TECHDOCS

WAGO I/O System 750/753

8-channel digital input/output; 24 VDC; 0.5 A

750-1506



Valid as of HW version 04 | FW version --
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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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1 Provisions

1.1 Scope of Applicability

This document applies to the following product:

750-1506 (8DI/8DO 24V DC 0.5A) 8-channel digital input/output; 24 VDC; 0.5 A.

From hardware version	04
From firmware version	--
Product detail page	www.wago.com/750-1506

Note

Note applicable documents!

The complete operating instructions for the product consists of several, applicable documents. The product must only be installed and operated in accordance with the complete operating instructions. Knowledge of all applicable documents is required for proper use. You can find all documents and information on the product detail page.

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 receives binary control signals from digital field devices (e.g., from sensors, transmitters, switches or proximity sensors) and transmits control signals from the automation device to connected actuators (e.g., solenoid valves, contactors, transmitters, relays or other electrical loads).

The I/O module is suitable for interference-free use in safety circuits.

The I/O module has eight input channels and eight output channels, allow direct connection of single-wire sensors and actuators.

Each input channel has a noise-rejection RC filter with a 3.0 ms time constant.

The I/O module inputs provide high-side switching. If the 24 V potential for field power is switched to an input connection, the signal status for the corresponding input channel is set to “high.”

The I/O module’s outputs provide high-side switching. If the signal status of an output channel is “high,” the 24 V potential for the field power supply is switched to the corresponding output connection.

For each channel, a green status LED indicates the signal status.

The field level and the system level are electrically isolated from one another.

The I/O module can be operated on all head stations of the WAGO I/O System 750/753.

3 Properties

3.1 View

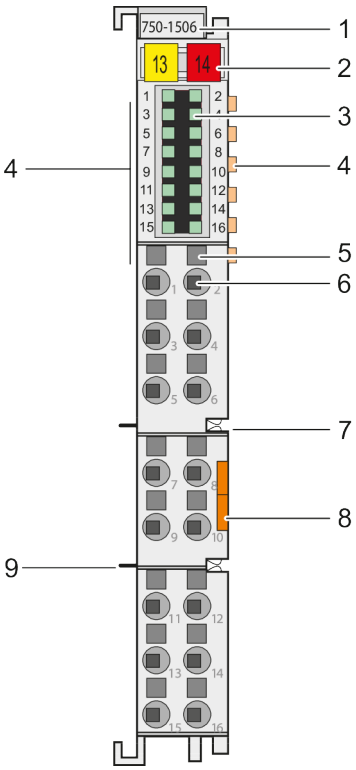


Figure 1: View

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

3.2 Indicators

For each channel, a green status LED indicates the signal status.

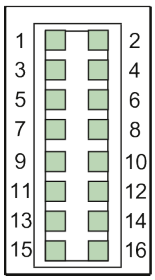


Figure 2: Indicators

Channel	Designation	LED	State	Function
1	DI 1 status	1	Off	DI 1 input: signal voltage (0)
			Green	DI 1 input: signal voltage (1)
	DO 1 status	9	Off	DO 1 output: signal voltage (0)
			Green	DO 1 output: signal voltage (1)
2	DI 2 status	2	Off	DI 2 input: signal voltage (0)
			Green	DI 2 input: signal voltage (1)
	DO 2 status	10	Off	DO 2 output: signal voltage (0)
			Green	DO 2 output: signal voltage (1)
3	DI 3 status	3	Off	DI 3 input: signal voltage (0)
			Green	DI 3 input: signal voltage (1)
	DO 3 status	11	Off	DO 3 output: signal voltage (0)
			Green	DO 3 output: signal voltage (1)
4	DI 4 status	4	Off	DI 4 input: signal voltage (0)
			Green	DI 4 input: signal voltage (1)
	DO 4 status	12	Off	DO 4 output: signal voltage (0)
			Green	DO 4 output: signal voltage (1)
5	DI 5 status	5	Off	DI 5 input: signal voltage (0)
			Green	DI 5 input: signal voltage (1)
	DO 5 status	13	Off	DO 5 output: signal voltage (0)
			Green	DO 5 output: signal voltage (1)
6	DI 6 status	6	Off	DI 6 input: signal voltage (0)
			Green	DI 6 input: signal voltage (1)
	DO 6 status	14	Off	DO 6 output: signal voltage (0)
			Green	DO 6 output: signal voltage (1)
7	DI 7 status	7	Off	DI 7 input: signal voltage (0)
			Green	DI 7 input: signal voltage (1)
	DO 7 status	15	Off	DO 7 output: signal voltage (0)
			Green	DO 7 output: signal voltage (1)
8	DI 8 status	8	Off	DI 8 input: signal voltage (0)
			Green	DI 8 input: signal voltage (1)
	DO 8 status	16	Off	DO 8 output: signal voltage (0)
			Green	DO 8 output: signal voltage (1)

