SIEMENS

SIMATIC

ET 200BL
Analog input module AI 8xI 2-/4-wire (6ES7134-8GF00-0AN0)

Equipment Manual

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08/2025
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Legal information

Warning notice system

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

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

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified persons are those who, because of their training and experience, are familiar with the installation, assembly, commissioning, operation, decommissioning and disassembly of the product and can recognize risks and avoid possible hazards.

Proper use of Siemens products

Note the following:

⚠ WARNING

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

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Disclaimer of Liability

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

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Introduction

1

1.1 Introduction

Purpose of the documentation

This documentation provides important information on configuring, installing, wiring and commissioning the ET 200BL distributed I/O system.

Basic knowledge required

A basic knowledge of automation technology is required to understand the documentation.

Validity of the documentation

This documentation applies to the distributed I/O system, ET 200BL.

Conventions

Please pay particular attention to notes highlighted as follows:

NOTE

Notes contain important information on the product, handling the product or on part of the documentation to which you should pay particular attention.

ID link for the digital nameplate



The ID Link is a globally unique identifier according to IEC 61406, which you will find in the future as a QR code on your product.

The figure shows an example of an ID link for the digital input module DI 16x24 VDC.

You can recognize the ID link by the frame with a black frame corner at the bottom right. The ID link takes you to the digital nameplate of your product.

Scan the QR code on the product or on the packaging label with a smartphone camera, barcode scanner or reader app. Call the ID link.

In the digital nameplate, you will find product data, manuals, declarations of conformity, certificates and other helpful information about your product.

Standards

You can find a dated reference to the respective standards or the EU Declaration of Conformity on the Internet (https://sieportal.siemens.com/su/blGuI).

1.2 Siemens Industry Online Support

You can find current information on the following topics quickly and easily here:

- **Product support**

  All the information and extensive know-how on your product, technical specifications, FAQs, certificates, downloads, and manuals.

- **Application examples**

  Tools and examples to solve your automation tasks – as well as function blocks, performance information and videos.

- **Services**

  Information about Industry Services, Field Services, Technical Support, spare parts and training offers.

- **Forums**

  For answers and solutions concerning automation technology.

- **mySupport**

  Your personal working area in Industry Online Support for messages, support queries, and configurable documents.

This information is provided by the Siemens Industry Online Support in the Internet (https://support.industry.siemens.com).

1.3 SiePortal

SiePortal is the catalog and ordering system of Siemens AG for automation and drive solutions on the basis of Totally Integrated Automation (TIA) and Totally Integrated Power (TIP).

You can find catalogs for all automation and drive products on the Internet (https://mall.industry.siemens.com).

1.4 ET 200BL Documentation Guide



The documentation for the SIMATIC ET 200BL distributed I/O system is arranged into three areas.

This arrangement enables you to access the specific content you require.

You can download the documentation free of charge from the Internet (https://support.industry.siemens.com/cs/de/en/view/109987785).

Basic information



The System Manual describes in detail the configuration, installation, wiring and commissioning of the SIMATIC ET 200BL distributed I/O system.

The online help of STEP 7 (TIA Portal) and STEP 7 MicroWIN support you during configuration and programming.

Examples:

- ET 200BL System Manual
- Online help TIA Portal
- STEP 7 MicroWIN online help

Device information



Equipment manuals contain a compact description of the module-specific information, such as properties, wiring diagrams, characteristics and technical specifications.

Examples:

- Equipment Manuals Interface Modules
- Equipment Manuals Digital Modules
- Equipment Manuals Analog Modules

General information



The function manuals contain detailed descriptions on general topics relating to the SIMATIC ET 200BL distributed I/O system.

Examples:

- Function Manual Diagnostics
- Function Manual Communication
- PROFINET Function Manual
- Function Manual Designing Interference-free Controllers

Manual Collection ET 200BL

The Manual Collection contains the complete documentation on the SIMATIC ET 200BL distributed I/O system gathered together in one file.

You can find the Manual Collection on the Internet.
(https://support.automation.siemens.com/WW/view/en/109987784)

1.4.1 Tool support

Tools

The tools described below support you in all steps: from planning, over commissioning, all the way to analysis of your system.

TIA Selection Tool

The TIA Selection Tool tool supports you in the selection, configuration, and ordering of devices for Totally Integrated Automation (TIA).

As successor of the SIMATIC Selection Tools , the TIA Selection Tool assembles the already known configurators for automation technology into a single tool.

With the TIA Selection Tool , you can generate a complete order list from your product selection or product configuration.

You can find the TIA Selection Tool on the Internet.
(https://support.industry.siemens.com/cs/ww/en/view/109767888)

1.4.2 MultiFieldbus Configuration Tool (MFCT)

MultiFieldbus Configuration Tool

MultiFieldbus Configuration Tool (MFCT) is a PC-based software and supports the configuration of MultiFieldbus- and DALI-devices. In addition, the MFCT offers convenient options for mass firmware updates of ET 200 devices with MultiFieldbus- support and reading service data for many other Siemens devices.

Functional scope of the MFCT

- MultiFieldbus configuration:
  Engineering, configuration and diagnostics of MultiFieldbus-devices, provision of the required project files (project, UDT-, CSV- and EDS-file), transfer/export of the files to device and/or data memory.
- DALI configuration:
  Device selection and online configuration of DALI devices.
- TM FAST:
  Generation and download of FPGA-UPD- and FPGA-DB-files.

- Maintenance:
  Topology scan of a Ethernet network, reading of service data, parameter assignment and firmware update.
- Settings:
  Language switching German / English, network scanner speed, setting of the network adapter, installation of GSDML-and EDS-files.

System/installation requirements for MFCT

The MFCT runs under Microsoft Windows and does not require installation or administrator rights.

