

**WAGO → I/O → SYSTEM 750**

**Fieldbus Independent  
I/O Modules**

**2 AI DC  $\pm 10$  V, Differential  
Measurement Input  
750-479**



**Manual**

Version 1.0.6

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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.

# Content

<b>1 Important Notes .....</b>	<b>4</b>
1.1 Legal Bases.....	4
1.1.1 Copyright.....	4
1.1.2 Personnel Qualifications.....	4
1.1.3 Use of the 750 Series in Compliance with Underlying Provisions .....	5
1.1.4 Technical Condition of Specified Devices .....	5
1.2 Standards and Guidelines for Operating the 750 Series.....	6
1.3 Symbols .....	7
1.4 Safety Information.....	8
1.5 Font Conventions .....	9
1.6 Number Notation.....	9
1.7 Scope .....	9
<b>2 I/O Modules .....</b>	<b>10</b>
2.1 Analog Input Modules.....	10
2.1.1 750-479 [2 AI DC $\pm 10$ V, Differential Measurement Input].....	10
2.1.1.1 View.....	10
2.1.1.2 Description.....	10
2.1.1.3 Display Elements .....	11
2.1.1.4 Schematic Diagram.....	12
2.1.1.5 Technical Data .....	13
2.1.1.6 Process Image .....	14
2.1.2 750-479/000-001 [2 AI DC $\pm 10$ V Differential Measurement Input/Sync] .....	16
2.1.2.1 View.....	16
2.1.2.2 Description.....	16
2.1.2.3 Display Elements .....	17
2.1.2.4 Schematic Diagram.....	18
2.1.2.5 Technical Data .....	19
2.1.2.6 Process Image .....	21
<b>3 Use in Hazardous Environments .....</b>	<b>22</b>
3.1 Identification .....	22
3.1.1 For Europe according to CENELEC and IEC .....	22
3.1.2 For America according to NEC 500 .....	23
3.2 Installation Regulations.....	24
3.2.1 ANSI/ISA 12.12.01 .....	25
3.2.2 TÜV Nord Ex-i applications.....	26
3.2.3 ATEX and IEC Ex .....	27

# 1 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.

## 1.1 Legal Bases

### 1.1.1 Copyright

This Manual, including all figures and illustrations, is copyright-protected. Any further use of this Manual by third parties that violate pertinent copyright provisions is prohibited. Reproduction, translation, electronic and phototechnical filing/archiving (e.g., photocopying) as well as any amendments require the written consent of WAGO Kontakttechnik GmbH & Co. KG, Minden, Germany. Non-observance will involve the right to assert damage claims.

WAGO Kontakttechnik GmbH & Co. KG reserves the right to provide for any alterations or modifications that serve to increase the efficiency of technical progress. 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.

### 1.1.2 Personnel Qualifications

The use of the product described in this Manual requires special personnel qualifications, as shown in the following table:

Activity	Electrical specialist	Instructed personnel*)	Specialists**) having qualifications in PLC programming
Assembly	X	X	
Commissioning	X		X
Programming			X
Maintenance	X	X	
Troubleshooting	X		
Disassembly	X	X	

\*) Instructed persons have been trained by qualified personnel or electrical specialists.

\*\*) A specialist is a person, who – thanks to technical training – has the qualification, knowledge and expertise to meet the required specifications of this work and to identify any potential hazardous situation in the above listed fields of activity.

All responsible persons have to familiarize themselves with the underlying legal standards to be applied. WAGO Kontakttechnik GmbH & Co. KG does not assume any liability whatsoever resulting from improper handling and damage incurred to both WAGO's own and third-party products by disregarding detailed information in this Manual.

### **1.1.3 Use of the 750 Series in Compliance with Underlying Provisions**

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 the actuators or higher-level control systems. Using programmable controllers, the signals can also be (pre-)processed.

The components 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 components in wet and dusty environments is prohibited.

### **1.1.4 Technical Condition of Specified Devices**

The components to be supplied Ex Works, are equipped with hardware and software configurations, which meet the individual application requirements. Changes in hardware, software and firmware are permitted exclusively within the framework of the various alternatives that are documented in the specific manuals. WAGO Kontakttechnik GmbH & Co. KG will be exempted from any liability in case of changes in hardware or software as well as to non-compliant usage of components.