3.3 Wiring Interface

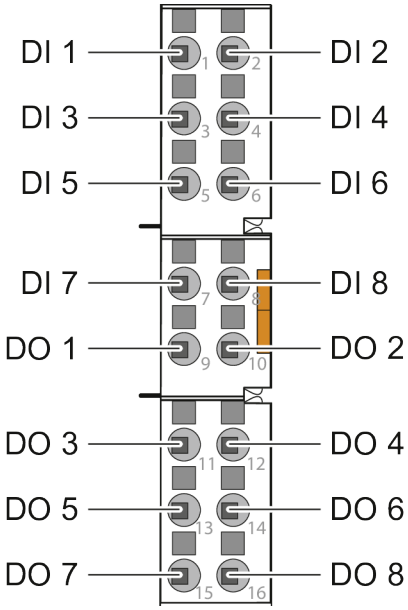


Figure 3: Push-in CAGE CLAMP® Connections

Channel	Designation	Connection	Function
1	DI 1	1	Input DI 1: signal voltage
	DO 1	9	Output DO 1: signal voltage
2	DI 2	2	Input DI 2: signal voltage
	DO 2	10	Output DO 2: signal voltage
3	DI 3	3	Input DI 3: signal voltage
	DO 3	11	Output DO 3: signal voltage
4	DI 4	4	Input DI 4: signal voltage
	DO 4	12	Output DO 4: signal voltage
5	DI 5	5	Input DI 5: signal voltage
	DO 5	13	Output DO 5: signal voltage
6	DI 6	6	Input DI 6: signal voltage
	DO 6	14	Output DO 6: signal voltage
7	DI 7	7	Input DI 7: signal voltage
	DO 7	15	Output DO 7: signal voltage
9	DI 8	8	Input DI 8: signal voltage
	DO 8	16	Output DO 8: signal voltage

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.

