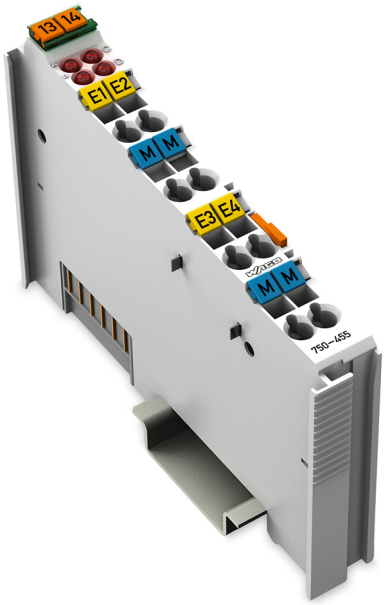
TECHDOCS

WAGO I/O System 750/753

4-channel analog input; 4 … 20 mA; single-ended

750-455; 750-455/025-000



Product manual
Valid as of HW version 07 | FW version 04
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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.

E-Mail: **documentation@wago.com**

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 Provisions

1.1 Scope of Applicability

This document applies to the following products:

750-455 (4AI 4-20mA S.E.) 4-channel analog input; 4 … 20 mA; single-ended.

From hardware version	07
From firmware version	04
Product detail page	**www.wago.com/750-455**

750-455/025-000 (4AI 4-20mA S.E. /T) 4-channel analog input; 4 … 20 mA; single-ended; ext. temperature.

From hardware version	06
From firmware version	04
Product detail page	**www.wago.com/750-455/025-000**

Applicable document

System Manual I/O System 750/753

- Provisions
- Safety
- Planning
- Transport and Storage
- Assembly and Disassembly
- Conductor Termination
- Decommissioning

2 Overview

The I/O module processes standard 4 … 20 mA signals from the field.

The I/O module has four input channels for field signals. The ground connections are available for all four channels on a common 0 V ground potential. This potential is not the 0 V field power of the power jumper contacts.

One red error LED per channel indicates a wire break or measurement overrange/underrange.

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

The internal power supply powers the module.

The potentials for the field level received via the power jumper contacts are electrically isolated and passed on to subsequent I/O modules, without being used themselves.

3 Properties

3.1 View

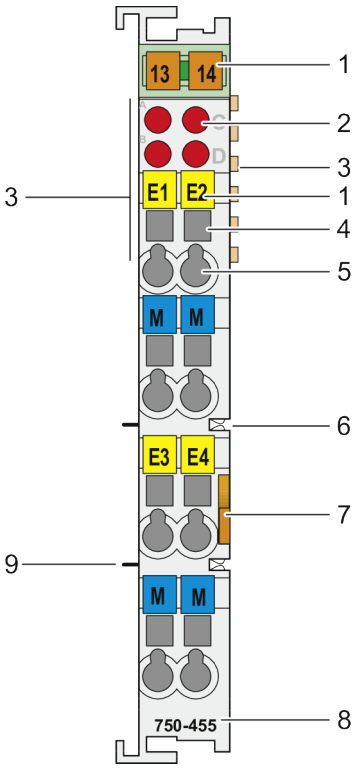

Figure 1: View

1	Slot for Mini-WSB (optional)	🕮 System Manual I/O System 750/753
2	Status LEDs	🖱 Indicators [▸ 7]
3	Data contacts	🕮 System Manual I/O System 750/753
4	Access to open the associated CAGE CLAMP® connection	🕮 System Manual I/O System 750/753
5	CAGE CLAMP® connections	🖱 Wiring Interface [▸ 8] and 🕮 System Manual I/O System 750/753
6	Power jumper contacts (spring)	🖱 Power Jumper Contacts [▸ 9] and 🕮 System Manual I/O System 750/753
7	Release tab	🕮 System Manual I/O System 750/753
8	Item number	🖱 Scope of Applicability [▸ 4]
9	Power jumper contacts (blade)	🖱 Power Jumper Contacts [▸ 9] and 🕮 System Manual I/O System 750/753

3.2 Indicators

One red error LED per channel indicates a wire break or measurement overrange/underrange.

