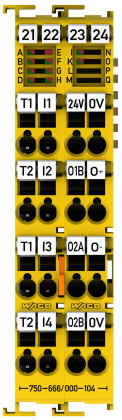
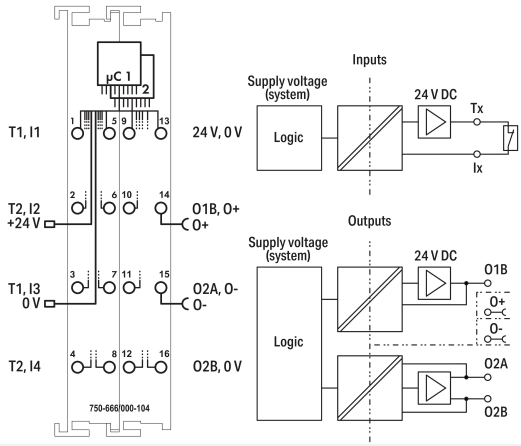
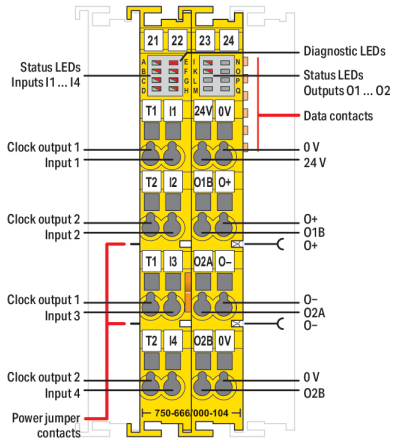
Data Sheet | Item Number: 750-666/000-104

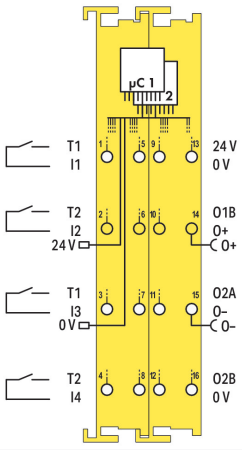
Fail-safe 4/2 channel digital input/output; 24 VDC; 10 A; Logic; PROFIsafe

https://www.wago.com/750-666/000-104









This module (Item No. 750-666/000-104) features two power outputs (O1 … O2) and four pulse-sensitive inputs (I1 … I4), and can perform functionally safe logic linking of safe digital inputs and outputs. This enables the module to independently control its safe digital outputs. As a result, safe applications up to SIL 3 / PL e can be implemented without a safety controller, e.g., in combination with WAGO Controllers PFC100, PFC200, PFC300, and the WAGO Basic Controller 100.

The module includes configurable virtual inputs and outputs. It can receive additional virtual output values from a controller and link this information with the safe digital inputs. The internal logic is configured using the WAGO Safety Editor (SEDI).

The sensors can be powered either directly via 24 VDC or via the two pulse-timed outputs (T1 … T2). The inputs support potential-free emergency-off

switches with contacts, safety interlock switches, and mode selector switches, as well as safety sensors and safety semiconductor outputs (e.g., light barriers, PLC outputs). The power outputs switch both DC13 resistive and inductive loads with a rated current of up to 10 A, without requiring any additional external circuitry.

Power output O1 can be operated in high-side switching mode, while power output O2 can be used in high-side or low-side switching mode. Both power outputs are single-channel. The module monitors short circuits, cross circuits and 24 V power supply from separate sources. Monitoring and other safety-relevant parameters – such as operating modes, disabling of test pulses, discrepancy times, or filter times – can be configured via WAGO-I/O-*CHECK*.

The configuration tool can be conveniently integrated into engineering systems supporting both CC2 and CC3 tool calling interfaces (TCI). The PROFIsafe address can be set using the DIP switch located on the side of the module, or via WAGO-I/O-*CHECK*.

The module can operate without a safety controller and fieldbus-independent, but also supports PROFIsafe protocol V2.6 (PROFINET®). Field and system levels are electrically isolated. Individual safety modules can be arranged in any combination when configuring the fieldbus node.

To protect the 24 VDC power supply against surge and burst (to IEC 61000-6-7 and for marine applications), a WAGO filter module or a suitable external interference suppression filter must be used. Additional information can be found in the product manual (available in German and English). This module (Item No. 750-666/000-104) was evaluated by UL to UL/CSA 61010-1, UL/CSA 61010-2-201, UL 121201, and CSA-C22.2 No. 213.
The functional safety assessment to the specified standards was conducted by TÜV Rheinland.

Additional information and examples can be found in the WAGO Download Center (link: Learning Material | WAGO Download Center) .