For MFCT you must also install the following software:

- Microsoft .NET Framework 4.8 (You can find an Offline Installer on the Internet. (https://support.microsoft.com/en-us/topic/microsoft-net-framework-4-8-offline-installer-for-windows-9d23f658-3b97-68ab-d013-aa3c3e7495e0))
- NPcap from directory "Misc"
- PG/PC interface from directory "Misc"
- Microsoft C++ Redistributable for x86-systems (you can find the installation data for download on the Internet. (https://aka.ms/vs/15/release/vc_redist.x86.exe))

The download of the tool and further information as well as documentation on the individual functions of the MFCT can be found on the Internet.
(https://support.industry.siemens.com/cs/de/en/view/109773881)

1.4.3 SIMATIC Technical Documentation

Additional SIMATIC documents will complete your information. You can find these documents and their use at the following links and QR codes.

The Industry Online Support gives you the option to get information on all topics. Application examples support you in solving your automation tasks.

Overview of the SIMATIC Technical Documentation

Here you will find an overview of the SIMATIC documentation available in Siemens Industry Online Support:



Industry Online Support International (https://support.industry.siemens.com/cs/ww/en/view/109742705)

Watch this short video to find out where you can find the overview directly in Siemens Industry Online Support and how to use Siemens Industry Online Support on your mobile device:



Quick introduction to the technical documentation of automation products per video (https://support.industry.siemens.com/cs/us/en/view/109780491)



YouTube video: Siemens Automation Products - Technical Documentation at a Glance (https://youtu.be/TwLSxxRQQsA)

Retention of the documentation

Retain the documentation for later use.

For documentation provided in digital form:

1. Download the associated documentation after receiving your product and before initial installation/commissioning. Use the following download options:
   - Industry Online Support International: (https://support.industry.siemens.com)

     The article number is used to assign the documentation to the product. The article number is specified on the product and on the packaging label. Products with new, non-compatible functions are provided with a new article number and documentation.
   - ID link:

     Your product may have an ID link. The ID link is a QR code with a frame and a black frame corner at the bottom right. The ID link takes you to the digital nameplate of your product. Scan the QR code on the product or on the packaging label with a smartphone camera, barcode scanner, or reader app. Call up the ID link.
2. Retain this version of the documentation.

Updating the documentation

The documentation of the product is updated in digital form. In particular in the case of function extensions, the new performance features are provided in an updated version.

1. Download the current version as described above via the Industry Online Support or the ID link.
2. Also retain this version of the documentation.

mySupport

With "mySupport" you can get the most out of your Industry Online Support.

Registration	You must register once to use the full functionality of "mySupport". After registration, you can create filters, favorites and tabs in your personal workspace.
Support requests	Your data is already filled out in support requests, and you can get an overview of your current requests at any time.
Documentation	In the Documentation area you can build your personal library.
Favorites	You can use the "Add to mySupport favorites" to flag especially interesting or frequently needed content. Under "Favorites", you will find a list of your flagged entries.
Recently viewed articles	The most recently viewed pages in mySupport are available under "Recently viewed articles".
CAx data	The CAx data area gives you access to the latest product data for your CAx or CAe system. You configure your own download package with a few clicks: • Product images, 2D dimension drawings, 3D models, internal circuit diagrams, EPLAN macro files • Manuals, characteristics, operating manuals, certificates • Product master data

You can find "mySupport" on the Internet. (https://support.industry.siemens.com/My/ww/en)

Application examples

The application examples support you with various tools and examples for solving your automation tasks. Solutions are shown in interplay with multiple components in the system - separated from the focus on individual products.

You can find the application examples on the Internet.
(https://support.industry.siemens.com/cs/ww/en/ps/ae)

Industrial Cybersecurity 2

2.1 Introduction to industrial cybersecurity

Due to the digitalization and increasing networking of machines and industrial plants, the risk of cyber attacks is also growing. Appropriate protective measures are therefore mandatory, particularly in the case of critical infrastructure facilities.

This section provides an overview of security-related information pertaining to your SIEMENS device.

2.2 Cybersecurity information

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

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

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit
https://www.siemens.com/cybersecurity-industry.

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

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
https://new.siemens.com/cert.

2.3 Cybersecurity-relevant information

Observe all cybersecurity-relevant information.

Topics with cybersecurity-relevant information	Reference
Operational application environment and security assumptions	
Requirements for the operational application environment of the system and security assumptions	You can find this section in the System Manual (https://support.industry.siemens.com/cs/ww/en/view/109987776).
Security properties of the product	
Access protection	Note the information on access protection in the Protection chapter of the System Manual (https://support.industry.siemens.com/cs/ww/en/view/109987776).
Secure operation	
Recommendations for safe operation	You can find cross-system information on the safe operation of interface modules in the System Manual (https://support.industry.siemens.com/cs/ww/en/view/109987776).
Corrective measures for known risks	Corrective measures for known risks are announced on the Siemens ProductCERT and Siemens CERT (https://siemens.com/productcert) web page. You can find more information on SIEMENS ProductCERT in the System Manual (https://support.industry.siemens.com/cs/ww/en/view/109987776).
Security checks	You can find descriptions of specific security measures, such as cyclic checks of the configuration via checksums, in the Industrial cybersecurity section of the System Manual (https://support.industry.siemens.com/cs/ww/en/view/109987776).
Secure decommissioning Products that contain security-relevant data must be securely decommissioned before disposal or resale.	You can find information on secure decommissioning in the System Manual (https://support.industry.siemens.com/cs/ww/en/view/109987776), Secure operation of the system section

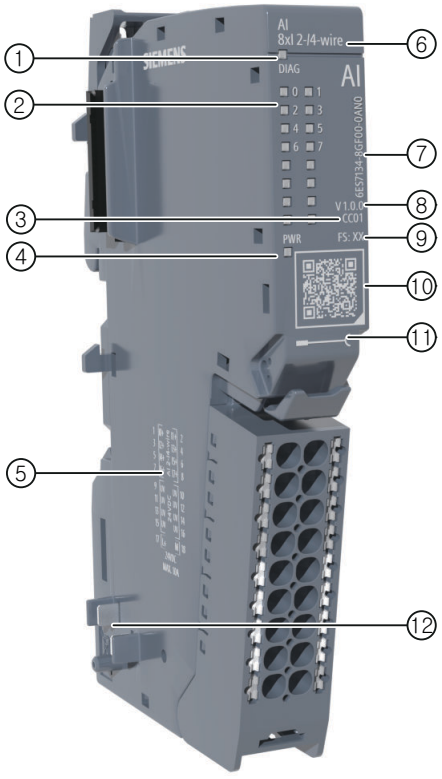
Product overview

3

Article number

6ES7134-8GF00-0AN0

View of the module



①	LED for diagnostics	⑦	Article number
②	LEDs for channel status	⑧	Firmware version
③	Color code for selecting the color identification labels	⑨	Function state
④	LED for supply voltage	⑩	Identification link
⑤	Wiring diagram	⑪	Illustration of 24V DC field power bus connection
⑥	Module type and name	⑫	24V DC power bus connector