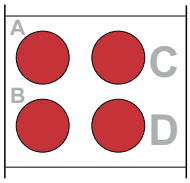

Figure 2: Indicators

Channel	Designation	LED	State	Function
1	Error AI 1	A	Off	Normal operation
			Red	Wire break or measurement underrange or overrange
2	Error AI 2	C	Off	Normal operation
			Red	Wire break or measurement underrange or overrange
3	Error AI 3	B	Off	Normal operation
			Red	Wire break or measurement underrange or overrange
4	Error AI 4	D	Off	Normal operation
			Red	Wire break or measurement underrange or overrange

3.3 Wiring Interface

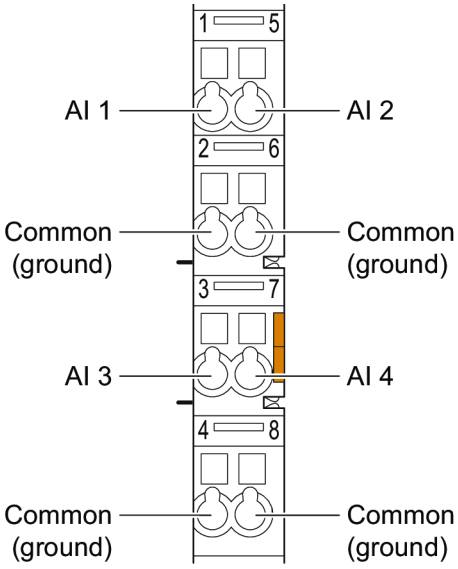

Figure 3: CAGE CLAMP® Connections

Channel	Designation	Connection	Function
1	AI 1	1	Analog input 1: signal
	Ground	2	Analog input: ground
2	AI 2	5	Analog input 2: signal
	Ground	6	Analog input: ground
3	AI 3	3	Analog input 3: signal
	Ground	4	Analog input: ground
4	AI 4	7	Analog input 4: signal
	Ground	8	Analog input: ground

3.4 Power Jumper Contacts

The potential for the field supply is fed in via the blade contacts and passed on via the spring contacts.

For additional information on the Power Jumper Contacts, please see
🕮 System Manual I/O System 750/753.

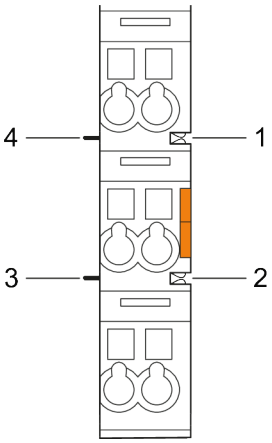

Figure 4: Power Jumper Contacts

No.	Type
1	Groove with spring contact
2	
3	Blade contact
4	

Arrangement in the Bus Node

For mechanical arrangement of the I/O module, the previous component must have at least 2 open grooves for accommodating the blade contacts.

For electrical compatibility requirements see Section Circuit Diagram [▸ 10].

3.5 Circuit Diagram

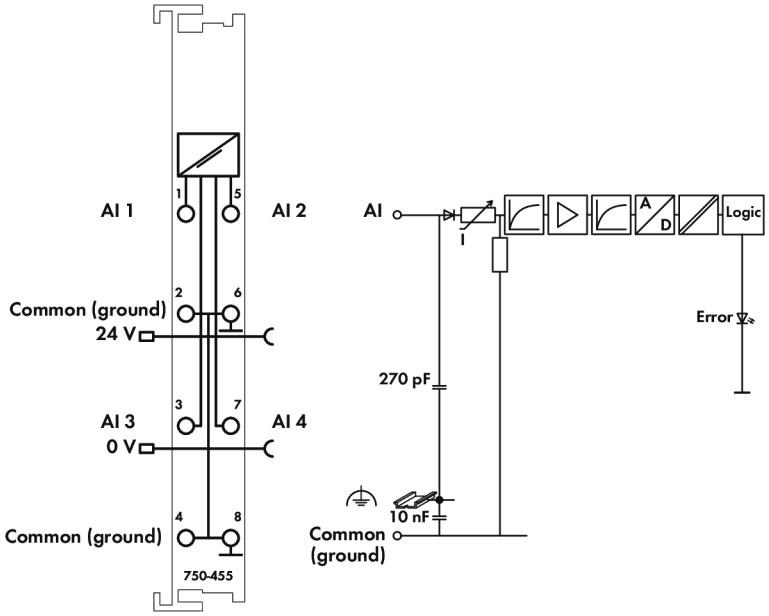

Figure 5: Circuit Diagram

For information on the system power supply, please see 🕮 **System Manual I/O System 750/753**.

4 Functions

4.1 Signal Processing

The I/O module provides one status byte (8 bits) and one data word (16 bits) per channel.

Whether the status byte can be read out via the fieldbus depends on how diagnostic information is transmitted by the corresponding fieldbus or the head station used. In any case, the status byte can be read out via the service interface of the head station using the WAGO-I/O-*CHECK* commissioning tool.

The I/O module captures the input current range 4 mA ... 20 mA with a resolution of 12 bits.

