process Data

1. Assign variables to the process data that describe the content in a meaningful way.

 \mapsto The names of the variables appear in the watch table:

₩	Siemens - D:\Automatisierung\1515F	_EP1-K	E5_V1	6\1515F_EP1-KE5_V	16						_ _ x
Pro	ject Edit View Insert Online O 🎦 🔒 Save project 📑 💥 🏥 📺	ptions	Tools	Window Help	🛃 💋 Go online	🖉 Go offline 🕌	 × -	Tota	lly Integrate	ed Automation PORT	AL
	Project tree 🛛 🛙	1	515F_	EP1-KE5_V16 → PL	C_1 [CPU 1515F	-2 PN] 🕨 Watch a	nd force tables	• Watch table	1	_ 7 =	× <
	Devices										8
	8	1	6) <u>a</u> r	1 10 10 91 93	2 00 00						Tes
2		-	i	Name	Address	Display format	Monitor value	Modify value	9	Comment	ting
TE	1515F_EP1-KE5_V16	A 1			%IBO	Bin 💌	1				
am	Add new device	2			%IB1	Bin					
-ifi	Devices & networks	3			%IB2	Bin					4
h	PLC_1 [CPU 1515F-2 PN]	≡ 4			%IB3	Bin					ast
L L	Device configuration	5			%IB4	Bin					ŝ
	🖏 Online & diagnostics	6			%IB5	Bin					
	Program blocks	7	5		%IB6	Bin					<u> </u>
	Technology objects	8			%IB7	Bin					E.
	External source files	9			%IB8	Bin					ari
	PLC tags	14	0		%IB9	Bin					es
	PLC data types	1	1		%IB10	Bin					
	Watch and force tables	15	2		%IB11	Bin					
	Add new watch table	15	3		%IB12	Bin					dd
	Forcetabelle	1.	4		%IB13	Bin					吉
	Watch table_1	11	5		%IB14	Bin					S
	Online backuns	¥ 1	6		%IB15	Bin					
	✓ Details view	1	7		%IB16	Bin					
		11	В		<add new=""></add>						
					N						
	1	_			63						
	Name										_
			<								>
							Properties	🔜 🛄 Info 🕕	& Diagnos	tics 📃 🖃	A
	Portal view Overview		A AS	-3-Gateway	e & dia Wa	tch table 1		The PPOFINET de	vice name "PN	VES* W	
			000 13	o doceway	10 00 W			The PROFINEL de	vice name PN	KED W	

Figure 4.14

Once you have created the watch table, you can transfer this data to the PLC. The data is checked for consistency by the PLC and compiled.



Transfering Data to the PLC

VA	Siemens - D:\Automatisierung\1515	F_EP	1-KE	5_V1(5\1515F_EP1-KE5_V1	16	
Pr	oject Edit View Insert Online (Option	5	Tools ± (21	Window Help	🔄 💋 Go ol	nline 🚀 Go affline
	Project tree	1	15	15F_I	Er 1)E5_V16 → PL	.c_1 [CPU 1!	515F-2 PN] → Wati
	Devices	1	-	e?	2 5 6 9, 9	2 ag a	27 1
2				1	Name	Address	Display format
in	1515F_EP1-KE5_V16	^	1			%IB0	Bin
am	Add new device		2			%IB1	Bin
5	💼 Devices & networks		3	0		%182	Bin
h	PLC_1 [CPU 1515F-2 PN]	=	4			%IB3	Bin
SLC	Device configuration		5			%IB4	Bin
	🖏 Online & diagnostics	-	6			%IB5	Bin





- 1. Press the "Download to device" symbol (1).
 - → The "Enhanced download to device" window opens. This window contains the connections with device names that are defined in the PROFINET network. See chapter 4.2.1.2.

	Device	Device type	Slot	Interface type	Address	Subnet	
	PLC 1	CPU 1515F-2 PN	1 X1	PN/IE	192.168.178.19	PN/IE	1
		CPU 1515F-2 PN	1 X2	PN/IE	192.168.1.1		
		Type of the PG/PC inte	erface:	PN/IE			
		PG/PC inte	erface	Pealtek USB (hE Family Controller		_ 7 @ 6
		Connection to interfacels	ubnet:	PN/IF 1	abe ranny controller		 7 @
		Connection to interfacers	ubitee				
		151 <u>G</u> a	termay:	-		-	
	Select target de Device	vice: Device type	Interf	ace type Ad	Show all compatible dress	devices Target dev	ice
Constant of the	PLC_2	CPU 1515F-2 PN	PN/IE	19	2.168.178.19	PLC_2	
*8	.	77 8	PN/IE	Ac	cess address		
🗌 Flash LED							
						Start	search
					Display only error r	nessages	
nline status înforma	tion:						-
nline status informa Found accessible	tion: device pn-ke5		und				1
nline status informa Found accessible Scan completed	tion: • device pn-ke5 1 compatible device:	s of 3 accessible devices fo	unu.				
nline status informa Found accessible Scan completed ? Retrieving device	tion: device pn-ke5 1 compatible device: information	s of 3 accessible devices fo	unu.				1

Figure 4.16

- 2. Select the PLC.
- 3. Press the "Load" button.

→ The "Load preview" window is displayed.



tatus	1	Target	Message	Action					
40	S	▼ PLC_1	1 Ready for loading.						
	4	✓ Protection	Protection from unauthorized access						
			Devices connected to an enterprise network or directly to the internet must be appropriately protected against unauthorized access, e.g. by use of firewalls and network segmentation. For more information about industrial security, please visit http://www.siemens.com/industrialsecurity						
	0	Stop modules	The modules are stopped for downloading to device.	Stop all					
	0	Device configura	Delete and replace system data in target	Download to device					
	0	Test and commis	Test and commis Modules with active test and commissioning function can prevent the downlo Software Download software to device						
	0	Software							
	0	Additional infor	There are differences between the settings for the project and the settings for	🗹 Overwrite all					
	ø	 Project compatib 	Different project versions in the offline configured device and target device (o	Upgrade target device.					
	0	Text libraries	Download all alarm texts and text list texts to device	Consistent download					
T			III.						
				Refresh					

Note

In the download dialog, the PLC sets itself to the "Stop" operating state if another operating state is set.

4. Press the "Load" button.

i

 ${}\rightarrowtail$ An event log of the loading process is displayed.

ect Edit View Insert Online	Option	Tools Window Help Totally I	ntegrated Auto	mation
Save project 📑 🐰 📳		1 ± (* ± 🖥 🛄 🕼 🚆 🐺 🌽 Go online 🖉 Go offline 🥼 🖪 👫 🗶 📃 🥤		PORTA
Project tree		i15F_EP1-KE5_V16 PLC_1 [CPU 1515F-2 PN] Watch and force tables Watch table_1	1	
Devices				
FØ	1.	2 2 2 1 1 1 1 1 9, 9, 99 00 00		
				-
1515E EP1-KES V16		September 24 Info	Diagnostics	
Add new device	-	General Cross-references Compile		
Devices & networks		A B Show all messages		
▼ PLC_1 [CPU 1515F-2 PN]	III			
Device configuration		Message Go to ?	Date	Time
😼 Online & diagnostics		Scanning for devices completed for interface Realtek USB GbE Family Controller Found 2 de	1/25/2022	5:24
🕨 🙀 Program blocks		The PROFINET device name "PN-KE5" was successfully assigned to MAC address "00-0D-81-0.	1/25/2022	5:27
Technology objects		The project 1515F EP1-KE5 V16 was saved successfully.	1/25/2022	5:55
External source files		 Start downloading to device. 	1/25/2022	5:57
🕨 🛃 PLC tags		▼ PLC_1	1/25/2022	5:58
PLC data types		 Hardware configuration 	1/25/2022	5:58
 Watch and force tables 		PLC_1 stopped.	1/25/2022	6:01
Add new watch table		Hardware configuration was loaded successfully.	1/25/2022	6:01
Forcetabelle	_	Routing configuration was loaded successfully.	1/25/2022	6:01
Watch table_1		PLC_1 started.	1/25/2022	6:01
Online backuns		'Main' was loaded successfully.	1/25/2022	6:01
Details view		'I/O_FLT1' was loaded successfully.	1/25/2022	6:01
Module		'I/O_FLT2' was loaded successfully.	1/25/2022	6:01
		'RACK_FLT' was loaded successfully.	1/25/2022	6:01
Name		Startup' was loaded successfully.	1/25/2022	6:01
Pevice configuration	~	Scanning for devices completed for interface Realtek USB GbE Family Controller. Found 2 de	1/25/2022	5:57
Online & diagnostics		Loading completed (errors: 0; warnings: 0).	1/25/2022	6:01
Deserves blocks	~			>







Opening a Watch Table

1. Switch to the "Watch and force tables" tab.

Pr	oject Edit View Insert Onlin F 🎦 🕞 Save project 📑 🐰 🔮	Op	tion ×	5	Tools ± C	Window Help	9	🚰 💋 Go onli	ne 🔊 Go offline 🛔
	Project tree	П	4	15	15F_E	P1-KE5_V16	PL	C_1 [CPU 151	5F-2 PN] + Wate
	Devices								
	- Bi] 🗉	3	-	-	12 10 9	1 2	2 00 00	
ş					i	Name		Add 1 &	Display format
i	1515F_EP1-KE5_V16	0	^	1				%IBO	Bin
me	Add new device			2				%IB1	Bîn
160	📠 Devices & networks			3				%IB2	Bin
pre	PLC_1 [CPU 1515F-2 PN]	•		4				%IB3	Bin
5	Device configuration			5				%IB4	Bin
	Q Online & diagnostics			6				%IB5	Bin
	Program blocks			7				%IB6	Bin
	Technology objects			8	1			%IB7	Bin

Figure 4.19

2. Click on the "Watch all" symbol. 1.

 \mapsto The watch table opens.

יש Save project 🛁 א אַ oject tree		うき 1515	(#2 1 U 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Go onl	ne 💉 Go 5E-2 PNI	offline	force tables	Watch ta	able 1	POR
Devices										
			1 12 19 10 9 , 90 27	00 00				_		
		i	Name	Address	Display	Monitor value	Modify value	9	Comm	Tag comment
1515F_EP1-KE5_V16		1	"IN_Flags_Slave1"	%IBO	Bin	2#0000_0000				Bit 7-4=Flags Bit 0-3=Slave1
Add new device		2	"IN_Slave2_Slave3"	%IB1	Bin	2#0100_0000				Bit 7-4=Slave2 Bit 0-3=Slave3
h Devices & networks		3	"IN_Slave4_Slave5"	%IB2	Bin	2#0111_0011				Bit 7-4=Slave4 Bit 0-3=Slave5
PLC_1 [CPU 1515F-2 PN]		4	"IN_Slave6_Slave7"	%IB3	Bin	2#1110_0000				Bit 7-4=Slave6 Bit 0-3=Slave7
Device configuration	=	5	"IN_Slave8_Slave9"	%IB4	Bin	2#0000_0000				Bit 7-4=Slave8 Bit 0-3=Slave9
& Online & diagnostics		6	"IN_Slave26_Slave27"	%IB13	Bin	2#0000_0000				Bit 7-4=Slave26 Bit 0-3=Slave27
Rrogram blocks	0	7	"IN_Slave28_Slave29"	%IB14	Bin	2#0000_0000				Bit 7-4=Slave28 Bit 0-3=Slave29
Technology objects		8	"IN_Slave30_Slave31"	%IB15	Bin	2#0000_0000				Bit 7-4=Slave30 Bit 0-3=Slave31
External source files		9	"OUT_Flags_Slave1"	%Q80	Bin	2#0000_0000				Bit 7-4=Flags Bit 0-3=Slave1
PLC tags		10	"OUT_Slave2_Slave3"	%QB1	Bin	2#0000_0000				Bit 7-4=Slave2 Bit 0-3=Slave3
PLC data types		11	"OUT_Slave4_Slave5"	%QB2	Bin 💌	2#0000_0000	16#05		1	Bit 7-4=Slave4 Bit 0-3=Slave5
▼ 🥅 Watch and force tables		12	"OUT_Slave6_Slave7"	%QB3	Bin	2#0000_0000				Bit 7-4=Slave6 Bit 0-3=Slave7
Add new watch ta		13	"OUT_Slave8_Slave9"	%QB4	Bin	2#0000_0000				Bit 7-4=Slave8 Bit 0-3=Slave9
Fill Forcetabelle		14	"OUT_Slave10_Slave11"	%Q85	Bin	2#0000_0000				Bit 7-4=Slave10 Bit 0-3=Slave11
Watch table_1		15	"OUT_Slave12_Slave13"	%QB6	Bin	2#0000_0000				Bit 7-4=Slave12 Bit 0-3=Slave13
Online backups		16	"OUT_Slave14_Slave15"	%QB7	Bin	2#0000_0000				Bit 7-4=Slave14 Bit 0-3=Slave15
Traces		17		<add nev<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td></add>						
Device proxy data										
Program info	~									
	1	<					101			

Figure 4.20



Controlling Outputs

You can use the modify value to influence outputs listed in the tables.

1. Enter a value in the "Modify value" column.

🛉 🔚 Save project 📑 🐰 💷	×	" <u></u>) ≑ (°		🖉 Go onli	ne 💋 Go	offline 🛃 🛄				POR
oject tree				ICAO 121			Torce tables 🕨			-4.81
Devices										
			1. 19 10 91 90 27							
		i	Name	Address	Display	Monitor value	Modify value	9	Comm	Tag comment
1515F_EP1-KE5_V16	0 ^	1	"IN_Flags_Slave1"	%IB0	Bin	2#0000_0000				Bit 7-4=Flags Bit 0-3=Slave1
Add new device		2	"IN_Slave2_Slave3"	%IB1	Bin	2#0100_0000				Bit 7-4=Slave2 Bit 0-3=Slave3
Devices & networks		3	"IN_Slave4_Slave5"	%IB2	Bin	2#0111_0011				Bit 7-4=Slave4 Bit 0-3=Slave5
PLC_1 [CPU 1515F-2 PN]	0	4	*IN_Slave6_Slave7*	%IB3	Bin	2#1110_0000				Bit 7-4=Slave6 Bit 0-3=Slave7
Device configuration	章	5	"IN_Slave8_Slave9"	%IB4	Bin	2#0000_0000				Bit 7-4=Slave8 Bit 0-3=Slave9
😵 Online & diagnostics		6	"IN_Slave26_Slave27"	%IB13	Bin	2#0000_0000				Bit 7-4=Slave26 Bit 0-3=Slave27
Program blocks	•	7	*IN_Slave28_Slave29*	%IB14	Bin	2#0000_0000				Bit 7-4=Slave28 Bit 0-3=Slave29
Technology objects		8	"IN_Slave30_Slave31"	%IB15	Bin	2#0000_0000				Bit 7-4=Slave30 Bit 0-3=Slave31
External source files		9	"OUT_Flags_Slave 1"	%QBO	Bin	2#0000_0000				Bit 7-4=Flags Bit 0-3=Slave1
PLC tags	•	10	"OUT_Slave2_Slave3"	%QB1	Bin	2#0000_0000				Bit 7-4=Slave2 Bit 0-3=Slave3
C PLC data types		11	"OUT_Slave4_Slave5"	%QB2	Bin 💌	2#0000_0000	16#05		4	Bit 7-4=Slave4 Bit 0-3=Slave5
▼ 🙀 Watch and force tables		12	"OUT_Slave6_Slave7"	%QB3	Bin	2#0000_0000				Bit 7-4=Slave6 Bit 0-3=Slave7
💕 Add new watch ta		13	"OUT_Slave8_Slave9"	%QB4	Bin	2#0000_0000				Bit 7-4=Slave8 Bit 0-3=Slave9
Forcetabelle		14	*OUT_Slave10_Slave11*	%QB5	Bin	2#0000_0000				Bit 7-4=Slave10 Bit 0-3=Slave11
Watch table_1		15	"OUT_Slave12_Slave13"	%QB6	Bin	2#0000_0000				Bit 7-4=Slave12 Bit 0-3=Slave13
Online backups		16	"OUT_Slave14_Slave15"	%QB7	Bin	2#0000_0000				Bit 7-4=Slave14 Bit 0-3=Slave15
🕨 🔄 Traces		17		<add new<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td></add>						
Device proxy data Program info	~									
	>	<)III			

Figure 4.21

2. Activate the modify value with the key combination "Shift+F9."



Tip

Analog Values and Error Lists

In the watch table, you can watch analog values and error lists for appropriately configured nodes.

💁 🛃 Save project 🛛 🚊 💥 🧾		x n	* (** 🗟 🗵 🖬 🖫	. 🚿 Go onli	ne 💋 Go	offline	■ × ∃	_ •	Totally Integrated Au	PORT
roject tree	Ð	15	15F_EP1-KE5_V16 → PLC_	1 [CPU 151	5F-2 PN]	Watch and	force tables 🔸	Watch ta	ible_1	- 7 1
Devices										
 8		1	₩ <u>12</u> 10 16 9. %.	2 00 00	1					
			i Name	Address	Display	Monitor value	Modify value	9	Comm Tag comment	
1515F EP1-KE5 V16		A 17	Il analogue data Asi line 1	11111111111111111111					halos anno las Status annos	
Add new device		18	"ana_in_Slv29"	%IW116	DEC	6366				
Devices & networks		19	Il configuration errors							
PLC_1 [CPU 1515F-2 PN]		20		%IB68	Bin	2#0000_0100				
Device configuration		章 21		%IB69	Bin	2#1000_0000				
🗓 Online & diagnostics		22		%IB70	Bin	2#0001_0000				
Program blocks	0	23		%IB71	Bin	2#0000_0000				
Technology objects	1	- 24		%IB72	Bin	2#0000_0000				
External source files		25		%IB73	Bin	2#0000_0000				
PLC tags		26	Il peripheral errors							
PLC data types		27		%IB76	Bin	2#0000_0000				
 Watch and force tables 		28		%IB77	Bin	2#0000_0000				
Add new watch ta		29		%IB78	Bin	2#0000_1000				
Forcetabelle		30		%IB79	Bin	2#0000_0000				
Watch table_1		31		%IB80	Bin	2#0000_0000				
🕨 🔣 Online backups		32		%881	Bin	2#0000_0000				
Traces		33		%IB82	Bin	2#0000_0000				
Device proxy data		34		<add nev<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td></add>						
Program info		~								
	>		<		3 °	III				>
Details view							Propert	ies 🐴	Info 😨 Diagnostics	1-
Bortal view	niew		ASia Gatew Watch t	able 1 👝 F	C taris	Main (O	81)	Com.	and an RI C. J. via address (R-J)	

4.2.2 Modules

You can use the modules from the GSDML file to configure the gateway for the transfer of various process data. Below is a description of all the modules available in the GDSML file.



Note

The following representations show the default settings of the respective modules.

Use the one-segment module for the VBG-EP1-KE5-D and the two-segment modules for the VBG-EP1-KE5-DMD.

In the case of VBG-EP1-KE5-D, there is no reference to segment 1 or segment 2.

4.2.2.1 Digital Data

The gateway uses the digital data modules to transfer digital process data to the PLC. You can find the following modules for configuring the gateway in the GSDML file.

Digital Input and Output Data

Module	Number of segments	Description
32 bytes DIO	1	32 bytes of digital input and output data for all single nodes, A nodes, and B nodes in segment 1
Line 1: 16 bytes DIO	2	16 bytes of digital input and output data for all nodes ¹ in segment 1
Line 2: 16 bytes DIO	2	16 bytes of digital input and output data for all nodes ¹ in segment 2
Line 1: 32 bytes DIO	2	32 bytes of digital input and output data for all nodes in segment 1
Line 2: 32 bytes DIO	2	32 bytes of digital input and output data for all nodes in segment 2

Table 4.1

1. with a standard address or O address

Digital Input Data

Module	Number of segments	Description
32 bytes DI	1	32 bytes of digital input data for all single nodes, A nodes, and B nodes in segment 1
Line 1: 16 bytes DI	2	16 bytes of digital input data for all nodes ¹ in segment 1
Line 2: 16 bytes DI	2	16 bytes of digital input data for all nodes ¹ in segment 2
Line 1: 32 bytes DI	2	32 bytes of digital input data for all nodes in segment 1
Line 2: 32 bytes DI	2	32 bytes of digital input data for all nodes in segment 2

Table 4.2



Digital Output Data

Module	Number of segments	Description
32 bytes DO	1	32 bytes of digital output data for all single nodes, A nodes, and B nodes in segment 1
Line 1: 16 bytes DO	2	16 bytes of digital output data for all nodes ¹ in segment 1
Line 2: 16 bytes DO	2	16 bytes of digital output data for all nodes ¹ in seg- ment 2
Line 1: 32 bytes DO	2	32 bytes of digital output data for all nodes in seg- ment 1
Line 2: 32 bytes DO	2	32 bytes of digital output data for all nodes in seg- ment 2

Table 4.3

Input Data

The data of address 0 is reserved for AS-Interface status messages to the gateway:

Error	Designation	Description
F0	Config Error	0 = Configuration OK 1 = Configuration error present
F1	ASi Power Fail	0 = AS-i voltage OK 1 = AS-i voltage missing / too low
F2	Peripheral Fault	0 = Peripherals OK 1 = Peripheral fault present
F3	Configuration Active	0 = Protected mode 1 = Configuration mode

Table 4.4

Output Data

F0 can be used by the PLC to put the gateway into offline mode:

Flag	Designation	Description
FO	Offline Mode flag	0 = Switches ASi gateway into online mode 1 = Switches ASi gateway into offline mode
F1	Reserved	-
F2	Reserved	-
F3	Reserved	-

Table 4.5

Assignment of AS-Interface / PROFINET in the 16-Byte Field

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
F3	F2	F1	F0	Node 1/1A			•
Node 2/2	A			Node 3/3A			
Node 30/30A				Node 31/31A			
	Bit 7 F3 Node 2/2 Node 30/	Bit 7Bit 6F3F2Node 2/2 ×Node 30/30A	Bit 7 Bit 6 Bit 5 F3 F2 F1 Node 2/2	Bit 7 Bit 6 Bit 5 Bit 4 F3 F2 F1 F0 Node 2/2	Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 F3 F2 F1 F0 Node 1/1 Node 2/2 V Node 3/3 Node 3/3 V V Node 31/2	Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 F3 F2 F1 F0 Node 1/1 Node 2/2 $$	Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 Bit 1 F3 F2 F1 F0 Node $1/1 \times$ View View

Table 4.6

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	F3	F2	F1	F0	Node 1/1A			
1	Node 2/2A				Node 3/3A			
15	Node 30/	30A			Node 31/31A			
16	Reserved				Node 1B			
17	Node 2B				Node 3B			
31	Node 30	3			Node 31B			

Assignment of AS-Interface / PROFINET in the 32-Byte Field

Table 4.7

Analog Data



Note

The actual memory address of the AS-Interface nodes is defined in the hardware configuration of the PLC.