Figure 3-1 View of the AI 8×I 2-/4-wire module

Properties

The module has the following technical properties:

- Analog input module with 8 inputs (single-ended)
- For 2-wire and 4-wire transducers
- Input ranges for current measurement:
  - 4 to 20 mA, resolution 15 bits
  - 0 to 20 mA, resolution 15 bits
  - ±20 mA, resolution 16 bits including sign
- Configurable diagnostics (per module)

The module supports the following functions:

- Firmware update
- I&M identification data
- Parameter reassignment in RUN

You can configure the module with a GSD file.

Table 3-1 Version dependencies of the functions

Function	Function state (FS)	FW version	TIA Portal	MicroWin	Other engineering software with GSDML support (e.g. MFCT, TST)	GSD file (PROFINET IO)
Firmware update	01	V1.0.0 or higher	V18 or higher	V3.0 or higher	GSDML V2.45	X
I&M identification data	01	V1.0.0 or higher	V18 or higher	V3.0 or higher	GSDML V2.45	X
Parameter reassignment in RUN	01	V1.0.0 or higher	V18 or higher	V3.0 or higher	GSDML V2.45	X

Accessories and spart parts

The following accessories and spare parts can be ordered separately:

Table 3-2 Accessories and spare parts for the AI 8×I 2-/4-wire module

Acessories and spare parts	Article number
Terminal block 24V	6ES7193-8ST00-1AN0
Color Coding labels	6ES7193-6CP01-2MA0
Reference identification label	6ES7193-6LF30-0AW0

A detailed list of the available accessories and spare parts can be found in the system manual ET 200BL distributed I/O system.

Wiring up

4

4.1 Terminal assignment

General terminal assignment

This section contains the terminal assignment for the module.

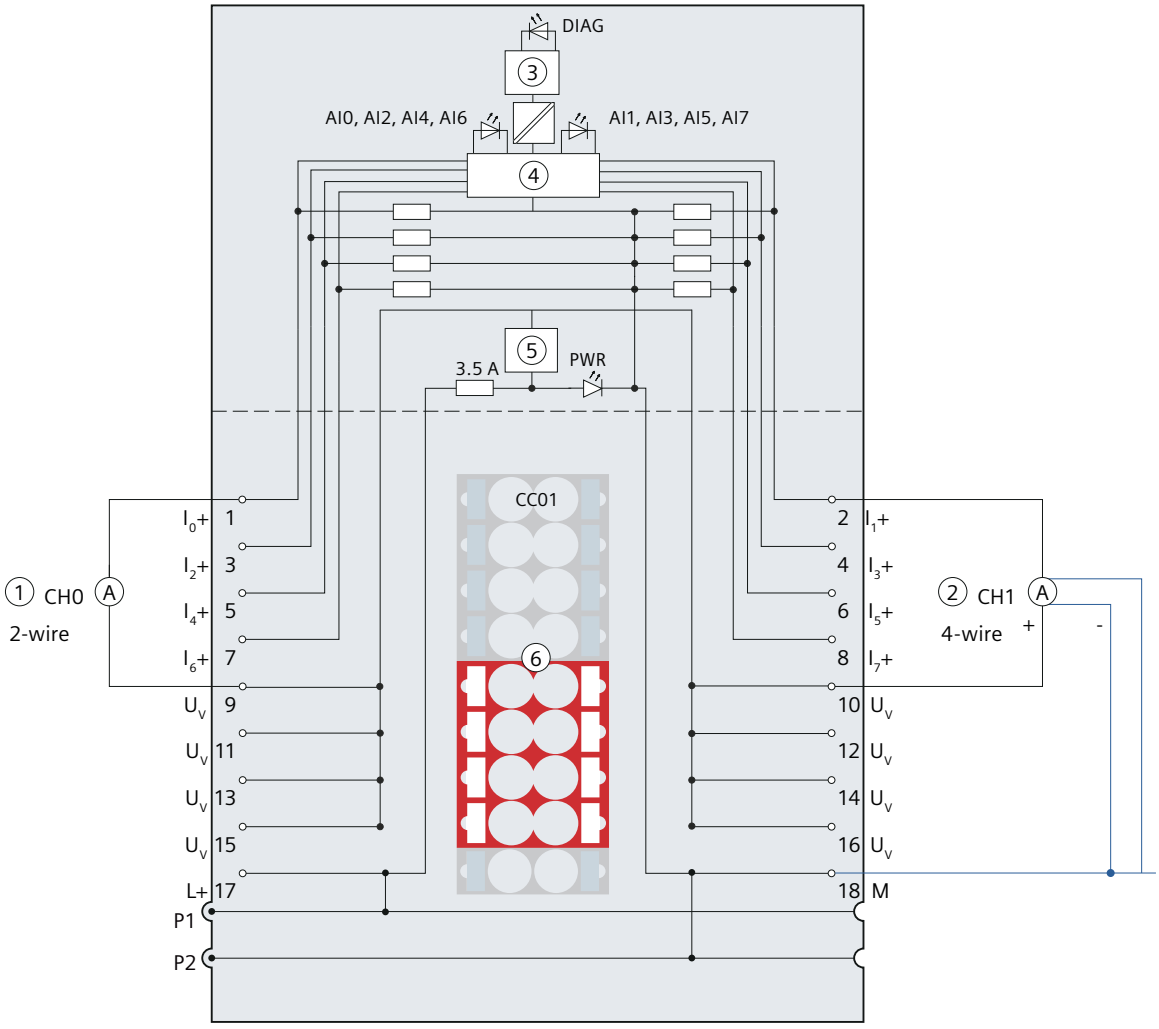
Terminal assignment for AI 8xI 2-/4-wire (6ES7134-8GF00-0AN0)						
Description	Signal	Terminal		Terminal	Signal	Description
Analog input channel 0	I_0+	1	1 CC01 2	2	I_1+	Analog input channel 1
Analog input channel 2	I_2+	3	3 4	4	I_3+	Analog input channel 3
Analog input channel 4	I_4+	5	5 6	6	I_5+	Analog input channel 5
Analog input channel 6	I_6+	7	7 8	8	I_7+	Analog input channel 7
Sensor supply	U_V	9	9 10	10	U_V	Sensor supply
Sensor supply	U_V	11	11 12	12	U_V	Sensor supply
Sensor supply	U_V	13	13 14	14	U_V	Sensor supply
Sensor supply	U_V	15	15 16	16	U_V	Sensor supply
24V DC field power supply	L+	17	17 18	18	M	Ground