The measured value is given in two's complement representation, and the numerical value is mapped to bits B15 ... B4 of the data word (bit 15 is the sign bit). Bits B3 and B2 are reserved and can take a value of 0 or 1. Bits B1 and B0 contain diagnostic information.

In the event of measurement overrange or underrange or wire break, the I/O module transmits the next displayable measured value and sets B0 and B1 to a value of 1.

Simplified Interpretation of the Measured Value

A simpler way to obtain the measured value is to interpret the entire data word as a 16-bit integer value. The measurement range is then scaled to the numerical value range from 0x0000 to 0x7FFF. The decimal places of the resulting analog value corresponding to the lower four bits, however, must be ignored.

4.2 Process Image

Table 1: Process Image of the I/O Module – Examples of Process Values

Input Current 4 … 20 mA	Numerical Value					Status byte Hex.	LED Error AI 1 … 4
	Binary			Hex.[3]	Dec.[3]		
	Measured Value B15 … B4	Reserved[1] B3, B2	Diagnostics[2] B1, B0				
<~3,0	'0000.0000.0000.	00	11'	0x0003	3	0x41	On
4.0	'0000.0000.0000.	XX	00'	0x0000	0	0x00	Off
5.6	'0000.1100.1101.	XX	00'	0x0CD0	3,280	0x00	Off
7.2	'0001.1001.1001.	XX	00'	0x1990	6,544	0x00	Off
8.8	'0010.0110.0110.	XX	00'	0x2660	9,824	0x00	Off
10.4	'0011.0011.0011.	XX	00'	0x3330	13,104	0x00	Off
12.0	'0100.0000.0000.	XX	00'	0x4000	16,384	0x00	Off
13.6	'0100.1100.1100.	XX	00'	0x4CC0	19,648	0x00	Off
15.2	'0101.1001.1001.	XX	00'	0x5990	22,928	0x00	Off
16.8	'0110.0110.0110.	XX	00'	0x6660	26,208	0x00	Off
18.4	'0111.0011.0011.	XX	00'	0x7330	29,488	0x00	Off
20.0	'0111.1111.1111.	XX	00'	0x7FF0	32,752	0x00	Off
>~21.0	'0111.1111.1111.	11	11'	0x7FFF	32,767	0x42	On

[1] Bits B3 and B2 are reserved and can each take a value of 0 or 1.
Exception: Diagnostics are pending; in that case, their value is fixed.
[2] Indicates whether a measurement overflow/underflow or wire break exists.
[3] The measured value depends on the reserved bits B3 and B2. In this example, X = 0 was assumed.

5 Planning

This section provides helpful information for planing the use of the product in a node.

5.1 Compatibility

The I/O module can be operated on all head stations of the WAGO I/O System 750/753 with the exception of the economy variants 750-320, 750-323, 750-324 and 750-327.

5.2 Aids

The status byte can be read out via the service interface of the head station using the WAGO-I/O-*CHECK* commissioning tool.

You can obtain the WAGO-I/O-*CHECK* under Item No. **759-302**. The description is available on the website at **www.wago.com**.

5.3 Connection Example

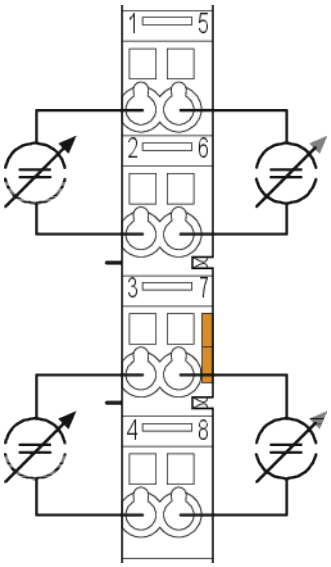

Figure 6: Connection Example

6 Appendix

6.1 Technical Data, Approvals, Guidelines and Standards

Note

Subject to changes!

Please also observe the further product documentation! You can generate the current datasheet at any time at: www.wago.com /<item number>.

See also

- Data sheet 750-455 [▸ 15]
- Data sheet 750-455/025-000 [▸ 18]

Data Sheet | Item Number: 750-455

4-channel analog input; 4 … 20 mA; Single-ended

https://www.wago.com/750-455

This analog input module processes standard 4–20 mA signals.
The input signal is electrically isolated and is transmitted with a resolution of 12 bits.
The internal system supply powers the module.
The input channels of the module have a common ground potential.

