TECHDOCS

Manual

WAGO-I/O-SYSTEM 750

750-564

4AO U/I

4-Channel Analog Output Module; Voltage/Current

Version 1.0.0

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

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We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally protected by trademark or patent.

WAGO is a registered trademark of WAGO Verwaltungsgesellschaft mbH.

Table of Contents

1 Notes about this Documentation

Note

Always retain this documentation!
This documentation is part of the product. Therefore, retain the documentation during the entire service life of the product. Pass on the documentation to any subsequent user. In addition, ensure that any supplement to this documentation is included, if necessary.

1.1 Validity of this Documentation

This documentation is only applicable to the I/O module 750-564 (4AO U/I).

The I/O module 750-564 shall only be installed and operated according to the instructions in this manual and in the manual for the used fieldbus coupler or controller.

NOTICE

Consider power layout of the WAGO I/O SYSTEM 750!
In addition to these operating instructions, you will also need the manual for the used fieldbus coupler or controller, which can be downloaded at www.wago.com. There, you can obtain important information including information on electrical isolation, system power and supply specifications.

1.2 Copyright

1.3 Symbols

DANGER

Personal Injury!
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

DANGER

Personal Injury Caused by Electric Current!
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Personal Injury!
Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Personal Injury!
Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Damage to Property!
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

NOTICE

Damage to Property Caused by Electrostatic Discharge (ESD)!
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

Note

Important Note!
Indicates a potential malfunction which, if not avoided, however, will not result in damage to property.

Information

Additional Information:
Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

1.4 Number Notation

Table 1: Number Notation

Number Code	Example	Note
Decimal	100	Normal notation
Hexadecimal	0x64	C notation
Binary	'100' '0110.0100'	In quotation marks, nibble separated with dots (.)

1.5 Font Conventions

Table 2: Font Conventions

Font Type	Indicates
italic	Names of paths and data files are marked in italic-type. e.g.: *C:\Program Files\WAGO Software*
Menu	Menu items are marked in bold letters. e.g.: **Save**
>	A greater-than sign between two names means the selection of a menu item from a menu. e.g.: **File** > **New**
Input	Designation of input or optional fields are marked in bold letters, e.g.: **Start of measurement range**
“Value”	Input or selective values are marked in inverted commas. e.g.: Enter the value “4 mA” under **Start of measurement range**.
[Button]	Pushbuttons in dialog boxes are marked with bold letters in square brackets. e.g.: **[Input]**
[Key]	Keys are marked with bold letters in square brackets. e.g.: **[F5]**

2 Important Notes

This section includes an overall summary of the most important safety requirements and notes that are mentioned in each individual section. To protect your health and prevent damage to devices as well, it is imperative to read and carefully follow the safety guidelines.

2.1 Legal Bases

2.1.1 Subject to Changes

WAGO Kontakttechnik GmbH & Co. KG reserves the right to provide for any alterations or modifications. WAGO Kontakttechnik GmbH & Co. KG owns all rights arising from the granting of patents or from the legal protection of utility patents. Third-party products are always mentioned without any reference to patent rights. Thus, the existence of such rights cannot be excluded.

2.1.2 Personnel Qualifications

All sequences implemented on WAGO I/O SYSTEM 750 devices may only be carried out by electrical specialists with sufficient knowledge in automation. The specialists must be familiar with the current norms and guidelines for the devices and automated environments.

All changes to the coupler or controller should always be carried out by qualified personnel with sufficient skills in PLC programming.

2.1.3 Use of the 750 Series in Compliance with Underlying Provisions

Fieldbus couplers, controllers and I/O modules found in the modular WAGO I/O SYSTEM 750 receive digital and analog signals from sensors and transmit them to actuators or higher-level control systems. Using controllers, the signals can also be (pre-) processed.

The devices have been developed for use in an environment that meets the IP20 protection class criteria. Protection against finger injury and solid impurities up to 12.5 mm diameter is assured; protection against water damage is not ensured. Unless otherwise specified, operation of the devices in wet and dusty environments is prohibited.

Operating the WAGO I/O SYSTEM 750 devices in home applications without further measures is only permitted if they meet the emission limits (emissions of interference) according to EN 61000-6-3. You will find the relevant information in the section “Device Description” > “Standards and Guidelines” in the manual for the used fieldbus coupler or controller.

Appropriate housing (per 2014/34/EU) is required when operating the WAGO I/O SYSTEM 750 in hazardous environments. Please note that a prototype test

certificate must be obtained that confirms the correct installation of the system in a housing or switch cabinet.

The implementation of safety functions such as EMERGENCY STOP or safety door monitoring must only be performed by the F I/O modules within the modular WAGO I/O SYSTEM 750. Only these safe F I/O modules ensure functional safety in accordance with the latest international standards. WAGO's interference-free output modules can be controlled by the safety function.

2.1.4 Technical Condition of Specified Devices

The devices to be supplied ex works are equipped with hardware and software configurations, which meet the individual application requirements. These modules contain no parts that can be serviced or repaired by the user. The following actions will result in the exclusion of liability on the part of WAGO Kontakttechnik GmbH & Co. KG:

- Repairs,
- Changes to the hardware or software that are not described in the operating instructions,
- Improper use of the components.

Further details are given in the contractual agreements. Please send your request for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

2.1.5 Disposal

2.1.5.1 Electrical and Electronic Equipment

Electrical and electronic equipment may not be disposed of with household waste. This also applies to products without this symbol.

Electrical and electronic equipment contain materials and substances that can be harmful to the environment and health. Electrical and electronic equipment must be disposed of properly after use.
WEEE 2012/19/EU applies throughout Europe. Directives and laws may vary nationally.

Environmentally friendly disposal benefits health and protects the environment from harmful substances in electrical and electronic equipment.

- Observe national and local regulations for the disposal of electrical and electronic equipment.
- Clear any data stored on the electrical and electronic equipment.
- Remove any added battery or memory card in the electrical and electronic equipment.
- Have the electrical and electronic equipment sent to your local collection point.

Improper disposal of electrical and electronic equipment can be harmful to the environment and human health.

2.1.5.2 Packaging

Packaging contains materials that can be reused.
PPWD 94/62/EU and 2004/12/EU packaging guidelines apply throughout Europe. Directives and laws may vary nationally.

Environmentally friendly disposal of the packaging protects the environment and allows sustainable and efficient use of resources.

- Observe national and local regulations for the disposal of packaging.
- Dispose of packaging of all types that allows a high level of recovery, reuse and recycling.

Improper disposal of packaging can be harmful to the environment and wastes valuable resources.

2.2 Safety Advice (Precautions)

For installing and operating purposes of the relevant device to your system the following safety precautions shall be observed:

DANGER

Do not work on devices while energized!
All power sources to the device shall be switched off prior to performing any installation, repair or maintenance work.

DANGER

Install device in only one suitable enclosure!
The device is an open system. Install the device in a suitable enclosure. This enclosure must:

- Guarantee that the max. permissible degree of pollution is not exceeded.
- Offer adequate protection against contact.
- Prevent fire from spreading outside of the enclosure.
- Offer adequate protection against UV irradiation.
- Guarantee mechanical stability
- Restrict access to authorized personnel and may only be opened with tools

DANGER

Ensure disconnect and overcurrent protection!
The device is intended for installation in automation technology systems. Disconnect protection is not integrated. Connected systems must be protected by a fuse.
Provide suitable disconnect and overcurrent protection on the system side!

DANGER

Ensure a standard connection!
To minimize any hazardous situations resulting in personal injury or to avoid failures in your system, the data and power supply lines shall be installed according to standards, with careful attention given to ensuring the correct terminal assignment. Always adhere to the EMC directives applicable to your application.

NOTICE

System supply only with appropriate fuse protection!
Without overcurrent protection, the electronics can be damaged.
For 24V system supply input voltage an external fuse, rated max. 2 A, slow acting, min. 30 VDC shall be used.

NOTICE

Field supply only with appropriate fuse protection!
Without overcurrent protection, the electronics can be damaged.
For 24V field supply input voltage an external fuse, rated max. 10 A, slow acting, min. 30 VDC shall be used.

NOTICE

Do not exceed maximum values via power contacts!
The maximum current that can flow through the power jumper contacts is 10 A. The power jumper contacts can be damaged and the permissible operating temperature can be exceeded by higher current values.
When configuring the system, do not exceed the permissible maximum current value. If there is a higher power requirement, you must use an additional supply module to provide the field voltage.

NOTICE

Do not exceed the maximum total current for I/O modules (5 VDC) via data contacts!
The maximum permissible total current for internal system supply of the I/O modules may not be exceeded. The permissible total current is specified in the technical data of the head station and power supply. The data contacts for internal system supply can be damaged and the permissible operating temperature can be exceeded by higher values.
When configuring the system, do not exceed the permissible total current. If there is a higher power requirement, you must use an additional supply to provide the system voltage (5 VDC)!

NOTICE

Ensure proper contact with the DIN-rail!
Proper electrical contact between the DIN-rail and device is necessary to maintain the EMC characteristics and function of the device.

NOTICE

Replace defective or damaged devices!
Replace defective or damaged device/module (e.g., in the event of deformed contacts).

NOTICE

Protect the components against materials having seeping and insulating properties!
The components are not resistant to materials having seeping and insulating properties such as: aerosols, silicones and triglycerides (found in some hand creams). If you cannot exclude that such materials will appear in the component environment, then install the components in an enclosure being resistant to the above-mentioned materials. Clean tools and materials are imperative for handling devices/modules.

NOTICE

Clean only with permitted materials!
Clean housing and soiled contacts with propanol.

NOTICE

Do not use any contact spray!
Do not use any contact spray. The spray may impair contact area functionality in connection with contamination.

NOTICE

Do not reverse the polarity of connection lines!
Avoid reverse polarity of data and power supply lines, as this may damage the devices involved.

NOTICE

Avoid electrostatic discharge!
The devices are equipped with electronic components that may be destroyed by electrostatic discharge when touched. Please observe the safety precautions against electrostatic discharge per DIN EN 61340-5-1/-3. When handling the devices, please ensure that environmental factors (personnel, work space and packaging) are properly grounded.

NOTICE

Do not use in telecommunication circuits!
Only use devices equipped with ETHERNET or RJ-45 connectors in LANs. Never connect these devices with telecommunication networks.

3 Device Description

The I/O module 750-564 (4AO U/I) provides a large number of standard signals for voltage and current.

The output signal can be parameterized channel by channel.

Wire break, short circuit, wiring errors and a faulty field power supply are diagnosed and indicated.

The I/O module is protected against incorrect wiring (feedback).

Voltage outputs can optionally be connected with 4-wire technology via the sense lines.

Power to the internal electronics is supplied via both the internal data bus and the field supply.

The Output signal is electrically isolated and will be transmitted with a resolution of 16 bits.

The I/O module 750-564 (4AO U/I) receives the 24 V voltage supply for the field level from an upstream I/O module or from the fieldbus coupler/controller via blade-formed power jumper contacts. It then provides these potentials to subsequent I/O modules via spring-formed power jumper contacts.

NOTICE

Do not exceed maximum values via power contacts!
The maximum current that can flow through the power jumper contacts is 10 A. The power jumper contacts can be damaged and the permissible operating temperature can be exceeded by higher current values.
When configuring the system, do not exceed the permissible maximum current value. If there is a higher power requirement, you must use an additional supply module to provide the field voltage.

With consideration of the power jumper contacts, the individual modules can be arranged in any combination when configuring the fieldbus node.
An arrangement in groups within the group of potentials is not necessary.

The 750-564 module can be used with the fieldbus couplers and controllers of the WAGO I/O SYSTEM 750 of the specified version or higher listed in the “Compatibility list” table.

Table 3: Compatibility List 750-564

Bus System	Fieldbus Coupler/ Controller/PFC	Item No.	Firmware Version
PROSINET	Fieldbus Coupler	750-375	07
		750-377	07
PROFIBUS	Fieldbus Coupler	750-333	22
	Controller	750-833	21
ETHERNET	Fieldbus Coupler	750-341	09
		750-342	19
		750-352	14
		750-362	02
		750-363	03
	Controller	750-823	03
		750-841	21
		750-842	19
		750-843	03
		750-852	14
		750-862	02
		750-871	09
		750-872	05
		750-873	05
		750-880	14
		750-881	14
		750-882	14
		750-885	14
		750-890	02
		750-891	02
		750-893	03
	Application Controller BA	750-884	14
	PFC100	750-810x	13
	PFC200	750-82xx	13
DeviceNet	Fieldbus Coupler	750-306	4M
	ECO Fieldbus Coupler	750-346	11
	Controller	750-806	11
CANopen	Fieldbus Coupler	750-337	22
		750-338	22
	ECO Fieldbus Coupler	750-347	12
		750-348	12
	Controller	750-837	18
		750-838	18

Table 3: Compatibility List 750-564

Bus System	Fieldbus Coupler/ Controller/PFC	Item No.	Firmware Version
Modbus®	Fieldbus Coupler	750-315/300-000	01
		750-316/300-000	01
	Controller	750-815/300-000	01
		750-816/300-000	01
EtherCat	Fieldbus Coupler	750-354	05
BACnet	Fieldbus Coupler	750-330	09
		750-332	02
	Controller	750-829	09
		750-832	02
		750-831	13
KNX	Controller	750-849	05
		750-889	14

3.1 View

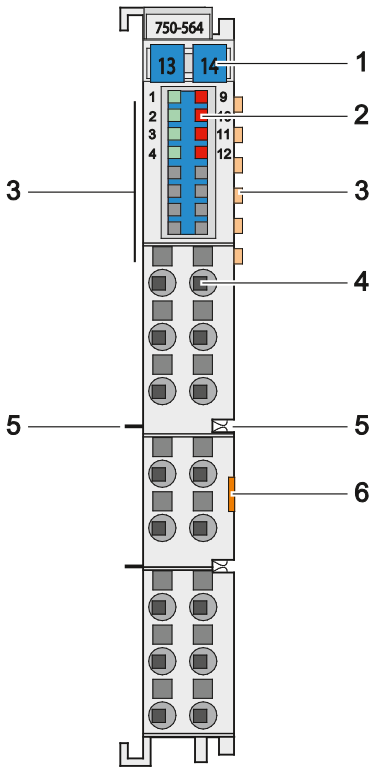


Figure 1: View

Table 4: Legend for Figure “View”

Pos.	Description	Details See Section
1	Marking possibility with Mini-WSB	---
2	Status LEDs	“Device Description” > “Display Elements”
3	Data contacts	“Device Description” > “Connectors”
4	Push-in CAGE CLAMP® connectors	“Device Description” > “Connectors”
5	Power jumper contacts	“Device Description” > “Connectors”
6	Release tab	“Mounting” > “Inserting and Removing Devices”

3.2 Connectors

3.2.1 Data Contacts/Local Bus

Communication between the head station and the I/O modules as well as the system supply of the I/O modules is carried out via the local bus. The contacting for the local bus consists of 6 data contacts, which are available as self-cleaning gold spring contacts.

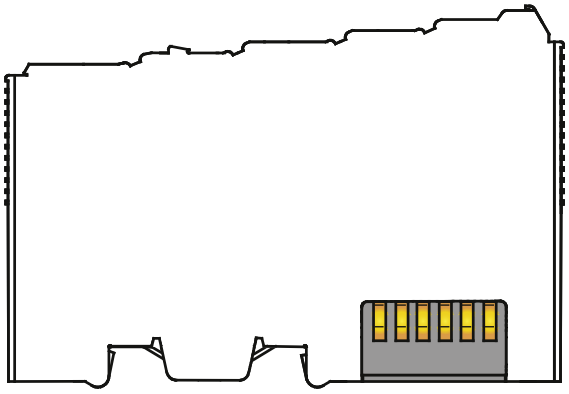


Figure 2: Data Contacts

3.2.2 Power Jumper Contacts/Field Supply

The I/O module 750-564 has 2 self-cleaning power jumper contacts that supply and transmit power for the field side. The contacts on the left side of the I/O module are designed as blade contacts and those on the right side as spring contacts.

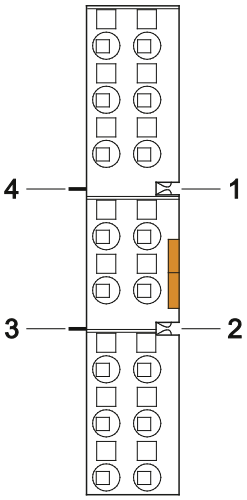


Figure 3: Power Jumper Contacts

Table 5: Legend for Figure “Power Jumper Contacts”

Contact	Type	Function
1	Spring contact	Potential transmission (U_v) for field supply
2	Spring contact	Potential transmission (0 V) for field supply
3	Blade contact	Potential feed-in (0 V) for field supply
4	Blade contact	Potential feed-in (U_v) for field supply

NOTICE

Do not exceed maximum values via power contacts!
The maximum current that can flow through the power jumper contacts is 10 A. The power jumper contacts can be damaged and the permissible operating temperature can be exceeded by higher current values.
When configuring the system, do not exceed the permissible maximum current value. If there is a higher power requirement, you must use an additional supply module to provide the field voltage.

Note

Use supply modules for ground (earth)!
The I/O module has no power jumper contacts for receiving and transmitting the earth potential. Use a supply module when an earth potential is needed for the subsequent I/O modules.