4.2 Wiring diagram

This section contains the pin assignment for the module.

Wiring: 2-wire and 4-wire connection

This following figure shows an example of the wiring diagram of the analog input module AI 8xI 2-/4-wire (2-wire and 4-wire connection).



①	2-wire connection for current measurement	I_n+	Input signal, channel n
②	4-wire connection for current measurement	U_V	Infeed voltage
③	Backplane bus interface	L+	24V DC
④	Analog-to-digital converter (ADC)	M	Ground
⑤	Current limitation	P1, P2	System-integrated, self-assembling voltage buses P1, P2 with connection to the infeed terminals, connected to the adjacent module on the left
⑥	Color identification label CC01 (optional)		

Figure 4-1 Wiring diagram for 2-wire and 4-wire connection

Protection against outside electrical influences

Below is a description of what you must pay attention to in terms of protection against electrical impacts and/or faults:

- Make sure that the system for discharging electromagnetic interference is connected to functional earth or to protective conductor with a sufficient cross-section for all plants with an ET 200BL distributed I/O system.
- For supply, signal and bus lines, you must ensure that the laying of the lines and the installation is correct.
- For signal and bus lines, you must ensure that a wire/cable break or a cross-circuit does not lead to undefined states of the plant or system.

You can find more information in the Designing interference-free controllers (https://support.automation.siemens.com/WW/view/en/59193566) function manual.

Parameters/address space

5

5.1 Measuring types and ranges

The analog input module AI 8xI 2-/4-wire has the following measuring ranges:

Table 5-1 Measuring ranges

Measurement type	Measuring range	Resolution
Current (2-wire or 4-wire connection)	0 to 20 mA 4 to 20 mA	15 bits 15 bits
Current (4-wire connection)	± 20 mA	16 bits including sign

You will find the tables of the measuring ranges as well as overflow, overrange, etc., in the section Representation of analog values (Page 34).

5.2 Parameters

Parameters of the AI 8xI 2-/4-wire module

The effective range of the parameters depends on the type of configuration. Distributed operation on PROFINET IO in an ET 200BL system is supported.

When assigning parameters in the user program, use the "WRREC" instruction to transfer the parameters to the module using the data records; refer to the section Parameter assignment and structure of the parameter data record (Page 30).

The following parameter settings are possible:

Table 5-2 Configurable parameters and their defaults (GSD file)

Parameter	Value range	Default	Changing parameters in RUN	Effective range with configuration software, e.g. STEP 7 (TIA Portal)
Diagnostics: No supply voltage L+	• Disable • Enable	Disable	Yes	Module
Diagnostics: Overflow	• Disable • Enable	Disable	Yes	Module
Diagnostics: Underflow	• Disable • Enable	Disable	Yes	Module
Diagnostics: Wire break	• Disable • Enable	Disable	Yes	Module

Parameter	Value range	Default	Changing parameters in RUN	Effective range with configuration software, e.g. STEP 7 (TIA Portal)
Measuring types and ranges	• Deactivated • Current 0 to 20 mA (4-wire connection) • Current 4 to 20 mA (4-wire connection) • Current +/-20 mA (4-wire connection) • Current 0 to 20 mA (2-wire connection) • Current 4 to 20 mA (2-wire connection)	Current 4 to 20 mA (4-wire connection)	Yes	Channel
Smoothing	• None • Weak • Medium • Strong	None	Yes	Channel
Interference frequency suppression	• 60 Hz (50 ms) • 50 Hz (60 ms)	50 Hz (60 ms)	Yes	Channel

NOTE

Unused channels

"Deactivate" unused channels in the parameter assignment to improve the cycle time of the module.
A deactivated channel always returns the value $7FFF_H$.

5.3 Explanation of the parameters

Diagnostics: No supply voltage L+

Diagnostics: No supply voltage L+ enabling of the diagnostics alarm for missing or insufficient supply voltage L+.

Diagnostics: Overflow

Enabling of the diagnostics when the measured value exceeds the overrange.

Diagnostics: Underflow

Enabling of the diagnostics when the measured value falls below the underrange.

Diagnostics: Wire break

Enabling of the diagnostics if the module has no current flow or the current is too weak to be measured at the relevant input.

The wire break and underflow diagnostics can be activated simultaneously. If both diagnostics events occur simultaneously, the Diagnostics: Wire break is output.

NOTE

The diagnostics for wire break only works for 4 to 20 mA measurement range.

Measuring types and ranges

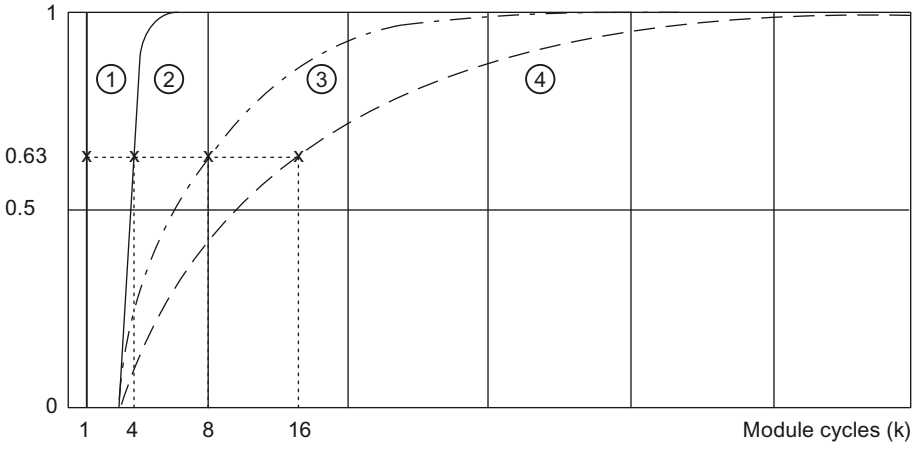
See section Measuring types and ranges (Page 19).