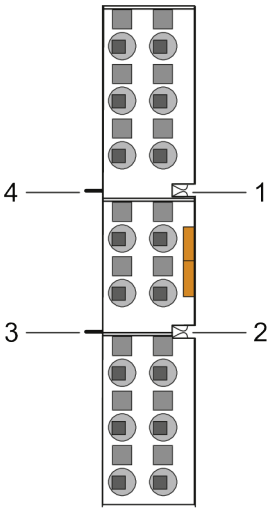


Figure 4: Power Jumper Contacts

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

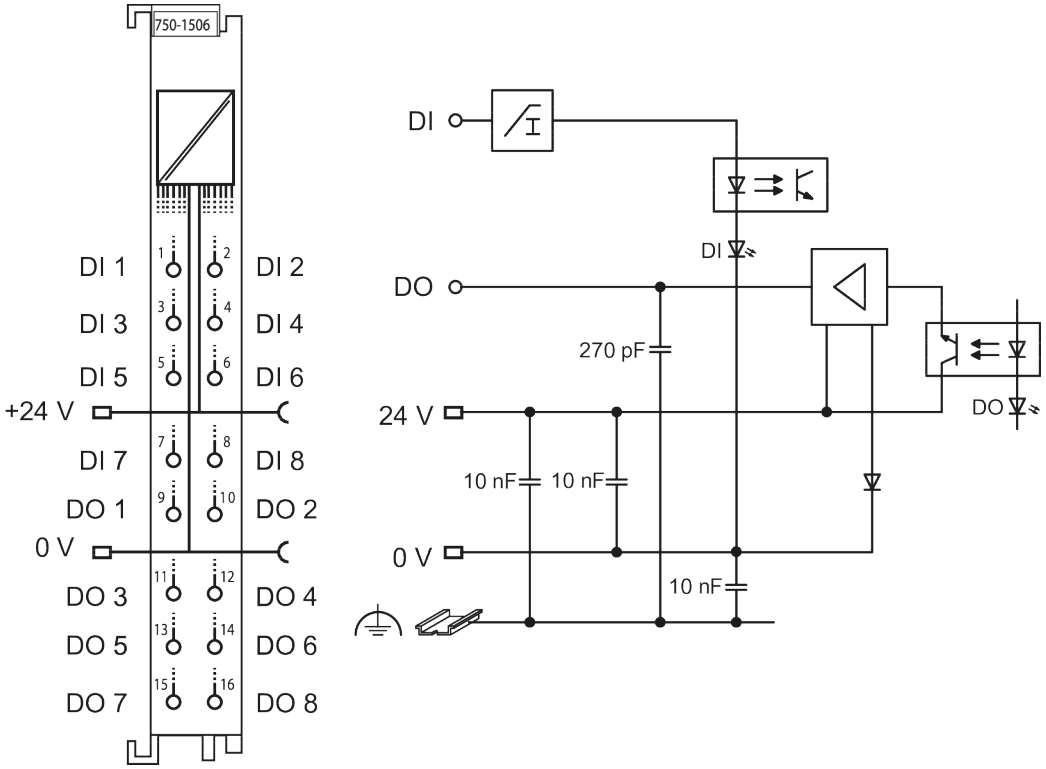


Figure 5: Circuit Diagram

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

4 Functions

4.1 Signal Processing

Each input channel has a noise-rejection RC filter with a 3.0 ms time constant.

The I/O module inputs provide high-side switching. If the 24 V potential for field power is switched to an input connection, the signal status for the corresponding input channel is set to "high."

The I/O module's outputs provide high-side switching. If the signal status of an output channel is "high," the 24 V potential for the field power supply is switched to the corresponding output connection.

4.2 Process Image

Table 1: Input bits 0 ... 7

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1

DI 1	DI 1 signal status – digital input channel 1
DI 2	DI 2 signal status – digital input channel 2
DI 3	DI 3 signal status – digital input channel 3
DI 4	DI 4 signal status – digital input channel 4
DI 5	DI 5 signal status – digital input channel 5
DI 6	DI 6 signal status – digital input channel 6
DI 7	DI 7 signal status – digital input channel 7
DI 8	DI 8 signal status – digital input channel 8

Table 2: Output bits 0 .. 7

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DO 8	DO 7	DO 6	DO 5	DO 4	DO 3	DO 2	DO 1

DO 1	DO 1 signal state – digital output channel 1
DO 2	DO 2 signal state – digital output channel 2
DO 3	DO 3 signal state – digital output channel 3
DO 4	DO 4 signal state – digital output channel 4
DO 5	DO 5 signal state – digital output channel 5
DO 6	DO 6 signal state – digital output channel 6
DO 7	DO 7 signal state – digital output channel 7
DO 8	DO 8 signal state – digital output channel 8

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.

5.2 Requirements for Wiring and Accessories

To protect the I/O module against overload, use a supply module with a fuse (e.g., Item No.: 750-601 or 750-610).

If applicable, use appropriate potential multiplication modules (e.g., Item Nos. 750-1605, 750-1606 or 750-1607) for the power supply to the sensors and actuators.

Use a suitable protective circuit to limit the induction voltage, such a recovery diode, parallel to the load. Inductive voltage limitation prevents damage to the I/O module's electronics when inductive loads are switched off.

An operating tool with a 2.5 mm blade (e.g., Item No.: 210-719) is required for opening the Push-in CAGE CLAMP® connections.

