

# WAGO → I/O → SYSTEM 750

## Fieldbus Independent I/O Modules

2 AO 4-20 mA

750-554



## Manual

Version 1.0.3

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Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as errors can never be fully excluded, we would appreciate any information or ideas at any time.

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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 trademark or patent protected.

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# 1 Important Comments

To ensure fast installation and start-up of the units described in this manual, we strongly recommend that the following information and explanations are carefully read and abided by.

## 1.1 Legal Principles

### 1.1.1 Copyright

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### 1.1.2 Personnel Qualification

The use of the product detailed in this manual is exclusively geared to specialists having qualifications in PLC programming, electrical specialists or persons instructed by electrical specialists who are also familiar with the valid standards. WAGO Kontakttechnik GmbH & Co. KG declines all liability resulting from improper action and damage to WAGO products and third party products due to non-observance of the information contained in this manual.

### 1.1.3 Intended Use

For each individual application, the components supplied are to work with a dedicated hardware and software configuration. Modifications are only permitted within the framework of the possibilities documented in the manuals. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.

Please direct any requirements pertaining to a modified and/or new hardware or software configuration directly to WAGO Kontakttechnik GmbH & Co. KG.

## 1.2 Symbols



### **Danger**

Always abide by this information to protect persons from injury.



### **Warning**

Always abide by this information to prevent damage to the device.



### **Attention**

Marginal conditions must always be observed to ensure smooth operation.



### **ESD (Electrostatic Discharge)**

Warning of damage to the components by electrostatic discharge. Observe the precautionary measure for handling components at risk.



### **Note**

Routines or advice for efficient use of the device and software optimization.



### **More information**

References on additional literature, manuals, data sheets and internet pages.

## 1.3 Number Notation

Number Code	Example	Note
Decimal	100	normal notation
Hexadecimal	0x64	C notation
Binary	'100' '0110.0100'	within inverted commas, nibble separated with dots

## 1.4 Safety Notes



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### Warning

Switch off the system prior to working on bus modules!

In the event of deformed contacts, the module in question is to be replaced, as its functionality can no longer be ensured on a long-term basis.

The components are not resistant against materials having seeping and insulating properties. Belonging to this group of materials is: e.g. aerosols, silicones, triglycerides (found in some hand creams).

If it cannot be ruled out that these materials appear in the component environment, then additional measures are to be taken:

- installation of the components into an appropriate enclosure
  - handling of the components only with clean tools and materials.
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### Attention

Cleaning of soiled contacts may only be done with ethyl alcohol and leather cloths. Thereby, the ESD information is to be regarded.

Do not use any contact spray. The spray may impair the functioning of the contact area.

The WAGO-I/O-SYSTEM 750 and its components are an open system. It must only be assembled in housings, cabinets or in electrical operation rooms. Access must only be given via a key or tool to authorized qualified personnel.

The relevant valid and applicable standards and guidelines concerning the installation of switch boxes are to be observed.

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### ESD (Electrostatic Discharge)

The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, e.g. gold contacts.

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## 1.5 Scope

This manual describes the Analog Output Module 750-554  
2 AO 4-20 mA of the modular WAGO-I/O-SYSTEM 750.

Handling, assembly and start-up are described in the manual of the Fieldbus Coupler. Therefore this documentation is valid only in the connection with the appropriate manual.

## 2 I/O Modules

### 2.1 Analog Output Modules

#### 2.1.1 750-554 [2 AO 4-20 mA]

2-Channel Analog Output Module 4-20 mA

##### 2.1.1.1 View

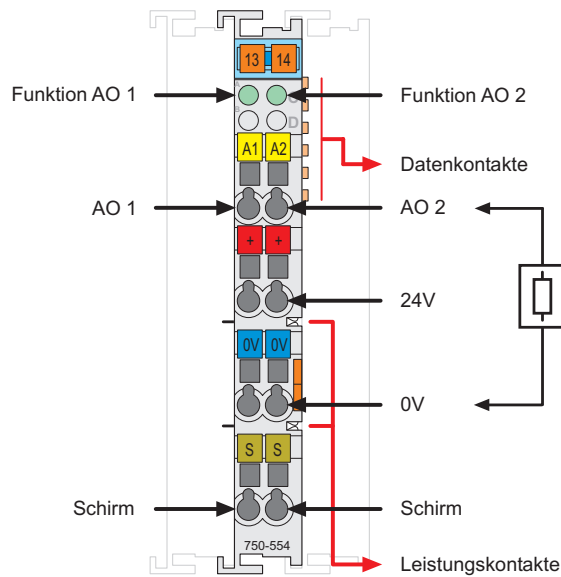


Fig. 2.1.1-1: 2-Channel Analog Output Module 750-554

g055400e

##### 2.1.1.2 Variations

Item-No.:	Designation	Description
750-554	2 AO (4-20mA)	2-Channel Analog Output Module , 4-20mA
750-554/000-200	2 AO (4-20mA) with Siemens (S5-FB 251)	2-Channel Analog Output Module , 4-20mA, adapted data format for S5-control systems with the use of function block FB 251

### 2.1.1.3 Description

The analog output module 750- and its variation create a standardized signal of 4-20 mA.