Smoothing

The individual measured values are smoothed by filtering. The smoothing can be set in 4 levels.

Smoothing time = number of module cycles (k) x cycle time of the module.

The following figure shows how many module cycles it takes for the smoothed analog value to approach 100%, depending on the configured smoothing. This applies to every signal change at the analog input.



① No smoothing (k = 1)
② Weak (k = 4)
③ Medium (k = 8)
④ Strong (k = 16)

Figure 5-1 Smoothing with AI 8xI 2-/4-wire

Interference frequency suppression

Suppresses the interference affecting analog input modules that is caused by the frequency of the AC voltage network used.

The frequency of the AC voltage network can negatively affect the measured value, in particular when measuring in the low voltage range and with thermocouples. With this parameter, the user specifies the supply frequency that is predominant in the plant.

5.4 Address space

The figure below shows the assignment of the address space for AI 8×I 2-/4-wire.

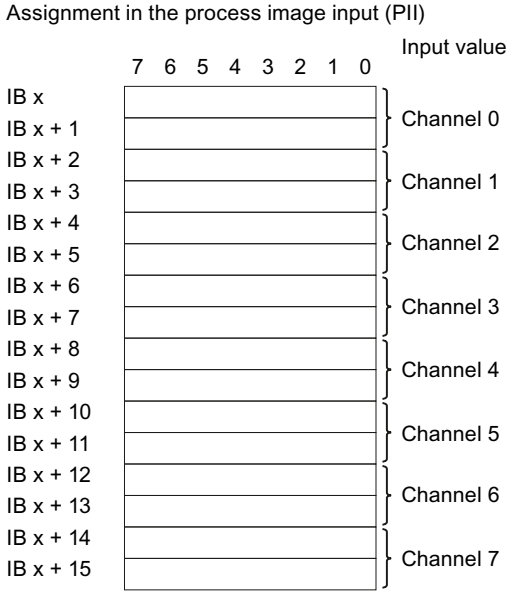


Figure 5-2 Address space of AI 8×I 2-/4-wire

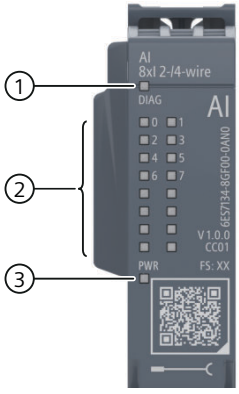
Interrupts/diagnostics alarms

6

6.1 Status and error displays

LED display

The figure below shows the LED displays of the AI 8xI 2-/4-wire module.



① DIAG (green/red)
② Channel status (green)
③ Power Status (green)

Meaning of the LEDs

The following tables contain the meaning of the status and error displays. Remedial measures for diagnostic alarms can be found in chapter Diagnostics alarms (Page 25).

DIAG LED

Table 6-1 DIAG LED fault display

DIAG LED	Meaning
☐ Off	Backplane bus supply of the ET 200BL not OK
☼ Flashing	Module not configured
■ On	Module parameters assigned
☼ Flashing	Module diagnostics is available

LED channel status

Table 6-2 LED channel status display

LED channel status	Meaning
□ Off	Channel deactivated
■ On	Channel activated

PWR LED

Table 6-3 Status display of the PWR LED

PWR LED	Meaning
□ Off	Supply voltage L+ missing
■ On	Supply voltage L+ present

6.2 Interrupts

The analog input module AI 8×I 2-/4-wire supports diagnostics interrupts.

Diagnostic interrupt

The module generates a diagnostic interrupt at the following events:

- Wire break (current 4 to 20 mA)
- Low limit violated
- High limit violated
- Error
- Parameter assignment error
- No supply voltage
- Channel temporarily unavailable

6.3 Diagnostics alarms

A diagnostic message is generated and the DIAG-LED flashes red on the module for each diagnostics event. You can read out the diagnostic messages, for example, in the diagnostic buffer of the CPU. You can evaluate the error codes with the user program.

Table 6-4 Diagnostics alarms, their meaning and how to deal with them

Diagnostics alarm	Error code	Meaning	Remedy
Wire break	6_H	Impedance of encoder circuit too high.	Use a different actuator type or wire differently, e.g. use cables with a larger cross-section
		Wire break between the module and sensor.	Connect the cable
		Channel not connected (open)	• Deactivate channel • Connect the encoder contacts
High limit violated	7_H	The value is above the overrange.	Correct interplay between module and encoder.
Low limit violated	8_H	The value is below the underrange.	Correct interplay between module and encoder.
Error	9_H	Internal module error occurred.	Replace module
Parameter assignment error	10_H	• The module cannot evaluate parameters for the channel. • Incorrect parameter assignment.	Correct the parameter assignment (diagnostics wire break set only with the permitted measuring ranges). Refer to Dependencies when configuring with GSD file (Page 30).
No supply voltage	11_H	No or insufficient supply voltage L+	Check the supply voltage L+
Channel temporarily unavailable	$1F_H$	Firmware being updated. The module is currently not performing any outputs.	• Wait for firmware update • Restart the firmware update

Technical specifications

7

7.1 Technical specifications

Technical specifications of the AI 8xI 2-/4-wire

The following table lists the technical specifications as of the issue date. You will find a data sheet including daily updated technical specifications on the Internet (https://support.industry.siemens.com/cs/ww/en/pv/6ES7134-8GF00-0AN0/td?dl=en).