General technical data	
Protocols	Fail-safe communication via PROFIsafe V2.6 (PROFINET®); Non-fail-safe communication (PROFINET®; with functional limitations)
Configuration options	Device address adjustable via DIP switch, WAGO Safety Editor 75x, or engineering software for the safety controller; Parameters adjustable via WAGO Safety Editor 75x or engineering software for the safety controller
Indicators	LEDs (A-D), green/red: Status/error I1 … I4; LED (E), red: Module error; LED (F), red/green: Local bus communication; LED (G), red/green: Protocol status; LED (H), red/green: Parameterization; LED (I, K), red/green: Status/error O1 … O2
Device specification	GSD specification: V2.4
Number of F I/O modules per node (fieldbus coupler/controller)	See information in the manual about the respective fieldbus coupler/controller
Device-specific	Channel-granular passivation: available; Safe logic: Up to 12 functions configurable; 30 virtual inputs and outputs via process image
Total number of channels (module)	6
Pluggable connector	fixed

Digital Inputs	
Number of digital inputs	4
Signal type	Digital
Signal type (voltage)	24 VDC
Sensor connection	4 x (Fail-safe input with test pulse)
Input characteristic	clock sensitive
Input characteristic	Type 1 per IEC 61131
Voltage range for signal (0)	−3 … +5 VDC
Voltage range for signal (1)	15 … 30 VDC
Input current per channel for signal (1) typ.	3 mA
Signal frequency (max.)	50 Hz
Input filter	0 … 200 ms (parameterizable in steps)
Response times	See product manual
Minimum signal duration	= input filter time + test pulse duration + 2 ms

Digital Clock Outputs

Clock outputs	2
Signal type	Digital
Signal type (voltage)	24 VDC
Output current per channel	0.1 A
Test pulse duration (clock outputs)	Parameterizable between 0.5 ms and 200 ms in steps
Connection requirement (permissible cable length)	200 m
Connection requirement (permissible cable type)	Shielded or unshielded
Output protection (clock outputs)	Short circuit and overload protection

Digital outputs

Number of digital outputs	2
Signal type	Digital
Signal type (voltage)	24 VDC
Output characteristic	Parameterizable test pulses
Output characteristics	10 ADC
Output current (per channel)	Resistive loads and general use: 10 ADC; Pilot duty and DC13: 2 ADC derating 1) per IEC 61010-1: 10 ADC ≤ 40 °C, linearly decreasing to 6 ADC at 55 °C derating 1) per UL 61010-1: 10 ADC ≤ 40 °C, 6 ADC ≤ 55 °C 1) Temperature derating is unnecessary if a power-loss-free I/O module is connected to the right side of the F I/O Module (Item No. 750-666/000-104). See the product manual for a list of the I/O modules that can be used for this.
Output current (module)	10 A
Output residual current at signal “0”	< 1.0 mA
Output protection	Protected and short-circuit-proof per IEC 61131-2; Breaking capacity of the output protection: 1000 ADC If the power-supplying network provides a short-circuit current greater than the breaking capacity, a short circuit at the output may lead to the destruction of the F I/O module. Limitation of the inductive switching voltage: See product manual
Response threshold (output protection) min.	10.8 ADC
Response threshold (output protection) max.	15.6 ADC
Parallel connection of outputs	Not possible
Controlling an IEC 61131-2-compatible input	Possible; see product manual
Response times (max.) (outputs)	See product manual
Switching frequency (max.)	0.1 Hz; Capacitive load (with active discharge switched on)
Switching frequency (max.) (2)	0.1 Hz; Inductive load DC 13 (50 W) per IEC 60947-5-1, see product manual
Switching frequency (max.) (3)	50 Hz; Resistive load
Capacitive load for each channel	10000 µF
Connection requirement (permissible cable length) (2)	200 m
Connection requirement (permissible cable type) (2)	Shielded or unshielded
Read-back time	1 … 500 ms (parameterizable in steps)
Test pulse duration (digital outputs)	0 … 500 ms; test pulse duration is adaptively adjusted to the actuator and corresponds to the read-back time at most.
Response threshold (output monitoring)min.	13.5 VDC (O1); Differential voltage between connections O2A and O2B: 4.0 … 6.0 V
Response threshold (output monitoring) max.	16.0 VDC (O1)

Technical data

Supply voltage (system)	5 VDC; via data contacts
Current consumption (5 V system supply)	120 mA
Overvoltage category	II
Supply voltage (field)	24 VDC, SELV/PELV (-25 … +30 %); For digital inputs; Power outputs: SELV/PELV 24 VDC (–25 … +20 %) for inductive loads (“Pilot Duty” / DC13); SELV/PELV 24 VDC (–25 … +30 %) for other applications; Current consumption from power outputs: 3 mA + load current
Current consumption, field supply (module with no external load)	30 mA
Isolation (peak value)	500 V output channel – output channel, system voltage, input channel
Number of incoming power jumper contacts	2
Number of outgoing power jumper contacts	2
Current carrying capacity (power jumper contacts)	10 A