4.2.2.2

The gateway uses the analog data module to transfer cyclic analog process data to the PLC.

You can configure the gateway for analog input or output data. The bandwidth of the data transfer can be adapted to the requirements of the analog modules present in the network.

Channel Settings

An AS-Interface analog module can transfer up to four channels with 16 bits (= 2 bytes) of data each. If not all four channels are used, the data transfer can be parameterized in such a way that only the channels actually used are transferred.

The data field size is defined by selecting the corresponding analog data module from the GSDML, e.g., "8 words AI" transfers 8 channels or 16 bytes of analog input data.

In the module parameters, the "Channel Filter" parameter can be used to select which channels and how many channels are transferred per node address.

the second s	The All the Delay of the Delay	L
Channel filter:	Channel 1	
	Channel 1	
	Channel 2	
	Channel 1+2	
	Channel 3	
	Channel 1+3	
	Channel 4	
	Channel 3+4	
	All 4 channels	

Figure 4.23 Channel Filter

The channel filter can be used to define how many channels each analog node can use. The amount of data for the individual settings is determined by the selected module.

- Channel *: 1 channel per consecutive node address
- Channel *+*: 2 channels per consecutive node address
- All 4 channels: 4 channels per consecutive node address

The "First device address" field is used to specify the numerically first assigned AS-Interface address of the connected analog nodes.

Note

The connected analog nodes must have consecutive addresses to make meaningful use of the setting.



Analog Input Data

Module	Number of segments	Description				
Modules for 2-channel (2 words) parameterizable analog input data:						
2 words AI	1	2-channel analog input data in segment 1				
Line 1: 2 words AI	2	2-channel analog input data in segment 1				
Line 2: 2 words AI	2	2-channel analog input data in segment 2				
Modules for 4-channel (4	words) param	eterizable analog input data:				
4 words AI	1	4-channel analog input data in segment 1				
Line 1: 4 words AI	2	4-channel analog input data in segment 1				
Line 2: 4 words AI	2	4-channel analog input data in segment 2				
Modules for 8-channel (8	words) param	eterizable analog input data:				
8 words AI	1	8-channel analog input data in segment 1				
Line 1: 8 words AI	2	8-channel analog input data in segment 1				
Line 2: 8 words AI	2	8-channel analog input data in segment 2				

Table 4.8

Analog Output Data

Module	Number of segments	Description
Modules for 2-channel (2	words) param	eterizable analog output data:
2 words AO	1	2-channel analog output data in segment 1
Line 1: 2 words AO	2	2-channel analog output data in segment 1
Line 2: 2 words AO	2	2-channel analog output data in segment 2
Modules for 4-channel (4)	words) param	eterizable analog output data:
4 words AO	1	4-channel analog output data in segment 1
Line 1: 4 words AO	2	4-channel analog output data in segment 1
Line 2: 4 words AO	2	4-channel analog output data in segment 2
Modules for 8-channel (8	words) param	eterizable analog output data:
8 words AO	1	8-channel analog output data in segment 1
Line 1: 8 words AO	2	8-channel analog output data in segment 1
Line 2: 8 words AO	2	8-channel analog output data in segment 2

Table 4.9



Example

The AS-Interface address 4 is set as the "First device address." There are four analog nodes connected. The channels 1+2 are transferred to each of the node addresses 4 - 7.4 bytes of data are transferred per analog node. The 8 words AI module transfers 16-byte data packets from the gateway to the PLC.

• The "Channel 1+2" channel filter is used to transfer analog data as a 16-byte data packet via channels 1 and 2 of node addresses 4 to 7.

Assignment of AS-Interface Analog Data / PROFINET in the 16-Byte Field

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	Node 4:2	Node 4: 2 bytes of analog data, channel 1							
1	1								
2	Node 4:2	bytes of a	analog data	a, channel	2				
3									
12	Node 7: 2 bytes of analog data, channel 1								
13									
14	Node 7:2	bytes of a	analog data	a, channel	2				
15									

Channel Filter "Channel 1+2"

Table 4.10

Channel Filter "Channel 1"

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	Node 4:2	Node 4: 2 bytes of analog data, channel 1							
1									
2	Node 5:2	bytes of a	nalog data	a, channel '	1				
3									
12	Node 10:	Node 10: 2 bytes of analog data, channel 1							
13									
14	Node 11: 2 bytes of analog data, channel 1								
15									
Table 4 11									

Table 4.11



4.2.2.3

Note

For analog nodes with A/B addresses, the data is mapped in channels 1 and 2 for nodes with an A address, and in channels 3 and 4 for nodes with a B address.

AS-Interface Diagnostic Information

Flags + Fault Detector

The gateway provides a list of collective error messages for each AS-Interface segment with the "Flags + Fault Detector." In the error message, the bits indicate whether there is an error in the network.

Error Messages

Module	Number of segments	Description
flags + fault det.	1	Collective error messages in segment 1
Line 1: flags + fault det.	2	Collective error messages in segment 1
Line 2: flags + fault det.	2	Collective error messages in segment 2

Table 4.12





Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	-	-	-	Earth fault	-	-	-	Peripheral fault
1	ASi master offline	ASi power fail	In normal operation	Configuration mode active	Auto address assign- ment available	Auto address assign- ment not possible	LDS.0	Configura- tion error

Assignment of AS-Interface/PROFINET in the 2-Byte Field

Table 4.13

Error Messages

Designation	Description			
Peripheral fault	0 = No activated node reports a peripheral fault 1 = At least one node reports a peripheral fault			
Earth fault	0 = No short circuit to ground detected on the AS-Interface network 1 = Short circuit to ground detected on the AS-Interface ne work			
Configuration error	0 = There is no configuration error 1 = At least one configuration error found			
LDS.0	0 = No ASi node with address 0 found 1 = ASi node with address 0 is connected to the ASi segment			
Auto address assignment not possible	0 = The condition for automatic address assignment is cur- rently met 1 = Automatic address assignment is currently not possible			
Auto address assignment available	0 = Automatic address assignment is disabled 1 = The gateway performs an automatic address assignment as soon as the conditions for automatic addressing are met.			
Configuration mode active	0 = ASi gateway is in protected mode 1 = ASi gateway is in configuration mode			
in normal operation	0 = ASi gateway not in the normal operating state (e.g., startup phase) 1 = ASi gateway is in the normal operating state			
ASi power fail	0 = ASi segment voltage OK 1 = ASi segment voltage too low or power failure during data transfer on the ASi network			
ASi master offline	0 = ASi gateway is online 1 = ASi gateway is offline			

Table 4.14

Configuration Errors

The gateway provides a list of configuration errors for each AS-Interface segment. The configuration errors indicate directly in the process data if a configuration error is present at a node address.

Error Messages

Module	Number of segments	Description
config. err.	1	Configuration error in segment 1
Line 1: config. err.	2	Configuration error in segment 1
Line 2: config. err.	2	Configuration error in segment 2

Table 4.15

Assignment of AS-Interface/PROFINET in the 8-Byte Field

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	0
1	15A/15	14A/14	13A/13	12A/12	11A/11	10A/10	9A/9	8A/8
2	23A/23	22A/22	21A/21	20A/20	19A/19	18A/18	17A/17	16A/16
3	31A/31	30A/30	29A/29	28A/28	27A/27	26A/26	25A/25	24A/24
4	7B	6B	5B	4B	3B	2B	1B	0
5	15B	14B	13B	12B	11B	10B	9B	8B
6	23B	22B	21B	20B	19B	18B	17B	16B
7	31B	30B	29B	28B	27B	26B	25B	24B

Table 4.16

Bit Values

- 1 A configuration error is present. The configuration of the node does not match the expected configuration.
- **0** Configuration OK. The configuration of the node matches the expected configuration.

Peripheral Faults

The gateway provides a list of peripheral faults for each AS-Interface segment. The peripheral faults indicate directly in the process data if a peripheral fault is present at a node address.

Error Messages

Module	Number of segments	Description
peripheral fault	1	Peripheral fault in segment 1
Line 1: peripheral fault	2	Peripheral fault in segment 1
Line 2: peripheral fault	2	Peripheral fault in segment 2

Table 4.17



Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	0
1	15A/15	14A/14	13A/13	12A/12	11A/11	10A/10	9A/9	8A/8
2	23A/23	22A/22	21A/21	20A/20	19A/19	18A/18	17A/17	16A/16
3	31A/31	30A/30	29A/29	28A/28	27A/27	26A/26	25A/25	24A/24
4	7B	6B	5B	4B	3B	2B	1B	0
5	15B	14B	13B	12B	11B	10B	9B	8B
6	23B	22B	21B	20B	19B	18B	17B	16B
7	31B	30B	29B	28B	27B	26B	25B	24B

Assignment of AS-Interface/PROFINET in the 8-Byte Field

Table 4.18

Bit Values

- 1 The node is enabled and reports a peripheral fault
- 0 The node does not report a peripheral fault or the node is disabled

4.2.2.4 Command Interface

In addition to the cyclic data images, information from the gateway can be retrieved via the command interface. For this purpose, the Command Interface module from the GSDML file is integrated into the cyclic data exchange. The gateway is addressed by the PLC with special commands via the Command Interface module. The node receives parameters or responds with the requested data.

Module	Number of segments	Description
12 bytes Command Int.	-	12-byte command interface
32 bytes Command Int.	-	32-byte command interface

Table 4.19

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Command							
1	Т	0	-	-	-	-	-	Segment
2	0		A/B	ASi node address				
3	Byte 1 payload data							
	Byte payload data							
n-1	Byte n-3	Byte n-3 payload data						

Table 4.20

Note

Γ

The node address is only used when a specific node is addressed, otherwise "Byte 0 payload data" is used.

The "command / toggle bit" command request is included in the command response if the command has been revised by the ASi gateway.

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	Command ¹								
1	Т	T Error code							
2	Byte 0 payload data								
	Byte p	Byte payload data							
n-1	Byte n-3 payload data								

Table 4.21

1. Corresponds to the requested command

Description

- Command: 1-byte command value
- T = Toggle bit: the bit must be inverted to resend the same command
- Segment: describes the AS-Interface segment that is controlled by the gateway
 - Segment = 0: AS-Interface segment 1
 - Segment = 1: AS-Interface segment 2
- A/B: node address is an A or B address
- ASi node address: numeric node address
- Error code: a description of an error in the execution of the command, if applicable
- Payload data: command-specific; contains data specified by a command

Overview of Commands

The following 1-byte commands can be sent to the gateway via the command interface:

Designation	Value _{hex}	Reference
GET_PERMANENT_PARAMETER	0x01	See chapter 7.1
WRITE_PARAMETER	0x02	See chapter 7.2
READ_PARAMETER	0x03	See chapter 7.3
STORE_ACTUAL_PARAMETERS	0x04	See chapter 7.4
STORE_ACTUAL_CONFIGURATION	0x07	See chapter 7.5
SET_OFFLINE_MODE	0x0A	See chapter 7.6
SET_AUTO_ADDRESS_ENABLE	0x0B	See chapter 7.7
SET_OPERATION_MODE	0x0C	See chapter 7.8
CHANGE_SLAVE_ADDRESS	0x0D	See chapter 7.9
SET_PERMANENT_CONFIGURATION	0x25	See chapter 7.10
GET_PERMANENT_CONFIGURATION	0x26	See chapter 7.11
READ_ACTUAL_CONFIGURATION	0x28	See chapter 7.12
SET_LPS	0x29	See chapter 7.13
GET_LPF	0x3E	See chapter 7.14
WRITE_EXTENDED_ID_CODE_1	0x3F	See chapter 7.15
SET_PERMANENT_PARAMETER	0x43	See chapter 7.16
GET_LPS	0x44	See chapter 7.17
GET_LAS	0x45	See chapter 7.18
GET_LDS	0x46	See chapter 7.19
GET_FLAGS	0x47	See chapter 7.20
SET_DATA_EXCHANGE_ACTIVE	0x48	See chapter 7.21



Designation	Value _{hex}	Reference
GET_DELTA_LIST	0x57	See chapter 7.22
GET_LCS	0x60	See chapter 7.23
GET_AUTO_ADDRESS_ENABLE	0xE1	See chapter 7.24

Table 4.22

Command Response Error Codes

The following error codes occur when a command execution fails.

Error Codes

Designation	Value	Description
OK	0x00	Error-free execution
HI_NG	0x11	General fault
HI_OPCODE	0x12	Impermissible value in the command
HI_LENGTH	0x13	The length of the command interface is too short
HI_ACCESS	0x14	No access permission Command not allowed due to operating mode
EC_NG	0x21	General fault
EC_SND	0x22	Node not detected at the specified source address
EC_SD0	0x23	Node detected at address 0
EC_SD2	0x24	Node not detected at the specified target address
EC_DE	0x25	Error during deletion
EC_SE	0x26	Error during writing
EC_AT	0x27	Temporary address
EC_ET	0x28	Temporary ID1 code
EC_RE	0x29	ID1 code read error
Unsupported command index	0x41	The command sent is not supported
Invalid command header	0x42	The command header sent contains an invalid value
Invalid command interface module length	0x43	The length of the command interface com- mand is invalid
Invalid request payload data	0x44	-
Reserved	0x45-0x47	-
Command conflict	0x48	The command sent conflicts with another command
Reserved	0x4A – 0x4B	-
Invalid configured slave address	0x4D	The configured node address is invalid
Auto addressing in progress	0x50	The command could not be executed because the master addresses automatically
Normal operation required	0x51	The command requires the gateway to be in normal operation
Permanent data access error	0x52	Error during permanent data access

PEPPERL+FUCHS

Designation	Value	Description
Device not activated	0x53	For example, when a user sends a parameter to a device that is not in LAS
Management phase busy	0x54	Command cannot be executed because the gateway is already executing a command
Undefined status	0x7F	Undefined error

Table 4.23

4.2.2.5 Gateway Record Modules

The Gateway Record Module can be used to access information from the gateway via acyclic PROFINET services. The configuration of the gateway can be changed.



Тір

Siemens TIA uses function blocks SFB52 "RDREC: Read data set" and SFB53 "WRREC: Write data set" for this purpose.

Master Data Module

Module	Number of segments	Description
ASi gateway record module	1	Acyclic PROFINET services in segment 1
Line 1: ASi gateway record module	2	Acyclic PROFINET services in segment 1
Line 2: ASi gateway record module	2	Acyclic PROFINET services in segment 2

In the case of PROFINET, acyclic data is exchanged via the "Record" service.

Assignment of AS-Interface/PROFINET

AS-Interface	PROFINET			
Control functions	Service	Index	Select node	Reference
Read_IDI	RecordDataRead	0x01		See chapter 8.1
Write_ODI	RecordDataWrite	0x02		See chapter 8.2
Set_Permanent_Parameter	RecordDataWrite	0x03	Yes	See chapter 8.3
Get_Permanent_Parameter	RecordDataRead	0x04	Yes	See chapter 8.4
Read_Parameter	RecordDataRead	0x06	Yes	See chapter 8.5
Set_Permanent_Configuration	RecordDataWrite	0x08	Yes	See chapter 8.3
Get_Permanent_Configuration	RecordDataRead	0x09	Yes	See chapter 8.7
Read_Actual_Configuration	RecordDataRead	0x0B	Yes	See chapter 8.8
Set_LPS	RecordDataWrite	0x0C		See chapter 8.9
Get_LPS	RecordDataRead	0x0D		See chapter 8.10
Get_LAS	RecordDataRead	0x0E		See chapter 8.11
Get_LDS	RecordDataRead	0x0F		See chapter 8.12
Get_Flags	RecordDataRead	0x10		See chapter 8.13
Set_Operation_Mode	RecordDataWrite	0x11		See chapter 8.14
Set_Offline_Mode	RecordDataWrite	0x12		See chapter 8.15
Set_Data_Exchange_Active	RecordDataWrite	0x13		See chapter 8.16



AS-Interface	PROFINET			
Control functions	Service	Index	Select node	Reference
Change_Slave_Address	RecordDataWrite	0x14		See chapter 8.17
Set_Auto_Addr_Enable	RecordDataWrite	0x15		See chapter 8.18
Get_Auto_Addr_Enable	RecordDataRead			See chapter 8.19
Get_LPF	RecordDataRead	0x17		See chapter 8.20
Write_Extended_ID-Code_1	RecordDataWrite	0x18		See chapter 8.21
Read_AIDI	RecordDataRead	0x19		See chapter 8.22
Write_AODI	RecordDataWrite	0x1A		See chapter 8.23
Get_Delta_List	RecordDataRead	0x40		See chapter 8.24
Get_LCS	RecordDataRead	0x41		See chapter 8.25
Write_Parameter	RecordDataWrite	0x42	Yes	See chapter 8.26
Read_Response_To_Write_Pa- rameter	RecordDataRead		Yes	See chapter 8.27
Reset_Slave	RecordDataWrite	0x43	Yes	See chapter 8.28
Read_Response_to_Reset_Slave	RecordDataRead		Yes	See chapter 8.29
Select_Slave	RecordDataWrite	0x44	Yes	See chapter 8.30
Store_Actual_Parameters	RecordDataWrite	0x45		See chapter 8.31
Store_Actual_Configuration	RecordDataWrite	0x46		See chapter 8.32

4.3 EtherNet/IP

4.3.1 Preparation

To connect a gateway to the controller, you need an EDS file. Each gateway version requires its own EDS file.

Switching to EtherNet/IP Mode

The standard protocol of the ASi gateway is PROFINET. You can switch the protocol using the push button.



Switching the Protocol

1. Press and hold the push button for at least five seconds.



Figure 4.24

 \mapsto The gateway switches to configuration mode.

 \mapsto The Config OK ASi Line 1 LED flashes.

2. VBG-EP1-KE5-DMD: Short-press the push button four times. VBG-EP1-KE5-D: Short-press the push button twice.

 \hookrightarrow The SF/MS LED flashes.

3. Press and hold the push button for at least five seconds.

→ The gateway switches the protocol to EtherNet/IP.

Downloading the EDS File

You can find the relevant EDS file in the "Software" section of the product detail page for your device.

Use the hardware or network configuration tools from the manufacturer of your controller to install the EDS file of your gateway. After installation, you will find the gateway in the hardware catalog as a "General Purpose Discrete I/O" device.

Reading the MAC Address

Each gateway has a unique MAC address that cannot be changed by the user. The assigned MAC address is printed on the right-hand side of the device.



Setting the Network Parameters

The gateway uses the DHCP protocol to set the required network parameters, such as IP address and subnet mask.

7	

Tip

You can change the network settings using the X3 diagnostic port. The default IP address of X3 is 192.168.1.2.

7

Setting the Network Parameters Using the BootP DHCP Tool

1. In a Rockwell development environment, we recommend using the "BootP DHCP Tool" program to set the correct IP address. This tool is included automatically when Studio 5000 is installed or can be downloaded separately from the Rockwell Automation Support Center.

Ethernet Address (MAC)	Туре	Discovery H (hr:min:sec)	listory #	IP Address	1	Hostname
00:0D:81:0B:61:A4	DHCP	9:04:52	5			
Delete Relation		Entered Re	elations	Enable BOOT	P/DHCP	Disable BOOTP/DHCP
Delete Relation Ethernet Address (MAC)	Туре	Entered Re	elations	Enable BOOT Hostname	P/DHCP Descri	Disable BOOTP/DHCP
Delete Relation Ethernet Address (MAC) 00:0D:81:0B:61:A4	Туре	Entered Re IP Address 192.168.1.10	elations	Enable BOOT Hostname ASi-Gat	P/DHCP Descri	Disable BOOTP/DHCP ption

Figure 4.25



Setting the Network Parameters Using RSLinx Classic Lite

1. You can use RSLinx to change the settings once the network settings have been set.

a 20			
KSWho - 1 Autobrowse Refresh the main Browsing - node 192.168.2.2 fr Autobrowse Refresh the main Browsing - node 192.168.2.2 fr Solution Stress S	AB_ETHIP-1\192.168.2.2 VBG General Pot Configuration Pot: 1 © Manually configure IP set Obtain IP settings automa IP Address: Network Mask: Gateway Address: Primary Name Server: Secondary Name Server: Domain Name: Host Name: Status: Network Inte	-EP1-KE5-DMD Configuration Advanced Port Configuration tings titically using BOOTP titically using DHCP 192 168 2 255 255 0 192 168 137 0 0 0 	. 2 . 0 . 1 . 0 . 1 . 0 . 1 . 0 . 1

Figure 4.26

4.3.2 Configuration

Implicit and Explicit Messaging

The ASi gateway supports implicit and explicit messaging for EtherNet/IP communication.

- I/O process data is exchanged cyclically via assembly objects and an existing connection using implicit messaging.
- Low-priority data, non-time-critical data, and configuration and diagnostic data can be exchanged via non-cyclical messages using explicit messaging.

Connections and Assembly Objects

The ASi gateway only supports the "Exclusive Owner" connection type for the exchange of I/O process data and communication via implicit messaging.