The module has two output channels and enables, for example, the direct wiring of two 2-conductor actuators to the connections AO 1 and 0V or AO 2 and 0V. The signals are transmitted via AO 1 or AO 2.

The channels have a common ground and a shield (screen) (S). The shield (screen) is directly connected to the DIN rail. A capacitive connection is made automatically when snapped onto the DIN rail.

The input signal is electrically isolated and will be transmitted with a resolution of 12 bits.

The operational readiness and the trouble-free internal data bus communication of the channels are indicated via a green function LED.

Any configuration of the output modules is possible when designing the fieldbus node. Grouping of module types is not necessary.

The voltage supply is done via the field supply.

The field side supply voltage of 24 V for the output module is derived from an adjacent I/O module or from a supply module. A capacitive connection of the supply potential to the adjacent I/O modules is made automatically via the internal power contacts when snapping the output modules.



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#### Warning

The maximum current of the internal power jumper contacts is 10 A. When configuring the system it is important not to exceed the maximum/sum current. However, if such a case should occur, another supply module must be added.

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#### Note

Use an appropriate supply module (e.g. 750-602) if an electrically isolated voltage supply is required!

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The analog output module 750-554 and its variations can be used with all couplers/controllers of the WAGO-I/O-SYSTEM 750 (except for the economy types 750-320, -323, -324 and -327).



### 2.1.1.4 Display Elements

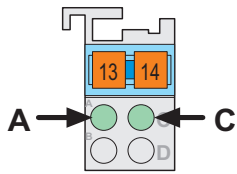


Fig. 2.1.1-2: Display elements g055202x

LED	Channel	Designation	State	Function
A green	1	Function AO 1	off	No operational readiness or the internal data bus communication is interrupted
			on	Operational readiness and trouble-free internal data bus communication
C green	2	Function AO 2	off	No operational readiness or the internal data bus communication is interrupted
			on	Operational readiness and trouble-free internal data bus communication