5.3 Connection Example

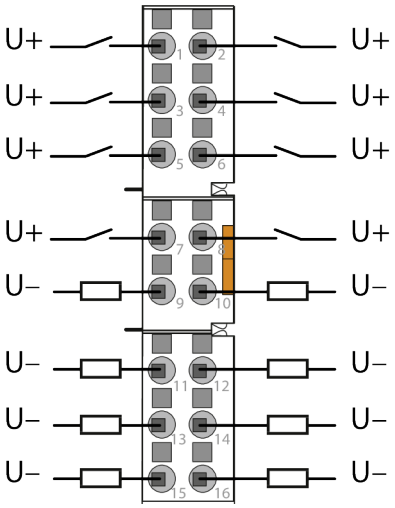


Figure 6: Example

5.4 Use in Safety Applications

The I/O module is suitable for interference-free use in safety circuits.

If the field-side supply is shut down via a safety switching device, the safety function of the I/O module is not active. If the interference-free I/O module is used correctly in a safety-related application, this does not affect either the SIL (or the Performance Level and category) achieved by the circuit. Note the following information.

- **Only operate with functional extra-low voltage**
  When using interference-free I/O modules, only use SELV/PELV-capable power supplies for the 24 VDC power supply.
- **Observe maximum voltage**
  Even in the event of failure, only a maximum voltage of $U_{max.}$ must be allowed to act on the interference-free I/O module; otherwise irreparable damage to the I/O module could occur. Use a power supply with active voltage limitation (overvoltage protection) or an alternate component. For the interference-free I/O module, the field supply voltage is: $U_{max.} < 32$ V
- **Ensure protection type IP54**
  Protection type IP54 is mandatory. Therefore, integration and operation of the interference-free I/O module is only allowed in switch boxes or control cabinets with protection type IP54 or higher.
- **Protect the outputs against feedback**
  The 24 V power supply must never be applied to the output of an interference-free I/O module. The system would not detect such a wiring error.
- **Avoid reverse power supply of the I/O module**
  A group of interference-free I/O modules must only be powered by a safety switching device. It is absolutely essential to avoid reverse power supply.
- **Prevent short circuits between outputs**
  It is absolutely essential to prevent short circuits between the outputs of different interference-free I/O modules. The system would not detect such short circuits.

According to EN ISO 13849-2, the following measures are required for an “external voltage” fault exclusion:

- Use of cables routed separately and
- Protection from external damage (e.g., with cable duct).

5.4.1 Connection to Safety Switching Devices or F I/O Modules

When the interference-free I/O module is used in safety-related applications, the I/O modules belonging to a safety switching device must be combined to form a potential group. The power supply of the potential group must only be provided via the following supply/filter modules:

Table 3: Supply/Filter Modules for Setting up a Potential Group

Supply module	Item no.: 750-601
	Item no.: 750-602
Filter module	Item no.: 750-626

Either a supply module or a distance module without power jumper contacts (item no.: 750-616) must be connected at the end of the potential group.