3.2.3 Push-in CAGE CLAMP® Connectors

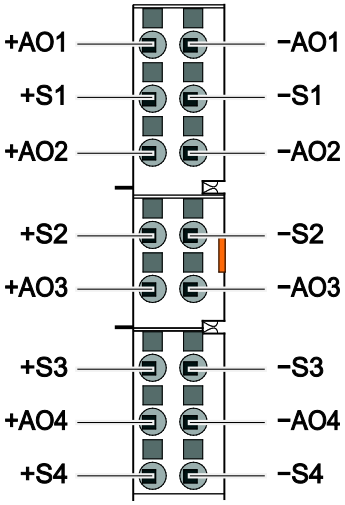


Figure 4: Push-in CAGE CLAMP® Connectors

Table 6: Legend for Figure “Push-in CAGE CLAMP® Connectors”

Channel	Designation	Connector	Function
1	+AO1	1	Positive voltage/current output
	−AO1	9	Negative voltage/current output
	+S1	2	Positive sense input
	−S1	10	Negative sense input
2	+AO2	3	Positive voltage/current output
	−AO2	11	Negative voltage/current output
	+S2	4	Positive sense input
	−S2	12	Negative sense input
3	+AO3	5	Positive voltage/current output
	−AO3	13	Negative voltage/current output
	+S3	6	Positive sense input
	−S3	14	Negative sense input
4	+AO4	7	Positive voltage/current output
	−AO4	15	Negative voltage/current output
	+S4	8	Positive sense input
	−S4	16	Negative sense input

Note

Use shielded signal lines!
Only use shielded signal lines for analog signals and I/O modules which are equipped with shield clamps. Only then can you ensure that the accuracy and interference immunity specified for the respective I/O module can be achieved even in the presence of interference acting on the signal cable.

3.3 Display Elements

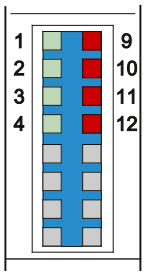


Figure 5: Display Elements

Table 7: Legend for Figure “Display Elements”

Channel	Designation	LED	Color	Description
1	Status LED 1	1	Green	Status signal for channel 1: operational readiness and local bus communication
	Error LED 1	9	Red	Error signaling for channel 1: wire break, short circuit, wiring errors, faulty field power supply or internal error
2	Status LED 2	2	Green	Status signal for channel 2: operational readiness and local bus communication
	Error LED 2	10	Red	Error signaling for channel 2: wire break, short circuit, wiring errors, faulty field power supply or internal error
3	Status LED 3	3	Green	Status signal for channel 3: operational readiness and local bus communication
	Error LED 3	11	Red	Error signaling for channel 3: wire break, short circuit, wiring errors, faulty field power supply or internal error
4	Status LED 4	4	Green	Status signal for channel 4: operational readiness and local bus communication
	Error LED 4	12	Red	Error signaling for channel 4: wire break, short circuit, wiring errors, faulty field power supply or internal error

Note

Indicators may be disabled with channels!
When a channel is disabled, the associated indicators are also disabled.
Both LEDs associated with the channel in question are then switched off.

You can find the interpretation of the internal LED states in Section “Diagnostics”.

3.4 Schematic Diagram

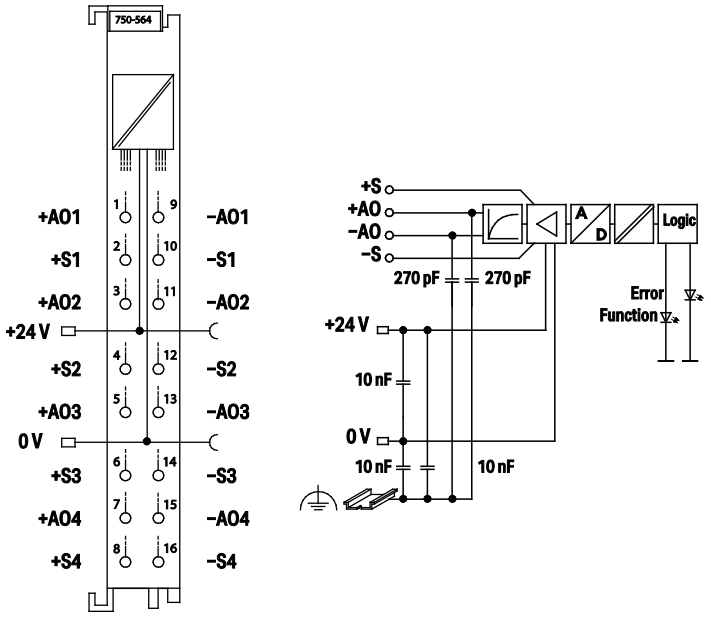


Figure 6: Schematic Diagram

3.5 Technical Data

3.5.1 Device

Table 8: Technical Data – Device

Width	12 mm
Height (from upper edge of DIN-rail)	69 mm
Depth	100 mm
Weight	50 g

3.5.2 Power Supply

Table 9: Technical Data – Power Supply

Power supply via power jumper contact	24 VDC (−25 % … +30 %)
Power consumption, system supply (5 V)	55 mA
Power consumption, field supply (I/O module with no external load)	20 mA at 24 V
Power consumption, field supply for typical operating conditions Load on 4 current outputs: 200 Ω per output Load on 4 current outputs: 2 kΩ per output	 43 mA at 24 V 37 mA at 24 V
Isolation	500 V system/field

3.5.3 Communication

Table 10: Technical Data – Communication

Data width, internal (local bus)	4 × 16-bit data 4 × 8 bits, control/status (optional, configurable)

3.5.4 Outputs

Table 11: Technical Data – Outputs

Number of outputs	4
Output type (adjustable)	• 0-10 mA • 2-10 mA • ±10 mA • 0-12 mA • ±12 mA • 0-20 mA • 4-20 mA *) • ±20 mA • 0-22 mA • ±22 mA • 0-5 V • 1-5 V • ±5 V • 0-10 V • 2-10 V • ±10 V • 0-12 V • ±12 V
Load impedance, voltage output	≥ 1 kΩ
Load impedance, current output	≤ 600 Ω
Outputs with feedback protection up to	31.2 V
Diagnostics	Wire break[1)], short circuit[2)], wiring errors, faulty field power supply, internal error
Resolution (configurable)	• 16-bit with positive signals • 15-bit + sign with positive or negative signals
Conversion time $_{typ.}$	≤ 3 ms for all channels

*) Factory setting
1) With output type “current”
2) With output type “voltage”

Note

Limitation on negative current output ranges!
If a channel is operated in the negative current output range, the other channels must not be operated in the **voltage** output range!

Table 12: Max. Error/Temperature Drift by Output Range

Output Ranges	**Max. Error at 25 °C** [Output range end value: %]	**Max. Temperature Drift** [ppm/K]
0-10 V; 2-10 V; ±10 V; 0-5 V; 1-5 V; ±5 V	0.05	25
0-12 V; ±12 V	0.075	25
0-20 mA; 4-20 mA; ±20 mA; 0-10 mA; 2-10 mA; ±10 mA; 0-12 mA; ±12 mA; 0-22 mA; ±22 mA	0.05	50

Table 13: Technical Data – Field Wiring

Wire connection	Push-in CAGE CLAMP®
Cross section, solid wire	0.08 mm² … 1.5 mm² / AWG 28 … 16
Cross section, fine-stranded wire	0.25 mm² … 1.5 mm² / AWG 22 … 16
Stripped lengths	8 mm … 9 mm / 0.33 in

3.5.5 Climatic Environmental Conditions

Table 14: Technical Data – Climatic Environmental Conditions

Surrounding air temperature, operation	0 °C … 55 °C
Surrounding air temperature, storage	−25 °C … +85 °C
Operating altitude	0 … 2000 m; (> 2000 m upon request)
Relative humidity	Max. 5 % … 95 % without condensation
Pollution degree	2
Protection type	IP20
Resistance to harmful substances	Acc. to IEC 60068-2-42 and IEC 60068-2-43
Maximum pollutant concentration at relative humidity < 75 %	$SO_2 \leq 25$ ppm $H_2S \leq 10$ ppm
Special conditions	Ensure that additional measures for components are taken, which are used in an environment involving: – dust, caustic vapors or gases – ionizing radiation

3.6 Approvals

The following approvals have been granted to 750-564 I/O modules:

Conformity Marking

UL E175199 for
use in Ordinary
Location

The following Ex approvals have been granted to 750-564 I/O modules:

TÜV 14 ATEX 148929 X

II 3 G Ex ec IIC T4 Gc

IECEx TUN 14.0035 X

Ex ec IIC T4 Gc

UL E198726 for Use in Hazardous Locations
Cl I, Div 2, Group A, B, C, D, T4

The following ship approvals have been granted to 750-564 I/O modules:

DNV GL
[Temperature: B, Humidity: A, Vibration: B, EMC: B,
Enclosure: A]

Information

More information about approvals.
Detailed references to the approvals are listed in the document “Overview Approvals **WAGO I/O SYSTEM 750**”, which you can find via the internet under: www.wago.com → DOWNLOADS → Documentation → System Description.

3.7 Standards and Guidelines

750-564 I/O modules meet the following standards and guidelines:

ATEX Directive	**2014/34/EU**
Explosive atmospheres. Equipment. General requirements	EN 60079-0
Explosive atmospheres Equipment protection by increased safety "e"	EN 60079-7
IECEx Scheme	
Explosive atmospheres General requirements	IEC 60079-0
Explosive atmospheres Equipment protection by increased safety "e"	IEC 60079-7
UL Ordinary Locations	
UL Standard for Safety – for Industrial Control Equipment	UL 61010-2-201
UL Hazardous Locations	
STANDARD FOR SAFETY – Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations	UL 121201
EMV Directive	**2014/30/EU**
EMV CE Immunity to interference	EN 61000-6-2 and EN 61131-2
EMV CE Emission of interference	EN 61000-6-3 and EN 61131-2
EMV Marine	
Emission of interference	according to DNV GL
Immunity to interference	according to DNV GL

4 Process Image

The 750-564 I/O Module provides one control/status byte (8 bits) and one data word (16 bits) per channel.
The I/O module outputs signals with a 16-bit process value resolution.

The digitized process value is output in a data word via the process image of the head station as output byte “0” (low) and output byte “1” (high).

With the setting “Process Image: Standard,” the head station hides the control/status bytes of the individual channels.
With the setting “Process Image: Advanced,” the control/status bytes are shown in the fieldbus process image.

The required setting can be made through parameterization with the **WAGO-I/O-*CHECK*** commissioning tool.
Alternatively, the I/O module can also be parameterized via the PROFIBUS and PROFINET device description (GSD file). The description of the parameterization can be found in the appendix in section “Configuration and Parameterization via GSD File with PROFIBUS DP and PROFINET IO.”

4.1 Overview

Note

Control/status byte with setting “Process Image: Standard”: Representation depends on the head station!
The I/O module provides the head station with a complete process image, including control/status bytes. The **WAGO-I/O-*CHECK*** commissioning tool accesses the complete commissioning process image. The head station uses a different process image for provision of cyclic process data via the fieldbus. Presentation of control/status bytes may be suppressed in this other process image, depending on the head station used (see table “Process Image (‘Standard’) – 750-564 I/O Module”).

Table 15: Process Image (“Standard”) – 750-564 I/O Module

Process image	
Output[1)]	
Byte 0	Process value CH1_D0
Byte 1	Process value CH1_D1
Byte 2	Process value CH2_D0
Byte 3	Process value CH2_D1
Byte 4	Process value CH3_D0
Byte 5	Process value CH3_D1
Byte 6	Process value CH4_D0
Byte 7	Process value CH4_D1

[1)] CHx_D0 = low byte of the process value for channel x
CHx_D1 = high byte of the process value for channel x

Table 16: Process Image (“Advanced”) – 750-564 I/O Module

Process image			
Output		**Input**	
Byte 0	Control byte CH1_C0	Byte 0	Status byte CH1_S0
Byte 1	Process value CH1_D0	Byte 1	Reserved
Byte 2	Process value CH1_D1	Byte 2	Reserved
Byte 3	Control byte CH2_C1	Byte 3	Status byte CH2_S1
Byte 4	Process value CH2_D0	Byte 4	Reserved
Byte 5	Process value CH2_D1	Byte 5	Reserved
Byte 6	Control byte CH3_C2	Byte 6	Status byte CH3_S2
Byte 7	Process value CH3_D0	Byte 7	Reserved
Byte 8	Process value CH3_D1	Byte 8	Reserved
Byte 9	Control byte CH4_C3	Byte 9	Status byte CH4_S3
Byte 10	Process value CH4_D0	Byte 10	Reserved
Byte 11	Process value CH4_D1	Byte 11	Reserved

[1)] CHx_Sx = Status byte x from channel x
CHx_D0 = low byte of the process value for channel x
CHx_D1 = high byte of the process value for channel x
[2)] CHx_Cx = control byte x of channel x

4.2 Control and Status Bytes

Control and status bytes are implemented identically for all channels. Therefore, the following description in this section applies to all control and status bytes of the I/O module.

Table 17: Control Byte CH1_C0

Control Byte CH1_C0, Byte 0							
Bit 7	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
Reg_Com = 0	-	-	-	-	-	-	-
Reg_Com = 1	**0/1**	**Register number**					
Reg_Com	Register communication						
	0:	Switch register communication off					
	1:	Switch register communication on					
0/1	Reserved						
-	Not used						

Table 18: Status Byte CH1_S0

Status Byte CH1_S0, Byte 0							
Bit 7	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
RegCom	General Error	Power supply fault	Wire break	Short circuit	Wiring error AO-	Wiring error	0

0	Reserved	
Wiring error	Wiring error	
	0:	No wiring error
	1:	Wiring error present. External voltage or short circuit present on the analog output +AO1 and −AO1 or sense input +S1 and −S1.
Wiring error AO-	AO- wiring error	
	0:	No wiring error on −AOx.
	1:	AO− wiring error present. Short circuit between 24 V and −AOx.
Short circuit[1)]	Short circuit	
	0:	No short circuit
	1:	Short circuit on the analog output between +AO1 and −AO1.
Wire break[2)]	Wire break	
	0:	No wire break.
	1:	Analog output +AO1 and −AO1 open or in an excessively high-ohm state, or external voltage on analog output +AO1 and −AO1 or sense input +S1 and −S1, or short circuit on the sense input between +S1 and −S1.
Power supply fault	Power supply fault	
	0:	Voltage for the field supply is adequate.
	1:	Voltage for the field supply is too low.
General Error	General error / internal error	
	0:	No error present, or bit 1 (wiring error), bit 2 (AO− wiring error), bit 3 (short circuit), bit 4 (wire break) or bit 5 (power supply fault) is not set.
	1:	General error present; bit 1 (wiring error), bit 2 (AO− wiring error), bit 3 (short circuit), bit 4 (wire break) or bit 5 (power supply fault) is set. Internal error present (DAC error); bit 1 (wiring error), bit 2 (AO− wiring error), bit 3 (short circuit), bit 4 (wire break) or bit 5 (power supply fault) is not set.
RegCom	Register communication	
	0:	Register communication is inactive (normal mode).
	1:	Register communication is active.

[1)] Only with output type “voltage”
[2)] Only with output type “current”

4.3 Prozess Data

4.3.1 Overview of Signal Types

The following table serves as an overview of all supported signal types.
With positive signals, the resolution can be set to either 16 bits or 15 bits.

Table 19: Overview of Signal Types

Bits 0 … 4 of Register 32	Signal type	Measurement Range	Resolution[1)]
0x00	Channel is disabled		
0x01	0-5 V	0 … +5 V	16 Bit
0x01	0-5 V	0 … +5 V	15 Bit
0x02	1-5 V	+1 … +5 V	16 Bit
0x02	1-5 V	+1 … +5 V	15 Bit
0x03	±5 V	−5 … +5 V	15 Bit + VZ
0x04	0-10 V	0 … +10 V	16 Bit
0x04	0-10 V	0 … +10 V	15 Bit
0x05	2-10 V	+2 … +10 V	16 Bit
0x05	2-10 V	+2 … +10 V	15 Bit
0x06	± 10 V	−10 … +10 V	15 Bit + VZ
0x07	0-10 mA	0 … +10 mA	16 Bit
0x07	0-10 mA	0 … +10 mA	15 Bit
0x08	2-10 mA	+2 … +10 mA	16 Bit
0x08	2-10 mA	+2 … +10 mA	15 Bit
0x09	±10 mA	−10 … +10 mA	15 Bit + VZ
0x0A	0-20 mA	0 … +20 mA	16 Bit
0x0A	0-20 mA	0 … +20 mA	15 Bit
0x0B	4-20 mA	+4 … +20 mA	16 Bit
0x0B	4-20 mA	+4 … +20 mA	15 Bit
0x0C	±20 mA	−20 … +20 mA	15 Bit + VZ
0x0D	0-12 V	0 … +12 V	16 Bit
0x0D	0-12 V	0 … +12 V	15 Bit
0x0E	±12 V	−12 … +12 V	15 Bit + VZ
0x0F	0-22 mA	0 … +22 mA	16 Bit
0x0F	0-22 mA	0 … +22 mA	15 Bit
0x10	±22 mA	−22 … +22 mA	15 Bit + VZ
0x11	0-12 mA	0 … +12 mA	16 Bit
0x11	0-12 mA	0 … +12 mA	15 Bit
0x12	±12 mA	−12 … +12 mA	15 Bit + VZ

[1)] 16 Bit/15 Bit + VZ: Bit 14 of Register 32 = 0
15 Bit: Bit 14 of Register 32 = 1

4.3.2 Prozess Value (Voltage)

Table 20: 0–5 V (16-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
0 V	0x0000	0
1 V	0x3333	13107
2 V	0x6666	26214
3 V	0x9999	39321
4 V	0xCCCC	52428
5 V	0xFFFF	65535

Table 21: 0–5 V (15-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
0 V	0x0000	0
1 V	0x1999	6553
2 V	0x3333	13107
3 V	0x4CCC	19660
4 V	0x6666	26214
5 V	0x7FFF	32767

Table 22: 1-5 V (16-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
1 V	0x0000	0
2 V	0x4000	16384
3 V	0x8000	32768
4 V	0xBFFF	49151
5 V	0xFFFF	65535

Table 23: 1-5 V (15-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
1 V	0x0000	0
2 V	0x3333	13107
3 V	0x4CCD	19661
4 V	0x6666	26214
5 V	0x7FFF	32767