Exclusive owner

This connection is bidirectional: The controller sends data to the gateway and the gateway sends data to the controller. This type of connection is referred to as "exclusive owner" because it connects a gateway to just **one** controller.



Connections and Assembly Objects

The possible connections for the ASi gateway with configurable inputs and outputs are listed



Note

Note

For the bit assignment of the process data, see chapter 4.3.3.



I/O Connections for VBG-EP1-KE5-D Single Master

Connection	Connection type	Diagnostics ¹	Instance ID	Length (bytes)
DIO (digital in (aut)	Exclusive owner	No	Output: 100	32
(digital in/out)			Input: 101	32
			Configuration: -	-
DIO Diagnostics	Exclusive owner	Yes	Output: 100	32
tics)			Input: 103	66
,			Configuration: 104	256
DIO Diagnostics AIO	Exclusive owner	Yes	Output: 102	72
analog in/out)			Input: 105	106
			Configuration: 104	256

Table 4.24

1. Contains diagnostic information

I/O Connections for VBG-EP1-KE5-DMD Double Master

Connection	Connection type	Diagnostics ¹	Instance ID	Length (bytes)
DIO (disitel is (sut)	Exclusive owner	No	Output: 100	64
(digital in/out)			Input: 101	64
			Configuration: -	-
DIO Diagnostics	Exclusive owner	Yes	Output: 100	64
(digital in/out and diagnos- tics)			Input: 103	132
,			Configuration: 104	256
DIO Diagnostics AIO	Exclusive owner	Yes	Output: 102	144
and analog in/out)			Input: 105	212
/			Configuration: 104	256

Table 4.25

4.3.2.2 Configuration Parameters

Depending on the connection, different assembly objects are used to transfer the configuration parameters for the gateway. See chapter 4.3.2.1. Each gateway has a fixed number of configuration parameters. The size for the configuration assembly instance is always 256 bytes. For details on the structure of configuration parameters, see "Configuration Data, Instance ID: 104" on page 86.

- VBG-EP1-KE5-D single master: uses the first 32 words (= 64 bytes) for the configuration parameters
- VBG-EP1-KE5-DMD double master: uses the first 63 words (= 126 bytes) for the configuration parameters

The following configuration parameters are available:

- Configuration assembly version
- Use_Activation_Parameter_Config
- Activation parameters per network and per node

F PEPPERL+FUCHS

4.3.2.3 Configuration Example

The procedure for configuring and commissioning gateways described here is based on Rockwell Automation "Studio 5000" software. If you are using a control system from a different manufacturer, please refer to the relevant documentation. The configuration is based on the example of the VBG-EP1-KE5-DMD double master. The configuration for other gateway versions is the same as the example, with a few minor adjustments.



Configuring VBG-EP1-KE5-DMD with Studio 5000

- 1. Install the EDS files for the gateway in RSLogix5000 using the EDS hardware installation tool in the "Tools" menu.
- 2. Select your controller.
- Add your gateway to your EtherNet/IP communication interface by right-clicking and running the "New Module..." command.



Figure 4.27

4. Select the gateway you want to add. Click the "Create" button.



Enter Search Text for Modul	e Type <u>C</u> lea	ar Filter	S	Hide Filters	*
Module Type Categor Analog CIP Motion Converter Communication	y Filters ,		Module Type Vendor Filters Online Development Inc.(Automation Parker Hannifin Corporation Pennerl + Fuchs	Value)	^
Communications Adapt	ter	- 10	Prosoft Technology		~
<	,	<		,	
Catalog Number	 Description 		Vendor	Category	^
VBG-EP1-KE5-DMD	VBG-EP1-KE5-DMD		Pepperl + Fuchs	Communications	,
VBG-EP1-KE5-D	VBG-EP1-KE5-D		Pepperl + Fuchs	Communications	1
254539	VBG-ENX-K30-DMD-S16-EV		Pepperl + Fuchs	Communications	F
254534	VBG-ENX-K20-DMD-EV		Pepperl + Fuchs	Communications	1
217256	VBG-ENX-K20-DMD		Pepperl + Fuchs	Communications	1.
<	VDC ENV VOD D EVOA			^ · · · >	

Figure 4.28

- 5. Name the gateway. Enter the correct IP address.
- 6. The name "ep1_ke5" and the IP address "192.168.1.12" have been used in this example.
- 7. Click the "Change" button.

ieneral" Conr Type: Vendor:	vBG-EP1-KE5-DMD VBG-EP1-KE5-DMD Pepperl + Fuchs	figuration Network
Parent:	Local	
Na <u>m</u> e:	ep1_ke5	Ethernet Address
Descri <u>p</u> tion:	ASi-Gateway	O IP Address:
Module Defii Revision: Electronic K Connections	nition 1.001 eying: Compatible Module :: Exclusive Owner 64 byte in/out	
	Change	

Figure 4.29

8. Change the revision, electronic coding, and connection type of the gateway. For more detailed information on connection types, see chapter 4.3.2.1.



Type:	VBG-EP1-KE	5-DMD VBG-EP1-KE5-DM	2				
Vendor: Parent: Name: Description:	Pepperl •	Module Definition	→ C	001 🖨	~		×
Module Definiti Revision: Electronic Key Connections:	on [2.1 DI	Name DIO Diagnostics AIO DIO DIO Diagnostics DIO Diagnostics AIO	Input: Output:	Size 106 72	Tag Si	effix EP1_DMD:I1 EP1_DMD:O1	
					Ж	Cancel Help	

Figure 4.30

- **9.** In the "Connection" tab, select the type of connection. This determines which process and diagnostic data the gateway provides.
- **10.** The "Connection" tab in the gateway properties displays the connection type selected. You can also set the "Requested Packet Interval (RPI)" and "Input Type" in this tab. The minimum value for the "RPI" parameter is 10 ms.

	ection	Module Info	Internet Protocol	Port Configuration Network	r	- 1	
		Name		Requested Packet Interval (RPI) (ms)	Connecti over Etheri	on Net/IP	Input Trigger
DIO Diagnost	tics AIO			10.0 🛊 10.0 - 3200.0	Unicast	V	Cyclic

Figure 4.31

- 11. Confirm the entries with "OK".
- **12.** In the "Controller Organizer," switch to the "Controller Tags" section. The controller tags for the configuration parameters have the same name as the gateway, followed by: C.
- **13.** You can define one parameter per node.





Figure 4.32

14. Configure the EtherNet/IP gateway and download the parameters to the controller.

4.3.3 Bit Assignment of the Process Data

Input and Output Data

Input data is read and output data is written. Different data sets are available based on the assembly objects selected. Digital, diagnostic, and analog data can be mapped.

DIO

DIO stands for digital inputs and outputs. Only IO from addresses 1/1A-31/31A and 1B-31B for network 1 for the single network gateway or addresses 1/1A-31/31A and 1B-31B for both networks 1 and 2 for the dual network gateway are mapped.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0				
0	F3	F2	F1	F0	Node 1/1	A						
1	Node 2/2	A		•	Node 3/3	A						
15	Node 30/	30A			Node 31/31A							
16	Reserved	ł			Node 1B							
17	Node 2B				Node 3B							
31	Node 30	3			Node 31B							

Table 4.26



Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	it 3 Bit 2 Bit 1 Bit 0						
0	-	-	-	-	Node 1/1	A						
1	Node 2/2	A			Node 3/3	A						
15	Node 30/	′30A			Node 31/31A							
16	Reserved	k			Node 1B							
17	Node 2B				Node 3B							
31	Node 30	3			Node 31B							

VBG-EP1-KE5-D Output Data, SINT Format, Instance ID: 100

Table 4.27

VBG-EP1-KE5-D Input Data, INT Format, Instance ID: 101

	Bit																
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
0	Nod	e 2/2/	4		Nod	e 3/3/	Ą		F3	F3 F2 F1 F0				Node 1/1A			
1	Nod	e 6/6/	4		Nod	lode 7/7A				Node 4/4A				e 5/5/	4		
7	Nod	e 30/3	30A		Nod	e 31/3	31A	Node 28/28			28A		Nod	e 29/2	29A		
8	Nod	e 2B			Nod	e 3B			Reserved				Node 1B				
15	Nod	e 30E	6		Nod	Node 31B				Node 28B				Node 29B			

Table 4.28

VBG-EP1-KE5-D Output Data, INT Format, Instance ID: 100

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Nod	e 2/2/	4		Nod	Node 3/3A				-	-	-	Nod	Node 1/1A		
1	Nod	e 6/6/	4		Nod	Node 7/7A				Node 4/4A				e 5/5/	Ą	
7	Nod	e 30/3	30A		Node 31/31A				Nod	e 28/2	28A		Node 29/29A			
8	Nod	e 2B			Nod	e 3B			Rese	erved			Node 1B			
15	Node 30B				Node 31B			Node 28B				Node 29B				

Table 4.29

VBG-EP1-KE5-DMD Input Data, SINT Format, Instance ID: 101

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3 Bit 2 Bit 1 Bit 0							
Network ²	1											
0	F3 F2 F1 F0 Node 1/1A											
1	Node 2/2	A			Node 3/3A							
15	Node 30/	30A			Node 31/31A							

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	t 2 Bit 1 Bit 0					
16	Reserved	1			Node 1B							
17	Node 2B				Node 3B							
31	Node 30E	3			Node 31E	3						
Network	2											
32	F3	F2	F1	F0	Node 1/1	A						
48	Reserved	1			Node 1B							
49	Node 2B				Node 3B							
63	Node 30E											

Table 4.30

VBG-EP1-KE5-DMD Output Data, SINT Format, Instance ID: 100

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0				
Network	1	•				•		•				
0	-	-	-	-	Node 1/1	IA						
1	Node 2/2	A			Node 3/3A							
15	Node 30/	30A			Node 31	/31A						
16	Reserved	k			Node 1B							
17	Node 2B				Node 3B	}						
31	Node 30	3			Node 31B							
Network	2											
32	-	-	-	-	Node 1/1	IA						
48	Reserved	k			Node 1B	}						
49	Node 2B				Node 3B							
63	Node 30	3			Node 31B							

Table 4.31

VBG-EP1-KE5-DMD Input Data, INT Format, Instance ID: 101

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Netv	vork 1															
0	Node	e 2/2A Node 3/3A							F3	F2	2 F1 F0 Node 1/1A					
1	Node	e 6/6/	4		Nod	Node 7/7A				e 4/4/	4		Node 5/5A			
7	Node	e 30/3	30A		Nod	Node 31/31A			Node	e 28/2	28A		Node 29/29A		29A	
8	Node 2B Node					Node 3B				Reserved				Node 1B		



	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
												-				
15	Nod	e 30E	3		Nod	e 31E	3		Nod	e 28B			Nod	e 29E	3	
Netv	vork 2	2			•								•			
16	Nod	e 2/2/	4		Nod	e 3/3/	4		F3	F2	F1	F0	Nod	e 1/1.	A	
17	Nod	e 6/6/	4		Nod	e 7/7/	4		Nod	e 4/4/	4		Nod	e 5/5	A	
23	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	e 28/2	28A		Nod	e 29/	29A	
24	Nod	e 2B			Nod	e 3B			Res	erved			Nod	e 1B		
31	Nod	e 30E	6		Nod	e 31E	3		Nod	e 28B			Nod	e 29E	3	

Table 4.32

VBG-EP1-KE5-DMD Output Data, INT Format, Instance ID: 100

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Netv	vork 1							•								
0	Nod	e 2/2/	4		Node	e 3/3/	4		-	-	-	-	Nod	le 1/1	А	
1	Nod	e 6/6/	4		Node	e 7/7/	4		Nod	e 4/4/	4		Nod	le 5/5	A	
7	Nod	e 30/3	30A		Node	e 31/3	31A		Nod	e 28/2	28A		Nod	le 29/	′29A	
8	Nod	e 2B			Node	e 3B			Res	erved			Nod	le 1B		
15	Nod	e 30B	3		Node	e 31E	3		Nod	e 28E	}		Nod	le 29	В	
Netv	vork 2	2														
16	Nod	e 2/2/	4		Node	e 3/3/	4		-	-	-	-	Nod	le 1/1	А	
17	Nod	e 6/6/	4		Node	e 7/7/	4		Nod	e 4/4/	4		Nod	le 5/5	A	
23	Nod	e 30/3	30A		Node	e 31/3	31A		Nod	e 28/2	28A		Nod	le 29/	′29A	
24	Nod	e 2B			Node	e 3B			Res	erved			Nod	le 1B		
31	Nod	e 30B	}		Node	e 31E	3		Nod	e 28E	6		Nod	le 29	В	

Table 4.33

DIO + Diagnostic Data

In addition to the input and output data for both networks, diagnostic data is also included in the mapping. The diagnostic data includes the lists of detected, projected, and activated nodes and the list of peripheral faults. Master flags are also included to give you additional information about the status of the two networks. For detailed information on the master flags, see table "Diagnostic Bits" on page 85.

VBG-EP1-KE5-D In	put Data, SIN	T Format, Ins	stance ID: 103
		, - ,	

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	F3	F2	F1	F0	Node 1/1	A		
1	Node 2/2	2A			Node 3/3	A		
15	Node 30	/30A			Node 31/	31A		
16	Reserve	d			Node 1B			
17	Node 2B				Node 3B			
31	Node 30	В			Node 31E	3		
32	-	-	-	Earth Fault	-	-	-	Periph- eral Fault
33	Offline	Power Fail	In Nor- mal Opera- tion	Config mode act	Auto Adr avail	Auto Adr not pos	LDS.0	Config Error
34	LDS	•			•	•	•	
	7A	6A	5A	4A	ЗA	2A	1A	0
35	LDS		1	•				•
	15A	14A	13A	12A	11A	10A	9A	8A
38	LDS							
	7B	6B	5B	4B	3B	2B	1B	0
41	LDS							
	31B	30B	29B	28B	27B	26B	25B	24B
42	LPS							
	7A	6A	5A	4A	ЗА	2A	1A	0
45	LPS							
	31A	30A	29A	28A	27A	26A	25A	24A
46	LPS							
	7B	6B	5B	4B	3B	2B	1B	0
49	LPS							
	31B	30B	29B	28B	27B	26B	25B	24B
50	LAS							
	7A	6A	5A	4A	ЗА	2A	1A	0

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0				
53	LAS											
	31A	30A	29A	28A	27A	26A	25A	24A				
54	LAS											
	7B	6B	5B	4B	3B	2B	1B	0				
57	LAS											
	31B	30B	29B	28B	27B	26B	25B	24B				
58	LPF											
	7A	6A	5A	4A	ЗA	2A	1A	0				
61	LPF											
	31A	30A	29A	28A	27A	26A	25A	24A				
62	LPF											
	7B	6B	5B	4B	3B	2B	1B	0				
65	LPF											
	31B	30B	29B	28B	27B	26B	25B	24B				

Table 4.34

VBG-EP1-KE5-D Output Data, SINT Format, Instance ID: 100

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0				
0	-	-	-	-	Node 1/1	ode 1/1A						
1	Node 2/2	A			Node 3/3	A						
15	Node 30/	30A			Node 31/	31A						
16	Reserved				Node 1B							
17	Node 2B				Node 3B							
31	Node 30E	3			Node 31B							

Table 4.35

VBG-EP1-KE5-D Input Data, INT Format, Instance ID: 103

	Bit																
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
0	Nod	e 2/2/	4		Nod	e 3/3/	À		F3	F2	F1	F0	Nod	e 1/1/	A		
1	Nod	e 6/6/	4		Nod	e 7/7/	ł		Nod	e 4/4/	4		Node 5/5A				
7	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	e 28/2	28A		Nod	e 29/2	29A		
8	Nod	Node 2B			Nod	Node 3B			Rese	erved			Nod	e 1B			
15	Nod	e 30E	}		Node 31B Node 28B Node 29B												

PEPPERL+FUCHS

Table	4.36
-------	------

	Bit															
ΙΝΤ	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
16	Offline	Power fail	In Normal Operation	Cfg mode act	Auto Adr avail	Auto Adr not Pos	LDS.0	Cfg error	1	1		Earth Fault	1			Peripheral Fault
17	LDS					07										
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
18	LDS															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
19	LDS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
20	LDS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
21	LPS															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
22	LPS															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
23	LPS		1									1			1	1
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
24	LPS		1									1			1	1
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
25	LAS															-
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
26	LAS															
07	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
27	LAS	4.40	100	100	440	100	0.0	0.0	70	0.0		40	0.0	0.0	4.0	0
00	15B	14B	13B	12B	118	10B	9B	8B	7B	6B	5B	4B	3B	2B	18	0
28	LAS	000	000		070		050	040			010		100	100	170	100
20	318	30B	29B	28B	27B	20B	25B	24B	23B	22B	218	20B	198	188	17В	168
29		110	124	104	110	104	0.4	٥٨	74	64	5 ۸	10	24	24	1 /	0
20	IDE	14A	13A	12A	IIA	IUA	ЭA	оA	78	UA	JA	4A	3A	28	IA	0
30	214	304	201	287	274	264	25 4	244	23 A	22A	214	204	104	194	170	164
31		50A	294	204	217	204	234	247	204	227	217	204	IJA	IOA	1/ 4	IUA
51	15B	1/R	13B	12B	11R	10B	0R	8B	7B	6B	5B	1B	ЗB	2B	1B	0
32	I PF		100	120		100	30	00	10	00	50	чU	50	20		0
02	31R	30B	29B	28B	27R	26B	25B	24R	23B	22B	21R	20R	19R	18R	17R	16B
Table	4.36		200	200	_, _	200	200	2.0	200			200				

VBG-EP1-KE5-D Output Data	, INT Format, Instance ID: 100
---------------------------	--------------------------------

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Nod	e 2/2/	4		Nod	e 3/3/	4		0	0	0	0	Nod	e 1/1	À	
1	Nod	e 6/6/	4		Nod	e 7/7/	Ą		Nod	e 4/4/	4		Nod	e 5/5	A	
7	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	e 28/2	28A		Nod	e 29/	29A	
8	Nod	Node 2B			Nod	Node 3B			Res	erved			Nod	e 1B		
15	Node 30B			Node 31B				Nod	e 28E	8		Nod	e 29E	3		

Table 4.37

VBG-EP1-KE5-DMD Input Data, SINT Format, Instance ID: 103

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Network	1			ļ				
0	F3	F2	F1	F0	Node 1/1	A		
1	Node 2/2	:A	.1		Node 3/3	A		
15	Node 30/	/30A			Node 31/	31A		
16	Reserved	b			Node 1B			
17	Node 2B				Node 3B			
31	Node 30	В			Node 31E	3		
Network 2	2							
32	F3	F2	F1	F0	Node 1/1	A		
		4	4	4				
48	Reserved	b			Node 1B			
49	Node 2B				Node 3B			
63	Node 30	В			Node 31E	3		
Network	1							
64	-	-	-	Earth Fault	-	-	-	Periph- eral Fault
65	Offline	Power Fail	In Nor- mal Opera- tion	Config mode act	Auto Adr avail	Auto Adr not pos	LDS.0	Config Error
66	LDS		+	+		•		•
	7A	6A	5A	4A	ЗA	2A	1A	0
69	LDS							
	31A	30A	29A	28A	27A	26A	25A	24A
70	LDS	4						
	7B	6B	5B	4B	3B	2B	1B	0

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
73	LDS					L		
	31B	30B	29B	28B	27B	26B	25B	24B
74	LPS							
	7A	6A	5A	4A	ЗA	2A	1A	0
77	LPS							
	31A	30A	29A	28A	27A	26A	25A	24A
78	LPS							
	7B	6B	5B	4B	3B	2B	1B	0
81	LPS							
	31B	30B	29B	28B	27B	26B	25B	24B
82	LAS							
	7A	6A	5A	4A	3A	2A	1A	0
85	LAS							
	31A	30A	29A	28A	27A	26A	25A	24A
86	LAS							
	7B	6B	5B	4B	3B	2B	1B	0
89	LAS							
	31B	30B	29B	28B	27B	26B	25B	24B
90	LPF							
	7A	6A	5A	4A	ЗA	2A	1A	0
93	LPF	•	•	•				•
	31A	30A	29A	28A	27A	26A	25A	24A
94	LPF							
	7B	6B	5B	4B	3B	2B	1B	0
97	LPF							
	31B	30B	29B	28B	27B	26B	25B	24B
Network 2								
98	0	0	0	Earth Fault	0	0	0	Periph- eral Fault
99	Offline	Power Fail	In Nor- mal Opera- tion	Config mode act	Auto Adr avail	Auto Adr not pos	LDS.0	Config Error
100	LDS							
	7A	6A	5A	4A	3A	2A	1A	0


Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
103	LDS								
	31A	30A	29A	28A	27A	26A	25A	24A	
104	LDS			1	1	1	1		
	7B	6B	5B	4B	3B	2B	1B	0	
107	LDS				•				
	31B	30B	29B	28B	27B	26B	25B	24B	
108	LPS				•				
	7A	6A	5A	4A	ЗA	2A	1A	0	
111	LPS								
	31A	30A	29A	28A	27A	26A	25A	24A	
112	LPS								
	7B	6B	5B	4B	3B	2B	1B	0	
115	LPS								
	31B	30B	29B	28B	27B	26B	25B	24B	
116	LAS								
	7A	6A	5A	4A	ЗA	2A	1A	0	
119	LAS								
	31A	30A	29A	28A	27A	26A	25A	24A	
120	LAS								
	7B	6B	5B	4B	3B	2B	1B	0	
123	LAS								
	31B	30B	29B	28B	27B	26B	25B	24B	
124	LPF	_	_						
	7A	6A	5A	4A	ЗA	2A	1A	0	
127	LPF								
	31A	30A	29A	28A	27A	26A	25A	24A	
128	LPF								
	7B	6B	5B	4B	3B	2B	1B	0	
131	LPF				·				
	31B	30B	29B	28B	27B	26B	25B	24B	