Please send your request for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

## 1.2 Standards and Guidelines for Operating the 750 Series

Please adhere to the standards and guidelines required for the use of your system:

- The data and power lines shall be connected and installed in compliance with the standards required to avoid failures on your system and to substantially minimize any imminently hazardous situations resulting in personal injury.
- For assembly, start-up, maintenance and troubleshooting, adhere to the specific accident prevention provisions which apply to your system (e.g. BGV A 3, "Electrical Installations and Equipment").
- Emergency stop functions and equipment shall not be made ineffective. See relevant standards (e.g. DIN EN 418).
- The equipment of your system shall conform to EMC guidelines so that any electromagnetic interferences will be eliminated.
- Operating 750 Series components in home applications without further measures is permitted only if they meet the emission limits (emissions of interference) in compliance with EN 61000-6-3. You will find the detailed information in section "WAGO-I/O-SYSTEM 750" → "System Description" → "Technical Data".
- Please observe the safety precautions against electrostatic discharge in accordance with DIN EN 61340-5-1/-3. When handling the modules, please ensure that environmental factors (persons, working place and packaging) are well grounded.
- The valid standards and guidelines applicable for the installation of switch cabinets shall be adhered to.

## 1.3 Symbols



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**Danger**

Always observe this information to protect persons from injury.

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**Warning**

Always observe this information to prevent damage to the device.

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**Attention**

Marginal conditions that must always be observed to ensure smooth and efficient operation.

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**ESD (Electrostatic Discharge)**

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

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**Note**

Make important notes that are to be complied with so that a trouble-free and efficient device operation can be guaranteed.

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**Additional Information**

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

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## 1.4 Safety Information

When connecting the device to your installation and during operation, the following safety notes must be observed:



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**Danger**

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 is only permitted via a key or tool to authorized qualified personnel.

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**Danger**

All power sources to the device must always be switched off before carrying out any installation, repair or maintenance work.

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**Warning**

Replace defective or damaged device/module (e.g. in the event of deformed contacts), as the functionality of field bus station in question can no longer be ensured on a long-term basis.

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**Warning**

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 the components must be installed in an enclosure that is resistant against the above mentioned materials. Clean tools and materials are generally required to operate the device/module.

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**Warning**

Soiled contacts must be cleaned using oil-free compressed air or with ethyl alcohol and leather cloths.

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**Warning**

Do not use contact sprays, which could possibly impair the functioning of the contact area.

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**Warning**

Avoid reverse polarity of data and power lines, as this may damage the devices.

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**ESD (Electrostatic Discharge)**

The devices are equipped with electronic components that may be destroyed by electrostatic discharge when touched.

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**Warning**

For components with ETHERNET/RJ-45 connectors:  
Only for use in LAN, not for connection to telecommunication circuits.

## 1.5 Font Conventions

- italic*      Names of paths and data files are marked in italic-type.  
e.g.: *C:\Programs\WAGO-IO-CHECK*
  
- italic***      Menu items are marked in italic-type, bold letters.  
e.g.: ***Save***
  
- \              A backslash between two names characterizes the selection of a menu point from a menu.  
e.g.: ***File \ New***
  
- END**        Pushbuttons are marked as bold with small capitals  
e.g.: **ENTER**
  
- < >         Keys are marked bold within angle brackets  
e.g.: **<F5>**
  
- Courier      The print font for program codes is Courier.  
e.g.: END\_VAR

## 1.6 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 (.)

## 1.7 Scope

This manual describes the Analog Input Module 750-479  
2 AI DC ±10 V, Differential Measurement Input 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 Input Modules

#### 2.1.1 750-479 [2 AI DC $\pm 10$ V, Differential Measurement Input]

2-Channel Analog Input Module DC  $\pm 10$  V,  
differential measurement input

##### 2.1.1.1 View

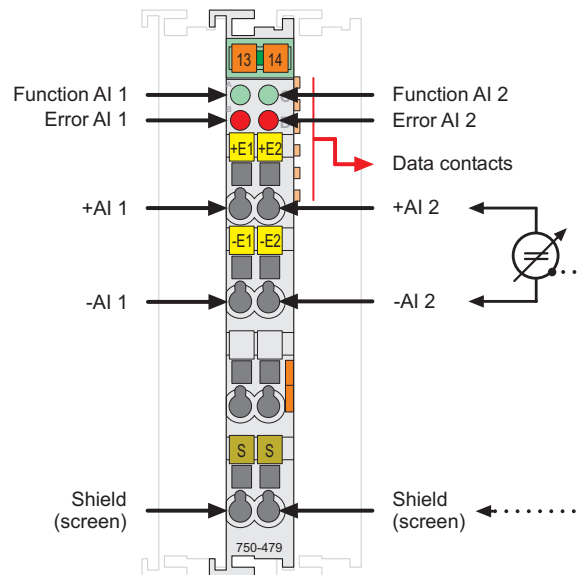


Fig. 2.1.1-1: View

g047900e

##### 2.1.1.2 Description

This analog input module receives signals with standardized values of  $\pm 10$  V.

The module has two differential input channels and can receive differential signals via the connections +AI 1 and -AI 1 or +AI 2 and -AI 2.

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 of each channel is electrically isolated and will be transmitted with a resolution of 14 bits (13 bits + sign bit).