Article number	6ES7134-8GF00-0AN0
General information	
Product type designation	AI 8xI 2-/4-wire
HW functional status	from FS01
Firmware version	V1.0.0
• FW update possible	Yes
Color code for module-specific color identification plate	CC01
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Measuring range scalable	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;
• PROFINET from GSD version/GSD revision	GSDML V2.45
Operating mode	
• Oversampling	No
• MSI	No
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
external protection for power supply lines	Yes; 24 V DC/10 A miniature circuit breaker with type B or C tripping characteristic
Input current	
Current consumption (rated value)	12 mA
Current consumption, max.	620 mA; all channels active with 0.575 A current output from encoder supply

Article number	6ES7134-8GF00-0AN0
Encoder supply	
24 V encoder supply	
• 24 V	Yes
• Short-circuit protection	Yes
• Output current, max.	575 mA
Current carrying capacity	
For P1 and P2 bus, max.	10 A
Power loss	
Power loss, typ.	0.6 W
Address area	
Address space per module	
• Address space per module, max.	16 byte
• Inputs	16 byte
Hardware configuration	
Automatic encoding	No
• Mechanical coding element	No
Formation of potential groups	
• support of potential groups	Yes
Analog inputs	
Number of analog inputs	8; Single-ended
• For current measurement	8
permissible input current for current input (destruction limit), max.	50 mA
Cycle time (all channels), min.	50 ms; per channel
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
– Input resistance (0 to 20 mA)	100 Ω; 15 bit
• -20 mA to +20 mA	Yes
– Input resistance (-20 mA to +20 mA)	100 Ω; 16 bit incl. sign
• 4 mA to 20 mA	Yes
– Input resistance (4 mA to 20 mA)	100 Ω; 15 bit
Cable length	
• shielded, max.	200 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz

Article number	6ES7134-8GF00-0AN0
• Conversion time (per channel)	60 / 50 ms
Smoothing of measured values	
• Number of smoothing levels	4
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes; 4x smoothing
• Step: Medium	Yes; 8x smoothing
• Step: High	Yes; 16x smoothing
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.5 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; Module-wise
• Short-circuit	No
• Group error	No
• Overflow/underflow	Yes; Module-wise

Article number	6ES7134-8GF00-0AN0
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
between backplane bus and supply voltage	Yes
Potential separation analog inputs	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Isolation	
Isolation tested with	500 V AC/707 V DC, type test
Standards, approvals, certificates	
Use in hazardous areas	
• EAC Ex	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual
connection method	
Terminals	
• Conductor cross-section, min.	0.14 mm^2; follow detailed information in System manual of ET 200BL
• Conductor cross-section, max.	2.5 mm^2; follow detailed information in System manual of ET 200BL
• Number of process terminals to I/O module	16
• Number of terminals with connection to P1 and P2 bus	2
Dimensions	
Width	15 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	81 g

Parameter data record

A

A.1 Dependencies when configuring with GSD file

When configuring the module with a GSD file, remember that the settings of some parameters are dependent on each other.

Configuring with a PROFINET GSD file

The table lists the properties and their dependencies on the measurement type and measuring range with PROFINET.

Measurement type	Measuring range	Diagnostics			
		No supply voltage L+	Overflow	Underflow	Wire break
Deactivated		*	*	*	*
Current (4-wire connection)	0 to 20 mA	x	x	x	-
	4 to 20 mA	x	x	x	x
	±20 mA	x	x	x	-
Current (2-wire connection)	0 to 20 mA	x	x	-	-
	4 to 20 mA	x	x	x	x

x = Property is allowed, - = Property is **not allowed**, * = Property is not relevant

A.2 Parameter assignment and structure of the parameter data record

Parameter assignment in the user program

The module can be re-configured in RUN (for example, the voltage or current values of selected channels can be changed in RUN without having an effect on the other channels).

Changing parameters in RUN

The "WRREC" instruction is used to transfer the parameters to the module using data record 128. The parameters set in STEP 7 are not changed in the CPU, which means the parameters set in STEP 7 are valid again after a restart.

STATUS output parameter

If errors occur when transferring parameters with the "WRREC" instruction, the module continues operation with the previous parameter assignment. The STATUS output parameter contains a corresponding error code.

You will find a description of the "WRREC" instruction and the error codes in the STEP 7 online help.

Structure of data record 128

NOTE

Channel 0 contains the diagnostics for the entire module.

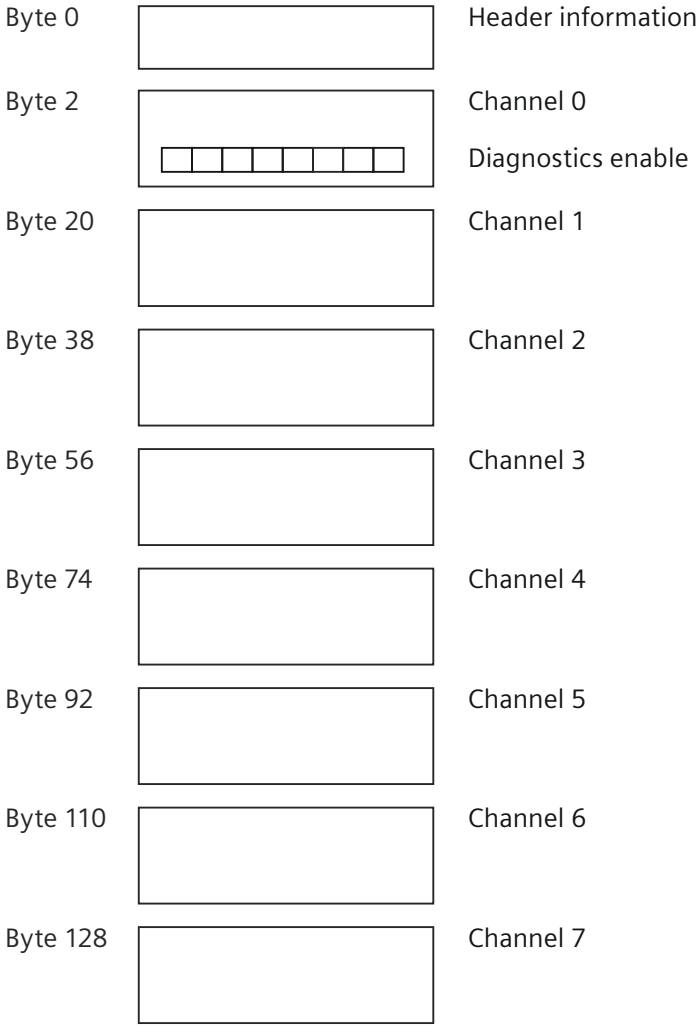


Figure A-1 Structure of data record 128

Header information

The figure below shows the structure of the header information.