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Functional Safety

Achievable safety classes	Logic: Cat. 4/PL e per ISO 13849; SIL 3 per IEC 61508 / EN 62061 Digital inputs and outputs (without clock outputs): Single-channel: Cat. 2/PL d per ISO 13849-1; SIL 2 per IEC 61508 / EN 62061; Dual-channel: Cat. 4/PL e per ISO 13849-1; SIL 3 per IEC 61508 / EN 62061
Safety standards	IEC 61508-1 ... -7; EN ISO 13849-1; EN 62061
Interface types according to ZVEI (inputs)	Drain; A, C0, C1, C2, C3
Interface types per ZVEI CB24I (outputs)	Source; C0, C1, C2, C3, D0, D1, D2, D3

Connection Data

Connection technology: I/O	16 x CAGE CLAMP®
Connectable conductor materials	Copper
Connection type	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	24 mm / 0.945 inches
Height	100 mm / 3.937 inches
Depth	67.8 mm / 2.669 inches
Depth from upper-edge of DIN-rail	60.6 mm / 2.386 inches

Mechanical data

Mounting type	DIN-35 rail
Pluggable connector	fixed

Material data

Housing material	Polycarbonate; polyamide 6.6
Fire load	1.909 MJ
Weight	96.6 g
Conformity marking	CE; UKCA

Environmental requirements

Ambient temperature (operation)	0 … +55 °C
Ambient temperature (storage)	-40 … +85 °C
Protection type	IP20
Protection class	III
Pollution degree	2 per IEC 61131-2
Operating altitude	0 … 2000 m / 0 … 6562 ft
Mounting position	Horizontal left, horizontal right, horizontal top, 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, EN 61000-6-7 (FS)
EMC emission of interference	per EN 61000-6-4, marine applications, EN 61000-6-3
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

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Commercial data

PU (SPU)	1 pcs
Packaging type	Box
Country of origin	DE
GTIN	4066966509441
Customs tariff number	85371098990

Product Classification

UNSPSC	32151705
ETIM 9.0	EC001599
ETIM 10.0	EC001599
ECCN	NO US CLASSIFICATION

Environmental Product Compliance

RoHS Compliance Status	Compliant,With Exemption
RoHS Exemption	6(c) 7(a) 7(c)-I 7(c)-II

Approvals / Certificates

General approvals

Approval	Standard	Certificate Name
UL Underwriters Laboratories Inc. (ORDINARY LOCATIONS)	-	E175199

Declarations of conformity and manufacturer's declarations

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

Approvals for marine applications

Approval	Standard	Certificate Name
DNV DNV GL SE	DNV-CG-0339,Aug.2021	TAA0000194

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)
IECEx TUEV Nord Cert GmbH	IEC 60079-0	IECEx TUN 14.0035 X (Ex ec IIC T4 Gc)
UL Underwriters Laboratories Inc. (HAZARDOUS LOCATIONS)	UL 121201	E198726

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Downloads

Environmental Product Compliance

Compliance Search

Environmental Product Compliance 750-666/000-104

Documentation

Manual

Product Manual Fail-safe 4/2 channel digital input/output	2024-09-17 19.11.2024	pdf 6500.87 KB

Bid Text

750-666/000-104	docx 41.50 KB
750-666/000-104	x81 17.57 KB

Instruction Leaflet

Gebrauchs- und Montageanleitung	V 1.0.0 26.02.2024	pdf 408.26 KB

CAD/CAE-Data

CAD data

2D/3D Models 750-666/000-104

1 Compatible Products

1.1 Optional Accessories

1.1.1 DIN-rail

1.1.1.1 Mounting accessories

Item No.: 210-196
Aluminum carrier rail; 35 x 8.2 mm; 1.6 mm thick; 2 m long; unslotted; similar to EN 60715; silver-colored

Item No.: 210-198
Copper carrier rail; 35 x 15 mm; 2.3 mm thick; 2 m long; unslotted; according to EN 60715; copper-colored

Item No.: 210-197
Steel carrier rail; 35 x 15 mm; 1.5 mm thick; 2 m long; slotted; similar to EN 60715; silver-colored

Item No.: 210-114
Steel carrier rail; 35 x 15 mm; 1.5 mm thick; 2 m long; unslotted; similar to EN 60715; silver-colored

Item No.: 210-118
Steel carrier rail; 35 x 15 mm; 2.3 mm thick; 2 m long; unslotted; according to EN 60715; silver-colored

Item No.: 210-115
Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; slotted; according to EN 60715; "Hole width 18 mm; silver-colored

Item No.: 210-112
Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; slotted; according to EN 60715; "Hole width 25 mm; silver-colored

Item No.: 210-113
Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; unslotted; according to EN 60715; silver-colored