The operational readiness and trouble-free internal data bus communication of the channels are indicated via a green Function LED. Overrange or underflow of the measuring range is indicated via a red error LED.

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

The voltage supply is done via system voltage.



**Attention**

This module has no power contacts. For field supply to downstream I/O modules, a supply module will be needed.

The analog input module 750-479 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).

**2.1.1.3 Display Elements**

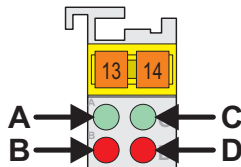


Fig. 2.1.1-2: Display Elements g041802x

LED	Channel	Designation	State	Function
A	1	Function AI 1	off	No operational readiness or the internal data bus communication is interrupted
			green	Operational readiness and trouble-free internal data bus communication
B		Error AI 1	off	Normal operation
			red	Overrange/underflow of the admissible measuring range
C	2	Function AI 2	off	No operational readiness or the internal data bus communication is interrupted
			green	Operational readiness and trouble-free internal data bus communication
D		Error AI 2	off	Normal operation
			red	Overrange/underflow of the admissible measuring range

2.1.1.4 Schematic Diagram

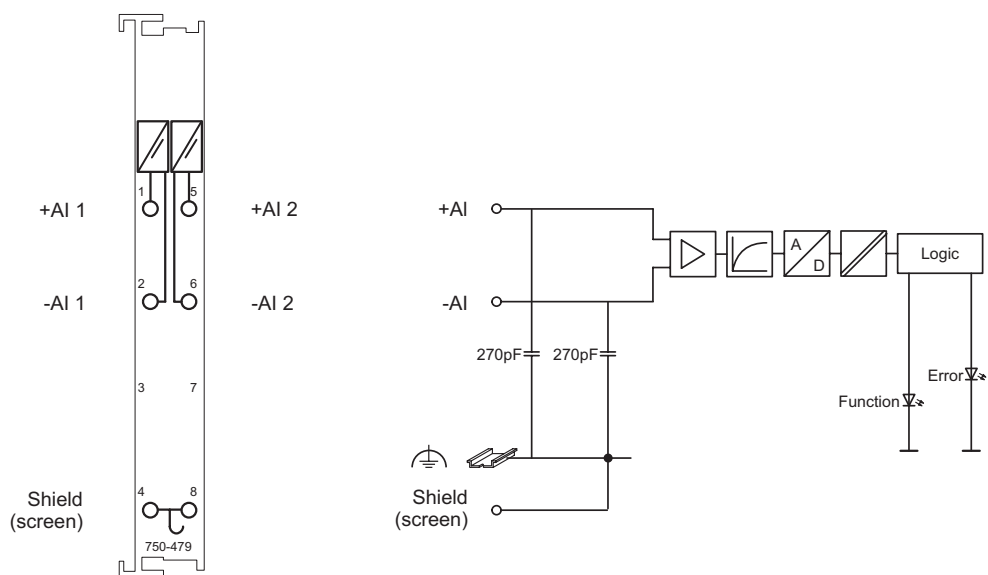
















Fig. 2.1.1-3: Schematic diagram

g0479001e

## 2.1.1.5 Technical Data

Module Specific Data	
Number of outputs	2, electrically isolated from each other
Measured-value acquisition	time synchronous
Voltage supply	via system voltage DC/DC
Current consumption <sub>typ.</sub> (internal)	80 mA
Signal voltage	$\pm 10$ V
Overrange/ measuring range underflow	status byte and LED
Input filter	low pass first order, f <sub>G</sub> = 5 kHz
Internal resistance	1 M $\Omega$
Resolution of the A/D converter	14 bit
Monotonicity without missing codes	yes
Resolution of the measured value	13 bit + sign bit
Value of a LSB (Least Significant Bit)	1.2 mV
Measuring error <sub>25 °C</sub>	$\leq \pm 0.05\%$ of the full scale value
Temperature coefficient	$< \pm 0.01\%/K$ of the full scale value
Measuring error	$\leq 0.4\%$ over whole temperature range $\leq 0.1\%$ of upper range value (non-linearity)
Crosstalk attenuation	$\geq 80$ db
Sampling time of repetition	1 ms
Sampling delay (module)	1 ms
Sampling delay (channel/channel)	$\leq 1$ $\mu$ s
Sampling duration	$\leq 5$ $\mu$ s
Method of conversion	SAR (Successive Approximation Register)
Operating mode	continuously sampling (preset)
Protection	RC circuit
Admissible continuous overload	DC $\pm 60$ V
Voltage resistance	DC 500V (channel/channel or channel/system)
Bit width	2 x 16 bits data 2 x 8 bits control/status (option)
Dimensions W x H* x L * from upper edge of 35 DIN rail	12 mm x 64 mm x 100 mm
Weight	ca. 55 g