Table 4.38

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0				
Network	(1			•	•		I	I				
0	-	-	-	-	Node 1/	′1A						
1	Node 2/	/2A	•		Node 3/	′3A						
15	Node 3	0/30A			Node 3	1/31A						
16	Reserve	ed			Node 1	В						
17	Node 2	В			Node 3	В						
31	Node 3	0B			Node 3	1B						
Network	2											
32	-	-	-	-	Node 1/	′1A						
			•									
48	Reserve	ed			Node 1B							
49	Node 2	В			Node 3B							
63	Node 3	0B			Node 3	1B						
	1											

VBG-EP1-KE5-DMD Output Data, SINT Format, Instance ID: 100

Table 4.39

VBG-EP1-KE5-DMD Input Data, INT Format, Instance ID: 103

	Bit																		
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
Netv	vork 1																		
0	Nod	e 2/2/	4		Nod	e 3/3/	A		F3	F2	F1	F0	Nod	le 1/1	А				
1	Nod	e 6/6/	4		Nod	e 7/7/	A		Nod	e 4/4	A	•	Nod	le 5/5	βA				
7	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	Node 28/28A Node 29/29A									
8	Nod	e 2B			Nod	e 3B			Res	served Node 1B									
15	Nod	e 30E	}		Nod	e 31E	3		Nod	3		Nod	le 291	В					
Netv	work 2	2																	
16	Nod	e 2/2/	٩		Nod	e 3/3/	A		F3	F2	F1	F0	Node 1/1A						
17	Nod	e 6/6/	٩		Nod	e 7/7/	A		Nod	e 4/4	A		Nod	le 5/5	Ā				
23	Nod	Node 30/30A Node 31/3						/31A Node 28/28A					Nod	le 29/	′29A				
24	Node 2B Node 3B								Reserved					Node 1B					
31	Nod	e 30E	}		Nod	e 31E	3		Nod	e 28E	3		Nod	le 291	В				
Netw	vork 1																		

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VBG-EP1-KE5-D*

Commissioning

	ΒΙ															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
32	Offline	Power fail	In Normal Operation	Cfg mode act	Auto Adr avail	Auto Adr not Pos	LDS.0	Cfg error	0	0	0	Earth Fault	0	0	0	Peripheral Fault
33	LDS					07										
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
34	LDS															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
35	LDS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
36	LDS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
37	LPS															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
38	LPS															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
39	LPS							1		1			1			
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
40	LPS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
41	LAS															
10	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
42	LAS	004	004	004	074	004	0.5.4	0.4.4	004		014	004	10.4	10.4	1 - 1	10.4
40	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
43		140	100	100	440	100		00	70						10	0
4.4	15B	14B	13B	12B	11B	IUR	ЯR	۶B	۲B	θВ	5B	4B	3B	2B	IВ	U
44	LAS	000	000	000	070	000	055	045	000	005	04 5	000	100	100	170	100
45	318	30B	29B	28B	27B	26B	25B	24B	23B	22B	218	20B	19B	188	17B	16B
45		1//	104	104	110	104	0.4	٥٨	7^	64	5٨	10	24	24	1 /	0
16		14A	IJA	12A	ПA	IUA	ЭA	οΑ	7 A	0A	SA	4A	ЪA	ZA	IA	U
40		30 ^	20 ^	20 A	271	26 ^	25 ^	211	23 V	20 M	21 4	20 ^	10^	101	174	164
17	IDE	JUA	29A	ZOA	218	20A	20A	24A	ZJA	22A	21A	ZUA	IBA	IOA	17A	IUA
47		1/1	12P	10P	110	10P	0R	8B	7R	6P	5R	1R	ЗR	2B	1R	0
<u>⊿</u> ₽	IDE	14D	IJD	12D	пD	IUD	30	00	י ט	00	50	40	50	20	1D	U
40	21R	30B	20R	28P	27R	26P	25R	2/R	23B	22P	21R	20R	10P	18P	17P	16P
L		50D	29D	20D	21 D	20D	200	24D	200	22D	21D	20D	120	IOD	17D	IUD

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Netv	vork 2															
49	Offline	Power fail	In Normal Operation	Cfg mode act	Auto Adr avail	Auto Adr not Pos	LDS.0	Cfg error	0	0	0	Earth Fault	0	0	0	Peripheral Fault
50	LDS					0/										
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
51	LDS									•					•	
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
52	LDS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
53	LDS									-					-	-
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
54	LPS															-
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
55	LPS	004	004	004	074	004	054	044	004	004	014	004	104	104	170	104
56	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	I/A	16A
50	15B	1/0	12P	10P	110	10P	0P	٥D	7P	6P	5P	1P	20	28	10	0
57		14D	130	120	ПD	IUD	90	00	70	OD	50	4D	50	20	ID	0
57	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
58	LAS	002													=	
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
59	LAS															<u> </u>
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
60	LAS									1					1	
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
61	LAS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
62	LPF															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
63	LPF														. – .	
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
64		4.40	100	100	440	100	0.0	0.0	70	0.0		45	0.0	0.0	4.0	0
6F		14B	13B	12B	11B	10B	ЯR	8B	7B	6B	5B	4B	38	2B	١B	0
CO		3∪¤	20P	<u> 20</u> ⊡	27D	26P	25P	21P	23⊡	20P	21₽	20₽	10P	19P	17¤	16P
L		308	290	20D	210	200	200	24D	230	220	210	200	190	IOD	1/0	TOD

	Bit																		
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
Netv	vork 1		•	•		•			•	•		•	•	•	•				
0	Nod	e 2/2/	4		Nod	e 3/3/	Ą		-	-	-	-	Noc	de 1/1	А				
1	Nod	e 6/6/	4		Nod	e 7/7/	Ą		Nod	le 4/4/	Ą		Noc	de 5/5	δA				
7	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	le 28/2	28A		Noc	de 29/	/29A				
8	Nod	e 2B			Nod	e 3B			Res	erved			Noc	de 1B					
15	Nod	e 30E	3		Nod	e 31E	3		Nod	le 28E	3		Node 29B						
Netv	vork 2	2																	
16	Nod	e 2/2/	4		Nod	e 3/3/	Ą						Noc	de 1/1	А				
17	Nod	e 6/6/	4		Nod	e 7/7/	Ą		Nod	le 4/4/	Ą		Noc	de 5/5	δA				
23	Nod	e 30/3	30A		Node 31/31A				Nod	le 28/2	28A		Node 29/29A						
24	Nod	e 2B			Nod	e 3B			Reserved				Node 1B						
31	Nod	e 30E	3		Nod	e 31E	3		Nod	le 28E	3	Node 29B							

VBG-EP1-KE5-DMD Output Data, INT Format, Instance ID: 100

Table 4.41

DIO + Diagnostic Data + Analog Data

In addition to the input, output, and diagnostic data, analog data is also included. Analog data includes five addresses from 27 to 31 for one or two networks. The analog data for each of the five addresses includes four 16-bit analog channels.

VBG-EP1-KE5-D Input Data, INT Format, Instance ID:	105
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	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Nod	e 2/2/	4		Nod	e 3/3/	À		F3	F2	F1	F0	Nod	e 1/1/	4	
1	Nod	e 6/6/	4		Nod	e 7/7#	1		Nod	e 4/4/	7		Nod	e 5/5/	4	
7	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	e 28/2	28A		Nod	e 29/2	29A	
8	Nod	e 2B			Nod	e 3B			Reserved				Node 1B			
15	Nod	e 30B	6		Nod	e 31B			Nod	e 28B	5		Nod	e 29E	3	
16	Offline	Power fail	In Normal Operation	Cfg mode act	Auto Adr avail	Auto Adr not Pos	LDS.0	Cfg error				Earth Fault				Peripheral Fault
17	LDS										•					
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
18	LDS															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
19	LDS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
20	LDS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
21	LPS															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
22	LPS											1				
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
23	LPS															-
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
24	LPS															
0.5	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
25	LAS		10.0	10.1		10.0		~ ^								
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
26	LAS	004	004	004	074	004	054	044	004	004	014	004	104	104	470	104
07	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
27	LAS	140	100	100	110	100					5 D	40			10	0
20	158	14B	138	128	ПВ	IUB	9B	8B	7B	6B	5B	4B	3B	28	IВ	0
20	21B	30B	20B	28B	27B	26B	25B	24B	23B	22B	21B	20B	10R	19B	17B	16B
20	IPE	300	290	200	270	200	250	24D	200	220	210	200	190	TOD	170	100
23	LΓΓ 15Δ	144	134	124	11Δ	104	۹A	84	74	64	5Δ	ΔΔ	34	24	1Δ	0
30	IPF	1-17	10/1	1273	1173	10/1	0/1	0/1	11	0/1	0/1	-173	0/1	273	17.	
00	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
31	LPF															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
32	LPF															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
33	Anal	og Inp	out Ad	Idress	27, 0	Chann	el 1									
34	Anal	og Inp	out Ad	dress	27, 0	Chann	el 2									
35	Anal	og Inp	out Ad	Idress	27, 0	Chann	el 3									
36	Anal	og Inp	out Ad	Idress	27, 0	Chann	el 4									
37	Anal	og Inp	out Ad	Idress	28, 0	Chann	el 1									
38	Anal	og Inp	out Ad	Idress	28, 0	Chann	el 2									
39	Anal	og Inp	out Ad	Idress	28, 0	Chann	el 3									
40	Anal	og Inp	out Ad	Idress	28, 0	Chann	el 4									
41	Anal	og Inp	out Ad	ldress	29, 0	Chann	el 1									
42	Anal	og Inp	out Ad	Idress	29, 0	Chann	el 2									
43	Anal	og Inp	out Ad	ldress	; 29, C	Chann	el 3									

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
44	Anal	log In	out Ac	ddress	s 29, (Chanr	nel 4									
45	Anal	log In	out Ac	ddress	s 30, (Chanr	nel 1									
46	Anal	Analog Input Address 30, Channel 2														
47	Anal	Analog Input Address 30, Channel 3														
48	Anal	log In	out Ac	ddress	s 30, (Chanr	nel 4									
49	Anal	log Inj	out Ac	ddress	s 31, (Chanr	nel 1									
50	Analog Input Address 31, Channel 2															
51	Anal	log In	out Ac	ddress	s 31, (Chanr	nel 3									
52	Anal	log In	out Ac	ddress	s 31, (Chanr	nel 4									

Table 4.42

VBG-EP1-KE5-D Output Data, INT Format, Instance ID: 102

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Nod	e 2/2/	A		Nod	e 3/3/	A		0	0	0	0	Nod	e 1/1	A	
1	Nod	e 6/6/	4		Nod	e 7/7/	Ą		Noc	de 4/4	A		Nod	e 5/5	A	
7	Nod	e 30/3	30A		Nod	e 31/3	31A		Noc	de 28/	28A		Nod	e 29/	′29A	
8	Nod	e 2B			Nod	e 3B			Res	serveo	ł		Nod	e 1B		
15	Nod	e 30B			Nod	e 31E	3		Noc	de 28	3		Nod	e 29	В	
16	Ana	log Οι	utput	Addre	ss 27	', Cha	Innel	1								
17	Ana	log Οι	utput	Addre	ss 27	', Cha	innel :	2								
18	Ana	log Οι	utput	Addre	ss 27	', Cha	innel	3								
19	Ana	log Οι	utput	Addre	ss 27	', Cha	Innel 4	4								
20	Ana	log Οι	utput	Addre	ss 28	, Cha	Innel	1								
21	Ana	log Οι	utput	Addre	ss 28	, Cha	innel :	2								
22	Ana	log Οι	utput	Addre	ss 28	, Cha	innel	3								
23	Ana	log Οι	utput	Addre	ss 28	, Cha	Innel 4	4								
24	Ana	log Οι	utput	Addre	ss 29	, Cha	Innel	1								
25	Ana	log Οι	utput	Addre	ss 29	, Cha	innel :	2								
26	Ana	log Οι	utput	Addre	ss 29	, Cha	innel	3								
27	Ana	log Ou	utput	Addre	ss 29	, Cha	Innel 4	4								
28	Ana	log Οι	utput	Addre	ss 30	, Cha	Innel	1								
29	Ana	log Οι	utput	Addre	ss 30	, Cha	innel :	2								
30	Ana	log Οι	utput	Addre	ss 30	, Cha	innel	3								
31	Ana	log Οι	utput	Addre	ss 30	, Cha	Innel 4	4								
32	Ana	log Οι	utput	Addre	ss 31	, Cha	Innel	1								
33	Ana	log Οι	utput	Addre	ss 31	, Cha	innel :	2								
34	Ana	log Οι	utput	Addre	ss 31	, Cha	innel	3								
35	Ana	log Οι	utput	Addre	ss 31	, Cha	Innel 4	4								

Table 4.43

	Bit			-												
ΙΝΤ	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Netv	vork 1															
0	Node	e 2/2/	4		Nod	e 3/3/	4		F3	F2	F1	F0	Nod	e 1/1/	4	
1	Node	e 6/6/	4		Nod	e 7/7/	4		Nod	e 4/4/	4		Nod	e 5/5/	4	
7	Node	e 30/3	30A		Nod	e 31/3	31A		Nod	e 28/2	28A		Nod	e 29/2	29A	
8	Node	e 2B			Nod	e 3B			Rese	erved			Nod	e 1B		
15	Node	e 30B	}		Nod	e 31B			Nod	e 28B			Nod	e 29B	5	
Netv	vork 2								1				1			
16	Node	e 2/2/	4		Nod	e 3/3/	4		F3	F2	F1	F0	Nod	e 1/1/	4	
17	Node	e 6/6/	4		Nod	e 7/7#	4		Nod	e 4/4/	۹.		Nod	e 5/5/	4	
23	Node	e 30/3	30A		Nod	e 31/3	31A		Nod	e 28/2	28A		Nod	e 29/2	29A	
24	Node	e 2B			Nod	e 3B			Rese	erved			Nod	e 1B		
31	Node	e 30B	5		Nod	e 31B			Nod	e 28B			Nod	e 29B	5	
Netv	vork 1												1			
32	Q	P	05	Q	A	A		Q	0	0	0	Ш	0	0	0	Pe
	fflin	owe	Noi	íg m	uto ,	, uto	0S.(ig ei				arth				erip
	(D	r fai	rma atior	lode	Adr	Adr)	rror				Fal				lera
) ac	ava	not						Ħ				ll Fa
				ť	=:	Pos										ult
33	LDS															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
34	LDS		•	•				•	•					•	•	
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
35	LDS		•	•				•	•					•	•	
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
36	LDS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
37	LPS		•	•				•	•					•	•	
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
38	LPS		•	•				•	•					•	•	
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
39	LPS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
40	LPS		•	•									•			
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
41	LAS		•	•									•			
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0

VBG-EP1-KE5-DMD Input Data, INT Format, Instance ID: 105



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VBG-EP1-KE5-D*

Commissioning

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
42	LAS															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
43	LAS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
44	LAS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
45	LPF															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
46	LPF															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
47	LPF															-
10	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
48	LPF	000	005	005	075	000	0.5	0.45	005	005	0 (D		105	100	4.50	100
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
Netv	vork 2															
49	Offli	Pov	ln N Op∈	Cfg	Auto	Auto	LDS	Cfg	0	0	0	Ear	0	0	0	Peri
	ne	/er f	orm Prati	mo	o Ac	0 Ac	ŝ.O	errc				ц. Ц				phe
		ail	1al on	de a	dr a∖	dr no		or				ault				rall
				lct	/ail	ot Po										-aul
50	LDS					SC										t
00	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
51	LDS		_			_	-	_		_	_		_			_
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
52	LDS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
53	LDS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
54	LPS															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
55	LPS															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
56	LPS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
57	LPS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
58	LAS												_			
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
59	LAS				0-1		0						4.0.5	4.0.5	4	4.0.1
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A

	Bit															
ΙΝΤ	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
60	LAS															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
61	LAS															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
62	LPF															
	15A	14A	13A	12A	11A	10A	9A	8A	7A	6A	5A	4A	ЗA	2A	1A	0
63	LPF															
	31A	30A	29A	28A	27A	26A	25A	24A	23A	22A	21A	20A	19A	18A	17A	16A
64	LPF															
	15B	14B	13B	12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	0
65	LPF															
	31B	30B	29B	28B	27B	26B	25B	24B	23B	22B	21B	20B	19B	18B	17B	16B
Netv	vork 1															
66	Anal	og Inp	out Ad	Idress	27, 0	Chanr	nel 1									
67	Anal	og Inp	out Ad	Idress	; 27, C	Chanr	nel 2									
68	Anal	og Inp	out Ad	Idress	27, 0	Chanr	nel 3									
69	Anal	og Inp	out Ad	Idress	; 27, C	Chanr	nel 4									
70	Anal	og Inp	out Ad	Idress	28, 0	Chanr	nel 1									
71	Anal	og Inp	out Ad	Idress	; 28, C	Chanr	nel 2									
72	Anal	og Inp	out Ad	Idress	28, 0	Chanr	nel 3									
73	Anal	og Inp	out Ad	Idress	s 28, C	Chanr	nel 4									
74	Anal	og Inp	out Ad	Idress	; 29, C	Chanr	nel 1									
75	Anal	og Inp	out Ad	Idress	; 29, C	Chanr	nel 2									
76	Anal	og Inp	out Ad	Idress	; 29, C	Chanr	nel 3									
77	Anal	og Inp	out Ad	Idress	; 29, C	Chanr	nel 4									
78	Anal	og Inp	out Ad	Idress	30, C	Chanr	nel 1									
79	Anal	og Inp	out Ad	Idress	30, C	Chanr	nel 2									
80	Anal	og Inp	out Ad	Idress	30, C	Chanr	nel 3									
81	Anal	og Inp	out Ad	Idress	30, C	Chanr	nel 4									
82	Anal	og Inp	out Ad	Idress	31, C	Chanr	nel 1									
83	Anal	og Inp	out Ad	Idress	31, C	Chanr	nel 2									
84	Anal	og Inp	out Ad	Idress	31, C	Chanr	nel 3									
85	Anal	og Inp	out Ad	Idress	31, C	Chanr	nel 4									
Netv	vork 2															
86	Anal	og Inp	out Ad	Idress	s 27, C	Chanr	nel 1									
87	Anal	og Inp	out Ad	Idress	s 27, C	Chanr	nel 2									
88	Anal	og Inp	out Ad	Idress	s 27, C	Chanr	nel 3									
89	Anal	og Inp	out Ad	Idress	s 27, C	Chanr	nel 4									
90	Anal	og Inp	out Ad	Idress	28, 0	Chanr	nel 1									
91	Anal	og Inp	out Ad	Idress	s 28, C	Chanr	nel 2									
92	Anal	og Inp	out Ad	Idress	s 28, C	Chanr	nel 3									

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
93	Anal	og In	put Ac	dress	s 28, (Chanr	nel 4									
94	Anal	og In	put Ac	dress	s 29, (Chanr	nel 1									
95	Anal	og In	put Ac	dress	s 29, (Chanr	nel 2									
96	Anal	og In	put Ac	dress	s 29, (Chanr	nel 3									
97	Anal	og In	put Ac	dress	s 29, (Chanr	nel 4									
98	Anal	og In	put Ac	dress	s 30, (Chanr	nel 1									
99	Anal	og In	put Ac	dress	s 30, (Chanr	nel 2									
100	Anal	og In	put Ac	dress	s 30, (Chanr	nel 3									
101	Anal	og In	put Ac	dress	s 30, (Chanr	nel 4									
102	Anal	og In	put Ac	dress	s 31, (Chanr	nel 1									
103	Anal	og In	put Ac	dress	s 31, (Chanr	nel 2									
104	Anal	og In	out Ac	dress	s 31, (Chanr	nel 3									
105	Anal	og In	put Ac	dress	s 31, (Chanr	nel 4									

Table 4.44

VBG-EP1-KE5-DMD Output Data, INT Format, Instance ID: 102

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Netv	vork 1															
0	Nod	e 2/2/	4		Nod	e 3/3/	A		-	-	-	-	Noc	de 1/	1A	
1	Nod	e 6/6/	4		Nod	e 7/7/	A		Nod	le 4/4	A	-	Noc	de 5/	5A	
7	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	le 28/2	28A		Noc	de 29)/29A	
8	Node 2B Node 3B								Res	erved			Noc	de 1E	3	
15	Nod	Node 30B Node 31B								le 28E	3		Noc	de 29	B	
Netv	vork 2	2			_											
16	Nod	e 2/2/	4		Nod	e 3/3/	A		-	-	-	-	Noo	de 1/	1A	
17	Nod	e 6/6/	4		Nod	e 7/7/	A		Nod	le 4/4	A		Noo	de 5/	5A	
23	Nod	e 30/3	30A		Nod	e 31/3	31A		Nod	le 28/2	28A		Noo	de 29)/29A	
24	Nod	e 2B			Nod	e 3B			Res	erved			Noo	de 1E	3	
31	Nod	e 30B	8		Nod	e 31E	3		Nod	le 28E	3		Noc	de 29	B	
Netv	work 1															
32	Analog Output Address 27, Channel 1															
33	Ana	log Oı	utput	Addre	ess 27	', Cha	innel :	2								
34	Ana	log Oı	utput	Addre	ess 27	', Cha	innel	3								
35	Ana	log Oı	utput	Addre	ess 27	', Cha	nnel 4	4								
36	Ana	log Oı	utput	Addre	ess 28	, Cha	Innel	1								
37	Analog Output Address 28, Channel 1 Analog Output Address 28, Channel 2															

	Bit															
INT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
38	Analo	og Ou	tput /	Addre	ess 28	Cha	nnel 3	}								
39	Analo	og Ou	tput /	Addre	ss 28	Cha	nnel 4									
40	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 1									
41	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 2)								
42	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 3	;								
43	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 4									
44	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 1									
45	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 2									
46	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 3	}								
47	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 4									
48	Analo	og Ou	tput /	Addre	ess 31	Cha	nnel 1									
49	Analo	og Ou	tput /	Addre	ess 31	Cha	nnel 2									
50	Analo	og Ou	tput /	Addre	ess 31	Cha	nnel 3	}								
51	Analo	og Ou	tput /	Addre	ess 31	Cha	nnel 4									
Netv	vork 2															
52	Analo	og Ou	tput /	Addre	ess 27	Cha	nnel 1									
53	Analo	og Ou	tput /	Addre	ess 27	Cha	nnel 2									
54	Analo	og Ou	tput /	Addre	ess 27	Cha	nnel 3	3								
55	Analo	og Ou	tput /	Addre	ess 27	Cha	nnel 4									
56	Analo	og Ou	tput /	Addre	ess 28	Cha	nnel 1									
57	Analo	og Ou	tput /	Addre	ess 28	Cha	nnel 2	2								
58	Analo	og Ou	tput /	Addre	ess 28	Cha	nnel 3	3								
59	Analo	og Ou	tput /	Addre	ess 28	Cha	nnel 4									
60	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 1									
61	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 2	2								
62	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 3	}								
63	Analo	og Ou	tput /	Addre	ess 29	Cha	nnel 4									
64	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 1									
65	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 2	2								
66	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 3	}								
67	Analo	og Ou	tput /	Addre	ess 30	Cha	nnel 4									
68	Analo	og Ou	tput /	Addre	ess 31	Cha	nnel 1									
69	Analo	og Ou	tput /	Addre	ess 31	Cha	nnel 2									
70	Analo	og Ou	tput /	Addre	ess 31	Cha	nnel 3	}								
71	Analo	og Ou	tput	Addre	ess 31	Cha	nnel 4	_								

Table 4.45



Diagnostic Bits Flag

Error	Designation	Description
F0	Configuration Errors	0 = Configuration OK 1 = Configuration error present
F1	ASi Power Fail	0 = ASi voltage OK 1 = ASi voltage missing/too low
F2	Peripheral Faults	0 = Peripheral OK 1 = Peripheral fault present
F3	Configuration mode active	0 = Protected mode 1 = Configuration mode

Table 4.46

Diagnostic Bits

•	
Designation	Description
Peripheral fault	0 = No activated node reports a peripheral fault 1 = At least one node reports a peripheral fault
Earth fault	0 = No short-circuit to ground 1 = Short-circuit to ground detected; ASi network + or - is grounded
Configuration error	0 = There is no configuration error 1 = At least one configuration error detected
LDS.0	0 = No ASi node with address 0 found 1 = ASi node with address 0 found
Auto address assignment not possible	0 = The conditions for automatic address assignment are currently met 1 = Automatic address assignment is currently not pos- sible
Auto address assignment available	0 = Automatic address assignment is disabled 1 = Automatic address assignment as soon as the con- ditions are met
Configuration mode active	0 = ASi gateway is in protected mode 1 = ASi gateway is in configuration mode
In normal operation	0 = ASi gateway not in the normal operating state (e.g., startup phase) 1 = ASi gateway is in the normal operating state
ASi power fail	0 = ASi mains voltage OK 1 = ASi mains voltage too low or power failure during data transfer on the ASi network
ASi master offline	0 = ASi gateway is online 1 = ASi gateway is offline

Table 4.47

List of Detected LDS Nodes

The gateway provides a list of detected nodes for each ASi network. This indicates whether a node is detected or not.