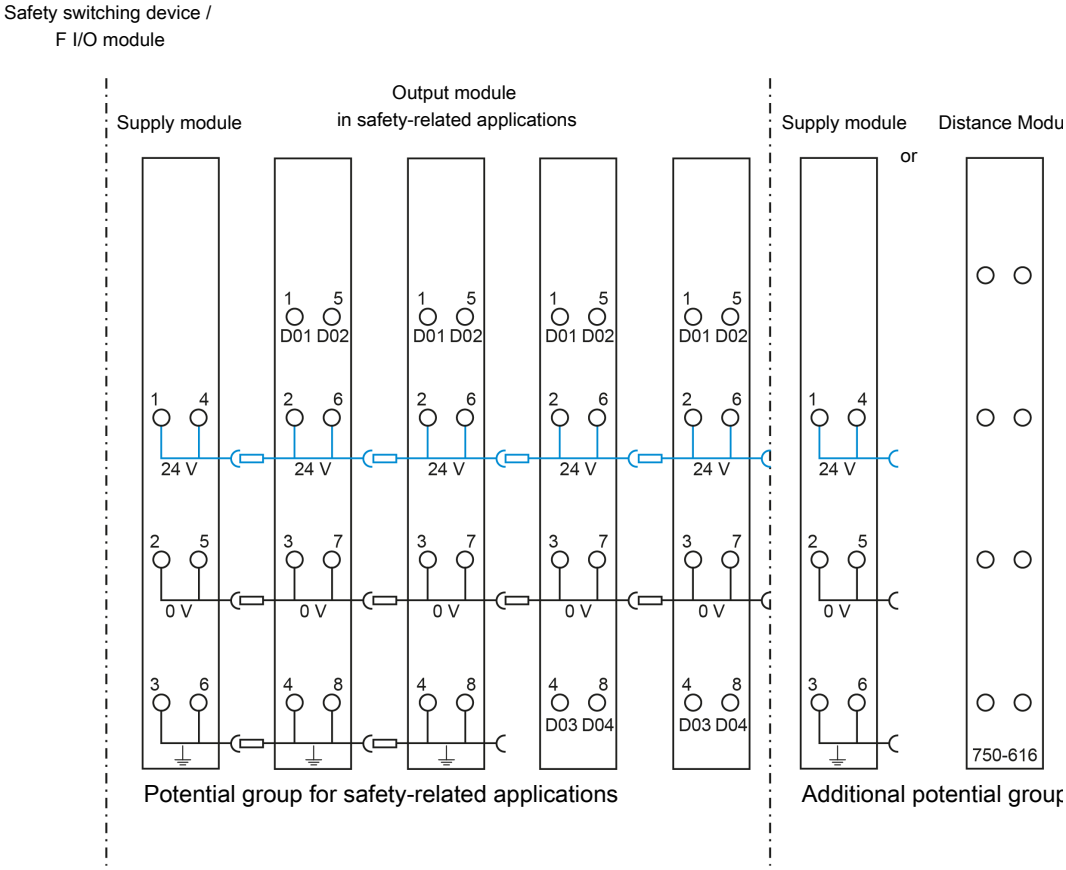


Figure 7: Setting Up a Potential Group (Example)