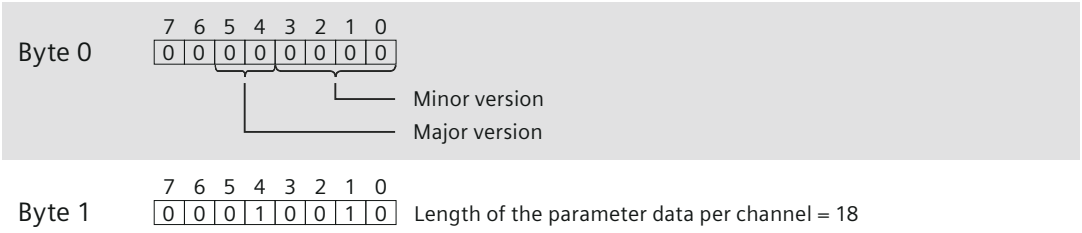
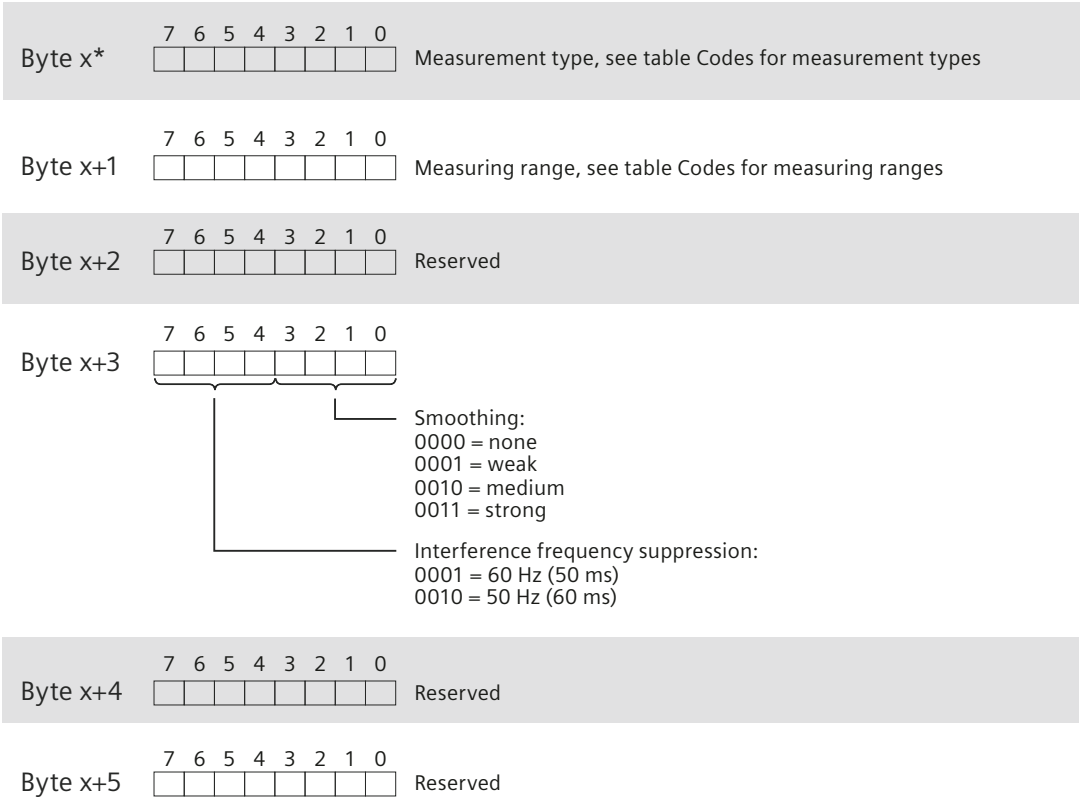


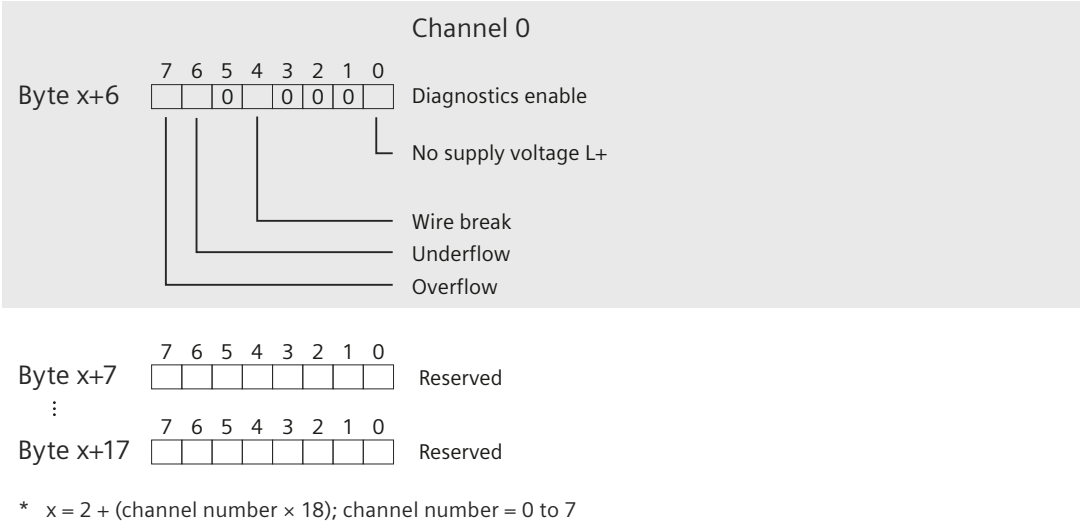
Figure A-2 Header information

Parameters

The figure below shows the structure of the parameters for channels 0 to 7.