- 0 No node detected/present at the specified address
- 1 A node is detected/present at the specified address.

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List of Projected LPS Nodes

The gateway provides a list of projected nodes for each ASi network. This indicates whether a device should be present or not.

- 0 No device is expected for the specified address.
- 1 A device must be present at the specified address.

List of Activated LAS Nodes

The gateway provides a list of activated nodes for each ASi network. This indicates whether or not a node is currently exchanging data.

- 0 The node is not activated.
- 1 The node is activated.

List of Peripheral Faults LPF

The gateway provides a list of peripheral faults for each ASi network. This indicates whether there is a peripheral fault for each node.

- 0 The node does not have a peripheral fault
- 1 The node sends a peripheral fault diagnostic bit

Analog Process Data of Five ASi Nodes per Network

The first ASi analog address is 27.

An ASi analog module can transfer up to four channels with 16 bits (= 2 bytes) of data each. The gateway reserves 8 bytes of data per analog node. Addresses from 27 to 31 are supported for analog nodes. A total of 40 bytes of process data are assigned to analog inputs and outputs respectively



Note

Analog nodes that support extended addressing with A/B addresses only occupy two channels per node. A addresses are mapped to channel 1+2; B addresses are mapped to channel 3+4.

Configuration Data, Instance ID: 104

Configuration data is available when ASi diagnostic data is mapped. If the second byte "Use_Activation_Parameter_Config" is set to 1, all parameters listed in the configuration are stored in non-volatile memory. These parameters are only applied when EtherNet/IP Forward is opened or when the gateway is switched on. If used, the gateway sends a reset command and activates the ASi nodes with these new parameters for EtherNet/IP Forward Open or Power Cycle.

Byte	Description	Factory setting
0	Configuration_Assembly_Version	0
1	Use_Activation_Parameter_Config	0 = Do not use any parameters from this configuration 1 = Use parameters from this configura- tion
2	Active_param_L1_addr_1_1A.	0xF = Factory setting 0x0 – 0xF = Permitted range
32	Active_param_L1_addr_31_31A.	0xF = Factory setting
33	Active_param_L1_addr_1B_1B.	0x0 - 0xF = Permitted range



Byte	Description	Factory setting
63	Active_param_L1_addr_31B_31B.	0xF = Factory setting
64	Active_param_L2_addr_1_1A.1	-0x0 - 0xF = Permitted range
94	Active_param_L2_addr_31_31A.	0xF = Factory setting
95	Active_param_L2_addr_1B_1B.	-0x0 - 0xF = Permitted range
126	Active_param_L2_addr_31B_31B.	0xF = Factory setting 0x0 – 0xF = Permitted range

1. ASi network L2 is only used with the VBG-EP1-KE5-DMD

4.3.4 EtherNet/IP Class 3 Objects

Objects can be read or written (Get or Set). This enables acyclic communication with the ASi gateway for identification, resetting, or configuration.

Identity object 01_{hex}, 1 instance

Class attributes for the identity object 01 hex

Attribute ID	Name	Data type	Data value	Access
1	Revision	UINT	2	Get
2	Max Instances	UINT	1	Get
3	Number of Instances	UINT	7	Get

Table 4.48

Instance attributes for the identity object 01 hex

Attribute ID	Name	Data type	Data value	Access
1	Vendor ID	UINT	57	Get
2	Device Type	UINT	12	Get
3	Product Code	UINT	392 [VBG-EP1-KE5-D] 393 [VBG-EP1-KE5-DMD]	Get
4	Revision	UINT USINT	Major revision Minor revision	Get
5	Status	WORD	See EtherNet/IP specification	Get
6	Serial Number	USINT STRING	Length of character string Serial number	Get
7	Product Name	USINT STRING	Length of character string Model number	Get

Table 4.49

Common services for object 01_{hex}

Service code	Implemented in class	Implemented in instance	Service name
1 _{hex}	Yes	Yes	Get_Attribute_All
5 _{hex}	No	Yes	Reset
0E _{hex}	Yes	Yes	Get_Attribute_Single

Service code	Implemented in class	Implemented in instance	Service name
4B _{hex}	No	Yes	Flash_LED
Table 4.50	•	-	



Reset

Data to be sent: source data length 1 byte

0 = Restart

1 = Reset to standard. Resets password, EtherNet/IP, and ASi configurations

Data to be received once the message has been completed: none

	ResetData2=1 Perform	ns a system reset, ***Warning everyt IP Set to DHCP Passwsord set to defa AS-i Network Configuration	in in system hing is set to factory default including*** ault • erased
Reset	ResetToggle	MOV	MSG
-] [Source 0 Dest ResetData2 0.⊄	Message Control MSG_4
	ResetToggle	MOV	
]/[]	Source 1	
		Dest ResetData2	

Figure 4.33

Message Configuration - MSG_4

Aessage	e Type:		CIP Ge	neric			\sim	
Service	Device	Reset			\sim	Source	ResetData2	~
Type.						Source Length:	1	(Bytes)
Service Code:	5	(Hex)	Class:	1	(Hex)	Destination		~
Instance:	1	Att	ribute :	0	(Hex)	Element:	Now Tag	1

Diagnostic and Configuration Object 64hex

The object makes it possible to read and write both the current and permanent parameters.

Permanent parameter: This parameter is stored in a non-volatile memory and is used each time the node is activated after a power cycle.

Current parameter: This is the current parameter used by the node. The settings for the current parameter are written directly to the node. The response to the write operation is the parameter echo, which comes directly from the ASi node and does not have to be identical to the current parameter. This parameter is not stored in a non-volatile memory. The permanent parameter overwrites this value the next time the node is activated after the power cycle. It is only possible to write this parameter when the nodes are activated.

The identity object provides identification information and general information about the ASi gateway



Class Attributes for the Object $\mathbf{64}_{hex}$

Attribute ID	Name	Data type	Data value	Access
1	Revision	UINT	2	Get
2	Max Instances	UINT	1 [VBG-EP1-KE5-D] 2 [VBG-EP1-KE5-DMD]	Get
3	Number of Instances	UINT	1 [VBG-EP1-KE5-D] 2 [VBG-EP1-KE5-DMD]	Get

Table 4.51

Instance Attributes for the Object 64hex

Attribute ID	Name	Data type	Data value	Access
1	Actual Parameter	ARRAY OF UINT8 [62]	List of the current parameters of all ASi devices in the ASi network	Get Set
2	Permanent Parameter	ARRAY OF UINT8 [62]	List of permanent parameters of all ASi devices in the ASi network; changes to the per- manent parameters are applied the next time the device is switched on.	Get Set

Table 4.52

Service code	Implemented in class	Implemented in instance	Service name
1 _{hex}	Yes	Yes	Get_Attribute_All
0E _{hex}	Yes	Yes	Get_Attribute_Single
10 _{hex}	No	Yes	Set_Attribute_Single
18 _{hex}	No	Yes	Get_Member
19 _{hex}	No	Yes	Set_Member
32 _{hex}	No	Yes	Custom_Service ¹

Table 4.53

1. Write parameters and read echo



Reading All Current Parameters

Data to be sent: none

Data to be received once the message has been completed: 62 bytes. Use the "parameter" UDT provided by Pepperl+Fuchs to easily separate parameters.

Parameters	{}		PF_Parameters
Parameters.ADR_1A	1	Decimal	SINT
Parameters.ADR_2A	7	Decimal	SINT
Parameters.ADR_3A	4	Decimal	SINT
Parameters.ADR_4A	4	Decimal	SINT
Parameters.ADR_5A	5	Decimal	SINT
Parameters.ADR_6A	6	Decimal	SINT
Parameters.ADR_7A	7	Decimal	SINT
Parameters.ADR_8A	8	Decimal	SINT
Parameters.ADR_9A	9	Decimal	SINT
Parameters.ADR_10A	10	Decimal	SINT
Parameters.ADR_11A	15	Decimal	SINT
Parameters.ADR_12A	15	Decimal	SINT
Parameters.ADR_13A	15	Decimal	SINT
Parameters.ADR_14A	_15	Decimal	SINT
Parameters.ADR_15A	15	Decimal	SINT
Parameters.ADR_16A	15	Decimal	SINT

Figure 4.35

al parameters are read 1 or 2 for Network 1 or 2 ddress 1, byte 1 = address 2
MSG Message Control MSG_1 CENCE

Figure 4.36

Message Configuration - MSG_1

CIP Generic		~	
te Single V	Source		~
	Source Length:	0	(Bytes)
ex) Class: 64 (Hex)	Destination	Parameters	~
Attribute: 3 (Hex)	Element:	New Tag	
	te Single V ex) Class: 64 (Hex) Attribute: 3 (Hex)	te Single Source Source Length: ex) Class: 64 (Hex) Attribute: 3 (Hex)	Ite Single Source Source Length: 0 (Hex) Destination Attribute: 3



Writing Current Parameters

Data to be sent: 2 bytes

Byte 0 = Address for setting the parameter

Byte 1 = Parameter to be set

Param_Send_Data	{}	Decimal	SINT[2]	
Param_Send_Data[0]	1	Decimal	SINT	Address
Param_Send_Data[1]	1	Decimal	SINT	Parameter

Figure 4.38

Data to be received once the message has been completed: 1 byte

Param_Echo	1 D	Decimal	SINT	~
gure 4.39				_
Service Code 32 Data b	Write / , Class 64, Instar yte 0 = Address t Data byte	Actual Parameter nce (1 or 2 for Netwo to Write to 1=1, 2=2, e 1 = Parameter data Mess	rk 1 or 2) and Attribute 3 33=1b, 34=2b age Control MSG_2	EN E
Configuration* Communicatio	n Tag			
Message Type: CIP	Generic		\sim	
Service Custom	```	Source	Param_Send_Dat	ta 🗸
Type.		Source Length	n: 2 🗘 (B	ytes)
Service 32 (Hex) Clas	55: 64 (He	ex) Destination	Param_Echo	~
	te: 3 (He	ex) Element:	New Tag	
Instance: 1 Attribut			New ray	
Instance: 1 Attribut	work 1		New Tay	

Byte 0 = Parameter echo



Reading All Permanent Parameters

Data to be sent: none

Data to be received once the message has been completed: 62 bytes. Use the "parameter" UDT provided by Pepperl+Fuchs to easily separate parameters.

▲ Parameters	{}		PF_Parameters
Parameters.ADR_1A	1	Decimal	SINT
Parameters.ADR_2A	7	Decimal	SINT
Parameters.ADR_3A	4	Decimal	SINT
Parameters.ADR_4A	4	Decimal	SINT
Parameters.ADR_5A	5	Decimal	SINT
Parameters.ADR_6A	6	Decimal	SINT
Parameters.ADR_7A	7	Decimal	SINT
Parameters.ADR_8A	8	Decimal	SINT
Parameters.ADR_9A	9	Decimal	SINT
Parameters.ADR_10A	10	Decimal	SINT
Parameters.ADR_11A	15	Decimal	SINT
Parameters.ADR_12A	15	Decimal	SINT
Parameters.ADR_13A	15	Decimal	SINT
Parameters.ADR_14A	.15	Decimal	SINT
Parameters.ADR_15A	15	Decimal	SINT
Parameters.ADR_16A	15	Decimal	SINT
Figure 4.42			

All Perm	nanent parameters are read
Instanc	se 1 or 2 for Network 1 or 2
Data byte 0 =	Address 1, byte 1 = address 2
Data	byte 1 = Parameter data
Read_All_Perm_Param	MSG Message Control MSG_5(EN) -(DN) -(ER)

Figure 4.43

Message	e Type:	CIP Generic			\sim	
Service	Get Attribut	e Single	~	Source		\sim
i jpc.				Source Length:	0	(Bytes)
Service Code :	e (He	ex) Class: 64	(Hex)	Destination	Parameters	s ~
nstance:	:1	Attribute: 4	(Hex)	Element:	New Tag.	•
		Networ	k 1	1		

Message Configuration - MSG_5



Setting All Permanent Parameters

Data to be sent: 62 bytes. Use the "parameter" UDT provided by Pepperl+Fuchs to easily separate parameters

 Parameters.ADR_1A Parameters.ADR_2A Parameters.ADR_3A Parameters.ADR_3A Parameters.ADR_3A Parameters.ADR_4A Decimal SINT Parameters.ADR_5A Decimal SINT Parameters.ADR_6A Decimal SINT Parameters.ADR_7A Decimal SINT Parameters.ADR_8A Decimal SINT Parameters.ADR_9A Decimal SINT Parameters.ADR_10A Decimal SINT Parameters.ADR_11A Decimal SINT Parameters.ADR_13A Parameters.ADR_13A Parameters.ADR_14A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT Parameters.ADR_16A SINT SINT SINT Parameters.ADR_16A SINT SINT	Parameters	{}		PF_Parameters
 Parameters.ADR_2A Parameters.ADR_3A Parameters.ADR_3A Parameters.ADR_4A Decimal SINT Parameters.ADR_5A Decimal SINT Parameters.ADR_6A Decimal SINT Parameters.ADR_7A Decimal SINT Parameters.ADR_8A Decimal SINT Parameters.ADR_9A Decimal SINT Parameters.ADR_10A Decimal SINT Parameters.ADR_11A Decimal SINT Parameters.ADR_12A Decimal SINT Parameters.ADR_13A Parameters.ADR_14A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT Parameters.ADR_16A Decimal SINT SINT Parameters.ADR_16A Decimal SINT SINT Parameters.ADR_16A Decimal SINT SINT Parameters.ADR_16A Decimal SINT SINT	Parameters.ADR_1A	1	Decimal	SINT
 Parameters.ADR_3A Parameters.ADR_4A Decimal SINT Parameters.ADR_5A Decimal SINT Parameters.ADR_6A Decimal SINT Parameters.ADR_7A Decimal SINT Parameters.ADR_8A Decimal SINT Parameters.ADR_9A Decimal SINT Parameters.ADR_10A Decimal SINT Parameters.ADR_11A Decimal SINT Parameters.ADR_12A Decimal SINT Parameters.ADR_13A Decimal SINT Parameters.ADR_14A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT 	Parameters.ADR_2A	7	Decimal	SINT
 Parameters.ADR_4A Parameters.ADR_5A Parameters.ADR_6A Decimal SINT Parameters.ADR_7A Parameters.ADR_8A Decimal SINT Parameters.ADR_9A Decimal SINT Parameters.ADR_10A Decimal SINT Parameters.ADR_11A Decimal SINT Parameters.ADR_12A Parameters.ADR_13A Parameters.ADR_14A Decimal SINT Parameters.ADR_15A SINT SINT SINT Parameters.ADR_16A Decimal SINT SINT<!--</td--><td>Parameters.ADR_3A</td><td>4</td><td>Decimal</td><td>SINT</td>	Parameters.ADR_3A	4	Decimal	SINT
 Parameters.ADR_5A Parameters.ADR_6A Decimal SINT Parameters.ADR_7A Decimal SINT Parameters.ADR_8A Decimal SINT Parameters.ADR_9A Decimal SINT Parameters.ADR_10A Decimal Decimal SINT Parameters.ADR_11A Decimal SINT Parameters.ADR_12A Decimal SINT Parameters.ADR_13A Decimal SINT Parameters.ADR_14A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT SINT 	Parameters.ADR_4A	4	Decimal	SINT
 Parameters.ADR_6A Parameters.ADR_7A Parameters.ADR_8A Parameters.ADR_9A Parameters.ADR_10A Parameters.ADR_11A Parameters.ADR_12A Parameters.ADR_13A Parameters.ADR_14A Parameters.ADR_15A Parameters.ADR_15A Decimal SINT Parameters.ADR_15A SINT SINT SINT Parameters.ADR_16A Decimal SINT SINT<	Parameters.ADR_5A	5	Decimal	SINT
 Parameters.ADR_7A Parameters.ADR_8A Decimal SINT Parameters.ADR_9A Decimal SINT Parameters.ADR_10A Decimal Decimal SINT Parameters.ADR_11A Decimal SINT Parameters.ADR_12A Decimal SINT Parameters.ADR_13A Decimal SINT Parameters.ADR_14A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT SINT 	Parameters.ADR_6A	6	Decimal	SINT
 Parameters.ADR_8A Parameters.ADR_9A Decimal SINT Parameters.ADR_10A Decimal SINT Parameters.ADR_11A Decimal SINT Parameters.ADR_12A Decimal SINT Parameters.ADR_13A Decimal SINT Parameters.ADR_14A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT SINT SINT SINT SINT SINT SINT SINT SINT 	Parameters.ADR_7A	7	Decimal	SINT
 Parameters.ADR_9A Parameters.ADR_10A Parameters.ADR_11A Parameters.ADR_11A Parameters.ADR_12A Parameters.ADR_13A Parameters.ADR_14A Parameters.ADR_15A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal Decimal Decimal Decimal Decimal SINT Parameters.ADR_16A Decimal Decimal Decimal SINT 	Parameters.ADR_8A	8	Decimal	SINT
 Parameters.ADR_10A Parameters.ADR_11A Decimal Decimal SINT Parameters.ADR_12A Decimal Decimal SINT Parameters.ADR_13A Decimal Decimal SINT Parameters.ADR_14A Decimal Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT 	Parameters.ADR_9A	9	Decimal	SINT
 Parameters.ADR_11A Parameters.ADR_12A Parameters.ADR_12A Decimal SINT Parameters.ADR_13A Decimal SINT Parameters.ADR_14A Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT 	Parameters.ADR_10A	10	Decimal	SINT
 Parameters.ADR_12A Parameters.ADR_13A Decimal Decimal SINT Parameters.ADR_14A Decimal Decimal SINT Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT 	Parameters.ADR_11A	15	Decimal	SINT
 Parameters.ADR_13A Parameters.ADR_14A Parameters.ADR_15A Parameters.ADR_15A Decimal SINT Parameters.ADR_16A Decimal SINT 	Parameters.ADR_12A	15	Decimal	SINT
 ▶ Parameters.ADR_14A ▶ Parameters.ADR_15A ▶ Parameters.ADR_16A ▲ Decimal ▶ SINT SINT 	Parameters.ADR_13A	15	Decimal	SINT
 ▶ Parameters.ADR_15A ▶ Parameters.ADR_16A ▲ 15 Decimal SINT 	Parameters.ADR_14A	.15	Decimal	SINT
▶ Parameters.ADR_16A 15 Decimal SINT	Parameters.ADR_15A	15	Decimal	SINT
	Parameters.ADR_16A	15	Decimal	SINT

Figure 4.45





nfiguration* Comm	unication* Tag			
lessage Type:	CIP Generic		~	
Service Set Attribu	te Single \vee	Source	Parameters	~
ype.		Source Length:	62	(Bytes)
ervice 10 (He	ex) Class: 64 (Hex) Destination		\sim
istance: 1	Attribute: 4 (Hex) Element.	New Tag	

5 Operation

5.1 Push Button

You can use the push button to save the current configuration of one or both AS-Interface segments directly at the gateway and to reset the gateway to the factory setting.