Standards and Regulations (cf. Chapter 2.2 of the Coupler/Controller Manual)		
EMC-Immunity to interference (CE)		acc. to EN 61000-6-2: 2005
EMC-Emission of interference (CE)		acc. to EN 61000-6-4: 2007
EMC-Immunity to interference (Ship building)		acc. to Germanischer Lloyd (2003)
EMC-Emission of interference (Ship building)		acc. to Germanischer Lloyd (2003)
Approvals (cf. Chapter 2.2 of the Coupler/Controller Manual)		
	cUL <sub>US</sub> (UL508)	
	ABS (American Bureau of Shipping)	
	BV (Bureau Veritas) (applied for)	
	DNV (Det Norske Veritas)	Cl. B
	GL (Germanischer Lloyd)	Cat. A, B, C, D (EMC 1)
	KR (Korean Register of Shipping)	
	LR (Lloyd's Register) (applied for)	Env. 1, 2, 3, 4
	NKK (Nippon Kaiji Kyokai)	
	PRS (Polski Rejestr Statków)	
	RINA (Registro Italiano Navale)	
	cUL <sub>US</sub> (UL1604)	Class I Div2 ABCD T4
	DEMKO / IEC	I M2 / II 3 G/D Ex nA IIC T4
	UCIEE	BR-Ex 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: <http://www.wago.com> → Documentation → WAGO-I/O-SYSTEM 750 → System Description

**2.1.1.6 Process Image**

The analog input module 750-479 transmits 16-bit measured values and 8 optional status bits per channel.

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

This value is represented with a 13 bit resolution on bit B2 ... B14 and the sign bit is represented on bit B15.

The states of the two first least significant bits B0 and B1 are not defined in the range from -10 V to +10 V.

Therefore, they are represented with an 'X' in the table.

The hexadecimal and decimal measured values are listed in the table assuming that the first two bits have the state '0'. When both bits have the state '1', the value 3 is added to the decimal measured value indicated in the table.

Some fieldbus systems can process input channel status information by means of a status byte.

This status byte can be displayed via the starting tool WAGO-I/O-CHECK 2. However, processing via the coupler / controller is optional, which means that accessing or parsing the status information depends on the fieldbus system.



**Attention**

The representation of the process data of some I/O modules or their variations in the process image depends on the fieldbus coupler/-controller used. Please take this information as well as the particular design of the respective control/status bytes from the section "Fieldbus Specific Design of the Process Data" included in the description concerning the process image of the corresponding coupler/controller.

For the standard module 750-479, the input voltage ranging from -10 V to +10 V is scaled on the numerical values ranging from 0x8000 to 0x7FFF.

Process values of module 750-479					
Input voltage  ±10 V	numerical value			status - byte hex.	LED Error AI 1, 2
	binary	hex.	dec.		
<-11.0	<'1000.0000.0000.00XX'	<0x8000	<-32768	0x41	on
<-10.0	<'1000.0000.0000.00XX'	<0x8000	<-32768	0x00	off
-10.0	'1000.0000.0000.00XX'	0x8000	-32768	0x00	off
-7.5	'1010.0000.0000.00XX'	0xA000	-24576	0x00	off
-5.0	'1100.0000.0000.00XX'	0xC000	-16384	0x00	off
-2.5	'1110.0000.0000.00XX'	0xE000	-8192	0x00	off
0.0	'0000.0000.0000.00XX'	0x0000	0	0x00	off
2.5	'0010.0000.0000.00XX'	0x2000	8192	0x00	off
5.0	'0100.0000.0000.00XX'	0x4000	16384	0x00	off
7.5	'0110.0000.0000.00XX'	0x6000	24576	0x00	off
10.0	'0111.1111.1111.11XX'	0x7FFC	32764	0x00	off
>10.0	>'0111.1111.1111.1111'	>0x7FFF	>32767	0x00	off
>11.0	>'0111.1111.1111.1111'	>0x7FFF	>32767	0x42	on

## 2.1.2 750-479/000-001 [2 AI DC $\pm 10$ V Differential Measurement Input/Sync]

2-Channel Analog Input Module DC  $\pm 10$  V,  
differential measurement input  
(triggered only with coupler 750-303)

### 2.1.2.1 View

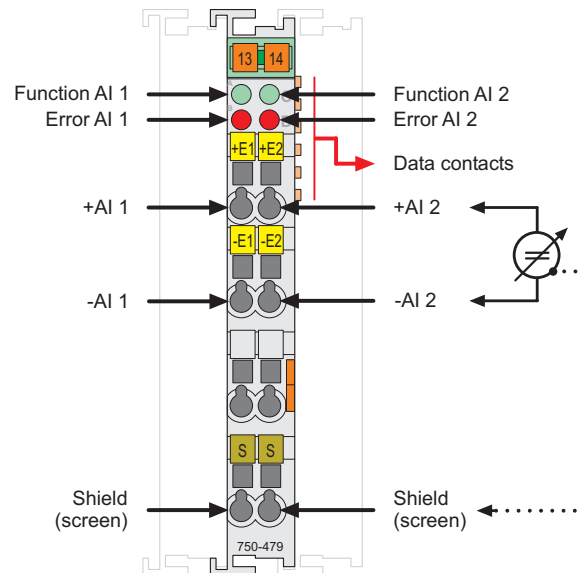


Fig. 2.1.2-1: View

g047900e

### 2.1.2.2 Description

This analog input module receives signals with standardized values of  $\pm 10$  V.