Table 24: ±5 V

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
−5 V	0x8000	−32768
−4 V	0x999A	−26214
−3 V	0xB333	−19661
−2 V	0xCCCD	−13107
−1 V	0xE666	−6554
0 V	0x0000	0
+1 V	0x1999	6553
+2 V	0x3333	13107
+3 V	0x4CCC	19660
+4 V	0x6666	26214
+5 V	0x7FFF	32767

Table 25: 0-10 V (16-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
0 V	0x0000	0
1 V	0x199A	6554
2 V	0x3333	13107
3 V	0x4CCD	19661
4 V	0x6666	26214
5 V	0x8000	32768
6 V	0x9999	39321
7 V	0xB333	45875
8 V	0xCCCC	52428
9 V	0xE666	58982
10 V	0xFFFF	65535

Table 26: 0-10 V (15-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
0 V	0x0000	0
1 V	0x0CCD	3277
2 V	0x1999	6553
3 V	0x2666	9830
4 V	0x3333	13107
5 V	0x4000	16384
6 V	0x4CCC	19660
7 V	0x5999	22937
8 V	0x6666	26214
9 V	0x7332	29490
10 V	0x7FFF	32767

Table 27: 2-10 V (16-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
2 V	0x0000	0
3 V	0x2000	8192
4 V	0x4000	16384
5 V	0x6000	24576
6 V	0x8000	32768
7 V	0x9FFF	40959
8 V	0xBFFF	49151
9 V	0xDFFF	57343
10 V	0xFFFF	65535

Table 28: 2-10 V (15-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
2 V	0x0000	0
3 V	0x1000	4096
4 V	0x2000	8192
5 V	0x3000	12288
6 V	0x4000	16384
7 V	0x4FFF	20479
8 V	0x5FFF	24575
9 V	0x6FFF	28671
10 V	0x7FFF	32768

Table 29: ±10 V

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
−10 V	0x8000	−32768
−9 V	0x8CCD	−29491
−8 V	0x999A	−26214
−7 V	0xA666	−22938
−6 V	0xB333	−19661
−5 V	0xC000	−16384
−4 V	0xCCCD	−13107
−3 V	0xD999	−9831
−2 V	0xE666	−6554
−1 V	0xF333	−3277
0 V	0x0000	0
+1 V	0x0CCC	3276
+2 V	0x1999	6553
+3 V	0x2666	9830
+4 V	0x3333	13107
+5 V	0x3FFF	16383
+6 V	0x4CCC	19660
+7 V	0x5999	22937
+8 V	0x6666	26214
+9 V	0x7332	29490
+10 V	0x7FFF	32767

Table 30: 0-12 V (16-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
0 V	0x0000	0
1 V	0x1555	5461
2 V	0x2AAB	10923
3 V	0x4000	16384
4 V	0x5555	21845
5 V	0x6AAA	27306
6 V	0x8000	32768
7 V	0x9555	38229
8 V	0xAAAA	43690
9 V	0xBFFF	49151
10 V	0xD555	54613
11 V	0xEAAA	60074
12 V	0xFFFF	65535

Table 31: 0-12 V (15-Bit Resolution)

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
0 V	0x0000	0
1 V	0x0AAB	2731
2 V	0x1555	5461
3 V	0x2000	8192
4 V	0x2AAA	10922
5 V	0x3555	13653
6 V	0x4000	16384
7 V	0x4AAA	19114
8 V	0x5555	21845
9 V	0x5FFF	24575
10 V	0x6AAA	27306
11 V	0x7554	30036
12 V	0x7FFF	32767

Table 32: ±12 V

Voltage Value (*U*)	Process Value (hex)	Process Value (dec)
−12 V	0x8000	−32768
−11 V	0x8AAB	−30037
−10 V	0x9555	−27307
−9 V	0xA000	−24576
−8 V	0xAAAB	−21845
−7 V	0xB555	−19115
−6 V	0xC000	−16384
−5 V	0xCAAA	−13654
−4 V	0xD555	−10923
−3 V	0xE000	−8192
−2 V	0xEAAA	−5462
−1 V	0xF555	−2731
0 V	0x0000	0
+1 V	0x0AAA	2730
+2 V	0x1555	5461
+3 V	0x1FFF	8191
+4 V	0x2AAA	10922
+5 V	0x3555	13653
+6 V	0x3FFF	16383
+7 V	0x4AAA	19114
+8 V	0x5555	21845
+9 V	0x5FFF	24575
+10 V	0x6AAA	27306
+11 V	0x7554	30036
+12 V	0x7FFF	32767

4.3.3 Process Values (Current)

Table 33: 0-10 mA (16-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x199A	6554
2 mA	0x3333	13107
3 mA	0x4CCD	19661
4 mA	0x6666	26214
5 mA	0x8000	32768
6 mA	0x9999	39321
7 mA	0xB333	45875
8 mA	0xCCCC	52428
9 mA	0xE666	58982
10 mA	0xFFFF	65535

Table 34: 0-10 mA (15-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x0CCD	3277
2 mA	0x1999	6553
3 mA	0x2666	9830
4 mA	0x3333	13107
5 mA	0x4000	16384
6 mA	0x4CCC	19660
7 mA	0x5999	22937
8 mA	0x6666	26214
9 mA	0x7332	29490
10 mA	0x7FFF	32767

Table 35: 2-10 mA (16-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
2 mA	0x0000	0
3 mA	0x2000	8192
4 mA	0x4000	16384
5 mA	0x6000	24576
6 mA	0x8000	32768
7 mA	0x9FFF	40959
8 mA	0xBFFF	49151
9 mA	0xDFFF	57343
10 mA	0xFFFF	65535

Table 36: 2-10 mA (15-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
2 mA	0x0000	0
3 mA	0x1000	4096
4 mA	0x2000	8192
5 mA	0x3000	12288
6 mA	0x4000	16384
7 mA	0x4FFF	20479
8 mA	0x5FFF	24575
9 mA	0x6FFF	28671
10 mA	0x7FFF	32768

Table 37: ±10 mA

Current Value (*I*)	Process Value (hex)	Process Value (dec)
−10 mA	0x8000	−32768
−9 mA	0x8CCD	−29491
−8 mA	0x999A	−26214
−7 mA	0xA666	−22938
−6 mA	0xB333	−19661
−5 mA	0xC000	−16384
−4 mA	0xCCCD	−13107
−3 mA	0xD999	−9831
−2 mA	0xE666	−6554
−1 mA	0xF333	−3277
0 mA	0x0000	0
+1 mA	0x0CCC	3276
+2 mA	0x1999	6553
+3 mA	0x2666	9830
+4 mA	0x3333	13107
+5 mA	0x3FFF	16383
+6 mA	0x4CCC	19660
+7 mA	0x5999	22937
+8 mA	0x6666	26214
+9 mA	0x7332	29490
+10 mA	0x7FFF	32767

Table 38: 0-20 mA (16-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x0CCD	3277
2 mA	0x199A	6554
3 mA	0x2666	9830
4 mA	0x3333	13107
5 mA	0x4000	16384
6 mA	0x4CCD	19661
7 mA	0x5999	22937
8 mA	0x6666	26214
9 mA	0x7333	29491
10 mA	0x8000	32768
11 mA	0x8CCC	36044
12 mA	0x9999	39321
13 mA	0xA666	42598
14 mA	0xB333	45875
15 mA	0xBFFF	49151
16 mA	0xCCCC	52428
17 mA	0xD999	55705
18 mA	0xE666	58982
19 mA	0xF332	62258
20 mA	0xFFFF	65535

Table 39: 0-20 mA (15-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x0666	1638
2 mA	0x0CCD	3277
3 mA	0x1333	4915
4 mA	0x1999	6553
5 mA	0x2000	8192
6 mA	0x2666	9830
7 mA	0x2CCC	11468
8 mA	0x3333	13107
9 mA	0x3999	14715
10 mA	0x4000	16384
11 mA	0x4666	18022
12 mA	0x4CCC	19660
13 mA	0x5333	21299
14 mA	0x5999	22937
15 mA	0x5FFF	24575
16 mA	0x6666	26214
17 mA	0x6CCC	27852
18 mA	0x7332	29490
19 mA	0x7999	31129
20 mA	0x7FFF	32768

Table 40: 4-20 mA (16-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
4 mA	0x0000	0
5 mA	0x1000	4096
6 mA	0x2000	8192
7 mA	0x3000	12288
8 mA	0x4000	16384
9 mA	0x5000	20480
10 mA	0x6000	24576
11 mA	0x7000	28672
12 mA	0x8000	32768
13 mA	0x8FFF	36863
14 mA	0x9FFF	40959
15 mA	0xAFFF	45055
16 mA	0xBFFF	49151
17 mA	0xCFFF	53247
18 mA	0xDFFF	57343
19 mA	0xEFFF	61439
20 mA	0xFFFF	65535

Table 41: 4-20 mA (15-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
4 mA	0x0000	0
5 mA	0x0800	2048
6 mA	0x1000	4096
7 mA	0x1800	6144
8 mA	0x2000	8192
9 mA	0x2800	10240
10 mA	0x3000	12288
11 mA	0x3800	14336
12 mA	0x4000	16384
13 mA	0x47FF	18431
14 mA	0x4FFF	20479
15 mA	0x57FF	22527
16 mA	0x5FFF	24575
17 mA	0x67FF	26623
18 mA	0x6FFF	28671
19 mA	0x77FF	30719
20 mA	0x7FFF	32767

Table 42: ±20 mA

Current Value (*I*)	Process Value (hex)	Process Value (dec)
−20 mA	0x8000	−32768
−19 mA	0x8666	−31130
−18 mA	0x8CCD	−29491
−17 mA	0x9333	−27853
−16 mA	0x999A	−26214
−15 mA	0xA000	−24576
−14 mA	0xA666	−22938
−13 mA	0xACCD	−21299
−12 mA	0xB333	-19661
−11 mA	0xB999	-18023
−10 mA	0xC000	−16384
−9 mA	0xC666	−14746
−8 mA	0xCCCD	−13107
−7 mA	0xD333	−11469
−6 mA	0xD999	−9831
−5 mA	0xE000	−8192
−4 mA	0xE666	−6554
−3 mA	0xECCC	−4916
−2 mA	0xF333	−3277
−1 mA	0xF999	−1639
0 mA	0x0000	0
+1 mA	0x0666	1638
+2 mA	0x0CCC	3276
+3 mA	0x1333	4915
+4 mA	0x1999	6553
+5 mA	0x1FFF	8191
+6 mA	0x2666	9830
+7 mA	0x2CCC	11468
+8 mA	0x3333	13107
+9 mA	0x3999	14745
+10 mA	0x3FFF	16383
+11 mA	0x4666	18022
+12 mA	0x4CCC	19660
+13 mA	0x5332	21298
+14 mA	0x5999	22937
+15 mA	0x5FFF	24575
+16 mA	0x6666	26214
+17 mA	0x6CCC	27852
+18 mA	0x7332	29490
+19 mA	0x7999	31129
+20 mA	0x7FFF	32767

Table 43: 0-22 mA (16-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x0BA3	2979
2 mA	0x1746	5958
3 mA	0x22E9	8937
4 mA	0x2E8B	11915
5 mA	0x3A2E	14894
6 mA	0x45D1	17873
7 mA	0x5174	20852
8 mA	0x5D17	23831
9 mA	0x68BA	26810
10 mA	0x745D	29789
11 mA	0x8000	32768
12 mA	0x8BA2	35746
13 mA	0x9745	38725
14 mA	0xA2E8	41704
15 mA	0xAE8B	44683
16 mA	0xBA2E	47662
17 mA	0xC5D1	50641
18 mA	0xD174	53620
19 mA	0xDD16	56598
20 mA	0xE8B9	59577
21 mA	0xF45C	62556
22 mA	0xFFFF	65535

Table 44: 0-22 mA (15-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x05D1	1489
2 mA	0x0BA3	2979
3 mA	0x1174	4468
4 mA	0x1746	5958
5 mA	0x1D17	7447
6 mA	0x22E8	8936
7 mA	0x28BA	10426
8 mA	0x2E8B	11915
9 mA	0x345D	13405
10 mA	0x3A2E	14894
11 mA	0x4000	16384
12 mA	0x45D1	17873
13 mA	0x4BA2	19362
14 mA	0x5174	20852
15 mA	0x5745	22341
16 mA	0x5D17	23831
17 mA	0x62E8	25320
18 mA	0x68B9	26809
19 mA	0x6E8B	28299
20 mA	0x745C	29788
21 mA	0x7A2E	31278
22 mA	0x7FFF	32767

Table 45: ±20 mA

Current Value (*I*)	Process Value (hex)	Process Value (dec)
−22 mA	0x8000	−32768
−21 mA	0x85D1	−31279
−20 mA	0x8BA3	−29789
−19 mA	0x9174	−28300
−18 mA	0x9746	−26810
−17 mA	0x9D17	−25321
−16 mA	0xA2E9	−23831
−15 mA	0xA8BA	−22342
−14 mA	0xAE8B	−20853
−13 mA	0xB45D	−19363
−12 mA	0xBA2E	−17874
−11 mA	0xC000	−16384
−10 mA	0xC5D1	−14895
−9 mA	0xCBA3	−13405
−8 mA	0xD174	−11936
−7 mA	0xD745	−10427
−6 mA	0xDD17	−8937
−5 mA	0xE2E8	−7448
−4 mA	0xE8BA	−5958
−3 mA	0xEE8B	−4469
−2 mA	0xF45D	−2979
−1 mA	0xFA2E	−1490
0 mA	0x0000	0
+1 mA	0x05D1	1489
+2 mA	0x0BA2	2978
+3 mA	0x1174	4468
+4 mA	0x1745	5957
+5 mA	0x1D17	7447
+6 mA	0x22E8	8936
+7 mA	0x28BA	10426
+8 mA	0x2E8B	11915
+9 mA	0x345C	13404
+10 mA	0x3A2E	14894
+11 mA	0x3FFF	16383
+12 mA	0x45D1	17873
+13 mA	0x4BA2	19362
+14 mA	0x5174	20852
+15 mA	0x5745	22341
+16 mA	0x5D16	23830
+17 mA	0x62E8	25320
+18 mA	0x68B9	26809
+19 mA	0x6E8B	28299

Table 45: ±20 mA

Current Value (*I*)	Process Value (hex)	Process Value (dec)
+20 mA	0x745C	29788
+21 mA	0x7A2E	31278
+22 mA	0x7FFF	32767

Table 46: 0-12 mA (16-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x1555	5461
2 mA	0x2AAB	10923
3 mA	0x4000	16384
4 mA	0x5555	21845
5 mA	0x6AAA	27306
6 mA	0x8000	32768
7 mA	0x9555	38229
8 mA	0xAAAA	43690
9 mA	0xBFFF	49151
10 mA	0xD555	54613
11 mA	0xEAAA	60074
12 mA	0xFFFF	65535

Table 47: 0-12 mA (15-Bit Resolution)

Current Value (*I*)	Process Value (hex)	Process Value (dec)
0 mA	0x0000	0
1 mA	0x0AAB	2731
2 mA	0x1555	5461
3 mA	0x2000	8192
4 mA	0x2AAA	10922
5 mA	0x3555	13653
6 mA	0x4000	16384
7 mA	0x4AAA	19114
8 mA	0x5555	21845
9 mA	0x5FFF	24575
10 mA	0x6AAA	27306
11 mA	0x7554	30036
12 mA	0x7FFF	32767

Table 48: ±12 mA

Current Value (*I*)	Process Value (hex)	Process Value (dec)
−12 mA	0x8000	−32768
−11 mA	0x8AAB	−30037
−10 mA	0x9555	−27307
−9 mA	0xA000	−24576
−8 mA	0xAAAB	−21845
−7 mA	0xB555	−19115
−6 mA	0xC000	−16384
−5 mA	0xCAAA	−13654
−4 mA	0xD555	−10923
−3 mA	0xE000	−8192
−2 mA	0xEAAA	−5462
−1 mA	0xF555	−2731
0 mA	0x0000	0
+1 mA	0x0AAA	2730
+2 mA	0x1555	5461
+3 mA	0x1FFF	8191
+4 mA	0x2AAA	10922
+5 mA	0x3555	13653
+6 mA	0x3FFF	16383
+7 mA	0x4AAA	19114
+8 mA	0x5555	21845
+9 mA	0x5FFF	24575
+10 mA	0x6AAA	27306
+11 mA	0x7554	30036
+12 mA	0x7FFF	32767

5 Mounting

⚠ DANGER

Do not work when devices are energized!
High voltage can cause electric shock or burns.
Switch off all power to the device prior to performing any installation, repair or maintenance work.

⚠ CAUTION

Risk of injury due to sharp-edged blade contacts!
The blade contacts are sharp-edged. Handle the I/O module carefully to prevent injury. Do not touch the blade contacts.

NOTICE

Do not contaminate contacts!
Contamination may negatively impact the functionality of data and power jumper contacts. Do not touch the contacts. Avoid contaminating the contacts.

NOTICE

Do not place the I/O modules on the gold spring contacts!
Do not place the I/O modules on the gold spring contacts in order to avoid soiling or scratching!

NOTICE

Pay attention to potential equalization from the environment!
The devices are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the devices, please ensure that environmental factors (personnel, work space and packaging) are properly equalized. Do not touch any conducting parts, e.g., data contacts.

NOTICE

Follow the installation instructions!
Only install this device in dry, indoor rooms.
Do not install the device on or in the vicinity of easily flammable materials!

5.1 Mounting Sequence

Fieldbus couplers, controllers and I/O modules of the WAGO I/O SYSTEM 750 are snapped directly on a carrier rail in accordance with the European standard EN 60175 (DIN 35).

The reliable positioning and connection is made using a tongue and groove system. Due to the automatic locking, the individual devices are securely seated on the rail after installation.

Starting with the fieldbus coupler or controller, the I/O modules are mounted adjacent to each other according to the project design. Errors in the design of the node in terms of the potential groups (connection via the power contacts) are recognized, as the I/O modules with power contacts (blade contacts) cannot be linked to I/O modules with fewer power contacts.