Technical data

Number of analog inputs	4
Total number of channels (module)	4
Signal type	Current
Signal type (current)	4 … 20 mADC
Sensor connection	4 x (2-wire)
Input voltage (max.)	32 V
Signal characteristics	Single-ended
Resolution [bit]	12 bits
Input resistance (max.)	100 Ω
Data width	4 x 16-bit data; 4 x 8-bit control/status (optional)
Conversion time (typ.)	10 ms
Measurement error (reference temperature)	25 °C
Measurement error, deviation (max.) from the upper-range value	0.1 %
Temperature error (max.) of the upper-range value	0.01 %/K
Supply voltage (system)	5 VDC; via data contacts
Current consumption (5 V system supply)	65 mA
Supply voltage (field)	24 VDC (-25 … +30 %); via power jumper contacts (power supply via blade contact; transmission (field side supply voltage only) via spring contact)
Isolation	500 V system/field
Indicators	LED (A-D) red: Error AI 1 … AI 4
Number of incoming power jumper contacts	2
Number of outgoing power jumper contacts	2

Connection data

Connection technology: inputs/outputs	8 x CAGE CLAMP®
Connectable conductor materials	Copper
Connection type 1	Inputs/outputs
Solid conductor	0.08 … 2.5 mm² / 28 … 14 AWG
Fine-stranded conductor	0.08 … 2.5 mm² / 28 … 14 AWG
Strip length	8 … 9 mm / 0.31 … 0.35 inches

Physical data

Width	12 mm / 0.472 inches
Height	100 mm / 3.937 inches
Depth	69.8 mm / 2.748 inches
Depth from upper-edge of DIN-rail	62.6 mm / 2.465 inches

Continued on next page

Mechanical data

Mounting type	DIN-35 rail
Pluggable connector	fixed

Material data

Color	light gray
Housing material	Polycarbonate; polyamide 6.6
Fire load	1.286 MJ
Weight	52 g
Conformity marking	CE

Environmental requirements

Ambient temperature (operation)	0 … +55 °C
Ambient temperature (storage)	-40 … +85 °C
Protection type	IP20
Pollution degree	2 per IEC 61131-2
Operating altitude	0 … 2000 m / 0 … 6562 ft
Mounting position	Horizontal left, horizontal right, horizontal top, horizontal bottom, vertical top and vertical bottom
Relative humidity (without condensation)	95 %
Vibration resistance	4g per IEC 60068-2-6
Shock resistance	15g per IEC 60068-2-27
EMC immunity to interference	per EN 61000-6-2, marine applications
EMC emission of interference	per EN 61000-6-4, marine applications
Exposure to pollutants	per IEC 60068-2-42 and IEC 60068-2-43
Permissible H_2S contaminant concentration at a relative humidity 75 %	10 ppm
Permissible SO_2 contaminant concentration at a relative humidity 75 %	25 ppm

Product classification

UNSPSC	32101502

Environmental Product Compliance

CAS-No.	1303-86-2 1317-36-8 7439-92-1
REACH Candidate List Substance	Diboron trioxide Lead Lead monoxide
RoHS Compliance Status	Compliant,With Exemption
RoHS Exemption	6(c) 7(a) 7(c)-I 7(c)-II
SCIP notification number (Austria)	236d4246-1547-46ff-aa98-585795c2ea72
SCIP notification number (Belgium)	188731cf-f22c-4900-9119-a9616d6b701c
SCIP notification number (Bulgaria)	747643ad-866b-4edc-87b5-f8e92cb74b17
SCIP notification number (Czech Republic)	32631e7c-0884-436b-8e84-7a6a6585dbd9
SCIP notification number (Denmark)	64209a78-edac-4fd1-899b-8af15a73700d
SCIP notification number (Finland)	aae38999-f9c8-4449-a196-5068e6236a60
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SCIP notification number (Romania)	42ad3d9f-b0b7-44c3-a36f-8f30391def72

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Environmental Product Compliance

SCIP notification number (Sweden)	d15e461c-1a42-4b90-865d-44f88540466d

Approvals / Certificates

General approvals

Approval	Standard	Certificate Name
EAC GZO Almaty Standart	TP TC 020/2011	EAC CoC 03083
KC National Radio Research Agency	Article 58-2, Clause 3	MSIP-REM-W43-AIM750

Declarations of conformity and manufacturer's declarations

Approval	Standard	Certificate Name
EU-Declaration of Conformity WAGO GmbH & Co. KG	-	-
UK-Declaration of Conformity WAGO GmbH & Co. KG	-	-

Approvals for marine applications

Approval	Standard	Certificate Name
ABS American Bureau of Shipping	-	22-2219060
BSH Bundesamt fuer Seeschifffahrt und Hydrographie	-	1104
BV Bureau Veritas S.A.	-	13453/E0 BV
DNV DNV GL SE	DNV-CG-0339,Aug.2021	TAA0000194
KR Korean Register of Shipping	-	KR HMB05880-AC001
LR Lloyds Register EMEA	-	LR22180952TA
PRS Polski Rejestr Statków	-	TE/1101/880590/23
RINA RINA Germany GmbH	-	ELE343521XG001