The module works synchronously with the internal data bus for all couplers/controllers used. When the module is connected to the Profibus Fieldbus Coupler 750-303, the (fieldbus) network wide acquisition of measured values can also be done synchronously. Triggering is done via this special Profibus-DP/FMS (12 Mbaud) coupler. After receiving the command "Global Control Command", the acquisition of measured values is initiated by the coupler. A delay of one cycle is to be expected when scaling the measured values. Sampling cycles  $\geq 1$  ms can be achieved.

The module has two differential input channels and can receive differential signals via the connections +AI 1 and -AI 1 or +AI 2 and -AI 2.

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 of each channel is electrically isolated and will be transmitted with a resolution of 14 bits (13 bits + sign bit).



The operational readiness and trouble-free internal data bus communication of the channels are indicated via a green Function LED. Overrange or underflow of the measuring range is indicated via a red error LED.

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

The voltage supply is done via system voltage.



**Attention**

This module has no power contacts. For field supply to downstream I/O modules, a supply module will be needed.

The analog input module 750-479/000-001 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).

**2.1.2.3 Display Elements**

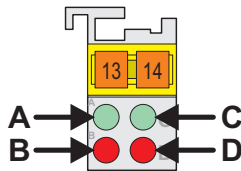


Fig. 2.1.2-2: Display Elements g041802x

LED	Channel	Designation	State	Function
A	1	Function AI 1	off	No operational readiness or the internal data bus communication is interrupted
			green	Operational readiness and trouble-free internal data bus communication
B		Error AI 1	off	Normal operation
			red	Overrange/underflow of the admissible measuring range
C	2	Function AI 2	off	No operational readiness or the internal data bus communication is interrupted
			green	Operational readiness and trouble-free internal data bus communication
D		Error AI 2	off	Normal operation
			red	Overrange/underflow of the admissible measuring range