### 2.1.1.5 Schematic Diagram

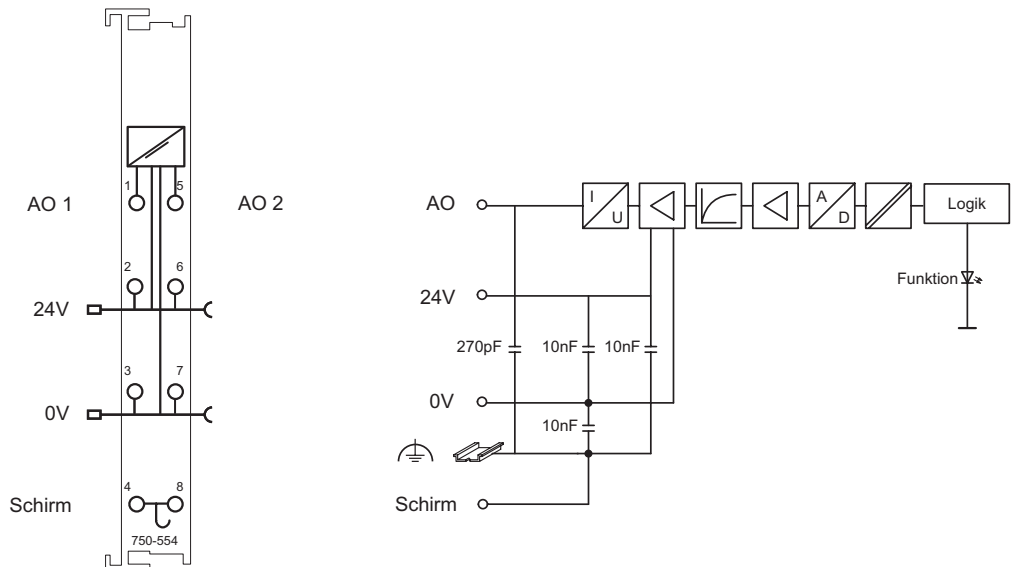













Fig. 2.1.1-3: 2-Channel Analog Output Module 750-554

g055401e

### 2.1.1.6 Technical Data

<b>Module Specific Data</b>	
Number of outputs	2
Voltage via power jumper contacts	DC 24 V (-25% ... +30%)
Current consumption <sub>typ.</sub> (internal)	70 mA
Signal current	4 mA... 20 mA
Load impedance	< 600 Ω
Linearity	± 10 µA
Resolution	12 Bit
Conversion time	approx. 2 ms
Measuring error <sub>25°C</sub>	<± 0.1 % of the full scale value
Temperature coefficient	<± 0.015 % / K of the full scale value
Isolation	500 V (Field/System)
Bit width	2 x 16 bits data 2 x 8 bits control/status (option)
Dimensions (mm) W x H x L	12 x 64* x 100 * from upper edge of 35 DIN rail
Weight	ca. 55 g
<b>Standards and Regulations (cf. Chapter 2.2 of the Coupler/Controller Manual)</b>	
EMC-Immunity to interference (CE)	acc. to EN 50082-2 (96)
EMC-Emission of interference (CE)	acc. to EN 50081-1 (93)
EMC-Immunity to interference (Ship building)	acc. to Germanischer Lloyd (97)
EMC-Emission of interference (Ship building)	acc. to Germanischer Lloyd (97)

Approvals (cf. Chapter 2.2 of the Coupler/Controller Manual)		
	cUL <sub>US</sub> (UL508)	
	ABS (American Bureau of Shipping)	
	BV (Bureau Veritas)	
	DNV (Det Norske Veritas)	Cl. B
	GL (Germanischer Lloyd)	Cat. A, B, C, D
	KR (Korean Register of Shipping)	
	LR (Lloyd's Register)	Env. 1, 2, 3, 4
	NKK (Nippon Kaiji Kyokai)	
	RINA (Registro Italiano Navale)	(only for 750-554)
	cUL <sub>US</sub> (UL1604)	Class I Div2 ABCD T4A
	KEMA	II 3 G EEx nA II T4
	Conformity Marking	



#### More Information

Detailed references to the approvals are listed in the document "Overview Approvals WAGO-I/O-SYSTEM 750", which you can find on the CD ROM ELECTRONICC Tools and Docs (Item-No.: 0888-0412)

or in the internet under:

[www.wago.com](http://www.wago.com) → Documentation → WAGO-I/O-SYSTEM 750 → System Description

### 2.1.1.7 Process Image

The analog output module 750-554 and its variations transmit 16-bit data and 8 status bits per channel.

The digitalized output value is transmitted in a data word (16 bits) as output byte 0 (low) and output byte 1 (high) via the process image of the coupler / controller.

This value is represented with a 12 bit resolution on bit B3 ... B14.

The three least significant bits (B0 ... B2) are not parsed.

Some fieldbus systems can process the status information using by means of a status byte.

As the returned status byte of this output module is always zero, it will not be parsed.

**2.1.1.7.1 Standard Format**

For the standard module 750-554, the numerical values ranging from 0x0000 to 0x7FFF are scaled on the output current ranging from 4 mA to 20 mA.

Process values of module 750-554				
Output current 4 mA - 20 mA	numerical value			status- byte hex.
	binary output value	hex.	dec.	
4	'0000.0000.0000.0000'	0x0000	0	0x00
6	'0001.0000.0000.0000'	0x1000	4096	0x00
8	'0010.0000.0000.0000'	0x2000	8192	0x00
10	'0011.0000.0000.0000'	0x3000	12288	0x00
12	'0100.0000.0000.0000'	0x4000	16384	0x00
14	'0101.0000.0000.0000'	0x5000	20480	0x00
16	'0110.0000.0000.0000'	0x6000	24576	0x00
18	'0111.0000.0000.0000'	0x7000	28672	0x00
20	'0111.1111.1111.1111'	0x7FFF	32767	0x00

**2.1.1.7.2 Special Formats**

To digitalize the output value, the variation 750-554/000-200 uses a data format adapted to the S5 control systems using FB 251.

For this version, the numerical values ranging from 0x0000 to 0x4000 are scaled on the output current ranging from 4 mA to 20 mA.

Process values of module 750-552/000-200				
Output current 4 mA - 20 mA	numerical value			status- byte hex.
	binary output value	hex.	dec.	
4	'0000.0000.0000.0000'	0x0000	0	0x00
6	'0000.1000.0000.0000'	0x0800	2048	0x00
8	'0001.0000.0000.0000'	0x1000	4096	0x00
10	'0001.1000.0000.0000'	0x1800	6144	0x00
12	'0010.0000.0000.0000'	0x2000	8192	0x00
14	'0010.1000.0000.0000'	0x2800	10240	0x00
16	'0011.0000.0000.0000'	0x3000	12288	0x00
18	'0011.1000.0000.0000'	0x3800	14336	0x00
20	'0100.0000.0000.0000'	0x4000	16384	0x00





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