NOTICE

Insert I/O modules only from the proper direction!
All I/O modules feature grooves for power jumper contacts on the right side. For some I/O modules, the grooves are closed on the top. Therefore, I/O modules featuring a power jumper contact on the left side cannot be snapped from the top. This mechanical coding helps to avoid configuration errors, which may destroy the I/O modules. Therefore, insert I/O modules only from the right and from the top.

Note

Don't forget the bus end module!
Always plug a bus end module (750-600) onto the end of the fieldbus node! You must always use a bus end module at all fieldbus nodes with WAGO I/O SYSTEM 750 fieldbus couplers or controllers to guarantee proper data transfer.

5.2 Inserting and Removing Devices

5.2.1 Inserting the I/O Module

1. Position the I/O module in such a way that the groove and spring are connected to the preceding and following components.

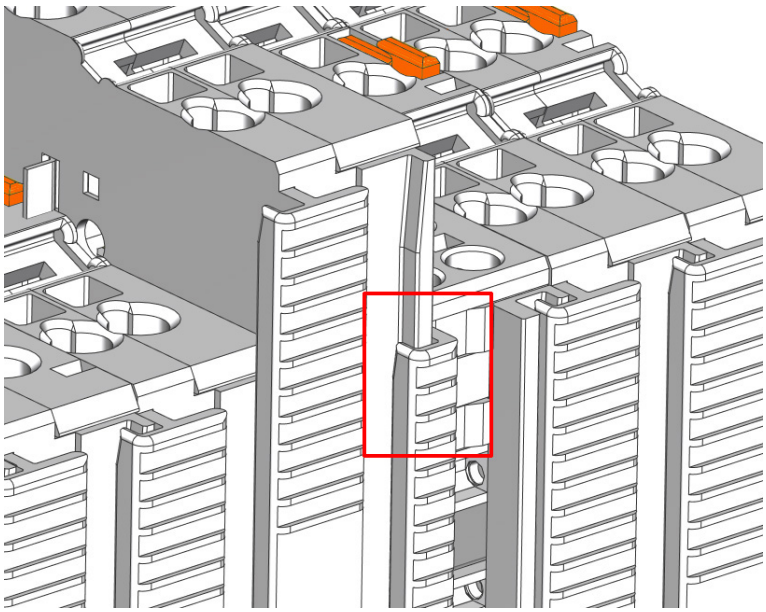


Figure 7: Inserting I/O Module (Example)

2. Press the I/O module into the assembly until the I/O module snaps into the carrier rail.

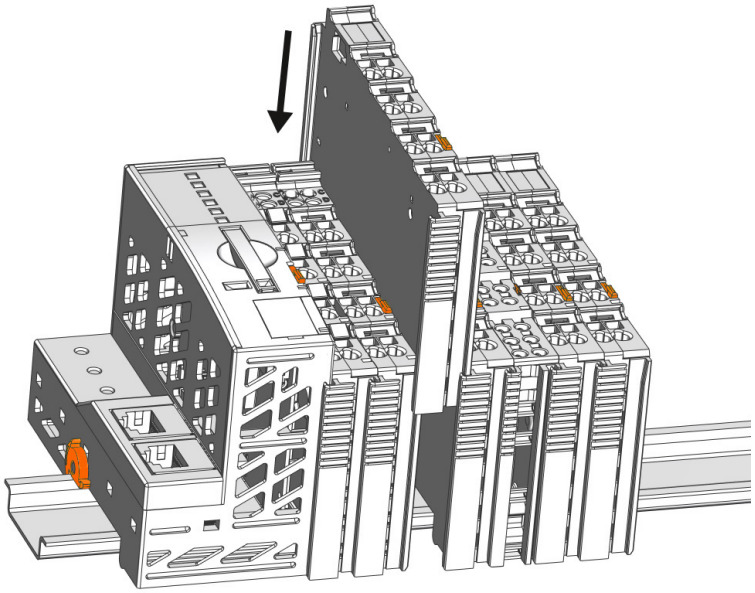


Figure 8: Snap the I/O Module into Place (Example)

3. Check that the I/O module is seated securely on the carrier rail and in the assembly. The I/O module must not be inserted crooked or askew.

Once the I/O module has snapped into place, the electrical connections for the data contacts and power contacts (if any) to the head station or to the preceding and, if applicable, following I/O module are established.

5.2.2 Removing the I/O Module

1. Remove the I/O module from the assembly by pulling the release tab.

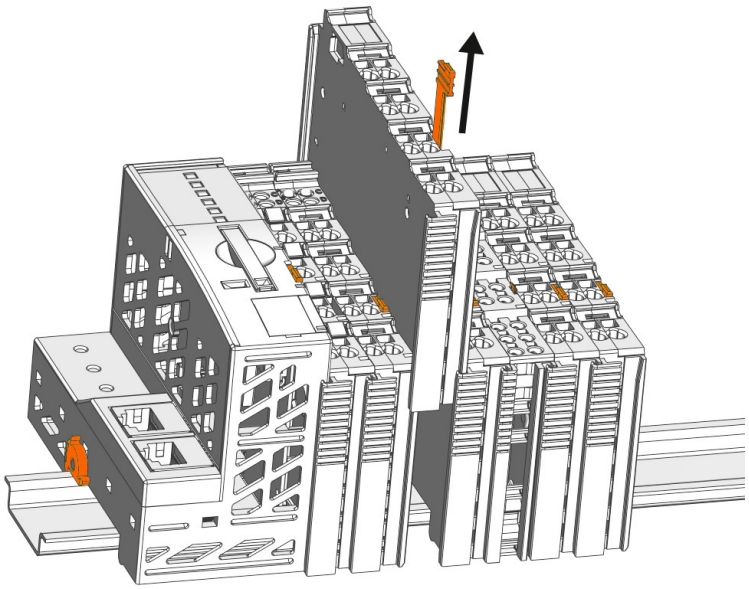


Figure 9: Removing the I/O Module (Example)

Electrical connections for data or power jumper contacts are disconnected when removing the I/O module.

6 Connect Devices

NOTICE

Do not apply any voltage to the outputs!
Never connect the outputs to external voltage sources. Also, do not connect the outputs to each other.
Failure to observe these measures can damage the product!

6.1 Connecting a Conductor to the Push-in CAGE CLAMP®

The Push-in CAGE CLAMP® connection is appropriate for solid, stranded and finely stranded conductors.

Note

Only connect one conductor to each Push-in CAGE CLAMP® connection!
Only one conductor may be connected to each Push-in CAGE CLAMP® connection.
Do not connect more than one conductor at one single connection!

If more than one conductor must be routed to one connection, these must be connected in an up-circuit wiring assembly, for example using WAGO feed-through terminals.

Terminate both solid and stranded or ferruled conductors by simply pushing them in - no tool required. For all other types of conductors, Push-in CAGE CLAMP® must be opened for connection with an operating tool with a 2.5 mm blade (order no. 210-719).

1. To open the Push-in CAGE CLAMP® insert the actuating tool into the opening above the connection.
2. Insert the conductor into the corresponding connection opening.
3. To close the Push-in CAGE CLAMP® simply remove the tool - the conductor is then clamped firmly in place.

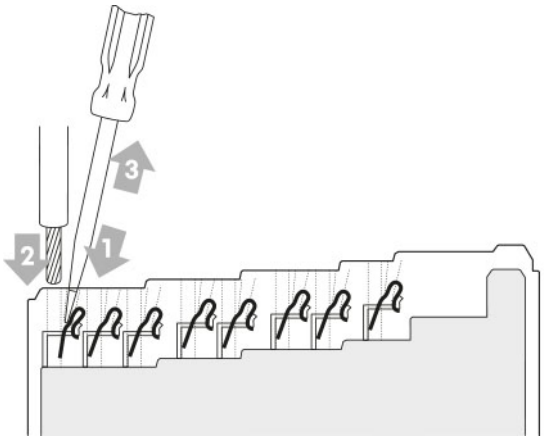


Figure 10: Connecting a Conductor to a Push-in CAGE CLAMP®

6.2 Connection Examples

Note

Use shielded signal lines!
Only use shielded signal lines for analog signals and I/O modules which are equipped with shield clamps. Only then can you ensure that the accuracy and interference immunity specified for the respective I/O module can be achieved even in the presence of interference acting on the signal cable.

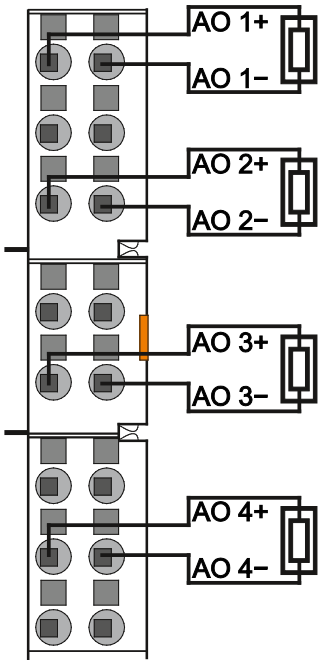


Figure 11: Connection Example – 2-Conductor Connection Current/Voltage Output

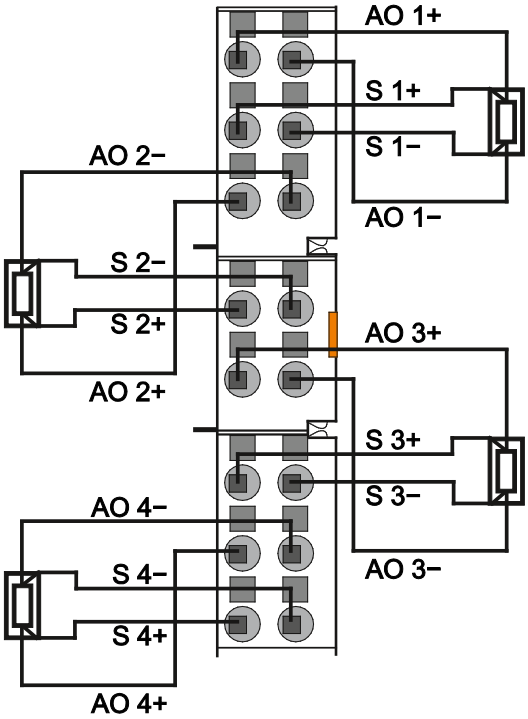


Figure 12: Connection Example – 4-Conductor Connection with Sense Lines (Voltage Output Only)

7 Commissioning

- Read out module information
- Enable/disable output channels separately
- Connect actuators
- Configure/parameterize output channels
- Calibrate output channels (see also Section “Calibrating Measured Values” and Section “Service” > “Recalibration”)
- Scale output channels (see also Section “Scaling Measured Values”)
- Read out diagnostic information
- Output process data
- Perform firmware update (see also Section “Service” > “Firmware Update/Downgrade”)
- Perform firmware downgrade (see also Section “Service” > “Firmware Update/Downgrade”

The following matrix indicates which tool can be used to make settings on the I/O module:

Table 49: Settings Using Tools

Settings	*e!COCKPIT*	WAGO-I/O-*CHECK*	GSD	GSDML
Channels enabled/disabled Output signals	×	×	×	×
Resolution	×	×	×	×
Process Image	×	×	×	×
Channel diagnostics	×	×	×	×
Synchronous D/A conversion	×	×	×	×
Response to K-Bus timeout	×	×	-	×
Switch-off delay for K-Bus timeout	×	×	-	-
User substitute value	×	×	-	×
Scaling	×	×	-	×
Calibration	×	×	-	-
Channel diagnostics	×	×	×	×
Diagnosis: power supply fault	×	×	-	×
Diagnosis: AO− wiring error	×	×	-	×
Diagnosis: wiring error	×	×	-	×
Diagnosis: wire break	×	×	-	×
Diagnosis: short circuit	×	×	-	×
Diagnosis: internal error	×	×	-	×

7.1 Configuration and Parameterization with WAGO-I/O-*CHECK*

The I/O Module 750-564 is supported by the WAGO-I/O-*CHECK* commissioning tool staring with **version 03.21.01(01)**.

WAGO-I/O-*CHECK* can be used to conveniently and completely configure and parameterize the I/O module. You have the following options:

- Graphical representation of the fieldbus node
- Display of the measured values
- Settings for the application
- Configuration of the I/O module operating modes
- Parameterization of module, channel and scaling settings
- Calibration of channels and adjustment of analog outputs
- Monitoring

Information

WAGO-I/O-*CHECK*
You can obtain the WAGO-I/O-*CHECK* software on a CD under Item No. 759-302. This CD contains all the application program files and an explanation. You can find a description on the website at www.wago.com

Note

Save all your settings before you begin parameterization!
To be on the safe side, you should always save all of your current settings in a parameter file before you begin parameterization. This allows you to always use the original values should the parameterization be incorrect.

To configure the I/O module with WAGO-I/O-*CHECK*, proceed as follows:

1. Open WAGO-I/O-*CHECK*.

2. Left-click on the menu item **[Identify]**.
   The node configuration is determined and displayed.

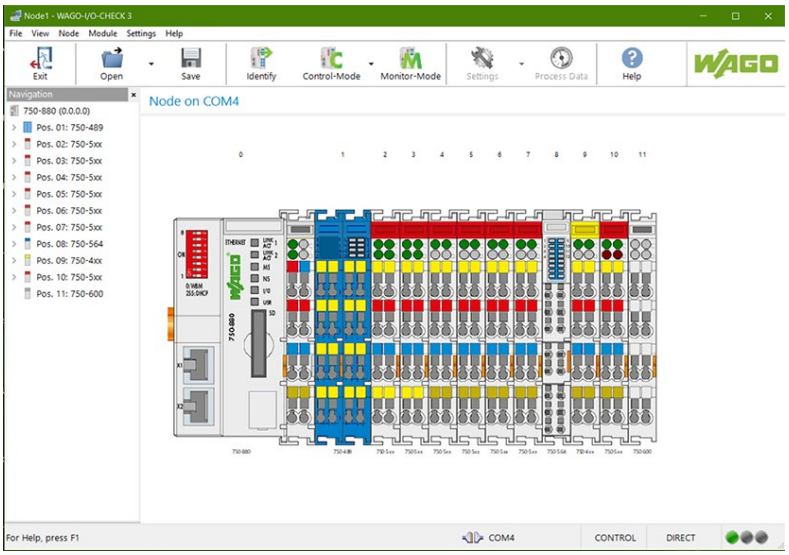


Figure 13: WAGO-I/O-*CHECK* User Interface (Example)

7.1.1 Control Mode

In “Control Mode,” the process output data of the individual channels can be set via write rules (assuming the fieldbus or a PFC application is not active).

1. Click the I/O module. The representation of the I/O module is marked.

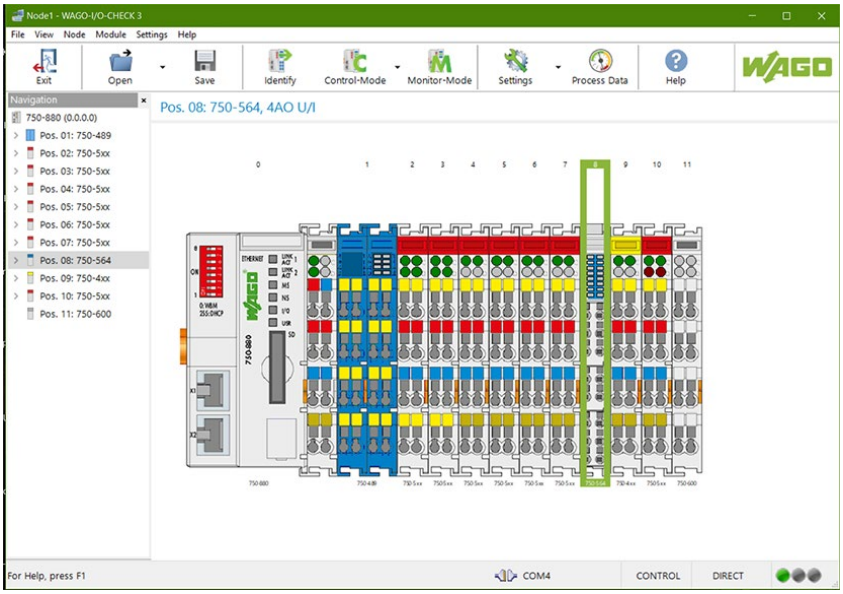


Figure 14: Selecting I/O Module

2. Click the **[Control-Mode]** menu item.

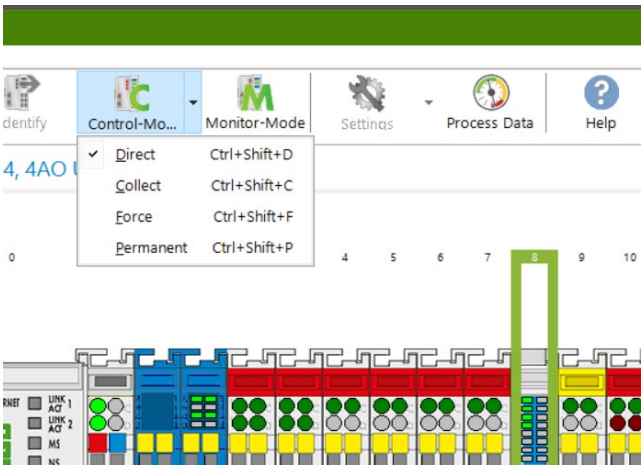


Figure 15: “Control Mode” Menu Item

The current status of the indicator is now displayed.