Approvals for hazardous areas

Approval	Standard	Certificate Name
ATEX TUEV Nord Cert GmbH	EN 60079-0	TUEV14ATEX148929X (II 3 G Ex ec IIC T4 Gc)
CCCEx CQST/CNEx	CNCA-C23-01	2020312310000213 (Ex ec IIC T4 Gc)
IECEx TUEV Nord Cert GmbH	IEC 60079-0	IECEx TUN 14.0035 X (Ex ec IIC T4 Gc)
INMETRO TÜV Rheinland do Brasil Ltda.	IEC 60079-0	TÜV 12.1297 X
KTL Korea Testing Laboratory	KOSHA Article 34, IEC60079-0	21-KA4BO-0550X
UKEx WAGO GmbH & Co. KG	EN 60079-0	UKCA_WA GO22UKEX003X_ec

Data Sheet | Item Number: 750-455/025-000

4-channel analog input; 4 … 20 mA; Single-ended; Ext. Temperature

https://www.wago.com/750-455/025-000

This analog input module processes standard 4–20 mA signals.
The input signal is electrically isolated and is transmitted with a resolution of 12 bits.
The internal system supply powers the module.
The input channels of the module have a common ground potential.

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Height	100 mm / 3.937 inches
Depth	69.8 mm / 2.748 inches
Depth from upper-edge of DIN-rail	62.6 mm / 2.465 inches

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Mechanical data

Mounting type	DIN-35 rail
Pluggable connector	fixed

Material data

Color	light gray
Housing material	Polycarbonate; polyamide 6.6
Fire load	1.264 MJ
Weight	50.9 g
Conformity marking	CE

Environmental requirements

Ambient temperature (operation)	-20 … +60 °C
Ambient temperature (storage)	-40 … +85 °C
Protection type	IP20
Pollution degree	2 per IEC 61131-2
Operating altitude	0 … 2000 m / 0 … 6562 ft
Mounting position	Horizontal left, horizontal right, horizontal top, horizontal bottom, vertical top and vertical bottom
Relative humidity (without condensation)	95 %
Relative humidity (with condensation)	Short-term condensation per Class 3K6/IEC EN 60721-3-3 and E-DIN 40046-721-3, accounting for a temperature range of −20 to +60 °C (except for wind-driven precipitation, water and ice formation)
Vibration resistance	4g per IEC 60068-2-6
Shock resistance	15g per IEC 60068-2-27
EMC immunity to interference	per EN 61000-6-2, marine applications
EMC emission of interference	per EN 61000-6-4, marine applications
Exposure to pollutants	per IEC 60068-2-42 and IEC 60068-2-43
Permissible H_2S contaminant concentration at a relative humidity 75 %	10 ppm
Permissible SO_2 contaminant concentration at a relative humidity 75 %	25 ppm

Product classification

UNSPSC	32101505

Environmental Product Compliance

CAS-No.	1303-86-2 1317-36-8 7439-92-1
REACH Candidate List Substance	Diboron trioxide Lead Lead monoxide
RoHS Compliance Status	Compliant,With Exemption
RoHS Exemption	6(c) 7(a) 7(c)-I 7(c)-II
SCIP notification number (Austria)	7b250c65-6466-42ce-921a-0d2868205564
SCIP notification number (Belgium)	4b090207-5679-472f-80db-1173b958d76a
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Environmental Product Compliance

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SCIP notification number (Romania)	a8b3059b-bd4b-4ccd-b15e-848d00f12685
SCIP notification number (Sweden)	13858077-7415-4a5a-8751-30f768081c0f

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UK-Declaration of Conformity WAGO GmbH & Co. KG	-	-

Approvals for marine applications

Approval	Standard	Certificate Name
ABS American Bureau of Shipping	-	22-2227356-PDA
BSH Bundesamt fuer Seeschifffahrt und Hydrographie	-	1104
LR Lloyds Register	-	LR2475997TA
PRS Polski Rejestr Statków	-	TE/1102/880590/23

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IECEx TUEV Nord Cert GmbH	IEC 60079-0	IECEx TUN 14.0035 X (Ex ec IIC T4 Gc)
INMETRO TÜV Rheinland do Brasil Ltda.	IEC 60079-0	TÜV 12.1297 X
UKEx WAGO GmbH & Co. KG	EN 60079-0	UKCA_WA GO22UKEX003X_ec

List of Figures

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