You can switch the fieldbus protocol.



Figure 5.1

>

Saving the Configuration and Switching to Protected Mode

This feature allows you to save the current configuration of the ASi networks to non-volatile memory and change the operating mode of the selected ASi network to protected mode.

1. Press and hold the push button for at least five seconds.

 \mapsto The LEDs for ASi line 1 flash yellow.

2. Store the current configuration in segment 1 by pressing the push button for at least five seconds.

 \mapsto When the configuration is saved, the LEDs for ASi line 1 flash green for five seconds.

→ If the configuration has not been saved, the LEDs for ASi line 1 flash red for five seconds.

3. To switch to segment 2, briefly press the push button.

 \rightarrow The LEDs for ASi line 2 flash yellow.

4. Store the current configuration in segment 2 by pressing the push button for at least five seconds.

→ When the configuration is saved, the LEDs for ASi line 2 flash green for five seconds. → If the configuration has not been saved, the LEDs for ASi line 2 flash for five seconds.

5. To switch to segments 1 and 2 at the same time, short-press the push button twice.

 \mapsto The LEDs for ASi line 1 and ASi line 2 flash yellow.

- 6. Store the current configuration in segments 1 and 2 by pressing the push button for at least five seconds.
 - \mapsto If the configuration has been stored, the Memory LED lights up green.
 - \mapsto If the configuration has not been stored, the Memory LED lights up red.



Note

The device exits the menu after five seconds without any input.



Switching the Fieldbus Protocol

A new gateway is always in PROFINET mode. The push button can be used to switch the fieldbus protocol to EtherNet/IP and back to PROFINET. Please note that switching the fieldbus mode will cause the gateway to restart and will reset the fieldbus configuration.

1. Press and hold the push button for at least five seconds.

 \rightarrow The LEDs for ASi line 1 flash yellow.

- VBG-EP1-KE5-DMD: Short-press the push button four times for EtherNet/IP or short-press three times for PROFINET.
- **3.** VBG-EP1-KE5-D: Short-press the push button twice for EtherNet/IP or short-press once for PROFINET.

 \hookrightarrow The SF/MS LED flashes.

4. Press and hold the push button for at least five seconds.

 \rightarrow The LEDs for ASi line 1 and ASi line 2 flash.

→ The gateway switches to EtherNet/IP mode

5. Switch back to PROFINET mode by repeating steps 1–3.



Factory Reset

This function resets the gateway to the state in which it was delivered. The function includes the web server password, the fieldbus configuration, the ASi configuration, and the SD card.

- 1. With the gateway and power supply switched off, press and hold the push button.
- 2. Switch on the power supply at the "ASi line 1" connection.

 \mapsto When the LED start sequence has finished, the "SF/MS" LED flashes yellow.

- Release the push button.
- 4. Press the push button for at least five seconds and then release it.

→ The gateway will reset to the factory setting when it restarts.



Note

- Do not interrupt the power supply during the factory reset.
- The device exits the menu after five seconds without any input and restarts.
- If an error occurs during the factory reset, the "Button function" LED flashes red. The device restarts.



Тір

To use extensive configuration options and fault analysis, use the web interface. See chapter 5.2.

5.2 Web Interface

The AS-Interface gateway has a web interface that allows you to configure the gateway and run diagnostics.

F PEPPERL+FUCHS	
Login	
User name *	
Password *	
SUBMIT	
All fields marked with an asterisk (*) are mandatory	
English ~ Legal information	
O Pepperi+Fuchs	

Figure 5.2

The web interface is called up via the fieldbus interface at terminals X1, X2, and X3. See chapter 3.1.3.

Open the web interface with a current web browser, such as Google Chrome, Mozilla Firefox, and Microsoft® Edge.

The web interface is accessed via an HTTP request: http://<ip - Address>. The IP address must be configured beforehand via the fieldbus; see chapter 4.2.1.1.



5.2.1 Login



Setting the Language

1. Click on the language selection field in the bottom left.

	Login
User name *	
Password *	
	•
	SUBMIT
All fields marked with an a	asterisk (*) are mandatory
English	Legal informa
Deutsch	

Figure 5.3

- 2. Click on the language you want the web interface to appear in.
- 3. You can select German or English.

 \mapsto The selected language is applied to the web interface.



Login

You need a user name and password to launch the web interface. At initial commissioning the user name is "admin." The password can be found on the gateway label.

1. Enter the user name in the "User name" field.

Note

- 2. Enter the password in the "Password" field.
- 3. Press the "Submit" button.

ECOUPERL+FUCHS Login User name* Password* COUPERL Al fields marked with an asterisk (*) are mandatory Mediated with an asterisk (*) are mandatory	EDEPPERL+FUCHS Login User name* Password* Colored SUBMIT All fields marked with an asterisk (*) are mandatory Megal information	
Login User name* Password * SUBMIT All fields marked with an asterisk (*) are mandatory English ~ Legal information	Login User name * Password * SUBMIT All fields marked with an asterisk (*) are mandatory	EPEPPERL+FUC
User name *	User name * Password * SUBMIT All fields marked with an asterisk (*) are mandatory English * Legal information	Login
Password * SUBMIT All fields marked with an asterisk (*) are mandatory Final English - Legal information	Password * SUBMIT All fields marked with an asterisk (*) are mandatory English * Legal information	User name *
SUBMIT All fields marked with an asterisk (*) are mandatory English Legal information	SUBMIT All fields marked with an asterisk (*) are mandatory English Legal information	Password *
SUBMIT I fields marked with an asterisk (*) are mandatory English + Legal information	SUBMIT I fields marked with an asterisk (*) are mandatory English + Legal information	
Il fields marked with an asterisk (*) are mandatory	II fields marked with an asterisk (*) are mandatory Denglish ~ Legal information	SUBMIT
English - Legal information	English - Legal information	I fields marked with an asterisk (*) are mandatory
		⊕ English - Legal info
		Pepperl+Fuchs

Figure 5.4

 \mapsto The web interface dashboard opens.



Legal Information

Please refer to the legal information for the most important information on data protection and licenses.

1. Click on the "Legal information" field

 \mapsto The "Legal information" window opens.

General Data Protection Information Version as of April 2020 Data protection is important to the operator and we would like to inform you about the methods we use to collect personal data by using the device during your visit to the website, as well as the scope and purpose of data collection. This information relates to the website and its corresponding sub-pages. To the extent that the website contains links to third-party websites, these are not covered by our privacy policy. 1. Responsible authority The responsible authority for this website is the operator of the device. 2. Collection and processing of personal data		
Version as of April 2020 Data protection is important to the operator and we would like to inform you about the methods we use to collect personal data by using the device during your visit to the website, as well as the scope and purpose of data collection. This information relates to the website and its corresponding sub-pages. To the extent that the website contains links to third-party websites, these are not covered by our privacy policy. 1. Responsible authority The responsible authority for this website is the operator of the device. 2. Collection and processing of personal data	General Data Protection Information	
Data protection is important to the operator and we would like to inform you about the methods we use to collect personal data by using the device during your visit to the website, as well as the scope and purpose of data collection. This information relates to the website and its corresponding sub-pages. To the extent that the website contains links to third-party websites, these are not covered by our privacy policy. 1. Responsible authority The responsible authority for this website is the operator of the device. 2. Collection and processing of personal data	Version as of April 2020	- 1
Responsible authority The responsible authority for this website is the operator of the device. Collection and processing of personal data	Data protection is important to the operator and we would like to inform you about the methods we use to collect personal data by using th device during your visit to the website, as well as the scope and purpose of data collection. This information relates to the website and its corresponding sub-pages. To the extent that the website contains links to third-party websites, these are not covered by our privacy policy.	
The responsible authority for this website is the operator of the device. 2. Collection and processing of personal data	1. Responsible authority	- 1
2. Collection and processing of personal data	The responsible authority for this website is the operator of the device.	
	2. Collection and processing of personal data	
In general, no personal data (e.g. name, address or email address) is processed.	In general, no personal data (e.g. name, address or email address) is processed.	- 1
To the extent that personal data is requested on this website (e.g. password and username), this data is disclosed voluntarily by the user. If you have any questions regarding the use of your data, please contact the operator of the device.	To the extent that personal data is requested on this website (e.g. password and username), this data is disclosed voluntarily by the user. If you have any questions regarding the use of your data, please contact the operator of the device.	1
Moreover, your movements on one of these websites cause the following data to be transmitted to our web server from your Internet	Moreover, your movements on one of these websites cause the following data to be transmitted to our web server from your Internet browser:	

Figure 5.5



5.2.2 Dashboard

The web interface is responsive and optimized for viewing on desktop PCs, tablets, and smart-phones.

Ansicht Tablet



Figure 5.6



Figure 5.7



View desktop PC

EPEPPERL+FUCHS	Product: VBG-EP1-KES-DMD Serial number: 40000114898745			÷ 8	
Lashboard ∠dsi AS-Interface ASi Line 1	Device picture	ASi lines diagnostic information ASi Line 1			
ASI Line 2		Master State Diagnostic Passive	Number of ASi devices Actual / Configured:	2/2	
Evens Network interfaces Firmware update Data backup		ASI Line 2 Master State Maintenance required	Number of ASi devices Actual / Configured:	0/0	
Reboot		Device identification		:	
HELP Technical support Contact	H H	Name Vendor Product		ASI 3 Gateway with two ASI lines PepperHFuchs VBG-EP1-KE5-DMD	
LEGAL INFORMATION Privacy Policy Licenses		Item number Serial number Hardware revision		322553 40000114898745 1	
	Ad Line 4 Ad Ad Phere Ad Ad Phere 4 Carry 1	Software revision Production batch		P2.3.0.1163 Week 23, 2021	

Figure 5.8

Note

F

The following descriptions refer to the display on a desktop PC.

Important Elements

[€] PEPPERL+F	UCHS Product: VBG-EP1-XE5-DMD Serial number: 40000114898745		\$ 3
ASi Line 1	Device picture	ASI lines diagnostic information ASI Line 1	56
ASi Line 2 System		N terres Master State Number of ASi c Los Diagnostic Passive Actual / Configure	zvices I: 2 / 2
Network interfac		ASI Line 2	
Firmware update Data backup		Maintenance required Actual / Configure	E 0/0
Factory reset Reboot		Device identification	:
HELP	n N x3	Name	ASI 3 Gateway with two ASI lines
Technical support Contact	li	F Vendor	Pepperl+Fuchs VBC-EP1-KES-DMD
LEGAL INFORMATION	· · · · · · · · · · · · · · · · · · ·	Item number	322553
Privacy Policy Licenses		Serial number Hardware revision	40000114898745
	Maa, 🖁 – 🔍 🗣 📰 🔭	Software revision	P2.3.0.1163
		Production batch	Week 23, 2021
1	Main window		
2	Top bar		
3	Navigation		
(4), (5)	Diagnostic symbols		
(6)	User menu		

PEPPERL+FUCHS

Main window

The main window shows an overview of the following topics:

- Device picture
- Diagnostics summary for AS-Interface segment 1 and AS-Interface segment 2
- Device identification

Top bar

The top bar contains information that is always visible to the user:

- Device identification: Product name and serial number
- System-wide diagnostics symbol
- User menu:
 - 1. Web interface language setting
 - 2. User settings for the current session
 - 3. Password change

Diagnostic Symbols

The web interface informs the user at various levels about diagnostic states in the system. This diagnostic information is shown using the following symbols and dependencies. The meaning of the symbols depends on the information associated with them.

Symbol	Color	Description
	Gray	Diagnostics disabled
~ /	Green	Device or system is enabled
⟨ ↓ ↓	Blue	Maintenance required
<u> </u>	Yellow	Out of specification System is outside of the permitted specification
		 System has a problem that is outside of the system scope, such as a peripheral fault
V / V	Orange	Check function
🚫 / 🔵	Red	Error

Table 5.1

Dependencies

Top bar	Displays the system-wide diagnostics of the device. Summarizes the top-level diagnostic data in the navigation.
Navigation	Diagnostic symbols are shown separately and refer to the respective description of the element, e.g., "ASi Line 1." You can use the navigation arrows to navigate through the list. The individual list elements are grouped together with a diagnostic symbol.
Main window	Detailed description and analysis of individual faults.



5.2.3 AS-Interface

The "AS-Interface" menu allows you to access the various AS-Interface segments with the associated gateway and the respective AS-Interface nodes.

You can configure and operate the system or use diagnostics.



Figure 5.9

Note



ASi line 2 is only supported by the VBG-EP1-KE5-DMD.

"ASI MASTER" Tab

You will find status information about the ASi segments under the "ASI MASTER" tab. You can configure the gateway and the respective segment.







Diagnostics

In the "Diagnostics" area, you will find information about the gateway and/or the AS-Interface segment.

Configuration

You can configure the gateway and all nodes in the "Configuration" area.

Operating Mode

- In **Protected mode**, the gateway only enables projected nodes. Any unexpected or incompatible nodes are not enabled for process data exchange.
- In **Configuration mode**, the gateway accepts all nodes and allows interaction with them, e.g., via a PLC.

Automatic Address Assignment

 The Automatic addressing check box enables automatic address assignment in protected mode. This enables the gateway to automatically address new nodes that were installed in place of a faulty node. The new node must be compatible with the faulty node. If a node is replaced with an incompatible node, the address must be assigned manually. Automatic address assignment attempts to change the AS-Interface address of a new node if it is the only compatible device for a missing device.

Offline

• The **Offline** check box switches the gateway for the respective AS-Interface segment to offline mode.

Data Exchange Active

• The gateway does not exchange process data with detected nodes.

"ASI DEVICES" Tab

Under the "ASI DEVICES" tab, you will find all the nodes of the respective AS-Interface segment that the gateway expects or finds.

Product: VBG-EP1-KE5-DMD Serial number: 40000114898745			ى 🔄
Copress 7.8 L 0 Copress 7.8 L 0 Copres	Profile Permanent (Power up) € 7. B. E. 0 .7. B. E. 0 .7. B. E. 0 Notation: 10.0.10.102 Parameters Permanent (Power up) 3. < 2. < 1: < 0: 3. < 2. < 1: < 0: 3. < 2. < 1: < 0: Diagnostic Peripheral Fault ■ OK Device State ■ Detected ■ Projected ● Activate Advanced options Process data ▲ toppi (Digita)	ed Output (Dipital)	✓ Digital/Analog ▼
		0000	



- 1) Overview of AS-Interface nodes
- 2) Information about the selected node
- Filter for node list



- (4) AS-Interface segment action menu
- 5 Information about individual nodes
- 6) Status and configuration of the selected node
- (7) Action menu of the selected node

Overview of AS-Interface Nodes

List of all nodes in the selected segment. The overview includes the following functions:

Filter ASi device list

FPPPERL+FUCHS	Product: VBG-EP1- Serial number: 4000011	KE5-DMD 14898745				♦ 8
III Dashboard ∠rsi AS-Interface ♦ ∧	Filter ASi device list	ASI DEVICES	STORE ACTUAL ASI LINE CONFIGURATION	1 < >		5 APPLY -
ASI Line 1	Select all Select all Select all Asi devices Digital Asi devices Analog ASi devices OK OK			Profile Perminent (Power up) 7.8.6.0 Netstern: 10.80.01.3.02 Parameters Perminent (Power up) 3: © 2: © 1: © 0: © Actual # 2: © 2: © 1: © 0: ©	Actual 7.8.E.0	
				Diagnostic Peripheral Fault CK Detected Projected Activated Advanced options		×
				Process data 🖌 Inper (Dipital) 3 3 1 3	Overer (Nights) ③ ② ⑦ ④	Digital/Analog v

Figure 5.12

You can filter the list of nodes based on the following criteria:

- Faulty nodes
- Digital nodes
- Analog nodes

AS-Interface Segment Action Menu

- You can save all existing nodes from the list of ASI DEVICES on the AS-Interface segment in the list of expected nodes LPS.
 - Nodes are available if they are included in the list of detected nodes LDS.
- You can manually add more nodes to the expected nodes.

Note

All nodes that you add via the web interface must be connected to the AS-Interface segment. Unconnected nodes are deleted when they are transferred to the LPS.



Figure 5.13

Information about individual devices

Digital 7.A.7.7	
3A Diagnostic OK	

Figure 5.14

- The list entry shows:
 - The profile
 - The type of node: digital or analog
 - The address
 - · Diagnostic information of the respective node

Information about the Selected AS-Interface Node

Detailed display of all information about the selected node. The overview includes the following functions:

Status and Configuration

 Informs about the node settings expected by the gateway Shows the currently detected device information Allows commissioning without PLC

Profile

Profile	
Permanent (Power up)	Actual
7.B.E.0	7.B.E.0
Notation: IO.ID.ID1.ID2	

Figure 5.15

- The "Permanent (Power up)" field displays the projected AS-Interface node profile that the gateway expects.
- The "Actual" field displays the detected AS-Interface node profile of the connected node.



Parameters

Parameters		
Permanent (Pow	er up)	
3: 🔽 2: 🗹	1: 🔽	0: 🔽
Actual 🧪		
3: 🗸 2: 🗸	1: 🗸	0: 🗸

Figure 5.16

- The "Permanent (Power up)" field displays the projected AS-Interface parameters that the gateway expects.
- The "Actual" field displays the AS-Interface parameters of the connected node currently in use.
- You can click on the pen icon to modify the parameters of the node in "Force" mode.



Warning!

Parameter Changes

If you change the parameters of a node via the web interface, you are responsible for any safety-relevant effects.

Make sure that the system is taken out of operation before you change the parameters.

You are responsible for ensuring that the parameters match the expected states in the application after exiting "Force" mode. After exiting "Force" mode, the modified parameters are applied immediately.



Figure 5.17

Diagnosis Information

- OK
- Peripheral faults
- Missing node

Device Status

- Detected
- Projected
- Enabled

Advanced options

Selection * CTT1 Identification CTT1 Diagnostic	^
CTT1 Identification CTT1 Diagnostic	
CTT1 Diagnostic	





Using the advanced options, it is possible to read the identification or diagnosis of a node that uses CTT1 strings.

CTT1

Process data

Process data 🗪	Digital/Analog 🔻
Input (Digital)	Output (Digital) $3 \ 2 \ 1 \ 0$

Figure 5.19

- Displays the input and output process data of the node. The representation of the process data depends on the respective node.
- You can click on the pen icon to modify the outputs of the node in "Force" mode.



Caution!

Changing Process Data

As a user, you are responsible for any changes to the process data of a node made via the web interface.

As a user, you are responsible for making sure that the system is taken out of service before you make any changes to the process data.

A change in the process data of the device can result in the following consequences or events (this list is not exhaustive):

- Switching of outputs
- Physical damage to actuators, e.g., motors
- Damage to the system
- Personal injury

CTT2

In the "Digital/Analog" selection field, you can modify process data by selecting "CTT2 direct access."

Process data CTT2

Process data 🧪	CTT2 direct access 🔻
Request (Execute) *	EXECUTE
12:07:2a	
12:07:2a Response (Execute)	
12:07:2a Response (Execute) 52:01:00:00:60:66:66	:66:66:66:FF:FF:0F:00:00:
12:07:2a Response (Execute) 52:01:00:00:60:66:66 00:00:00:00:00:00:00:00	:66:66:66:FF:FF:0F:00:00: :00:00:00:00:00:00:00:00:00:00:

All fields marked with an asterisk (*) are mandatory

Figure 5.20

Enter the CTT2 request, the index of the target object, and the data length in the "Request" field. Enter the information as HEX values.


CTT2 Request Types

0x10	16 _{DEC}	acyclic standard read service request
0x11	17 _{DEC}	acyclic standard write service request
0x12	18 _{DEC}	acyclic vendor specific read service request
0x13	19 _{DEC}	acyclic vendor specific write service request

For the correct request number of the individual ASi nodes and the information read via CTT2, consult the manufacturer's information on the nodes.

Action menu of the selected node

Store actual ASi device configuration Change ASi device address/ID1 code
Reboot ASi device Remove projected ASi device

Figure 5.21

The action menu allows you to control the following functions:

- Change an AS-Interface device identification: Change AS-Interface address/ID1 code:
- Accept the projected profiles and parameters from the form
- Use a detected profile and parameters as projected: Change device configuration
- Reset a node: Force reboot and reconnection
- Remove nodes from the list of projected nodes for the gateway

PEPPERL+FUCHS

Change ASi device address/ID1 code

Change ASi device address/ID1 code	×
 This dialog changes the address/ID1 code settings in the ASi device itself. The ASi gateway will not update the stored configuration expectation. 	
Address *	i
1	
The ASi device address is a unique identifier on the ASi line	
ID1 code *	i
E	
The extended ID1 code allows to set the customer specific identifier	
RESET APPLY All fields marked with an asterisk (*) are mandatory	



5.2.4 System

The "System" menu contains the following content:

- List of events
- Firmware update
- Data backup
- Factory reset
- **Restart** of the device.

5.2.4.1 Events



Figure 5.23

Under the "Events" (1) menu item, you will find a list of all gateway events with a log of the severity of the event and an explanation. This function contains a filter that enables users to search through the events in a structured way.

2022-12



5.2.4.2 Network Interfaces

PEPPERL+FUCHS	Product: VBG-EP1-KE5-DMD Serial number: 40000094288192				\$ 3
Dashboard	X1/X2 X1 X2				
∠lSi AS-Interface ◆ ✓ ⊙ System □ ^	Configure IPv4			Current configuration Base settings:	'n
Events	IPv4 method *			Name	X1/X2
Network interfaces	Manual			MAC address	00:0D:81:0B:61:A4
Firmware update	Addresses			IPv4 settings:	
Data backup 📃				IPv4 method	Manual
Factory reset	IP address *	Netmask *	Gateway *	IP address	192.168.2.123
Reheat	192.168.2.123	255.255.255.0	0.0.0.0	Gateway	0.0.0.0
HELP Technical support Contact LEGAL INFORMATION Privacy Policy Licenses	RESET APPLY All fields marked with an asterisk (*) are mandatory				

Figure 5.24

Under the "Network interfaces" menu item, you can change the configuration of industrial Ethernet interface X1/X2 via the web interface.