5.4.2 Connection Examples for Use in Safety Applications

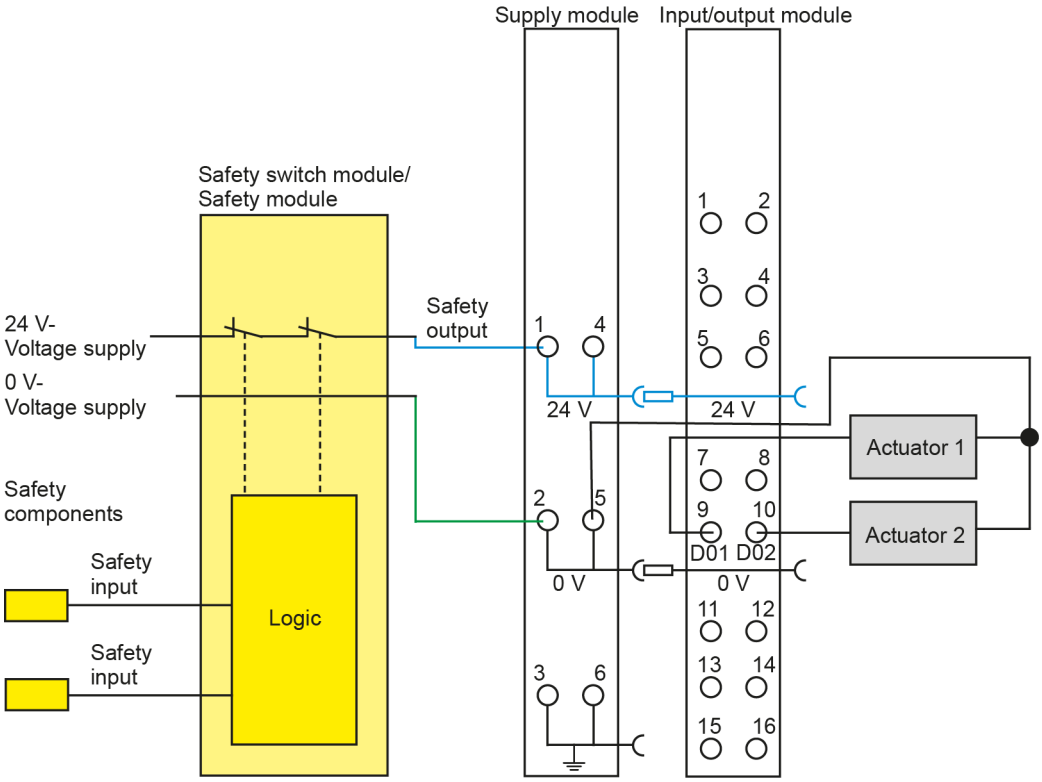


Figure 8: Two-Channel, **Single-Pole** Power Supply Shutdown

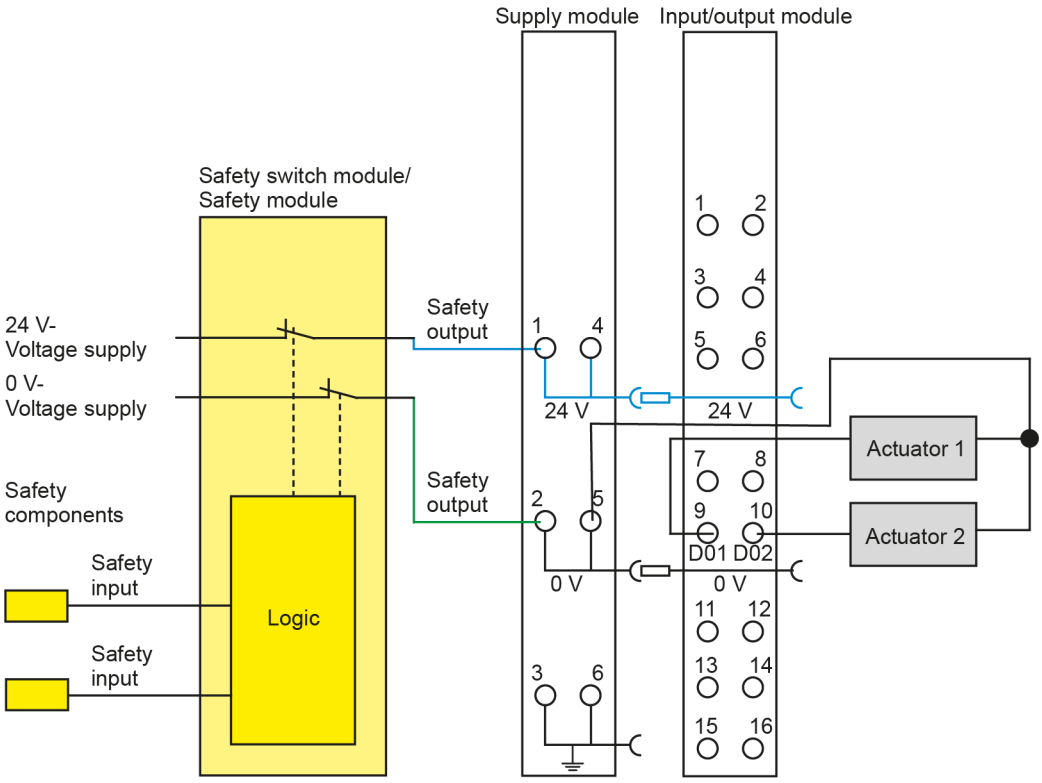


Figure 9: Two-Channel, **Two-Pole** Power Supply Shutdown

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 750-1506 [▶ 18]