3. Click the **[Process Data]** menu item**.**

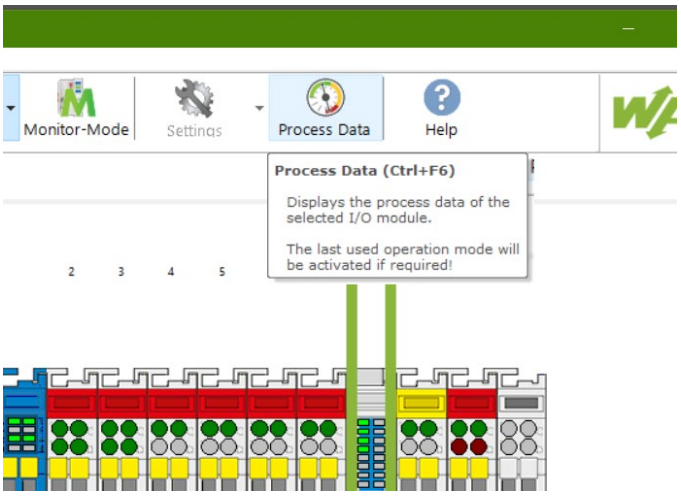


Figure 16: “Process Data” Menu Item

The dialog for controlling the process output data opens.

4. Set the desired values for each channel via the write rules or directly in the input fields at the bottom.

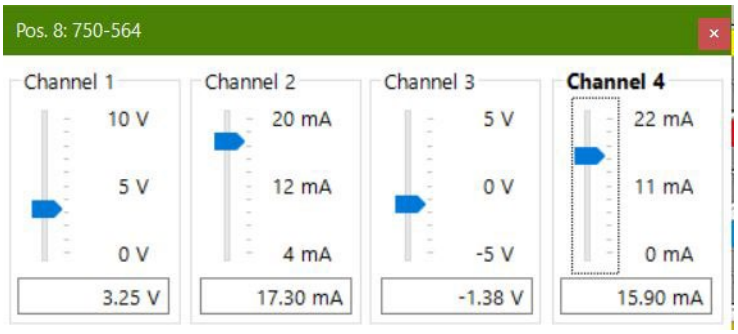


Figure 17: Setting Process Output Data

7.1.2 Parameterization Dialog

To open specific parameterization dialogs for the I/O Module 750-564, proceed as follows:

1. Leave control mode by clicking the **[Control-Mode]** menu item again. The current status of the indicator is no longer displayed, and the **[Settings]** menu item can now be enabled.

2. Click the **[Settings]** menu item again**.**

The parameterization dialog appears, which forms the basis for the following description.

The parameterization dialog is divided into the following areas:

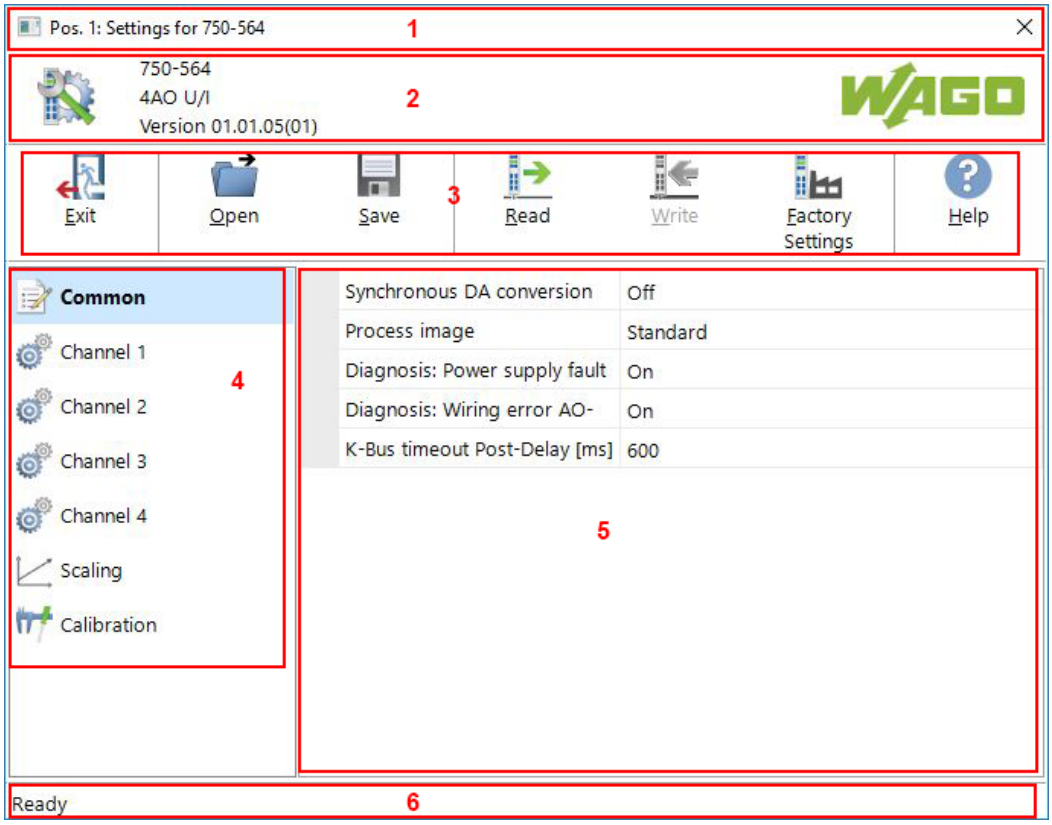


Figure 18: I/O Module Parameterization Dialog

1 **Title bar** with the position and indication of the selected I/O module
2 **Information bar** including item number, name, version number and version date of the I/O module
3 **Buttons**
4 **Menu**
5 **Application area** with the parameters
6 **Status bar**

The individual areas are explained in more detail in the following sections.

7.1.2.1 Title Bar

The title bar in the parameterization dialog contains the program icon, the window title and the button for closing the application window.

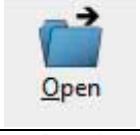
The window title provides information about the position of the selected I/O module within the fieldbus node used and the item number of the selected I/O module.

7.1.2.2 Information Bar

- Item number: 750-564
- Item description: 4AO U/I
- Version: 01.01.xx (xx)

7.1.2.3 Buttons

Table 50: Buttons

Button	Function	Explanation
	**[Exit]**	Closes the parameterization dialog. The connection to the I/O module is interrupted.
	**[Open]**	Opens the dialog for loading a saved parameter file.
	**[Save]**	Opens the dialog for saving parameterization information in a parameter file.
	**[Read]**	Reads the current parameterization from the I/O module.
	**[Write]**	Writes the modified parameters to the I/O module.
	**[Factory Settings]**	Resets all I/O module settings to factory settings **Note**: The values for the user calibration are also reset to their default values. Therefore, after the factory settings are restored, modified values must be modified again and written to the I/O module. **Tip:** Make a note of any value settings before resetting the I/O module.
	**[Help]**	Opens an I/O module help dialog.

7.1.2.4 Menu

Via the menu items, select the application area view.

7.1.3 Settings via the Menu

7.1.3.1 Common

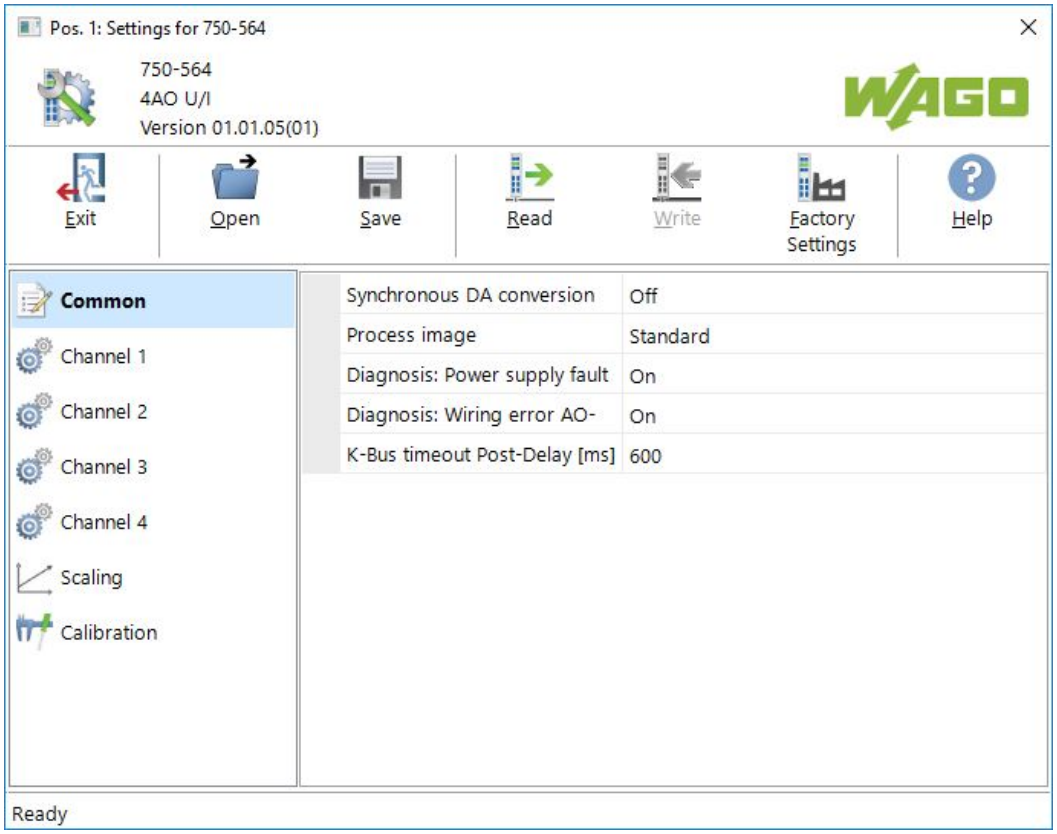


Figure 19: “Common” Menu Item

The **[Common]** menu item contains the global parameters of the I/O module that are valid for **all** channels.

Note

Global module parameter settings can be overwritten by channel-specific settings!

If channel diagnostics (see menu items “Channel 1” ... “Channel 4”) are switched off for a specific channel, the global module diagnostic settings are ignored for this channel!

Table 51: “Common” Menu Item

Parameter	Value	Description
Synchronous DA conversion	Off*)	If synchronous conversion is switched on, the output channels are processed, not one after another, but rather synchronously. Thus a change to all output stages of the I/O module occurs at the same time. Furthermore, D/A (digital-to-analog) conversion is coupled to the local bus cycle, so the output values are updated synchronously with the local bus.
	On	
Process image	Standard*)	In the standard process image, the control/status byte of the head station is hidden and thus not visible in the fieldbus process image.
	Extended	With the “Extended” setting, the control/status byte is shown on the fieldbus process image. Thus the diagnostic messages in the status byte can also be evaluated by a higher-level controller. **Note:** Changing the setting causes an automatic restart of the node, since the process image of the head station changes.
Diagnosis: Power supply fault	Off	Switches the supply voltage monitoring on/off If the supply voltage is faulty, a corresponding error message is output in the status byte of all channels.
	On*)	
Diagnosis: Wiring error AO−	Off	Switches the wiring error monitoring for outputs –AOx on/off If the wiring is faulty, the outputs switch off for about one second to prevent the actuators on the field side from being destroyed. After this, the system checks whether the error persists.
	On*)	

Table 51: “Common” Menu Item

Parameter	Value	Description
K-Bus timeout Post-Delay [ms]	*[16-bit decimal value]*	If the I/O module watchdog is triggered (e.g., in the event of a faulty local bus connection), the outputs of the individual channels switch to a defined output state (see section “Channel Settings”). If the error is eliminated, the I/O module waits for the amount of time specified here before a change to the output channels occurs. This prevents output value jumps when the local bus restarts.
	[Input field] 0…600)…65535*	

*) Factory setting

7.1.3.2 Channel Settings

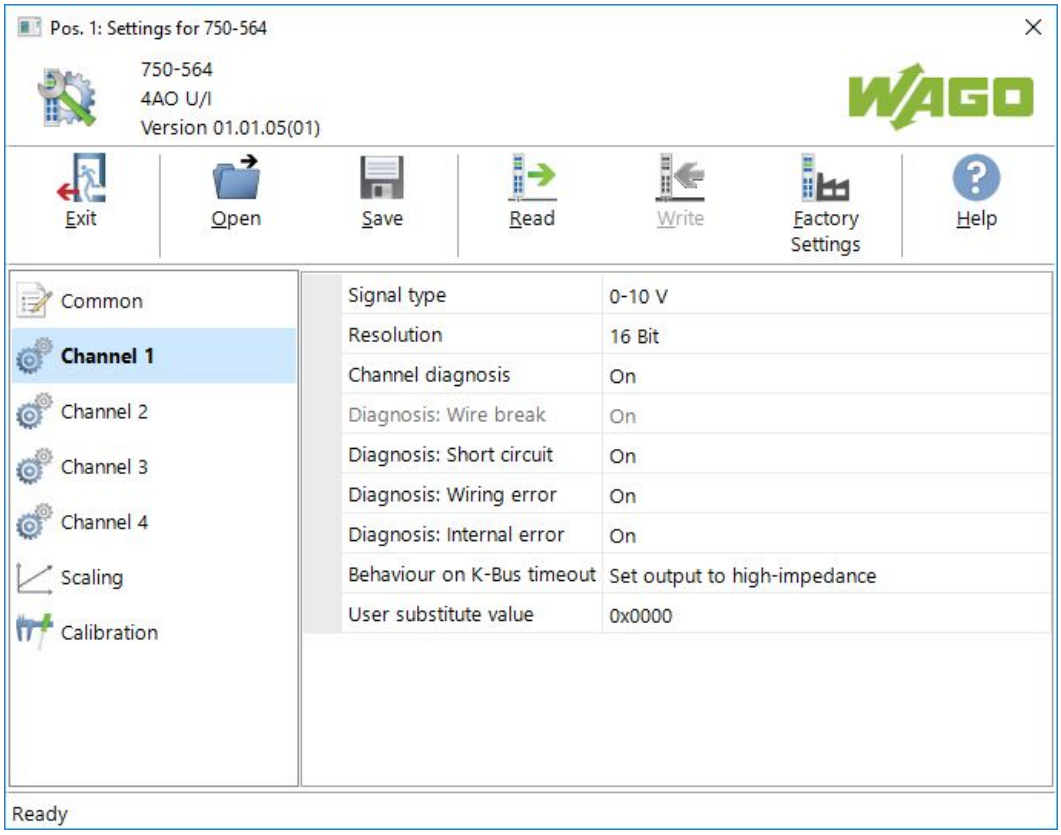


Figure 20: Menu Items “Channel 1” ... “Channel 4”

Menu items **[Channel 1]** to **[Channel 4]** contain the channel-specific parameters of the I/O module. The parameter list is identical for all channels. If you change a value, a pen symbol appears to the left of the parameter in question, and the **[Write]** button, which had been grayed out before, is enabled.
Click the **[Write]** button to save any settings you have been made and apply them to the I/O module.

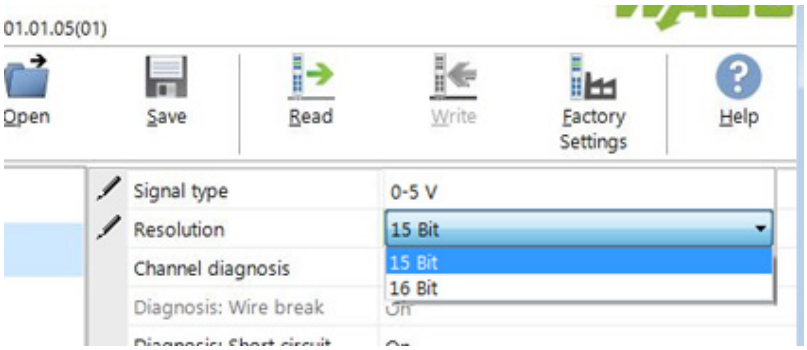


Figure 21: Marking Modified Parameters

Table 52: Menu Items “Channel 1” ... “Channel 4”

Parameter	Value	Description
Signal type	Channel deactivated, 0-5 V, 1-5 V, ±5 V, 0-10 V, 2-10 V, ±10 V, 0-12 V, ±12 V, 0-10 mA, 2-10 mA, ±10 mA, 0-20 mA, 4-20 mA *), ±20 mA, 0-22 mA, ±22 mA, 0-12 mA, ±12 mA	Selection of the signal type (value ranges [V] or [mA]) for the channel. The channel can also be deactivated in this parameter.

Table 52: Menu Items “Channel 1” ... “Channel 4”

Parameter	Value	Description
Resolution[1)]	15 Bit	With resolution “15 Bit,” 15 bits are provided for the output range. **Example:** With a measurement range setting of “0–10 V,” 0x0000 = 0 V and 0x7FFF = 10 V. Values from 0x8000 to 0xFFFF are ignored in this setting or always provide the lower endpoint of the range (i.e.: 0 V, 0 mA, 2 V, 2 mA etc.).
	16 Bit [*)]	With resolution “16 Bit,” the entire numerical range is provided for the output value. **Example:** With a measurement range setting of “0–10 V,” 0x0000 = 0 V and 0xFFFF = 10 V.
Channel diagnosis	Off	Switches diagnostics on/off for the channel in general. Switching off channel diagnostics causes the settings for the individual diagnostics “wire break,” “short circuit” etc. to be ignored. The status byte then also always remains at 0x00 when there is a pending diagnosis. **Note:** If channel diagnostics are switched off for this channel, the global diagnostic settings (see “Common” menu item) are ignored for this channel!
	On[*)]	
Diagnosis: Wire break [2)]	Off	Switches wire break diagnosis on/off
	On[*)]	
Diagnosis: Short circuit [3)]	Off	Switches short circuit diagnosis on/off
	On[*)]	
Diagnosis: Wiring error	Off	Switches wiring error diagnosis on/off
	On[*)]	
Diagnosis: Internal error	Off	Switches internal error diagnosis on/off
	On[*)]	

Table 52: Menu Items “Channel 1” ... “Channel 4”

Parameter	Value	Description
Behaviour on K-Bus timeout		Behavior when the local bus watchdog is triggered (“Local bus communication faulty”):
	Deactivated	No response from the channel. The output stage retains its last output value setting. The local bus “RUN” LED also lights up green when local bus communication is faulty.
	Hold last output value	The output stage retains its last output value setting. The local bus “RUN” LED of the channel goes out when local bus communication is faulty.
	Set output to high-impedance *)	The output stage of the channel switches off; the output becomes high-ohm.
	Set output to user substitute value	A specified output value (parameter: User substitute value) is written to the output stage. (Value setting = “process value“)
User substitute value	*[Input field]*	Substitute value relates to the K-Bus setting “Set output to user substitute value.” Note: Scaling/calibration still occurs before the output stage sets the substitute value.
	With resolution of 16 Bit: 0x0000*) ... 0xFFFF	
	With resolution of 15 Bit: 0x0000*) ... 0x7FFF	
	With resolution of 15 Bit + VZ: 0x8000 ... 0x0000*) ... 0x7FFF	

*) Factory setting
1) Only relevant for output channels with a positive range.
2) Only applies to output type “current”
3) Only applies to output type “voltage”

7.1.3.3 Scaling

Under the “Scaling” menu item, you can enable and modify the user scaling for each channel. You select the corresponding channel via the tabs in the application area.