2.1.2.4 Schematic Diagram

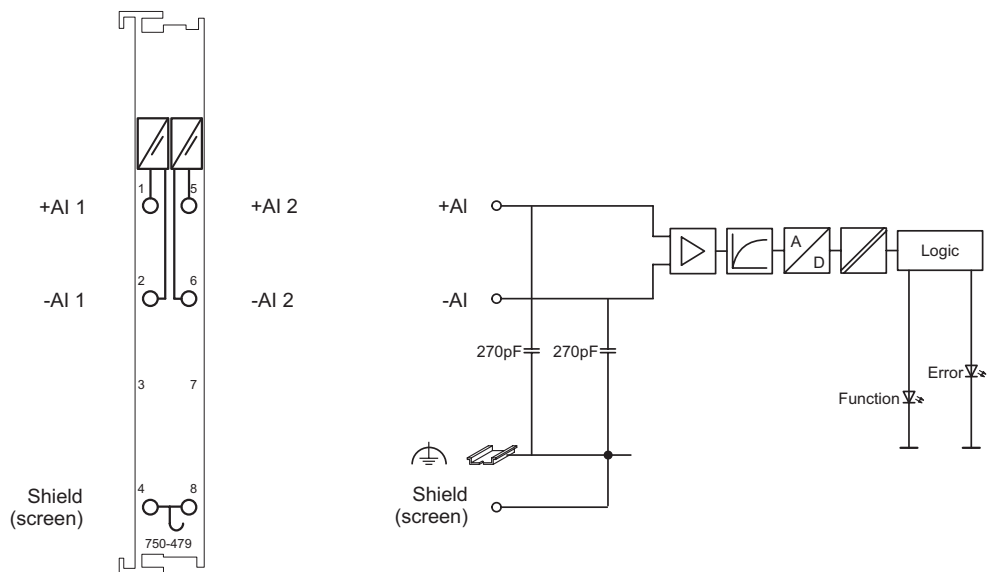




Fig. 2.1.2-3: Schematic diagram

g0479001e

### 2.1.2.5 Technical Data

Module Specific Data	
Number of outputs	2, electrically isolated from each other
Measured-value acquisition	time synchronous <sup>1)</sup>
Voltage supply	via system voltage DC/DC
Current consumption (internal)	$\leq 100$ mA
Signal voltage	$\pm 10$ V
Overrange/ measuring range underflow	status byte, status bit, measured value and LED <sup>2)</sup>
Input filter	low pass first order, fG = 5 kHz
Internal resistance	1 M $\Omega$
Resolution of the A/D converter	14 bit
Monotonicity without missing codes	yes
Resolution of the measured value	13 bit + sign bit
Value of a LSB (Least Significant Bit)	1.2 mV
Measuring error <sub>25 °C</sub>	$\leq \pm 0.05\%$ of the full scale value
Temperature coefficient	$< \pm 0.01\%/K$ of the full scale value
Measuring error	$\leq 0.4\%$ over whole temperature range $\leq 0.1\%$ of upper range value (non-linearity)
Crosstalk attenuation	$\geq 80$ db
Sampling time of repetition	1 ms
Operating mode	triggered
Sampling delay (instruction/conversion)	$\leq 50$ $\mu$ s
Sampling delay (module)	1 ms
Sampling delay (channel/channel)	$\leq 1$ $\mu$ s
Sampling duration	$\leq 5$ $\mu$ s
Method of conversion	SAR (Successive Approximation Register)
Protection	RC circuit
Admissible continuous overload	DC $\pm 60$ V
Voltage resistance	DC 500V (channel/channel or channel/system)
Bit width	2 x 16 bits data 2 x 8 bits control/status (option)
Dimensions W x H* x L * from upper edge of 35 DIN rail	12 mm x 64 mm x 100 mm
Weight	ca. 55 g

Standards and Regulations (cf. Chapter 2.2 of the Coupler/Controller Manual)		
EMC-Immunity to interference (CE)	acc. to EN 61000-6-2: 2005	
EMC-Emission of interference (CE)	acc. to EN 61000-6-4: 2007	
Approvals (cf. Chapter 2.2 of the Coupler/Controller Manual)		
	Conformity Marking	
	DNV (Det Norske Veritas)	Cl. B

<sup>2)</sup> Minimum/maximum limiting values can also be set according to customers' specifications.

<sup>1)</sup> In connection with synchronized sampling of the slaves (fieldbus-coupler 750-303 (as from version 0101))



### 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: <http://www.wago.com> → Documentation → WAGO-I/O-SYSTEM 750 → System Description

### 2.1.2.6 Process Image

The analog input module 750-479/000-001 transmits 16-bit measured values per channel with status information as well as 8 optional status bits to the coupler/controller.  
 However, accessing the status byte depends on the fieldbus system being used.



#### Attention

The representation of the process data of some I/O modules or their variations in the process image depends on the fieldbus coupler/-controller used. Please take this information as well as the particular design of the respective control/status bytes from the section "Fieldbus Specific Design of the Process Data" included in the description concerning the process image of the corresponding coupler/controller.

The status information of the 16-bit value is mapped in bit 0 and bit 1, the digitalized measured value in bit 2 to bit 15.

Process values of module 750-479/000-001						
Input voltage ±10 V	numerical value with status informations <sup>1)</sup>				status- byte hex.	LED Error AI 1, 2
	binary	FÜ <sup>1)</sup>	hex.	dec.		
>10.0	'0111.1111.1111.11	01'	0x7FFD	32765	0x42	on
10.0	'0111.1111.1111.11	00'	0x7FFC	32764	0x00	off
7.5	'0110.0000.0000.00	00'	0x6000	24576	0x00	off
5.0	'0100.0000.0000.00	00'	0x4000	16384	0x00	off
2.5	'0010.0000.0000.00	00'	0x2000	8192	0x00	off
0.0	'0000.0000.0000.00	00'	0x0000	0	0x00	off
-2.5	'1110.0000.0000.00	00'	0xE000	-8192	0x00	off
-5.0	'1100.0000.0000.00	00'	0xC000	-16384	0x00	off
-7.5	'1010.0000.0000.00	00'	0xA000	-24576	0x00	off
-10.0	'1000.0000.0000.00	00'	0x8000	-32768	0x00	off
<-10.0	'1000.0000.0000.00	01'	0x8001	-32767	0x41	on

<sup>1)</sup> status informations: F: Error, Ü: over control

### 3 Use in Hazardous Environments

WAGO-I/O-SYSTEM 750 (electrical components) is designed for use in zone 2 explosive environments. The following sections include both the identification of components and the installation regulations to be observed.