Technical data

Number of digital inputs	8
Number of digital outputs	8
Total number of channels (module)	16
Signal type	Digital
Signal type (voltage)	24 VDC
Sensor connection	8 x (1-wire)
Input characteristic	high-side switching
Input filter	3 ms
Input current per channel for signal (0) typ.	0.6 mA
Input current per channel for signal (1) typ.	2.4 mA
Input current per channel for signal (1) min.	2.2 mA
Input current per channel for signal (1) max.	2.5 mA
Voltage range for signal (0)	−3 … +5 VDC
Voltage range for signal (1)	15 … 30 VDC
Actuator connection	8 x (1-wire)
Output characteristic	high-side switching
Output current per channel	0.5 A
Output current	short-circuit-protected
Load type	Resistive, inductive, lamp load
Switching frequency (max.)	1 kHz
Input data width (internal) max.	8 bits
Output data width (internal) max.	8 bits
Supply voltage (system)	5 VDC; via data contacts
Current consumption (5 V system supply)	30 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)
Current consumption, field supply (module with no external load)	16 mA
Isolation	500 V system/field
Indicators	LED (1-8) green: Status DI 1 … DI 8; LED (9-16) green: Status DO 1 … DO 8
Number of incoming power jumper contacts	2
Number of outgoing power jumper contacts	2
Current carrying capacity (power jumper contacts)	10 A

Connection Data

Connection technology: I/O	16 x Push-in CAGE CLAMP® (inputs/outputs)
Connectable conductor materials	Copper
Connection type	Inputs/outputs
Solid conductor	0.08 … 1.5 mm² / 28 … 16 AWG
Fine-stranded conductor	0.25 … 1.5 mm² / 22 … 16 AWG
Strip length	8 … 9 mm / 0.31 … 0.35 inches

Continued on next page

Physical data

Width	12 mm / 0.472 inches
Height	100 mm / 3.937 inches
Depth	69 mm / 2.717 inches
Depth from upper-edge of DIN-rail	61.8 mm / 2.433 inches

Mechanical data

Mounting type	DIN-35 rail
Pluggable connector	fixed

Material data

Color	light gray
Housing material	Polycarbonate; polyamide 6.6
Fire load	0.812 MJ
Weight	47.4 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 61000-6-3, 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	32151705
eCl@ss 10.0	27-24-26-04
eCl@ss 9.0	27-24-26-04
ETIM 9.0	EC001599
ETIM 10.0	EC001599
ECCN	NO US CLASSIFICATION

 Continued on next page

Environmental Product Compliance

CAS-No.	1303-86-2 1317-36-8 7439-92-1 75980-60-8
REACH Candidate List Substance	Diboron trioxide Lead Lead monoxide Phosphine oxide, diphenyl(2,4,6-trimethylbenzoyl)-
RoHS Compliance Status	Compliant,With Exemption
RoHS Exemption	7(a) 7(c)-I
SCIP notification number (Austria)	8e6c41df-7baf-4178-a64d-6cc37daff9e3
SCIP notification number (Belgium)	7159b8fa-307a-4ef3-8fcf-70f78f33bb3c
SCIP notification number (Bulgaria)	a1662001-d4c3-4fea-ab05-4daf020c4e7c
SCIP notification number (Czech Republic)	e2396461-e1ec-4c83-9fcc-4c88519d7822
SCIP notification number (Denmark)	b0edbb1d-c5d4-4992-be7c-952a95060ea1
SCIP notification number (Finland)	2872cf87-0b87-4286-a19c-d55aee25afaf
SCIP notification number (France)	c32073f6-8d5b-414f-a139-3426c99ff601
SCIP notification number (Germany)	a1116843-c5a9-4f67-b534-b23555a5b061
SCIP notification number (Hungary)	dab1854e-9cab-45ba-a486-c056fa37becf
SCIP notification number (Italy)	ad32464f-859e-4c30-b232-d24b0d58aa2b
SCIP notification number (Netherlands)	e6c3bcb7-e16f-4f26-9462-9d4ceeadb2a7
SCIP notification number (Poland)	7ca883e9-f8ea-45a0-a4ba-a74ef7c632a3
SCIP notification number (Romania)	df5fbc93-4572-4a46-b387-e4cf36268b75
SCIP notification number (Sweden)	cc79a74b-9dec-499f-8dc7-5f29fadb4912

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-DI0750

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.	-	30389/C0 BV
DNV DNV GL SE	DNV-CG-0339,Aug.2021	TAA0000194

Approvals for marine applications

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
UKEx WAGO GmbH & Co. KG	EN 60079-0	UKCA_WA GO22UKEX003X_ec
UL Underwriters Laboratories Inc. (HAZARDOUS LOCATIONS)	UL 121201	E198726

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