The manufacturer scaling can be switched on or off, but the gain and offset values cannot be changed.

Enabling user scaling allows gain and offset values to be adjusted.

Note

Checking/unchecking the box has an immediate effect!
When the box is checked, the setting is written immediately to the I/O module; it is not necessary to click the **[Write]** button.

The scaling process is performed on a channel basis; therefore, before the save operation, be sure to select the corresponding channel.

Click the **[Save]** button to save your settings. This process writes to all channels.

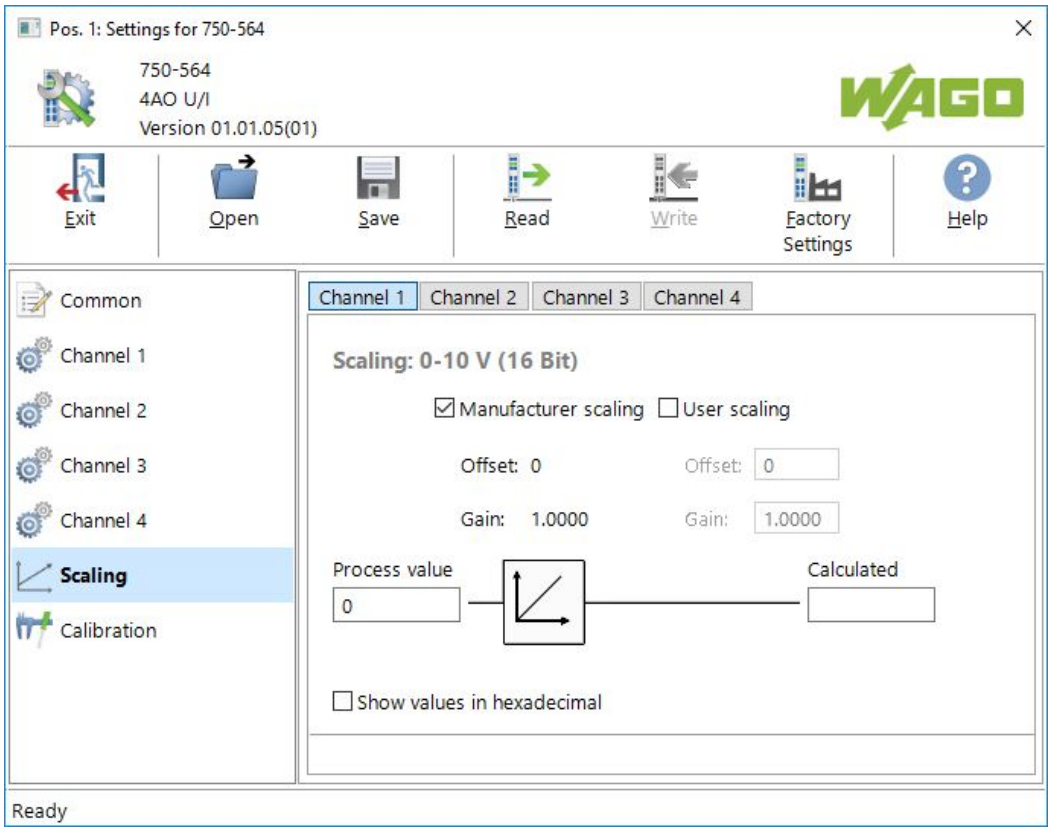


Figure 22: “Scaling” Menu Item

Table 53: “Scaling” Menu Item for Each Channel

Parameter	Value	Description
Manufacturer scaling	☑*)	Manufacturer scaling is active. The gain and offset values are factory-set.
	☐	Manufacturer scaling deactivated.
	Offset *[Display field]*	Indicates the offset value setting.
	Gain *[Display field]*	Indicates the gain value setting.
User scaling	☑	User scaling is activated. By enabling this setting, you can also specify the individual gain and offset values.
	☐*)	User scaling is deactivated.
	Offset *[Input Field]*	The offset value causes a zero offset of the process value (shift along the Y axis). The value entered must fall within the value range −32768 … 32767.
	Gain *[Input field]*	The gain value is used as a gain factor applied to the process value. The value entered must fall within the range from −2.0000 to 1.9999. The resolution of 1/16384 has already been taken into account for the decimal entry.
Process value	*[Input field]*	The process value (current/voltage value) for the selected channel can be entered in this input field. **Note:** Confirm the input with the “Return” key on your keyboard to write the process value to the I/O module!
Calculated	*[Output field]*	Indicates the calculated output voltage / output current. **Note:** The exact output value should be checked with a measuring device.
Show values in hexadecimal	☑	Hexadecimal representation is enabled.
	☐*)	Hexadecimal representation is disabled.

*) Factory setting

7.1.3.4 Calibration

Under the “Calibration” menu item, you can enable and adjust the user calibration for each channel. You select the corresponding channel via the tabs in the application area.

Manufacturer calibration is always activated according to the measurement range selected. Enabling user calibration allows gain and offset values to be adjusted.

Note

Checking/unchecking the box has an immediate effect!
When the box is checked, the setting is written immediately to the I/O module; it is not necessary to click the **[Write]** button.

Click the **[Save]** button to save your settings. The calibration process is performed on a channel basis; therefore, before the saving process, be sure to select the corresponding channel.

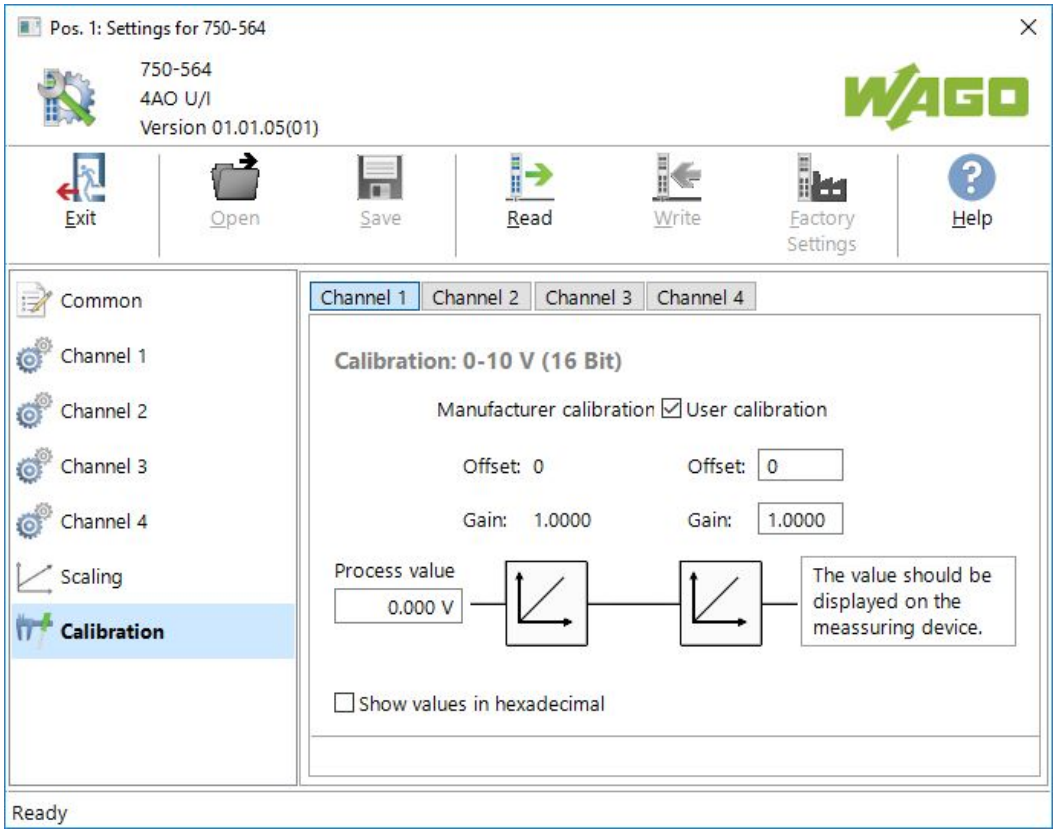


Figure 23: “Calibration” Menu Item

Table 54: “Calibration” Menu Item for Each Channel

Parameter	Value	Description
Manufacturer calibration	Offset *[Display field]*	Indicates the offset value setting.
	Gain *[Display field]*	Indicates the gain value setting.
User calibration	☐ *)	User calibration is deactivated.
	☑	User calibration is activated. By enabling this setting, you can also specify the individual gain and offset values.
	Offset *[Input Field]*	The offset value causes a zero offset of the process value (shift along the Y axis). The value entered must fall within the value range −32768 … 32767.
	Gain *[Input field]*	The gain value is used as a gain factor applied to the process value. The value entered must fall within the range from −2.0000 to 1.9999. The resolution of 1/16384 has already been taken into account for the decimal entry.
Process value	*[Input field]*	The process value (current/voltage value) for the selected channel can be entered in this input field. **Note:** Confirm the input with the “Return” key on your keyboard to write the process value to the I/O module!
Show values in hexadecimal	☑	Hexadecimal representation is enabled.
	☐ *	Hexadecimal representation is disabled.

*) Factory setting

7.2 Configuration and Parameterization with *e!COCKPIT*

The **750-564** I/O module is supported by the ***e!****COCKPIT* commissioning tool starting with version 1.6.1.4 – see manual “2759-0101 ***e!****COCKPIT*,” Section “Operating.”

7.3 Configuration and Parameterization via GSD File

The I/O module can also be parameterized via PROFIBUS and PROFINET device description (GSD file).

Note

Behavior after Overwriting with WAGO-I/O-*CHECK*!
If WAGO-I/O-*CHECK* is used to overwrite a parameterization made with the GSD file, the I/O module operates with the WAGO-I/O-*CHECK* settings until the 750-333 and 750-833 Fieldbus Couplers/Controllers are restarted.
After restart, the I/O module is re-parameterized via PROFIBUS using the GSD settings.

7.3.1 4AO U/I Configuration

7.3.1.1 PROFIBUS DP Fieldbus Couplers/Controllers 750-333(/0xx-000), 750-833(/0xx-000)

If the aforementioned PROFIBUS DP fieldbus devices are used, the process image size is configured by selecting the corresponding GSD entry.

Table 55: PROFIBUS DP Configuration

GSD Entry		PA length [Byte]		Data type	Inst.
Module	**Submodule**	**I**	**O**		
750-564 4AO U/I/16Bit	**n/a**	n/a	8	UINT16	4
750-564 4AO U/I/15Bit				INT16	
750-564 4AO U/I/16Bit RA		12	12	{UINT8, UINT16}	
750-564 4AO U/I/15Bit RA				{UINT8, INT16}	
PFC 750-564 4AO U/I[*)]		n/a	n/a	n/a	n/a

[*)] Only available with 750-833(/0xx-000)

7.3.1.2 PROFINET IO Fieldbus Couplers 750-375(/025-000), 750-377(/025-000)

If the aforementioned PROFINET IO fieldbus couplers are used, the process image size is configured by selecting the corresponding GSD entry.

Table 56: Configuration of 750-375(/025-000) and 750-377(/025-000)

GSD Entry		PA length [Byte]		Data type	Inst.
Module	Submodule	I	O		
750-564 4AO, U/I	4AO, UINT16[4] O, 16 bit	n/a	8	UINT16	4
	4AO, UINT16[4] O, 16 bit, PE				
	4AO, INT16[4] O, 15 bit			INT16	
	4AO, INT16[4] O, 15 bit, PE				
	4AO, {UINT8, UINT16}[4] I/O, 16 bit	12	12	{UINT8, UINT16}	
	4AO, {UINT8, UINT16}[4] I/O, 16 bit, PE				
	4AO, {UINT8, INT16}[4] I/O, 15 bit			{UINT8, INT16}	
	4AO, {UINT8, INT16}[4] I/O, 15 bit, PE				

7.3.2 Parameterization of 4AO U/I

7.3.2.1 PROFIBUS DP Fieldbus Couplers/Controllers 750-333(/0xx-000), 750-833(/0xx-000)

Based on the associated PROFIBUS GSD files, the I/O module can be supplied with operating parameters. The settings can be found under the category “Device-Specific Parameters.”

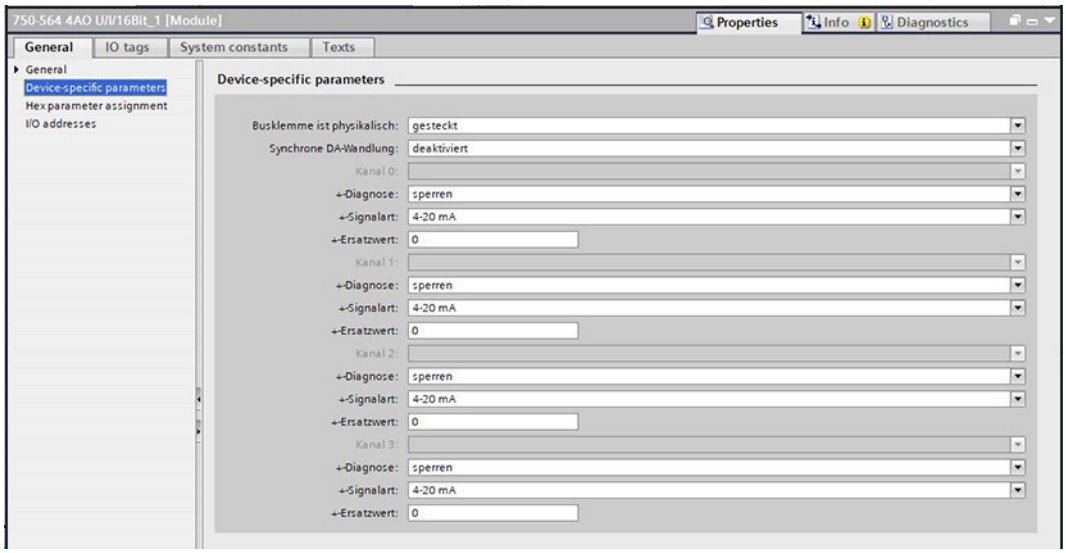


Figure 24: Example “Device-Specific Parameters” Dialog with PROFIBUS DP

7.3.2.2 PROFINET IO Fieldbus Couplers 750-375(/025-000), 750-377(/025-000)

Based on the associated PROFINET GSD files, the I/O module can be supplied with operating parameters, which are divided into the categories “General Module/Channel Parameters,” “Specific Module/Channel Parameters” and, depending on the selected submodule, an optional category “PROFIenergy Parameters.”