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1.1.2 Marking

1.1.2.1 Group marker carrier

Item No.: 750-107
Group marker carrier

1.1.2.2 Marker

Item No.: 2009-145/000-006
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; blue

Item No.: 2009-145/000-007
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; gray

Item No.: 2009-145/000-023
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; green

Item No.: 2009-145/000-012
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; orange

Item No.: 2009-145/000-005
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; red

Item No.: 2009-145/000-024
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; violet

Item No.: 2009-145
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; white

Item No.: 2009-145/000-002
Mini-WSB Inline; for Smart Printer; 1700 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; yellow

Item No.: 248-501/000-006
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; blue

Item No.: 248-501/000-007
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; gray

Item No.: 248-501/000-023
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; green

Item No.: 248-501/000-017
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; light green

Item No.: 248-501/000-012
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; orange

Item No.: 248-501/000-005
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; red

Item No.: 248-501/000-024
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; violet

Item No.: 248-501
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; white

Item No.: 248-501/000-002
Mini-WSB marking card; as card; not stretchable; plain; snap-on type; yellow

1.1.2.3 Marker carrier

Item No.: 750-103
Group marker carrier

1.1.3 Shield termination

1.1.3.1 Shield clamping saddles

Item No.: 790-108
Shield clamping saddle; 11 mm wide; diameter of compatible conductor; 3 … 8 mm

Item No.: 790-208
Shield clamping saddle; 12.4 mm wide; 3 … 8 mm

Item No.: 790-116
Shield clamping saddle; 19 mm wide; diameter of compatible conductor; 7 … 16 mm

Item No.: 790-216
Shield clamping saddle; 21.8 mm wide; 6 … 16 mm

Item No.: 790-124
Shield clamping saddle; 27 mm wide; diameter of compatible conductor; 6 … 24 mm

Item No.: 790-220
Shield clamping saddle; 30 mm wide; 6 … 20 mm

Item No.: 790-140
Shield clamping saddle; diameter of compatible conductor

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1.1.4 Supply module

1.1.4.1 Supply module

Item No.: 750-612
Power Supply; 0 … 230 V AC/DC

Item No.: 750-602
Power Supply; 24 VDC

Item No.: 750-601
Power Supply; 24 VDC; fuse holder

Item No.: 750-610
Power Supply; 24 VDC; fuse holder; Diagnostics

1.1.5 System enclosure

1.1.5.1 System enclosure

Item No.: 850-825
IP65 enclosure; Aluminium (RAL 7032); WxHxD (160x100x160 mm); 9 x M12, 4 x M20

Item No.: 850-826
IP65 enclosure; Aluminium (RAL 7032); WxHxD (240x100x160 mm); 4 x M20, 4 x M16, 14 x M12 cable grip

Item No.: 850-827
IP65 enclosure; Aluminium (RAL 7032); WxHxD (320x100x160 mm); 4 x M20, 8 x M16, 17 x M12 cable grip

Item No.: 850-828
IP65 enclosure; Aluminium (RAL 7032); WxHxD (480x100x160 mm); 4 x M20, 10 x M16, 35 x M12 cable grip

Item No.: 850-826/002-000
IP65 enclosure; Aluminium (RAL 7035); WxHxD (240x100x160 mm); 4 x M20, 4 x M16, 14 x M12 cable grip

Item No.: 850-827/002-000
IP65 enclosure; Aluminium (RAL 7035); WxHxD (320x100x160 mm); 4 x M20, 8 x M16, 17 x M12 cable grip

Item No.: 850-828/002-000
IP65 enclosure; Aluminium (RAL 7035); WxHxD (480x100x160 mm); 4 x M20, 10 x M16, 35 x M12 cable grip

Item No.: 850-834
IP65 enclosure; Polyester (RAL 7032); WxHxD (164x100x164 mm); 9 x M12, 4 x M20

Item No.: 850-835
IP65 enclosure; Polyester (RAL 7032); WxHxD (244x100x164 mm); 4 x M20, 4 x M16, 14 x M12 cable grip

Item No.: 850-836
IP65 enclosure; Polyester (RAL 7032); WxHxD (324x100x164 mm); 4 x M20, 8 x M16, 17 x M12 cable grip

Item No.: 850-814/002-000
IP65 enclosure; Sheet steel (RAL 7035); WxHxD (200x120x200 mm); without flange plate

Item No.: 850-815/002-000
IP65 enclosure; Sheet steel (RAL 7035); WxHxD (300x120x200 mm); without flange plate

Item No.: 850-816/002-000
IP65 enclosure; Sheet steel (RAL 7035); WxHxD (400x120x200 mm); without flange plate

Item No.: 850-817/002-000
IP65 enclosure; Sheet steel (RAL 7035); WxHxD (600x120x200 mm); without flange plate