The required IP address for operation via EtherNet/IP or PROFINET can be stored in the device.

Click the "APPLY" button to apply the changes. The device will then restart.

5.2.4.3 Firmware Update

1 —	2	3	4	5	6					
Firmware file selection	Upload firmware file	Check and confirm firmware data	Update firmware	Reboot and log in	Summary					
	D rop file here to upload									
		CHOOSI	EFILE							
				CANCEL	UPLOAD FILE					

Figure 5.25

You have the option to upload a new firmware file via the web interface under the "Firmware update" menu item.

If a firmware update is required, the wizard will guide you through the process of updating the gateway.



Note

The firmware update is only possible via Ethernet interfaces X1/X2



_		_			-	
			-	-		
_		_	C.		FN .	N

EPEPPERL+FUCHS	Product: VBG-EP1-KE5-DMD	♦ 3
Dashboard	SD CARD SAVE + RESTORE	
∠lsi AS-Interface ♦ ∨ (● System	SD card status	Export SD card configuration (i)
Events	() The SD card is missing	DOWNLOAD
Network interfaces Firmware update	FORMAT SD CARD	Export gateway configuration (i)
Data backup 📃		DOWNLOAD
Factory reset Reboot	Status of the SD card configuration	
	 There is no configuration available 	
HELP Technical support Contact LEGAL INFORMATION Privacy Policy Licenses	Diagnostic WRITE TO SD CARD TAKE OVER INTO GATEWAY	

Figure 5.26

Under the "Data backup" menu item, you can back up and restore the configuration of the gateway. The gateway uses an SD card for data backup. See chapter 3.1.5.

"SD CARD" Tab

EPPPERL+FUCH	Product: VBG-EP1-KE5-DMD	÷ 3
Dashboard	SD CARD SAVE + RESTORE	
⊿Si AS-Interface	SD card status	Export SD card configuration (i)
Events	1 Incompatible format	DOWNLOAD
Network interfaces Firmware update	FORMAT SD CARD	Export gateway configuration (i)
Data backup Factory reset Reboot	Status of the SD card configuration	DOWNLOAD
HELP Technical support Contact LEGAL INFORMATION Privacy Policy Licenses	Diagnostic WRITE TO SD CARD TAKE OVER INTO GATEWAY	

Figure 5.27

Status of the SD Card

This section of the tab displays the status of the SD card.

You can format SD cards that have an incompatible file format.



Warning!

Data Loss

Formatting a read/write tag will result in any data saved on it being lost.

If the device has formatted the SD card or a correctly formatted SD card is inserted, the current configuration data of the device is automatically saved to the SD card.





Status of the SD Card Configuration

This section of the tab displays the status of the SD card configuration.

EPEPPERL+FUCHS	Product: VBG-EP1-KE5-DMD	83
Dashboard	SD CARD SAVE + RESTORE	
∠Si AS-Interface ▲ ∨ System N Events 	SD card status Image: SD card is formatted	Export SD card configuration (;) DOWNLOAD
Network interfaces Firmware update Data backup	FORMAT SD CARD	Export gateway configuration ()
Factory reset Reboot	Status of the SD card configuration () There is a conflict with the AS-I gateway configuration	
HELP Technical support Contact LEGAL INFORMATION Privacy Policy Licenses	Diagnostic Asi Line 1: Conflict found with the AS-i gateway configuration Asi Line 2: In sync with the AS-i gateway configuration Device identification: In sync with the AS-i gateway configuration WRITE TO SD CARD	

Figure 5.28

If the device detects an SD card with valid configuration data that differs from the projected configuration, the web interface reports a conflict.

Resolving a conflict:

- Click "Write to SD card." The configuration data on the SD card is overwritten with the projected configuration data on the gateway. A warning message appears, which you must acknowledge.
- 2. Click "Copy from SD card."

The projected configuration data of the gateway is overwritten with the configuration data on the SD card. A warning message appears, which you must acknowledge. The gateway restarts.

"SAVE + RESTORE" Tab

Use this tab to export and import the gateway configuration.

EPEPPERL+FUCHS	Product: VBG-EP1-KE5-DMD	÷ 3
Dashboard	SD CARD SAVE + RESTORE	
∠Si AS-Interface ◆ ③ System ▲ Events ▲ Network interfaces Firmware update Data backup □ Factory reset Reboot	Upload configuration file	Export gateway configuration ()
HELP Technical support Contact	RESET UPLOAD FILE Status of the uploaded configuration ① There is no configuration available	
LEGAL INFORMATION Privacy Policy Licenses	Diagnostic ASI Line 1: No configuration available ASI Line 2: No configuration available Device identification: No configuration available TAKE OVER INTO GATEWAY	





5.2.4.5 Factory Settings

-	-	
FEPPERL+FUCHS	Produst: VB0-EP1-K85-DMD Serial number: 40000114998745	3
Dashboard	Reset firmware to the factory settings	
⊿si AS-Interface 🛛 🔶 ∽	Sattines *	ļ
System	Passwords	
Events	Industrial Ethernet	
Network interfaces	Asi Line 1	
Firmware update	AS-I Line 2	
Data backup	SD card	
Factory reset	Mandatory Field	
Reboot	RESET FORM RESET FIRMWARE	
	All fields marked with an asterisk (*) are mandatory	
HELP		
Contact		
LEGAL INFORMATION Privacy Policy Licenses		

Figure 5.30

You can reset the following entries or settings to the factory settings under the "Factory settings" menu item:

- Passwords
- Industrial Ethernet
- AS-Interface segment 1
- AS-Interface segment 2
- SD card



5.2.4.6

For a factory reset with or without I&M data in the TIA Portal, see chapter 4.2.1.3.

Restarting

Tip

Reboot device

(i) When rebooting, the event messages are deleted. All settings of the device are retained.

REBOOT DEVICE

Figure 5.31

You can restart the gateway without disconnecting it from the power supply under the "Restart" menu item.

5.3 Configuration Interface X3

The gateway has Ethernet-based configuration interface X3. Interface X3 is independent of Ethernet interfaces X1 and X2. The configuration interface is used to diagnose and configure the gateway. The configuration interface does not support a firmware update. Use Ethernet interface X1/X2 for a firmware update; see chapter 3.1.4.

The configuration interface is designed as a point-to-point connection. Communication takes place via a web interface.

The web interface is accessed with a web browser by entering the IP address http://192.168.1.2. You cannot change this IP address.

For details on the web interface, see chapter 5.2.

i

Note

The PC and gateway must be on the same subnet for access. Assign an IP address between 192.168.1.3 and 192.168.1.255 to your PC and set the subnet mask to 255.255.255.0.





5.4 REST API

The ASi gateway has a REST API for configuration. REST = Representational State Transfer, API = Application Programming Interface

An interface description is available on request.

6 Servicing and Overhaul

The device is designed and constructed to work robustly for long periods of time. For this reason, regular cleaning or servicing is not required.

In the event of a failure, always replace the device with an original device.



7 Annex A: PROFINET Command Interface Commands and Data Layout

7.1 Get Permanent Parameter

The ${\tt Get\ Permanent\ Parameter\ command\ reads\ out\ the\ parameter\ value\ that\ is\ expected\ for\ each\ node\ in\ the\ gateway.}$

The length of the payload data of the Get Permanent Parameter command and the response is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x01							
1	Т	-	-	-	-	-	-	Segment
2	-		A/B	ASi node	address			

Table 7.1

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x01							
1	Т	Error co	de					
2	-				PP3 ¹	PP2	PP1	PP0
Table 7.0								

Table 7.2

1. PP = Permanent parameter

7.2 Write Parameter

The Write Parameter command overwrites the current parameter value of the addressed node. The parameter value is stored in volatile memory in the gateway.

The command only addresses active nodes.

The response contains the parameter value returned by the node, which may differ from the written value.

The length of the payload data of the Write Parameter command is 2 bytes and the length of the payload data of the response is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x02								
1	Т	-	-	-	-	-	-	Segment	
2	-		A/B	ASi node	address				
3	-				P3 ¹	P2	P1	P0	

Table 7.3

1.P = Parameter

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0				
0	0x02	x02										
1	Т	Error code										
2	-				Node res	ponse						

Table 7.4

7.3 Read Parameter

The Read Parameter command returns the current parameter value^a of the addressed node.

The length of the payload data of the Read Parameter command and the response is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request	Format	of	the	Command	Request
-------------------------------	--------	----	-----	---------	---------

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x03							
1	Т	-	-	-	-	-	-	Segment
2	- A/B			ASi node	address			

Table 7.5

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0x03			-						
1	Т	Error cod	Error code							
2	-	•			PA3 ¹	PA2	PA1	PA0		

Table 7.6

1. PA = Parameter image

7.4 Store Actual Parameters

The Store Actual Parameters command overwrites the stored projected parameter values with the current actual parameter values. This stores the current parameters of all nodes as projected parameters. The projected parameters are sent to the ASi nodes each time the gateway is started.

No command request payload data and response payload data is required.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0x04	0x04									
1	Т	-	-	-	-	-	-	Segment			



a. Last parameter sent to the node or permanent parameter

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0x04	x04									
1	Т	T Error code									
T L L T O											

Table 7.8

7.5 Store Actual Configuration

The Store Actual Configuration command saves the current configuration data of the nodes as projected configuration data. The command is only executed in configuration mode.

Configuration data:

- IO code
- ID code
- ID1 code
- ID2 code
- ...

No command request payload data and response payload data is required.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x07							
1	Т	-	-	-	-	-	-	Segment
1	Т	-	-	-	-	-	-	

Table 7.9

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0x07	7								
1	Т	Error code								

Table 7.10

7.6 Set Offline Mode

The Set Offline Mode command switches between online and offline mode.

Online mode is the normal operating mode of the gateway. In offline mode, the gateway only processes jobs from the user. There is **no communication** with the nodes.

The OFFLINE = TRUE bit is not permanently stored, i.e., after a startup/restart, the gateway is set to online mode again.

The length of the payload data of the Set Offline Mode command is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x0A							
1	Т	-	-	-	-	-	-	Segment
2	-	-	-	-	-	-	-	Offline mode flag



Offline Phase Flag

- 0 Gateway is online
- 1 Gateway is offline

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x0A								
1	Т	Error code							

Table 7.12

7.7 Set Auto Address Enable

The Set Auto Address Enable command enables and disables the "Automatic addressing" function.

If automatic addressing is enabled, the gateway addresses nodes with the address 0. To do this, the gateway must detect missing configured nodes and identify them uniquely using the configuration data.

The AUTO_ADDR_ENABLE flag is stored in non-volatile memory, i.e., it is retained after a gateway startup/restart.

The length of the payload data of the Set Auto Address Enable command is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x0B							
1	Т	-	-	-	-	-	-	Segment
2	-	-	-	-	-	-	-	Auto Address Enable flag

Table 7.13

Auto Address Enable Flag

- 0 Automatic addressing is disabled
- **1** Automatic addressing is enabled

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x0B								
1	Т	Error code							





7.8 Set Operation Mode

The ${\tt Set}$ ${\tt Operating}$ ${\tt Mode}$ command switches the gateway to configuration mode or protected mode.}

The gateway is operated in configuration mode during commissioning. Protected mode is the standard operating mode.

- In protected mode, the only nodes that are enabled are those:
 - That are listed in the LPS
 - Whose target and actual configuration match
- In configuration mode, all detected nodes are enabled except the node with the address 0.

The target and actual configuration are checked, and if necessary, a configuration error is set.

The operation mode bit is stored in non-volatile memory, which means that it is retained even when the device is started up/restarted.

The length of the payload data of the Set Operating Mode command is 1 byte. The payload data is in the format shown in the tables below.



Caution!

Active outputs switched off

During the transition to the offline phase and the subsequent switchover to online mode, active outputs are briefly switched off.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x0C							
1	Т	-	-	-	-	-	-	Segment
2	-	-	-	-	-	-	-	Operating mode

Table 7.15

Operating mode

- 0 Operating mode: Protected mode
- 1 Operating mode: Configuration mode

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x0C							
1	Т	Error code						

Table 7.16

7.9

Change Slave Address

The Change Slave Address command changes the address of a node.

Note

This command is not executed if another node occupies the address "0." see "The Set Auto Address Enable command enables and disables the "Automatic addressing" function." on page 120.

The length of the payload data of the Change Slave Address command is 2 bytes. The payload data is in the format shown in the tables below.





Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x0D							
1	Т	-	-	-	-	-	-	Segment
2	-		A/B	Previous	node addr	ess		
3	-		A/B New node address					

Table 7.17

7.10 Set Permanent Configuration

The Set Permanent Configuration command sets the projected configuration data for the specified node. The configuration data is stored in the gateway in non-volatile memory.

This command is only allowed in configuration mode.

Using the saved configuration data and the LPS, the gateway can determine whether there are any configuration errors by comparing them with the configuration data of the existing nodes.



Caution!

Active outputs switched off

During the transition to the offline phase and the subsequent switchover to online mode, active outputs are briefly switched off.

The length of the payload data of the Set Permanent Configuration command is 3 bytes. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x25							
1	Т	-	-	-	-	-	-	Segment
2	-		A/B	ASi node	address			
3	ID2 code				ID1 code			
4	ID code				IO code			

Table 7.18

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x25							
1	Т	Error cod	е					

Table 7.19

7.11 Get Permanent Configuration

The Get Permanent Configuration command reads the projected configuration data:

- IO code
- ID code
- ID1 code
- ID2 code

The length of the payload data of the Get Permanent Configuration command is 1 byte and the length of the payload data of the response is 2 bytes. The payload data is in the format shown in the tables below.

2022-12



Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x26							
1	Т	-	-	-	-	-	-	Segment
2	-		A/B	ASi node	address			

Table 7.20

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0x26			-						
1	Т	Error code								
2	ID2 code		ID1 code							
	ID code IO code									

Table 7.21

7.12 Read Actual Configuration

The Read Actual Configuration command reads the current configuration data of the detected node from the gateway:

- EA configuration
- ID code
- ID1 code
- ID2 code

The length of the payload data of the Read Actual Configuration command is 1 byte, the length of the payload data of the response is 2 bytes. The payload data is in the format shown in the tables below.

If a node is not detected at the specified address, the command response contains four instances of the default value $0xF\!.$

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x28							
1	Т	-	-	-	-	-	-	Segment
2	-		A/B	ASi node	address			

Table 7.22

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x28								
1	Т	Error code							
2	ID2 code				ID1 code				
3	ID code				IO code				

7.13 Set LPS

The ${\tt Set}\ {\tt LPS}$ command saves the list of projected nodes on the gateway in non-volatile memory.

The length of the payload data of the ${\tt Set}$ ${\tt LPS}$ command is 9 bytes. The format of the payload data is shown in the tables below.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x29							
1	Т	0	-	-	-	-	-	Segment
2	-							
3	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-
7	7B	6B	5B	4B	3B	2B	1B	-
10	31B	30B	29B	28B	27B	26B	25B	24B

Format of the Command Request

Table 7.24

Bit

- **0** A node at the address corresponding to the bit is not expected.
- 1 A node at the address corresponding to the bit is expected.

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x29								
1	Т	Error code							

Table 7.25

7.14 Get LPF

The Get $\ \ LPF$ command reads a list of nodes reporting a peripheral fault. The LPF is updated cyclically by the gateway. Errors of the nodes or the connected peripherals can be found in the corresponding product documentation of the node.

No command request payload data is required.

The length of the payload data of the Get LPF command response is 8 bytes. The format of the payload data is shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x3E							
1	Т	0	-	-	-	-	-	Segment



Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x3E							
1	Т	Error cod	е					
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-
6	7B	6B	5B	4B	3B	2B	1B	-
9	31B	30B	29B	28B	27B	26B	25B	24B

Table 7.27

Bit

- **0** At the address specified by the bit, either an active node has no peripheral fault, a node is not enabled, or a node is not present.
- 1 A node at the address corresponding to the bit reports a peripheral fault.

Note

This description only applies to the bits where the address is occupied by a node.

7.15 Write Extended ID1 Code

The Write Extended ID1 Code command writes the ID1 code of the node with the address "0." The command is used for identification and is not used in the normal operation of the gateway.

The gateway forwards the ID1 code to the node without performing a plausibility check.

No command response payload data is required.

The length of the payload data of the Write Extended ID1 Code command is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x3F							
1	Т	-	-	-	-	-	-	Segment
2	-				ID1 code			

Table 7.28

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x3F	0x3F							
1	Т	T Error code							

7.16 Set Permanent Parameter

The Set Permanent Parameter command configures a parameter value for the specified node. The parameter is stored in the gateway in non-volatile memory.

The configured node parameter is sent to the node when the gateway is switched on.

The length of the payload data of the Set Permanent Parameter command is 2 bytes. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x43							
1	Т	-	-	-	-	-	-	Segment
2	-		A/B	ASi node	address			
3	-		•	•	PP3 ¹	PP2	PP1	PP0

Table 7.30

1. PP = Permanent parameter

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x43							
1	Т	Error code						

Table 7.31

7.17 Get LPS

The ${\tt Get}\ {\tt LPS}$ command reads the list of projected nodes.

No command request payload data is required.

The length of the payload data of the $\tt Get\ LPS$ command response is 8 bytes. The format of the payload data is shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x44							
1	Т	0	-	-	-	-	-	Segment

Table 7.32

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x44	•							
1	Т	T Error code							
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-	
6	7B	6B	5B	4B	3B	2B	1B	-	
9	31B	30B	29B	28B	27B	26B	25B	24B	



Bit

- **0** A node at the address corresponding to the bit is not expected.
- 1 A node at the address corresponding to the bit is expected.



This description only applies to the bits where the address is occupied by a node.

7.18 Get LAS

Note

The Get LAS command reads a list of enabled nodes.

No command request payload data is required.

The length of the payload data of the Get LAS command response is 8 bytes. The format of the payload data is shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x45							
1	Т	0	-	-	-	-	-	Segment

Table 7.34

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0x45								
1	Т	Error code							
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-	
6	7B	6B	5B	4B	3B	2B	1B	-	
9	31B	30B	29B	28B	27B	26B	25B	24B	

Table 7.35

Bit

- 0 A node at the address corresponding to the bit is disabled.
- 1 A node at the address corresponding to the bit is enabled.



Note

This description only applies to the bits where the address is occupied by a node.



7.19 Get LDS

The Get LDS command reads a list of detected nodes.

No command response payload data is required.

The length of the payload data of the ${\tt Get}\ {\tt LDS}$ command is 8 bytes. The format of the payload data is shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x46							
1	Т	0	-	-	-	-	-	Segment

Table 7.36

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x46							
1	Т	Error cod	е					
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-
6	7B	6B	5B	4B	3B	2B	1B	-
9	31B	30B	29B	28B	27B	26B	25B	24B

Table 7.37

Bit

- **0** A node at the address corresponding to the bit is not detected.
- 1 A node at the address corresponding to the bit is detected.



Note

This description only applies to the bits that are occupied by the address of a node.

7.20

Get Flags

The ${\tt Get}~{\tt Flags}$ command reads information about the state of the nodes and the segment.

No command response payload data is required.

The length of the payload data of the ${\tt Get}~{\tt Flags}$ command is 3 bytes. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x47							
1	Т	-	-	-	-	-	-	Segment



Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x47							
1	Т	Error cod	е					
2	-	-	-	-	-	-	-	Peripheral OK
3	Offline Ready	APF/ not APO	Normal Operation Active	Configu- ration Active	Auto Address Available	Auto Address Assign	LDS.0	Config OK
4	-	-	-	-	-	Auto Address Enable	Offline	Data Exchange Active

Table 7.39

Flags

Abbre-		
viation	Name	Description
Pok	Periphery_Ok	The flag is set if no node signals a peripheral fault.
S0	LDS.0	The flag is set if a node occupies the address 0.
AAs	Auto_Address_Assign	The flag is set if automatic addressing is possible.
AAv	Auto_Address_Available	The flag is set if automatic addressing can be per- formed. Exactly one node is out of operation.
CA	Configuration_Active	The flag is set in configuration mode and not set in protected mode.
NA	Normal_Operation_Ac- tive	The flag is set if the gateway is in normal operation.
APF	APF	The flag is set if the voltage on the AS-i segment is too low.
OR	Offline_Ready	The flag is set if the gateway is in offline mode.
Cok	Config_Ok	The flag is set if the target configuration (= projected configuration) and the actual configuration match.
AAe	Auto_Address_Enable	The flag indicates whether automatic addressing is blocked or enabled by the user.
OL	Offline	The flag is set if the offline operating state should be adopted or has already been adopted.
DX	Data_Exchange_Active	The flag enables data exchange with the nodes in the Data Exchange Phase. If the bit is not set, the exchange of process data with the nodes is blocked. Read ID telegrams are sent instead of data tele- grams. The bit is set by the gateway when it enters the offline phase.

7.21 Set Data Exchange Active

The Set Data Exchange Active command enables the process data exchange between the gateway and the nodes.

The length of the payload data of the Set Data Exchange Active command is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x48							
1	Т	-	-	-	-	-	-	Segment
2	-	-	-	-	-	-	-	Data exchange active flag

Table 7.41

Data Exchange Active Flag

- 0 Resets the flag on the gateway.
- 1 Sets the flag on the gateway.

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x48							
1	Т	Error cod	е					

Table 7.42

7.22 **Get Delta List**

The Get Delta List command reads a list of nodes with configuration errors.

No command request payload data is required.