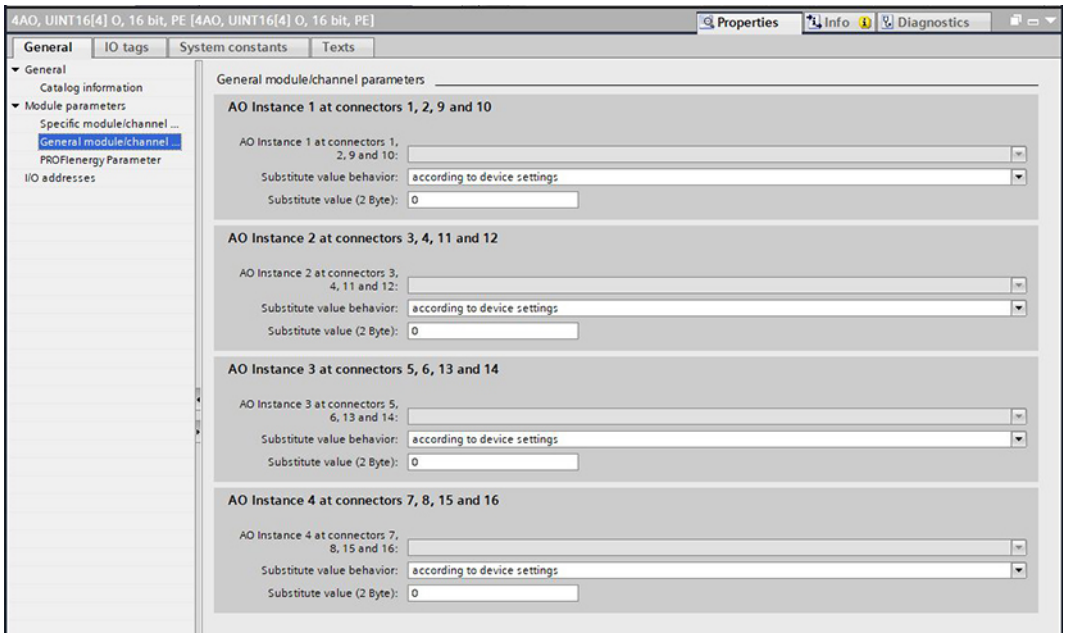


Figure 25: Example “General Module/Channel Parameters” Dialog with PROFINET IO

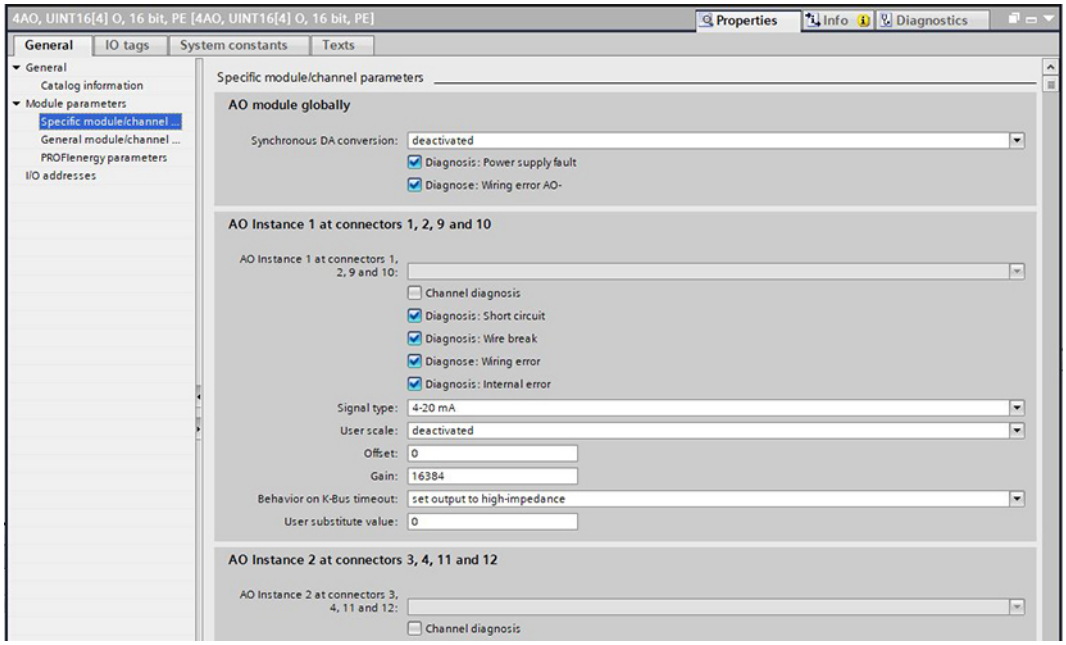


Figure 26: Example “Specific Module/Channel Parameters” Dialog with PROFINET IO

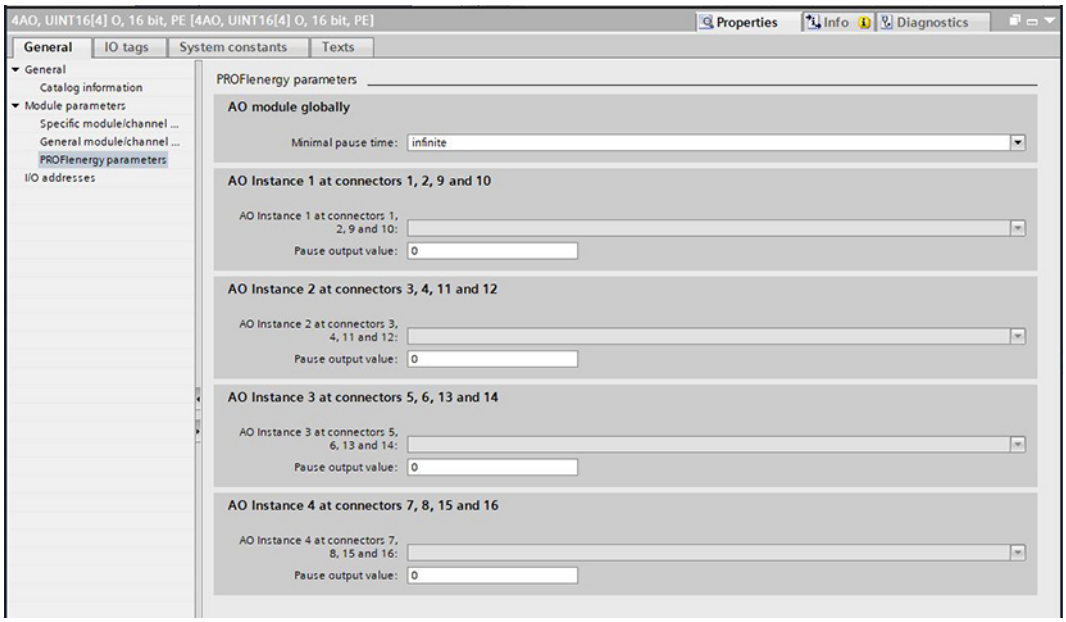


Figure 27: Example of Optional “PROFIenergy Parameters” Dialog with PROFINET IO

7.3.2.3 All PROFIBUS DP and PROFINET IO Fieldbus Couplers

The following assignment applies to the parameters of the I/O module in connection with the use of WAGO-I/O-*CHECK* as well when using PROFIBUS DP and PROFINET IO fieldbus devices.

Table 57: Device-Specific Parameters and Specific Module/Channel Parameters

GSD File		**WAGO-I/O-*CHECK***	
Name	**Value**	**Selection field**	**Value**
Synchronous D/A conversion [I/O module]	deactivated *)	Synchronous D/A conversion [I/O module]	Off*)
	activated		On
Signal type [Channel x (x = 0…3)]	Channel deactivated	Signal type [Channel x (x = 1…4)]	Channel deactivated
	0-5 V		0-5 V
	1-5 V		1-5 V
	+/-5 V		±5 V
	0-10 V		0-10 V
	2-10 V		2-10 V
	+/-10 V		±10 V
	0-10 mA		0-10 mA
	2-10 mA		2-10 mA
	+/-10 mA		±10 mA
	0-20 mA		0-20 mA
	4-20 mA *)		4-20 mA *)
	+/-20 mA		±20 mA
	0-12 V		0-12 V
	+/-12 V		±12 V
	0-22 mA		0-22 mA
	+/-22 mA		±22 mA
	0-12 mA		0-12 mA
	+/-12 mA		±12 mA

*) Factory setting

7.3.2.4 PROFIBUS DP Fieldbus Couplers 750-333(/0xx-000), 750-833(/0xx-000)

The PROFIBUS fieldbus couplers also allow diagnostics to be enabled on a channel basis and substitute values to be set if the setting “Substitute values are switched” was selected for the “Response to PROFIBUS DP failure” on the station representative.

Table 58: General Module/Channel Parameters [3] – PROFIBUS DP Fieldbus Couplers

GSD File		WAGO-I/O-*CHECK*	
Name	**Value**	**Selection field**	**Value**
Diagnostics [Channel x (x = 0…3)]	disabled[*]	Channel diagnosis [Channel x (x = 1…4)]	Off[*]
	enabled		On
Substitute value [Channel x (x = 0…3)]	0[*] … 65535[1] −32768 … 0[*] … 32767[2]	n/a	n/a

[*] Factory setting
[1] 16-bit resolution
[2] 15-bit resolution
[3] You can find further explanations in the manuals for the PROFIBUS fieldbus couplers/ controllers.

7.3.2.5 PROFINET IO Fieldbus Couplers 750-375(/025-000), 750-377(/025-000)

The PROFINET fieldbus couplers allow the (sub) module and channel-specific activation of the events to be used for station diagnostics, their actual activation and other channel-specific settings of the I / O module.

Table 59: General Module/Channel Parameters [3] – PROFINET IO Couplers

GSD File		WAGO-I/O-*CHECK*	
Name	**Value**	**Selection field**	**Value**
Substitute value behavior [Channel x (x = 0…3)]	According to the device settings[*]	n/a	n/a
	Keep last valid value		
	Set substitute value		
Substitute value [Channel x (x = 0…3)]	0[*] … 65535[1] −32768 … 0[*] … 32767[2]	n/a	n/a

[*] Factory setting
[1] 16-bit resolution
[2] 15-bit resolution
[3] You can find further explanations in the manuals for the PROFINET fieldbus couplers/ controllers

Table 60: Specific Module/Channel Parameters – PROFINET IO Couplers

GSD File		WAGO-I/O-*CHECK*	
Name	**Value**	**Selection field**	**Value**
Diagnostics: Power supply fault [I/O module]	0 (false)	Diagnosis: Power supply fault [Common]	Off
	1 (true)[*]		On[*]
Diagnostics: AO− wiring error [I/O module]	0 (false)	Diagnosis: wiring error AO− [Common]	Off
	1 (true)[*]		On[*]
Channel diagnostics [Channel x (x = 0…3)]	0 (false)[*]	Channel diagnosis [Channel x (x = 1…4)]	Off
	1 (true)		On[*]

Table 60: Specific Module/Channel Parameters – PROFINET IO Couplers

GSD File		WAGO-I/O-*CHECK*	
Name	**Value**	**Selection field**	**Value**
Diagnosis: short circuit [Channel x (x = 0…3)]	0 (false)	Diagnosis: Short circuit [Channel x (x = 1…4)]	Off
	1 (true) *)		On*)
Diagnosis: wire break [Channel x (x = 0…3)]	0 (false)	Diagnosis: Wire break [Channel x (x = 1…4)]	Off
	1 (true) *)		On*)
Diagnostics: Wiring error [Channel x (x = 0…3)]	0 (false)	Diagnosis: Wiring error [Channel x (x = 1…4)]	Off
	1 (true) *)		On*)
Diagnostics: Internal error [Channel x (x = 0…3)]	0 (false)	Diagnosis: Internal error [Channel x (x = 1…4)]	Off
	1 (true) *)		On*)
User scaling [Channel x (x = 0…3)]	deactivated*)	User scaling [Channel x (x = 1…4)]	Box unchecked *)
	activated		Box checked
Offset [Channel x (x = 0…3)]	−32768 … 0*) … 32767	Offset [Channel x (x = 1…4)]	−32768 … 0*) … 32767
Gain [Channel x (x = 0…3)]	−32768 … 16384*) … 32767	Gain [Channel x (x = 1…4)]	−2.0000 … 1.0000*) … 1.9999[3)]
Response to K-Bus timeout [Channel x (x = 0…3)]	deactivated	Behaviour on K-Bus timeout [Channel x (x = 1…4)]	Deactivated
	hold last output value		Hold last output value
	set output to high impedance *)		Set output high-impedance*)
	output user substitute value		Set output to user substitute value
User substitute value [Channel x (x = 0…3)]	0*) … 65535[1)] −32768 … 0*) … 32767[2)]	User substitute value [Channel x (x = 1…4)]	0x0000*) … 0xFFFF[1)] 0x8000 … 0x0000*) … 0x7FFF[2)]

*) Factory setting
1) 16-bit resolution
2) 15-bit resolution
3) The resolution of 1/16384 is already taken into account in WAGO-I/O-*CHECK*.

Table 61: PROFIenergy Parameters [3)] – PROFINET IO Couplers

GSD File		WAGO-I/O-*CHECK*	
Name	**Value**	**Selection field**	**Value**
Minimum pause time [I/O module]	infinite*)	n/a	n/a
	10 s		
	1 min		
	10 min		
	1 h		
	10 h		
	1 d		
Pause output value [Channel x (x = 0…3)]	0*) … 65535[1)] −32768 … 0*) … 32767[2)]	n/a	n/a

*) Factory setting
1) 16-bit resolution
2) 15-bit resolution
3) You can find further explanations in the manuals for the PROFINET fieldbus couplers/ controllers.

8 Scaling Measured Values

User scaling allows you to scale the process value on an application-specific basis within the following voltage and current ranges by parameterizing the gain and offset values:

- Signal type “0–10 mA”: 0 mA ... 20 mA
- Signal type “2–10 mA”: 0 mA ... 20 mA
- Signal type “±10 mA”: −20 mA ... 20 mA
- Signal type “0–12 mA”: 0 mA ... 20 mA
- Signal type “±12 mA”: −20 mA ... +20 mA
- Signal type “0–20 mA”: 0 mA ... 24 mA
- Signal type “4–20 mA”: 0 mA ... 24 mA
- Signal type “±20 mA”: −24 mA ... +24 mA
- Signal type “0–22 mA”: 0 mA ... 24 mA
- Signal type “±22 mA”: −24 mA ... +24 mA
- Signal type “0–5 V”: 0 V ... +6 V
- Signal type “1–5 V”: 0 V ... +6 V
- Signal type “±5 V”: −6 V ... +6 V
- Signal type “0–10 V”: 0 V ... +12 V
- Signal type “2–10 V”: 0 V ... +12 V
- Signal type “±10 V”: −12 V ... +12 V
- Signal type “0–12 V”: 0 V ... +12 V
- Signal type “±12 V”: −12 V ... +12 V

User scaling is optional.

The values for “Gain” and “Offset” are required in order to perform user scaling. The scaling gain indicates the gain factor. The scaling offset indicates the offset on the y axis. When these two values are input, a scaled process value results. The following general scaling equation applies:

- $y = (x + \text{Offset}) \times (\text{Gain} / 16384)$

The variables have the following meaning:

Table 62: Variable Legend – Scaling Process Values

Variable	Meaning/function
x	Unscaled process value
y	Scaled process value
Gain	Scaling gain (gain factor)
Offset	Scaling offset (offset)
16384	Resolution 1/16384

The x value (unscaled process value) serves as the input value for the user scaling. With user scaling switched off, the x value is carried over to y unchanged.

9 Calibrating Measured Values

The manufacturer calibration serves to compensate tolerances in electronic components of the I/O module. User calibration allows you to compensate for the tolerances of electronic components of both the I/O module and connected devices and to take into account factors such as component age and different ambient temperatures at the installation site.

Note

User calibration by channel required!
Perform the calibration for each channel individually to achieve the greatest possible measurement accuracy for each channel.

The variables in the following equations have the following meaning:

Table 63: Variable Legend – Calibrating Measured Values

Variable	Explanation
m	Calibration gain (gain factor)
b	Calibration offset (offset)
x1	Expected output voltage/output current 1
x2	Expected output voltage/output current 2
y1	Process value 1
y2	Process value 2

The “Gain” and “Offset” values are required in order to perform user calibration.
The calibration gain indicates the factor by which the process value is amplified.
The calibration offset indicates the offset of the process value on the y axis.
The following general calibration equation applies:

$y = (x + b) \times m$

The general calibration equation yields the following two equations for calculating the two values sought:

Calibration gain: $m = (y2 – y1) / (x2 – x1)$

Calibration offset: $b = y1 – (m \times x1)$

9.1.1 Example of Determining Gain and Offset

A two-point calibration method is used.
Perform the following steps in WAGO-I/O-*CHECK*:

1. Select a channel, as well as a signal type and the resolution, under **Channel Settings**.
   In this example, signal type “0 … 10 V” (16-bit resolution) has been selected.

2. Enable user calibration under **Calibration**.

3. Set the value for the calibration offset to “0”.

4. Set the value for the calibration gain to “1”.

5. Specify the first process value.

6. Read the expected output voltage on the measuring instrument.
Example:

   Process value 1 (y1) = 1 V
   At 1 V, the expected output voltage (x1) = 0.97 V

7. Specify the second process value.

8. Read the expected output voltage on the measuring instrument.
Example:

   Process value 2 (y2) = 9 V
   At 9 V, the expected output voltage (x2) = 9.05 V

9. Insert all calculated values into the respective equations.
You obtain the values for the calibration gain and offset sought as the result.
Example:

   Calibration gain:
   $m = (y2 – y1) / (x2 – x1)$
   → $m = (9\ V – 1\ V) / (9.05\ V – 0.97\ V) = 0.99$

   Calibration offset:
   $b = y1 – (m \times x1)$
   → $b = 1\ V − (0.99 \times 0.97\ V) = 0.04\ V$

10. Enter the calculated gain value (“0.99”) in WAGO-I/O-*CHECK*.

11. Convert the result for the calibration offset based on the process value resolution:

    0.04 V / 0.000152579 V per digit = 262 digits

12. Enter the calculated offset value (“262”) in WAGO-I/O-*CHECK*.

10 Diagnostics

10.1 Error States and Possible Causes

Table 64: Error States in Current Output Mode

Diagnostics (Status Byte)	Possible Cause
Wiring Error (0x42 hex.)	External voltage or short circuit on the analog output in question (+AOx/−AOx) or sense input (+Sx/−Sx)
−AO wiring error (0x44 hex.)	Short circuit between 24 V and −AOx
Wire break (0x50 hex.)	• Analog output (+AOx/−AOx) open/ excessively high-ohm (> 600 Ω) • External voltage on the analog output (+AOx/−AOx) or sense input (+Sx/−Sx) in question • Short circuit between +Sx and −Sx.
Power supply fault (0x60 hex.)	Voltage for the field supply is too low

Table 65: Error States in Voltage Output Mode

Diagnostics (Status Byte)	Possible Cause
Wiring Error (0x42 hex.)	External voltage or short circuit on the analog output in question (+AOx/−AOx) or sense input (+Sx/−Sx)
−AO wiring error (0x44 hex.)	Short circuit between 24 V and −AOx
Short circuit (0x48 hex.)	Short circuit on the analog output between +AOx and −AOx
Power supply fault (0x60 hex.)	Voltage for the field supply is too low

10.2 Diagnostics via Display Elements

The display elements of the I/O module provide information about possible states and cases of error. The tables below contain the interpretations of the signals.

Table 66: Signal Evaluation for Each Channel – Status LED

Status LED state	Possible interpretation
Off	Not ready for operation
	Local bus communication absent or interrupted
	Channel deactivated
Green	Operational readiness and uninterrupted local bus communication

Table 67: Signal Evaluation for Each Channel – Error LED

Error LED state	Possible interpretation
Off	No error
	Channel deactivated
	Diagnostics deactivated
Red	Wire break
	Short circuit
	Wiring error
	AO− wiring error
	Faulty field voltage supply
	Internal error

11 Use in Hazardous Environments

The **WAGO I/O SYSTEM 750** (electrical equipment) is designed for use in Zone 2 hazardous areas and shall be used in accordance with the marking and installation regulations.

The following sections include both the general identification of components (devices) and the installation regulations to be observed. The individual subsections of the “Installation Regulations” section must be taken into account if the I/O module has the required approval or is subject to the range of application of the ATEX directive.