Enable a parameter by setting the corresponding bit to "1".





* x = 2 + (channel number × 18); channel number = 0 to 7

Figure A-3 Structure of byte x to x+17 for channels 0 to 7

Codes for measurement types

The following table contains the codes for the measurement types of the analog input module. You must enter these codes at byte x (see previous figure).

Table A-1 Codes for measurement types

Measurement type	Code
Deactivated	0000 0000
Current, 4-wire connection	0000 0010
Current, 2-wire connection	0000 0011

Codes for measuring ranges

The following table contains the codes for the measuring ranges of the analog input module. You enter these codes at byte x+1 (see previous figure).

Table A-2 Codes for measuring ranges

Measuring range	Code
0 to 20 mA	0000 0010
4 to 20 mA	0000 0011
±20 mA	0000 0100

Representation of analog values

B

B.1 Representation of analog values for analog inputs

This appendix describes the analog values for all measuring ranges supported by the analog input module AI 8xI 2-/4-wire.

Measured value resolution

The resolution of the analog values differs depending on the analog module and its parameter assignment.

Each analog value is written left aligned to the tags. The bits marked with "x" are set to "0".

In the following table, you will find the representation of the binary analog values and the associated decimal or hexadecimal units of the analog values.

Table B-1 Resolution of the analog values

Resolution in bits including sign	Values		Analog value	
	Decimal	Hexadecimal	High byte	Low byte
15	2	2_H	Sign 0 0 0 0 0 0 0	0 0 0 0 0 0 1 x
16	1	1_H	Sign 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1

B.2 Representation of input ranges

In the following tables, you can find the digitized representation of the bipolar and unipolar input ranges. The resolution is 16 bits.

Table B-2 Bipolar input ranges

Dec. value	Measured value in %	Data word																Range
		2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
32767	>117.589	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Overflow
32511	117.589	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	Overrange
27649	100.004	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	
27648	100.000	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	Nominal range
1	0.003617	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
0	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-1	-0.003617	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
-27648	-100.000	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	

Dec. value	Measured value in %	Data word																Range
-27649	-100.004	1	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	Underrange
-32512	-117.593	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
-32768	<-117.593	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Underflow

Table B-3 Unipolar input ranges

Dec. value	Measured value in %	Data word																Range
		2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	
32767	>117.589	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Overflow
32511	117.589	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	Overrange
27649	100.004	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	
27648	100.000	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	Nominal range
1	0.003617	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
0	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-1	-0.003617	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Underrange
-4864	-17.593	1	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	
-32768	<-17.593	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Underflow

B.3 Representation of analog values in the current measuring ranges

The following tables list the decimal and hexadecimal values (codes) of the possible current measuring ranges.

Table B-4 Current measuring range ±20 mA

Values		Current measuring range	Range
Dec.	**Hex.**	**±20 mA**	
32767	7FFF	>23.52 mA	Overflow
32511	7EFF	23.52 mA	Overrange
27649	6C01		
27648	6C00	20 mA	Nominal range
20736	5100	15 mA	
1	1	723.4 nA	
0	0	0 mA	
-1	FFFF		
-20736	AF00	-15 mA	
-27648	9400	-20 mA	
-27649	93FF		Underrange
-32512	8100	-23.52 mA	
-32768	8000	<-23.52 mA	Underflow

Table B-5 Current measuring ranges 0 to 20 mA and 4 to 20 mA

Values		Current measuring range		Range
Dec.	**Hex.**	**0 to 20 mA ***	**4 to 20 mA**	
32767	7FFF	>23.52 mA	>22.81 mA	Overflow
32511	7EFF	23.52 mA	22.81 mA	Overrange
27649	6C01			
27648	6C00	20 mA	20 mA	Nominal range
20736	5100	15 mA	16 mA	
1	1	723.4 nA	4 mA + 578.7 nA	
0	0	0 mA	4 mA	
-1	FFFF			Underrange
-4864	ED00	-3.52 mA	1.185 mA	
-32768	8000	<-3.52 mA	<1.185 mA	Underflow

* For measurement type "2-wire connection", negative values are not possible for the range "0 to 20 mA". Therefore, no underrange or underflow exists here.

B.4 Measured values for wire break

The following table contains the measured values at a wire break depending on enabled diagnostics.

Table B-6 Measured values at a wire break depending on enabled diagnostics

Programmable diagnostics		Measured value		Explanation
Wire break	**Underflow**			
Enable	Enable	32767	$7FFF_H$	The "wire break" diagnostics is reported, because this has a higher priority.
Disable	Enable	-32768	8000_H	The "Lower limit violated" diagnostics is reported.
Disable	Disable	-32768	8000_H	No diagnostics reported.

Dimension drawing

C

This appendix contains a dimension drawing of the module mounted on a mounting rail. Always observe the specified dimensions for installation in cabinets, control rooms, etc.

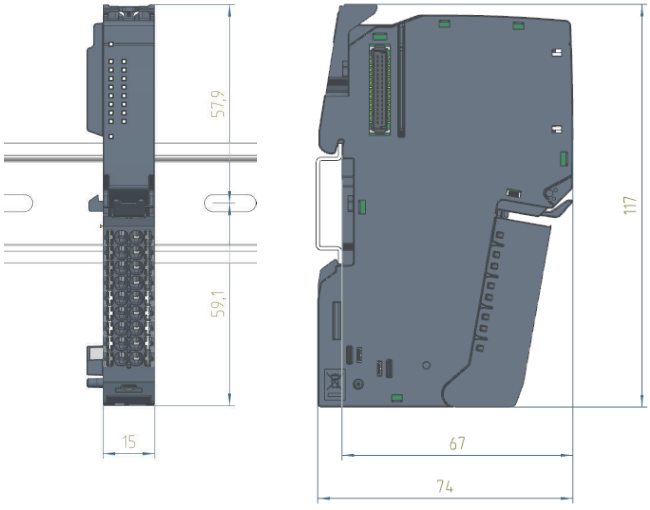


Figure C-1 Dimension drawing of the module (front and side view)