The length of the payload data of the Get Delta List command response is 8 bytes. The format of the payload data is shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x57							
1	Т	0	-	-	-	-	-	Line
T I I T 10								

Table 7.43

Format of the Command Response

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0x57							
Т	Error co	de					
7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-
7B	6B	5B	4B	3B	2B	1B	-
31B	30B	29B	28B	27B	26B	25B	24B
	Bit 7 0x57 T 7A/7 7B 31B	Bit 7 Bit 6 0x57 T T Error co 7A/7 6A/6 7B 6B 31B 30B	Bit 7 Bit 6 Bit 5 0x57 T Error code 7A/7 6A/6 5A/5 7B 6B 5B 31B 30B 29B	Bit 7 Bit 6 Bit 5 Bit 4 0x57 T Error cod⊭ 7A/7 6A/6 5A/5 4A/4 7B 6B 5B 4B 31B 30B 29B 28B	Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 0x57 T Error code	Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 0x57 T Error code	Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 Bit 1 0x57 T Error code 7A/7 6A/6 5A/5 4A/4 3A/3 2A/2 1A/1 7B 6B 5B 4B 3B 2B 1B 31B 30B 29B 28B 27B 26B 25B



Bit

- **0** The expected and detected node configurations match at the address specified by the bit.
- 1 The expected and detected node configurations do not match at the address specified by the bit.



Note

This description only applies to the bits that are occupied by the address of a node.

7.23 Get LCS

The Get LCS command reads a list of nodes that have caused at least one configuration error since the gateway was powered on or since the last time the list was read.

No command request payload data is required.

The length of the payload data of the ${\tt Get}$ ${\tt LCS}$ command response is 8 bytes. The format of the payload data is shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x60							
1	Т	0	-	-	-	-	-	Segment

Table 7.45

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0x60							
1	Т	Error cod	е					
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-
6	7B	6B	5B	4B	3B	2B	1B	-
9	31B	30B	29B	28B	27B	26B	25B	24B

Table 7.46

Bit

- 0 A node at the address specified by the bit is enabled.
- 1 A node at the address specified by the bit is corrupted, i.e., a previously enabled node is disabled. The value is not reset until a user explicitly reads the LCS node list.

Note

This description only applies to the bits that are occupied by the address of a node.

7.24 Get Auto Address Enable

The Get Auto Address Enable command returns the status of automatic addressing.

No command request payload data is required.

The length of the payload data of the Get Auto Address Enable command response is 1 byte. The payload data is in the format shown in the tables below.

Format of the Command Request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0xE1							
1	Т	-	-	-	-	-	-	Segment

Table 7.47

Format of the Command Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0xE1							
1	Т	Error co	de					
2	-	-	-	-	-	-	-	Auto Address Enable flag

Table 7.48

Auto Address Enable Flag

- 0 Automatic addressing is disabled
- 1 Automatic addressing is enabled



8 Annex B: PROFINET Record Commands and Data Layout

8.1 Read IDI 0x01

You can use the Read IDI function to read input data images from the gateway.



RecordDataRead Request

- 1. Map the Read IDI function to the RecordDataRead index 0x01.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0										
1	0										
2	-				Node 1/1A						
3	Node 2/2	A			Node 3/3A						
17	Node 30/	30A			Node 31/	31A					
18	-				Node 1B						
19	Node 2B				Node 3B						
33	Node 30E	3			Node 31B						
34	-										
35	-				PNIO status						
Table 9 1											

Table 8.1

PNIO status

OK Data has been written

NOK Data has not been written



8.2 Write ODI 0x02

You can use the Write ODI function to write output data images (ODI) to the gateway.



RecordDataWrite Request

- 1. Map the Write ODI function to RecordDataWrite index 0x02.
- 2. Assign an address to subslot 1 of the required ASi segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = ASi segment 1
 - 100 = ASi segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0			-						
1	0									
2	-				Node 1/1	A				
3	Node 2/2	A			Node 3/3A					
17	Node 30/	′30A			Node 31/31A					
18	-				Node 1B					
19	Node 2B				Node 3B					
33	Node 30	3			Node 31B					
34	-									
35	-									

Table 8.2

RecordDataWrite Response

The response includes the PNIO status. The PNIO status corresponds to the AS-Interface status.

PNIO Status

- **OK** Data has been written
- NOK Data has not been written





8.3 Set Permanent Configuration 0x08

You can use the ${\tt Set}$ ${\tt Permanent}$ ${\tt Configuration}$ function to set the configuration data of the specified node.



RecordDataWrite Request

- 1. Write the address of the desired node in index 0x44. See chapter 8.30.
- 2. Map the Set Permanent Configuration function to RecordDataWrite index 0x08.
- 3. Assign an address to subslot 1 of the required ASi segment.
- **4.** Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = ASi segment 1
 - 100 = ASi segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0									
1	0	0								
4	ID2 code				ID1 code					
5	ID code				IO code					

Table 8.3

RecordDataWrite Response

The response includes the PNIO status. The PNIO status corresponds to the AS-Interface status.

PNIO Status

- OK Data has been written
- NOK Data has not been written

8.4 Get Permanent Parameter 0x04

You can use the ${\tt Get}\ {\tt Permanent}\ {\tt Parameter}\ function\ to\ access\ the\ expected\ configuration\ data\ on\ the\ node.$



RecordDataRead Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Get Permanent Parameter function to the RecordDataRead index 0x04.
- 3. Assign an address to subslot 1 of the required AS-Interface segment.
- 4. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

PEPPERL+FUCHS

Format of the RecordDataRead Response

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	-				PA3 ¹	PA2	PA1	PA0
3	-							

Table 8.4

1. PA = Parameter image

8.5 Read Parameter 0x06

You can use the ${\tt Read}$ ${\tt Parameter}$ function to call up the current parameters of one AS-Interface node at a time.

>

RecordDataRead Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Read Parameter function to the RecordDataRead index 0x06.
- 3. Assign an address to subslot 1 of the required AS-Interface segment.
- 4. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0					-		
1	0							
2	-				PA3 ¹	PA2	PA1	PA0
3	-							

Table 8.5

1. PA = Parameter image



8.6 Set Permanent Configuration 0x08

You can use the ${\tt Set}$ ${\tt Permanent}$ ${\tt Configuration}$ function to set the configuration data of the specified node.



RecordDataWrite Request

- 1. Write the address of the desired node in index 0x44. See chapter 8.30.
- 2. Map the Set Permanent Configuration function to RecordDataWrite index 0x08.
- 3. Assign an address to subslot 1 of the required ASi segment.
- **4.** Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = ASi segment 1
 - 100 = ASi segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0									
1	0)								
4	ID2 code				ID1 code					
5	ID code			IO code						

Table 8.6

RecordDataWrite Response

The response includes the PNIO status. The PNIO status corresponds to the AS-Interface status.

PNIO Status

- OK Data has been written
- NOK Data has not been written

8.7 Get Permanent Configuration 0x09

You can use the ${\tt Get}\ {\tt Permanent}\ {\tt Configuration}\ {\tt function}\ to\ retrieve\ the\ expected\ configuration\ data\ on\ the\ node.$



RecordDataRead Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Get Permanent Configuration function to the RecordDataRead index 0x09.
- 3. Assign an address to subslot 1 of the required AS-Interface segment.
- 4. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1



100 = AS-Interface segment 2

3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	ID2 code				ID1 code			
3	ID code				IO code			

Table 8.7

8.8 Read Actual Configuration 0x0B

You can use the ${\tt Read}$ ${\tt Actual}$ ${\tt Configuration}$ function to access the configuration data detected on the node.



RecordDataRead Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Read Actual Configuration function to the RecordDataRead index 0x0B.
- 3. Assign an address to subslot 1 of the required AS-Interface segment.
- 4. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	•					•	
1	0							
2	ID2 code				ID1 code			
3	ID code				IO code			

Table 8.8

8.9 Set LPS 0x0C

You can use the ${\tt Set}\ {\tt LPS}$ function to store a list of the configured AS-Interface nodes.



RecordDataWrite Request

- 1. Map the Set LPS function to the RecordDataWrite index 0x0C.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01





- 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2

```
3. Subslot = 0x01
```

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0									
1	0	0								
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-		
6	7B	6B	5B	4B	3B	2B	1B	-		
9	31B	30B	29B	28B	27B	26B	25B	24B		
10	-									
11	-									
	•									

Table 8.9

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.10 Get LPS 0x0D

You can use the ${\tt Get}\ {\tt LPS}$ function to check a list of the configured AS-Interface nodes.



RecordDataRead Request

- 1. Map the Get LPS function to the RecordDataRead index 0x0D.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
6	7B	6B	5B	4B	3B	2B	1B	-
9	31B	30B	29B	28B	27B	26B	25B	24B
10	-	•			•		•	
11	-				PNIO sta	B 2B IB - 7B 26B 25B 24B		

Table 8.10

PNIO status

OK Data has been written

NOK Data has not been written

8.11

I Get LAS 0x0E

You can use the ${\tt Get}\ {\tt LAS}$ function to check a list of the enabled AS-Interface nodes.



RecordDataRead Request

- 1. Map the Get LAS function to the RecordDataRead index 0x0E.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0										
1	0	0									
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-			
6	7B	6B	5B	4B	3B	2B	1B	-			
9	31B	30B	29B	28B	27B	26B	25B	24B			
10	-	-									
11	-				PNIO sta	tus					

Table 8.11

PNIO status

- OK Data has been written
- NOK Data has not been written



8.12 Get LDS 0x0F

You can use the ${\tt Get}\ {\tt LDS}$ function to check a list of the available AS-Interface nodes.



RecordDataRead Request

- 1. Map the Get LDS function to the RecordDataRead index 0x0F.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0										
1	0										
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-			
6	7B	6B	5B	4B	3B	2B	1B	-			
9	31B	30B	29B	28B	27B	26B	25B	24B			
10	-										
11	-				PNIO status						

Table 8.12

PNIO status

OK Data has been written

NOK Data has not been written

8.13 Get Flags 0x10

You can use the ${\tt Get}~{\tt Flags}$ function to check the status of the AS-Interface flags.



RecordDataRead Request

- 1. Map the Get Flags function to the RecordDataRead index 0x10.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01



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Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	Offline Ready	APF/not APO	Normal Opera- tion Active	Configu- ration Active	Auto Address Available	Auto Address Assign	LDS.0	Config OK
3	-	-	-	-	-	Offline	Data Exchang e Active	Periph- eral OK

Table 8.13

8.14 Set Operation Mode 0x11

You can use the Set Operation Mode function to define the operating mode of the gateway.



RecordDataWrite Request

- 1. Map the Set Operation Mode function to RecordDataWrite index 0x11.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	0	0	0	0	0	0	0	Flag
3	-							

Table 8.14

Flag

- 0b0 Switch to protected mode
- 0b1 Switch to configuration mode

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

- OK Data has been written
- NOK Data has not been written



8.15 Set Offline Mode 0x12

You can use the Set Offline Mode function to define the operating mode of the gateway.



RecordDataWrite Request

- 1. Map the Set Offline Mode function to RecordDataWrite index 0x12.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	0	0	0	0	0	0	0	Flag
3	-							

Table 8.15

Flag

- 0b0 Switch to online mode
- 0b1 Switch to offline mode

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.16 Set Data Exchange Active 0x13

You can use the ${\tt Set}$ ${\tt Data}$ ${\tt Exchange}$ ${\tt Active}$ function to control data exchange between the gateway and the nodes.



RecordDataWrite Request

- 1. Map the Set Data Exchange Active function to RecordDataWrite index 0x13.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100



- 0 = AS-Interface segment 1
- 100 = AS-Interface segment 2
- 3. Subslot = 0x01

Format of the RecordDataWrite request

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	Т							
2	0	0	0	0	0	0	0	Flag
3	-	•	•	•	•	•	•	•

Table 8.16

Flag

- 0b0 Data exchange active
- 0b1 Data exchange disabled

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

- OK Data has been written
- NOK Data has not been written

8.17 Change Node Address 0x14

You can use the Change Node Address function to change the address of a node.



RecordDataWrite Request

- 1. Map the Change Node Address function to the RecordDataWrite index 0x14.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- **3.** Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	-						
1	0							
2	-		A/B	Previous	node addr	ess		
3	-		A/B	New node	e address			

Table 8.17


RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.18 Set Auto Address Enable 0x15

You can use the ${\tt Set}$ ${\tt Auto}$ ${\tt Address}$ ${\tt Enable}$ function to enable automatic address assignment.



RecordDataWrite Request

- 1. Map the Set Auto Address Enable function to RecordDataWrite index 0x15.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = ASi-Interface segment 1
 - 100 = ASi-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	0	0	0	0	0	0	0	Flag
3	-							

Table 8.18

Flag

- 0b0 Automatic address assignment disabled
- 0b1 Automatic address assignment enabled

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.19 Get Auto Address Enable 0x15

You can use the ${\tt Get}$ ${\tt Auto}$ ${\tt Address}$ ${\tt Enable}$ function to query the status of the automatic address assignment.}



RecordDataRead Request

- 1. Map the Get Auto Address Enable function to the RecordDataRead index 0x15.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	0	0	0	0	0	0	0	Flag
3	-							
4	-				PNIO stat	tus		

Table 8.19

Flag

- 0b0 Automatic address assignment disabled
- 0b1 Automatic address assignment enabled

PNIO status

- OK Data has been written
- NOK Data has not been written

8.20 Get LPF 0x17

You can use the Get $\ \mbox{LPF}$ function to read a list of peripheral faults (= List of Periphery Faults LPF) from the gateway.



RecordDataRead Request

- 1. Map the Get LPF function to the RecordDataRead index 0x017.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1





- 100 = AS-Interface segment 2
- 3. Subslot = 0x01

RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0									
1	0									
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-		
6	7B	6B	5B	4B	3B	2B	1B	-		
9	31B	30B	29B	28B	27B	26B	25B	24B		
10	-									
11	-				PNIO stat	tus		- - 24B		

Table 8.20

Bit

- **0** At the address specified by the bit, either an active node has no peripheral fault, a node is not enabled, or a node is not present.
- 1 A node at the address specified by the bit reports a peripheral fault.



Note

This description only applies to the bits that are occupied by the address of a node.

PNIO status

OK Data has been written

NOK Data has not been written

8.21 Write ID1 Code 0x18

You can use the $\tt Write \ ID1 \ Code$ function to change the ID1 code of the node to the ASi address 0.



RecordDataWrite Request

- 1. Map the Write ID1 Code function to the RecordDataWrite index 0x18.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

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Data								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	ID1 code							
3	-							

Dete

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK ID1 code changed

SND Node not detected

8.22 Read AIDI 0x19

You can use the Read AIDI function to read analog input data images from the gateway.



RecordDataRead Request

- 1. Map the Read AIDI function to the RecordDataRead index 0x019.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0									
1	0									
2	Analog in	nalog input data node 1, channel 0 or								
3	Analog in	nalog input data node 1A, channel 0								
4	Analog in	put data n	ode 1, cha	nnel 1 or						
5	Analog in	put data n	ode IA, ch	annel I						
6	Analog in	put data n	ode 1, cha	nnel 2 or						
7	Analog in	put data n	ode IB, ch	annei 0						
8	Analog in	put data n	ode 1, cha	nnel 3 or						
9	Analog in	put data n	ode IB, ch	annel I						
10	Analog in	Analog input data node 2, channel 0 or								
11	Analog in	nalog input data node 2A, channel 0								



Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
242	Analog in	Analog input data node 31, channel 0 or									
243	Analog in	Analog input data hode 31A, channel 0									
244	Analog in	nalog input data node 31, channel 1 or									
245	Analog in	Analog input data node 31A, channel 1									
246	Analog in	Analog input data node 31, channel 2 or									
247	Analog in	put data n	00e 31B, C	nannei U							
248	Analog in	put data n	ode 31, ch	annel 3 or							
249	Analog in	put data n	ode 31B, c	nannei i							
250	-										
251	- PNIO status										

PNIO status

OK Data has been written

NOK Data has not been written

8.23 Write AODI 0x1A

You can use Write AODI function to write analog output data images to the gateway.



RecordDataWrite Request

- 1. Map the Write AODI function to the RecordDataWrite index 0x1A.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0										
1	0)									
2	Analog o	utput data	node 1, ch	annel 0 or							
3	Analog o	utput data	node IA, d	nannei U							
4	Analog o	utput data	node 1, ch	annel 1 or							
5	Analog o	utput data	node IA, d	nannei i							
6	Analog o	utput data	node 1, ch	annel 2 or							
7	Analog of	Analog output data node 1B, channel 0									
8	Analog o	Analog output data node 1, channel 3 or									
9	Analog o	utput data	noae IB, C	nannel I							

2022-12

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0				
10	Analog ou	utput data	node 2, ch	annel 0 or								
11	Analog ot	utput data	node 2A, d	channel 0								
242	Analog ou	nalog output data node 31, channel 0 or										
243	Analog ol	utput data	node 31A,	channel 0								
244	Analog ou	Analog output data node 31, channel 1 or										
245	Analog ol	utput data	node 31A,	channel I								
246	Analog ou	utput data	node 31, c	hannel 2 o	r							
247	Analog ot	μιραι ααιά	noue 31D,	channel 0								
248	Analog ou	utput data	node 31, c	hannel 3 o	r							
249	Analog ol	Analog output data node 31B, channel 1										
250	-											
251]											

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.24 Get Delta List 0x40

You can use the Get Delta List function to request the delta list.



RecordDataRead Request

- 1. Map the Get Delta List function to the RecordDataRead index 0x40.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-

2022-12



Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
6	7B	6B	5B	4B	3B	2B	1B	-
9	31B	30B	29B	28B	27B	26B	25B	24B
10	-	•	•	•		•	•	•
11	-				PNIO sta	tus		

PNIO status

- OK Data has been written
- NOK Data has not been written

8.25 Get LCS 0x41

You can use the Get LCS function to check a list of the corrupted AS-Interface nodes (= List of Corrupted Nodes LCS).



RecordDataRead Request

- 1. Map the Get LCS function to the RecordDataRead index 0x41.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0										
1	0	0									
2	7A/7	6A/6	5A/5	4A/4	3A/3	2A/2	1A/1	-			
6	7B	6B	5B	4B	3B	2B	1B	-			
9	31B	30B	29B	28B	27B	26B	25B	24B			
10	-										
11	-				PNIO sta	tus		- - 24B			

Table 8.25

PNIO status

OK Data has been written

NOK Data has not been written

8.26 Write Parameter 0x42

You can use the ${\tt Write \ Parameter}$ function to overwrite the current parameter value of a node.



RecordDataWrite Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Write Parameter function to the RecordDataWrite index 0x42.
- 3. Assign an address to subslot 1 of the required AS-Interface segment.
- 4. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2					P3 ¹	P2	P1	P0
3	-							
4	-							

Table 8.26

1.P = Parameter

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.27 Read Node Response to Write Parameter 0x42

You can use the Read Node Response to Write Parameter function to retrieve the response for writing the parameters of one AS-Interface node at a time.



RecordDataRead Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Read Node Response to Write Parameter function to the RecordDataRead index 0x42.
- 3. Assign an address to subslot 1 of the required AS-Interface segment.



- 4. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0								
1	0								
2	- Node response								
3	-								
4	- PNIO status								
Table 0.07									

Table 8.27

PNIO status

OK Data has been written

NOK Data has not been written

8.28 Reset Node 0x43

You can use the ${\tt Reset}$ ${\tt Node}$ function to reset one AS-Interface node at a time.



RecordDataWrite Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Reset Node function to the RecordDataWrite index 0x43.
- 3. Assign an address to subslot 1 of the required AS-Interface segment.
- 4. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = ASi-Interface segment 1
 - 100 = ASi-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	-		ASi node	address				
3	-		•					

Table 8.28



RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.29 Read Node Response to Reset Node 0x43

You can use the Read Node Response to Reset Node function to retrieve the response for resetting the parameters of one AS-Interface node at a time.



RecordDataRead Request

- 1. Write the address of the desired node in the index 0x44. See chapter 8.30.
- 2. Map the Read Node Response to Reset Node function to the RecordDataRead index 0x43.
- 3. Assign an address to subslot 1 of the required ASi-Interface segment.
- 4. Parameters of the RecordDataRead request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = ASi-Interface segment 1
 - 100 = ASi-Interface segment 2
 - 3. Subslot = 0x01

Format of the RecordDataRead Response

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
0	0		•		•						
1	0										
2	-	- Node response									
3	-										
4	-				PNIO s	tatus					

Table 8.29

PNIO status

- OK Data has been written
- NOK Data has not been written



8.30 Select Node 0x44

You can use the Select Node function to select one AS-Interface node at a time.



RecordDataWrite Request

- 1. Map the Select Node function to the RecordDataWrite index 0x44.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	- ASi node address							
3	-							

Table 8.30

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

- OK Data has been written
- NOK Data has not been written

8.31 Store Actual Parameters 0x45

You can use the \mbox{Store} \mbox{Actual} $\mbox{Parameters}$ function to permanently save the current parameters.



RecordDataWrite Request

- 1. Map the Store Actual Parameters function to the RecordDataWrite index 0x45.
- 2. Assign an address to subslot 1 of the required AS-Interface segment.
- **3.** Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01



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Bvte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	0							1
3	0							•

Dete

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

OK Data has been written

NOK Data has not been written

8.32 Store Actual Configuration 0x46

You can use the \mbox{Store} \mbox{Actual} $\mbox{Configuration}$ function to permanently save the current configuration.



RecordDataWrite Request

- 1. Map the Store Actual Configuration function to the RecordDataWrite index 0x46.
- 2. Assign an address to subslot 1 of the required AS-Interface segment
- 3. Parameters of the RecordDataWrite request:
 - 1. Index = 0x01
 - 2. Slot = 0 or 100
 - 0 = AS-Interface segment 1
 - 100 = AS-Interface segment 2
 - 3. Subslot = 0x01

Data

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0							
1	0							
2	0							1
3	0							

Table 8.32

RecordDataWrite Response

The response includes the PNOI status. The PNOI status corresponds to the AS-Interface status.

PNIO status

- OK Data has been written
- NOK Data has not been written







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