11.1 Marking Configuration Examples

11.1.1 Marking for Europe According to ATEX and IECEx

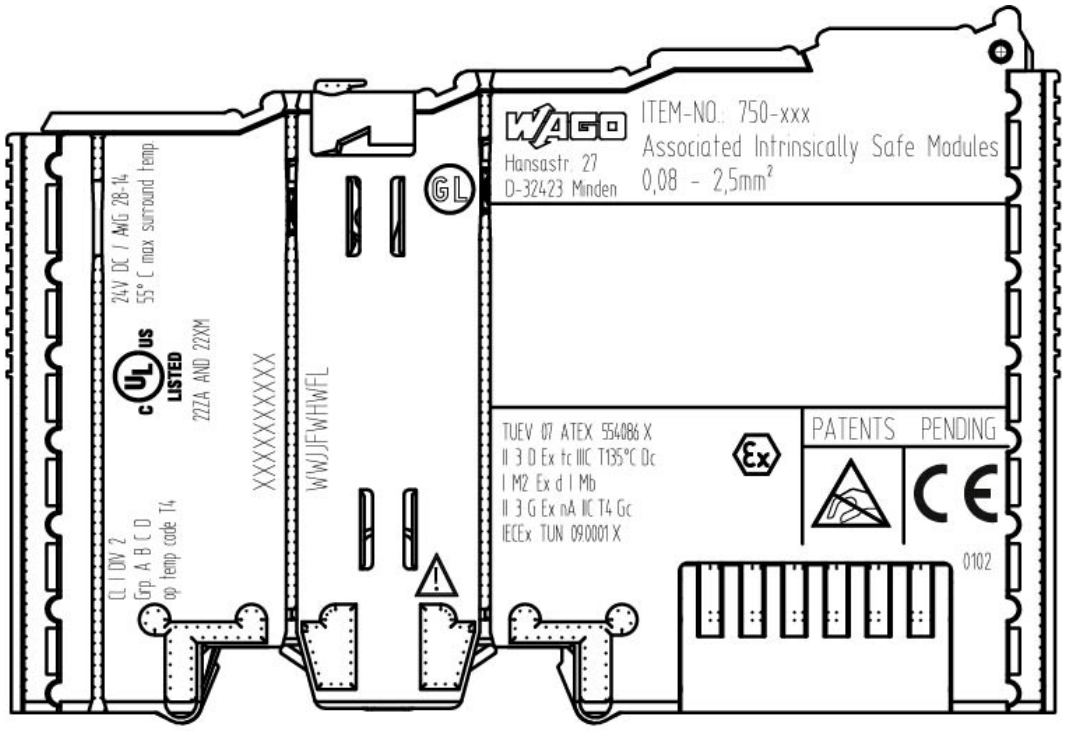


Figure 28: Marking Example per ATEX and IECEx

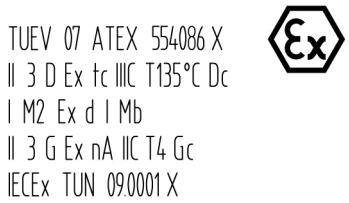


Figure 29: Text Detail – Marking Example per ATEX and IECEx

Table 68: Description of the Marking Example per ATEX and IECEx

Marking Text	Description
TUEV 07 ATEX 554086 X IECEx TUN 09.0001 X	Approving authority or certificate numbers
Dust	
II	Device group: All except mining
3 D	Device category 3 (Zone 22)
Ex	Explosion protection mark
tc	Protection type: Protection by enclosure
IIIC	Dust group: Explosive dust atmosphere
T135°C	Maximum surface temperature of the enclosure (no dust bin)
Dc	Level of equipment protection (EPL)
Mining	
I	Device group: Mining
M2	Device category: High degree of safety
Ex	Explosion protection mark
d	Protection type: Pressure-tight encapsulation
I	Electrical devices in potentially explosive mines
Mb	Level of equipment protection (EPL)
Gases	
II	Device group: All except mining
3 G	Device category 3 (Zone 2)
Ex	Explosion protection mark
nA	Protection type: Non-sparking equipment
IIC	Gas group: Explosive gas atmosphere
T4	Temperature class: Max. surface temperature 135 °C
Gc	Level of equipment protection (EPL)

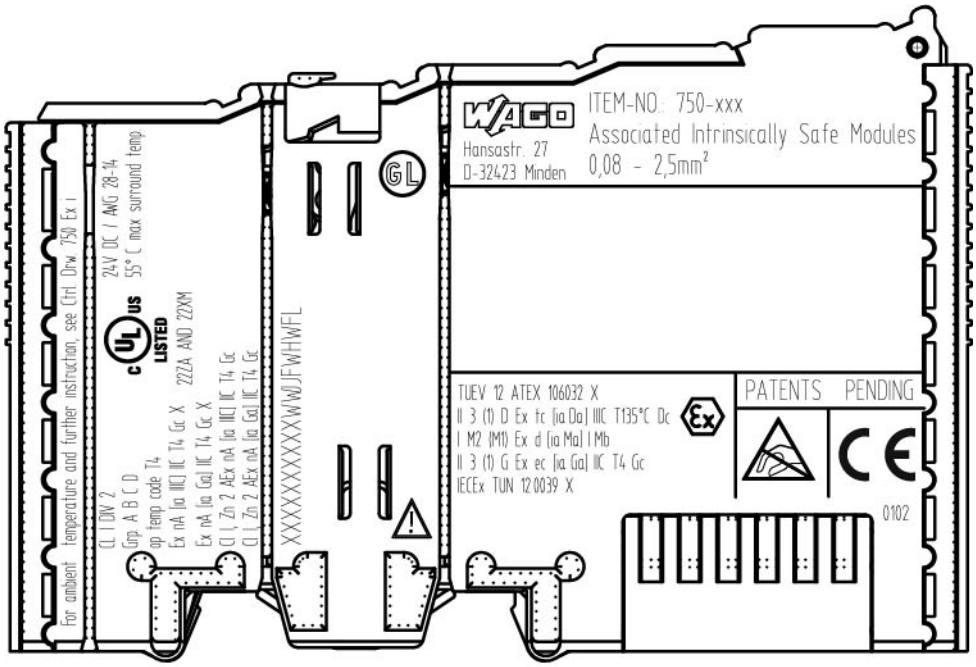


Figure 30: Marking Example of an Approved I/O Module Ex i per ATEX and IECEx

TUEV 12 ATEX 106032 X
II 3 (1) D Ex tc [ia Da] IIIC T135°C Dc
I M2 (M1) Ex d [ia Ma] I Mb
II 3 (1) G Ex ec [ia Ga] IIC T4 Gc
IECEx TUN 12 0039 X

Figure 31: Text Detail – Marking Example of an Approved I/O Module Ex i per ATEX and IECEx

Table 69: Description of the Marking Example of an Approved I/O Module Ex i per ATEX and IECEx

Marking Text	Description
TUEV 12 ATEX 106032 X IECEx TUN 12 0039 X	Approving authority or certificate numbers
Dust	
II	Device group: All except mining
3 (1) D	Device category 3 (Zone 22) that contain safety devices for Category 1 (Zone 20) devices
Ex	Explosion protection mark
tc	Protection type: Protection by enclosure
[ia Da]	Protection type and equipment protection level (EPL): Associated equipment with intrinsically safe circuits for Zone 20
IIIC	Dust group: Explosive dust atmosphere
T135°C	Max. surface temperature of the enclosure (no dust bin)
Dc	Level of equipment protection (EPL)
Mining	
I	Device group: Mining
M2 (M1)	Device category: High level of safety with circuits that offer a very high level of safety
Ex	Explosion protection mark
d	Protection type: Pressure-tight encapsulation
[ia Ma]	Protection type and equipment protection level (EPL): Associated equipment with intrinsically safe circuits
I	Electrical devices in potentially explosive mines
Mb	Level of equipment protection (EPL)
Gases	
II	Device group: All except mining
3 (1) G	Device category 3 (Zone 2) that contain safety devices for Category 1 (Zone 0) devices
Ex	Explosion protection mark
ec	Protection type: Increased safety
[ia Ga]	Protection type and equipment protection level (EPL): Associated equipment with intrinsically safe circuits for Zone 0
IIC	Gas group: Explosive gas atmosphere
T4	Temperature class: Max. surface temperature 135 °C
Gc	Level of equipment protection (EPL)

11.1.2 Marking for the United States of America (NEC) and Canada (CEC)

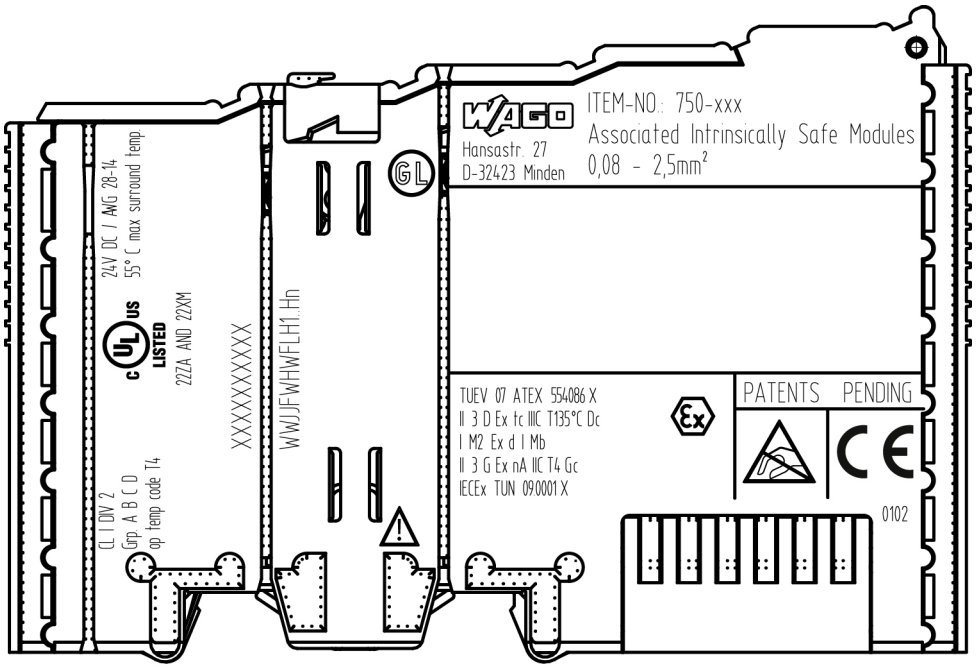


Figure 32: Marking Example According to NEC

CL I DIV 2
Grp. A B C D
op temp code T4

Figure 33: Text Detail – Marking Example According to NEC 500

Table 70: Description of Marking Example According to NEC 500

Marking	Description
CL I	Explosion protection (gas group)
DIV 2	Area of application
Grp. A B C D	Explosion group (gas group)
op temp code T4	Temperature class

Figure 34: Text Detail – Marking Example for Approved Ex i I/O Module According to NEC 505

Table 71: Description of Marking Example for Approved Ex i I/O Module According to NEC 505

Marking	Description
Cl I,	Explosion protection group
Zn 2	Area of application
AEx	Explosion protection mark
nA	Type of protection
[ia Ga]	Type of protection and equipment protection level (EPL): Associated apparatus with intrinsic safety circuits for use in Zone 20
IIC	Group
T4	Temperature class
Gc	Equipment protection level (EPL)

Figure 35: Text Detail – Marking Example for Approved Ex i I/O Module According to NEC 506

Table 72: Description of Marking Example for Approved Ex i I/O Modules According to NEC 506

Marking	Description
Cl I,	Explosion protection group
Zn 2	Area of application
AEx	Explosion protection mark
nA	Type of protection
[ia IIIC]	Type of protection and equipment protection level (EPL): Associated apparatus with intrinsic safety circuits for use in Zone 20
IIC	Group
T4	Temperature class
Gc	Equipment protection level (EPL)

Ex nA [ia IIIC] IIC T4 Gc X
Ex nA [ia Ga] IIC T4 Gc X

Figure 36: Text Detail – Marking Example for Approved Ex i I/O Modules According to CEC 18 attachment J

Table 73: Description of Marking Example for Approved Ex i I/O Modules According to CEC 18 attachment J

Marking	Description
Dust	
Ex	Explosion protection mark
nA	Type of protection
[ia IIIC]	Type of protection and equipment protection level (EPL): Associated apparatus with intrinsic safety circuits for use in Zone 20
IIC	Group
T4	Temperature class
Gc	Equipment protection level (EPL)
X	Symbol used to denote specific conditions of use
Gases	
Ex	Explosion protection mark
nA	Type of protection
[ia Ga]	Type of protection and equipment protection level (EPL): Associated apparatus with intrinsic safety circuits for use in Zone 0
IIC	Group
T4	Temperature class
Gc	Equipment protection level (EPL)
X	Symbol used to denote specific conditions of use

11.2 Installation Regulations

For the installation and operation of electrical equipment in hazardous areas, the valid national and international rules and regulations which are applicable at the installation location must be carefully followed.

11.2.1 Special Notes including Explosion Protection

The following warning notices are to be posted in the immediately proximity of the WAGO I/O SYSTEM 750 (hereinafter “product”):

WARNING – DO NOT REMOVE OR REPLACE FUSED WHILE ENERGIZED!

WARNING – DO NOT DISCONNECT WHILE ENERGIZED!

WARNING – ONLY DISCONNECT IN A NON-HAZARDOUS AREA!

Before using the components, check whether the intended application is permitted in accordance with the respective printing. Pay attention to any changes to the printing when replacing components.

The product is an open system. As such, the product must only be installed in appropriate enclosures or electrical operation rooms to which the following applies:

- Can only be opened using a tool or key
- Inside pollution degree 1 or 2
- In operation, internal air temperature within the range of 0 °C ≤ Ta ≤ +55 °C or −20 °C ≤ Ta ≤ +60 °C for components with extension number …/025-xxx or −40 °C ≤ Ta ≤ +70 °C for components with extension number …/040-xxx
- Minimum degree of protection: min. IP54 (acc. to EN/IEC 60529)
- For use in Zone 2 (Gc), compliance with the applicable requirements of the standards EN/IEC/ABNT NBR IEC 60079-0, -7, -11, -15
- For use in Zone 22 (Dc), compliance with the applicable requirements of the standards EN/IEC/ABNT NBR IEC 60079-0, -7, -11, -15 and -31
- For use in mining (Mb), minimum degree of protection IP64 (acc. EN/IEC 60529) and adequate protection acc. EN/IEC/ABNT NBR IEC 60079-0 and -1
- Depending on zoning and device category, correct installation and compliance with requirements must be assessed and certified by a “Notified Body” (ExNB) if necessary!

Explosive atmosphere occurring simultaneously with assembly, installation or repair work must be ruled out. Among other things, these include the following activities

- Insertion and removal of components
- Connecting or disconnecting from fieldbus, antenna, D-Sub, ETHERNET or USB connections, DVI ports, memory cards, configuration and programming interfaces in general and service interface in particular:
  - Operating DIP switches, coding switches or potentiometers
  - Replacing fuses

Wiring (connecting or disconnecting) of non-intrinsically safe circuits is only permitted in the following cases

- The circuit is disconnected from the power supply.
- The area is known to be non-hazardous.

Outside the device, suitable measures must be taken so that the rated voltage is not exceeded by more than 40 % due to transient faults (e.g., when powering the field supply).

Product components intended for intrinsically safe applications may only be powered by 750-606 or 750-625/000-001 bus supply modules.

Only field devices whose power supply corresponds to overvoltage category I or II may be connected to these components.

11.2.2 Special Notes Regarding UL Hazardous Location

For UL Hazardous Location acc. to UL File E198726, the following additional requirements apply:

- Use in Class I, Division 2, Group A, B, C, D or non-hazardous areas only
- ETHERNET connections are used exclusively for connecting to computer networks (LANs) and may not be connected to telephone networks or telecommunication cables
- **WARNING** – The radio receiver module 750-642 may only be used to connect to external antenna 758-910!
- **WARNING** – Product components with fuses must not be fitted into circuits subject to overloads!
  These include, e.g., motor circuits.
- **WARNING** – When installing I/O module 750-538, “Control Drawing No. 750538” in the manual must be strictly observed!

Information

Additional Information
Proof of certification is available on request.
Also take note of the information given on the operating and assembly instructions.
The manual, containing these special conditions for safe use, must be readily available to the user.

12 Service

12.1 Firmware Update/Downgrade

You can update firmware on the Series 750 I/O Modules with the software “WAGO I/O-Update 750.” The I/O modules can be updated via the service interface or, for ETHERNET-based fieldbuses, via the fieldbus connection on the fieldbus coupler/controller.

Observe the following information:

NOTICE

Do Not Switch Off the I/O Module!
Interrupting the update process can damage the I/O module.
Do not remove the I/O module during the update process. Do not interrupt the power supply!

- Ensure that communication with the fieldbus coupler/controller is not interrupted during the update process.
- Any PLC application running on the controller must be stopped before the update process.
- Before an update via the service interface, disconnect the fieldbus cable from the fieldbus coupler/controller.
- Do not close the software during the update.
- Only run the software from a local hard disk.

Note

Additional Information from WAGO Support!
Additional information about the software “WAGO I/O-Update 750” is available through WAGO Support.

Information

Firmware Downgrade
Contact WAGO Support to discuss whether a firmware downgrade is possible in your situation.

12.2 Recalibration

Calibrating the I/O module may provide the process value accuracy required by the application.

It may be necessary to perform a recalibration in order to maintain the accuracy despite aging of individual components of the line. The operator of the equipment must determine the intervals at which such recalibration is to be performed.

The corresponding sections on the topic of calibration explain how the recalibration is to be performed with the help of the various commissioning tools.

12.3 WAGO UII (Unique Item Identifier)

Each I/O module is provided with a unique **WAGO UII** (“Unique Item Identifier”).

Application example:
The I/O module can be permanently assigned a calibration certificate via this UII.

List of Figures

List of Tables

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