#### 3.1 Identification

##### 3.1.1 For Europe according to CENELEC and IEC

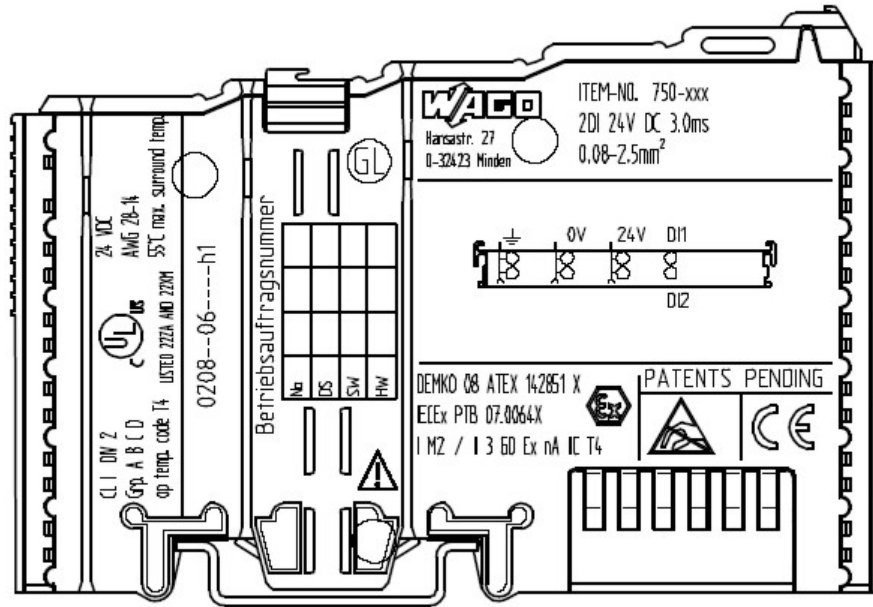


Fig. 3.1.1-1: Example for lateral labeling of bus modules (750-400, 2 channel digital input module 24 V DC)

p01xx03x

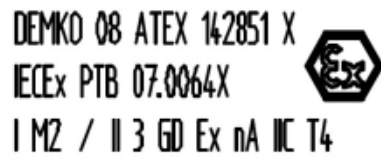


Fig. 3.1.1-2: Printing on text detail in accordance with CENELEC and IEC

p01xx04x

Tab. 3-1: Description of Printing on

Printing on Text	Description
DEMKO 08 ATEX 142851 X IECEX PTB 07.0064X	Approval body and/or number of the examination certificate
I M2 / II 3 GD	Device group and Unit category
Ex nA	Type of ignition and extended identification
IIC	Device group
T4	Temperature class

### 3.1.2 For America according to NEC 500

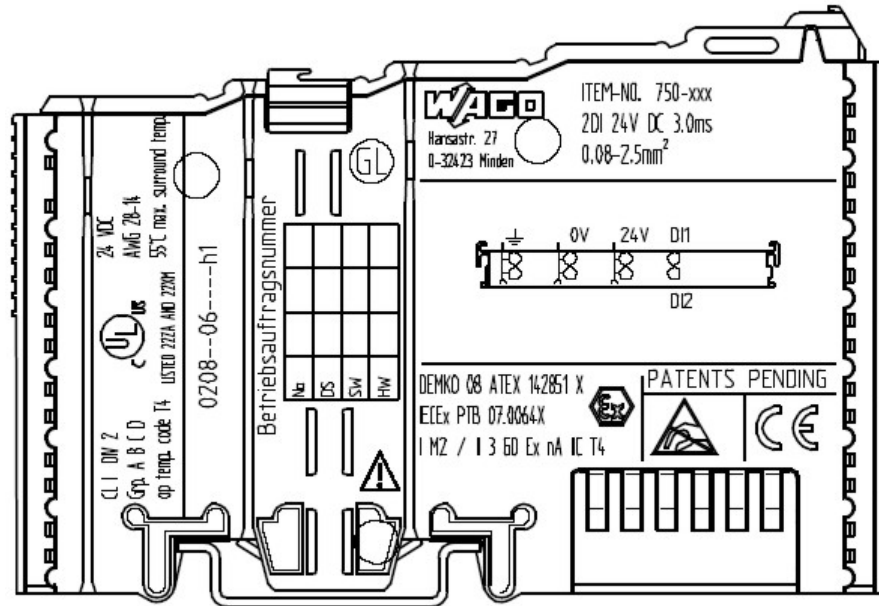


Fig. 3.1.2-3: Example for lateral labeling of bus modules (750-400, 2 channel digital input module 24 V DC)

p01xx03x



Fig. 3.1.2-4: Printing on text detail in accordance with CENELEC and IEC

p01xx05x

Tab. 3-2: Description of Printing on

Printing on Text	Description
CL 1	Explosion protection group (condition of use category)
DIV 2	Area of application (zone)
Grp. ABCD	Explosion group (gas group)
Op temp. code T4	Temperature class

## 3.2 Installation Regulations

In the **Federal Republic of Germany**, various national regulations for the installation in explosive areas must be taken into consideration. The basis for this forms the working reliability regulation, which is the national conversion of the European guideline 99/92/E6. They complemented by the installation regulation EN 60079-14. The following are excerpts from additional VDE regulations:

Tab. 3-3: VDE Installation Regulations in Germany

Standard	Installation Regulations
DIN VDE 0100	Installation in power plants with rated voltages up to 1000 V
DIN VDE 0101	Installation in power plants with rated voltages above 1 kV
DIN VDE 0800	Installation and operation in telecommunication plants including information processing equipment
DIN VDE 0185	lightning protection systems

The **USA** and **Canada** have their own regulations. The following are excerpts from these regulations:

Tab. 3-4: Installation Regulations in USA and Canada

Standard	Installation Regulations
NFPA 70	National Electrical Code Art. 500 Hazardous Locations
ANSI/ISA-RP 12.6-1987	Recommended Practice
C22.1	Canadian Electrical Code



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### Warning

When using the **WAGO-I/O SYSTEM 750** (electrical operation) with Ex approval, the following points are mandatory:

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### 3.2.1 ANSI/ISA 12.12.01

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.



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**Warning**

Explosion hazard - substitution of components may impair suitability for Class I, Div. 2.

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**Warning**

Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

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When a fuse is provided, the following marking shall be provided:

”A switch suitable for the location where the equipment is installed shall be provided to remove the power from the fuse.”

The switch need not be integrated in the equipment.

For devices with Ethernet connectors:

”Only for use in LAN, not for connection to telecommunication circuits.”



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**Warning**

Use Module 750-642 only with antenna module 758-910.

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### 3.2.2 TÜV Nord Ex-i applications

For operation in zone 2, the **WAGO-I/O-System 750-\*\*\*** must be mounted in an enclosure that fulfills the requirements of the directive 94/9/EG and the relevant standards EN 60079-0 and EN 60079-15. The fulfillment of these requirements must be certified by an appointed office.

Only devices that are suitable for operation in areas subject to explosion of zone 2 and 22 and that are suitable for the conditions in the place of installation (declaration of conformity or certificate from a test office) may be connected to not intrinsically safe circuits in zone 2 or zone 22.

If the interface circuits are operated without the 750-3 fieldbus coupler ../...-... (DEMKO 08 ATEX 142851 X), then measures must be taken outside of the device so that the rated voltage will not be exceeded by more than 40 % due to temporary faults.

The connection and interruption of non intrinsically-safe circuits under voltage is only permissible during installation, maintenance or for repair purposes. The simultaneous occurrence of explosive atmosphere and installation, maintenance, etc. must be ruled out.

For operation in zone 22, the **WAGO-I/O-System 750-\*\*\*** must be mounted in an enclosure that fulfills the requirements of the directive 94/9/EG and the relevant standards EN 61241-0 and EN 61241-1. The fulfillment of these requirements must be certified by an appointed office. The housing must be marked on the outside with

II 3 (1) GD Ex nA tD [ia] [iaD] IIC/IIB A22 IP6X T135°C (T4) and/ or

II 3 (2) GD Ex nA tD [ib] [ibD] IIC/IIB A22 IP6X T135°C (T4).

The marking must take into account all devices built into the enclosure.

The manufacturer of the whole device must ensure that taking into account the maximum ambient temperature range, the temperature in the enclosure will not drop below 0 °C or exceed 55 °C.

DIP switches, coding switches, and potentiometers that are connected to the module may only be operated if an explosive atmosphere can be ruled out.

### 3.2.3 ATEX and IEC Ex

GROUP I, CATEGORY M2 only with a suitable enclosure according to IEC 60079-0 and IEC 60079-1 required by end-user. When used in Category M2 locations, the modules have to be installed in suitable ATEX Category M2 certified enclosures according to EN 60079-0: 2006 and EN 60079-1: 2007.

The Fieldbus Independent Modules of the **WAGO-I/O-System 750-.../....-....** have to be installed in a Pollution Degree 2 environment or better in the end use application for use with an IP54 minimum enclosure. Except otherwise specified below. Otherwise the modules have to be installed in an IP64 minimum enclosure.

Modules 750-609 and 750-611 have to be installed in an IP 64 minimum enclosure.

When used in the presence of combustible dust the enclosure shall comply with the relevant requirements of IEC 61241-0:2004 and IEC 61241-1:2004.

Installation, addition, removal or replacement of modules, fieldbus connectors or fuses may only take place when the system supply and the field supply are switched off, or when the area is known to be non-hazardous.

DIP-switches, binary-switches and potentiometers attached to the modules may only be adjusted when the area is known to be non-hazardous.

Module 750-642 has to be used only with antenna module 758-910 with a max. cable length of 2.5 m.

Provide the transient protection device not exceeding 40 % of the rated voltage at the power supply terminal of the apparatus.

Ambient temperature range: -20 °C to +55 °C



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#### **Additional Information**

Proof of certification is available on request.

Also take note of the information given on the module technical information sheet.

The Instruction Manual, containing these special conditions for safe use, must be readily available to the user.

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