



UR20 I/O System Overview

Overview

The Weidmüller u-remote UR20 is a modular IP20 remote I/O system that provides powerful features and industry leading ease of use. The space saving design mounts on DIN rail using a single fieldbus coupler, plus up to 16 I/O modules. Installation ease of use includes removable color coded push in connectors and IO bus to provide DC power to all modules. The webserver interface allows for quick setup without the need to download software. Available protocols include PROFINET, EtherCAT, Modbus TCP, and EtherNet/IP, each with dual RJ-45 ports (10/100 Mbps) supporting daisy-chain topology without an external switch.

The I/O range includes digital I/O (8 or 16 channels), relay outputs, analog inputs, temperature and load cell. A 4-port IO-Link master can also be added to pair with any field bus protocol. Power-feed modules segment current paths as needed, and an empty-slot module reserves space for future expansion.



Features:

- 10A current paths
- Integrated web server in every coupler (accessed via Ethernet)
- Specialty modules include temperature modules (RTD, Thermocouple), strain gauge (24 bit, 4/6-wire), and IO-Link Master
- Slim 11.5mm module width for very high channel/connection density, saving cabinet space
- Powers up to three (3) 4-port IO-Link masters. Power feed modules can be added for input or output bus power
- Temperature range 0–50 °C (when horizontally mounted)

Weidmüller UR20 System Components		
Part Number	Price	Description
<u>UR20-FBC-EIP-ECO</u>	\$309.00	Bus coupler, 24 VDC, (2) Ethernet (RJ-45) port(s), EtherNet/IP, 100 Mbps.
<u>UR20-FBC-MOD-TCP-ECO</u>	\$263.00	Bus coupler, 24 VDC, (2) Ethernet (RJ-45) port(s), Modbus TCP, 100 Mbps.
<u>UR20-FBC-EC-ECO</u>	\$263.00	Bus coupler, 24 VDC, (2) Ethernet (RJ-45) port(s), EtherCAT, 100 Mbps.
<u>UR20-FBC-PN-ECO</u>	\$315.00	Bus coupler, 24 VDC, (2) Ethernet (RJ-45) port(s), PROFINET, 100 Mbps.
<u>UR20-8DI-P-3W</u>	\$88.00	Discrete input module, 8-point, 24 VDC, sinking, 1 common(s), 8 point(s) per common.
<u>UR20-8DI-N-3W</u>	\$96.00	Discrete input module, 8-point, 24 VDC, sourcing, 1 common(s), 8 point(s) per common.
<u>UR20-16DI-P</u>	\$117.00	Discrete input module, 16-point, 24 VDC, sinking, 1 common(s), 16 point(s) per common.
<u>UR20-16DI-N</u>	\$125.00	Discrete input module, 16-point, 24 VDC, sourcing, 1 common(s), 16 point(s) per common.
<u>UR20-8DO-N</u>	\$100.00	Discrete output module, 8-point, 24 VDC, sinking, 1 common(s), 8 point(s) per common, 0.5A/point, 4A/module.
<u>UR20-8DO-P</u>	\$92.00	Discrete output module, 8-point, 24 VDC, sourcing, 1 common(s), 8 point(s) per common, 0.5A/point, 4A/module.
<u>UR20-16DO-N</u>	\$150.00	Discrete output module, 16-point, 24 VDC, sinking, 1 common(s), 16 point(s) per common, 0.5A/point, 8A/module.
<u>UR20-16DO-P</u>	\$141.00	Discrete output module, 16-point, 24 VDC, sourcing, 1 common(s), 16 point(s) per common, 0.5A/point, 8A/module.
<u>UR20-8DIO-P-3W-DIAG</u>	\$137.00	Discrete combo module, Input: up to (8) points, 24 VDC, sinking/sourcing, Output: up to (8) points, 24 VDC, sourcing, 0.5A/point, 4A/common.
<u>UR20-4RO-CO-255</u>	\$145.00	Relay output module, 4-point, 277 VDC/277 VAC, (4) Form C, 4 common(s), 1 point(s) per common, 6A/point, 24A/module.
<u>UR20-2AI-SG-24-DIAG</u>	\$468.00	Load cell input module, 2-channel, voltage, 24-bit resolution, input voltage signal range(s) of 0.5–30 mV/VDC. For use with 5 VDC 4- or 6-wire load cells.
<u>UR20-2AI-UI-16</u>	\$220.00	Analog input module, 2-channel, current/voltage, 16-bit.
<u>UR20-4AI-UI-16</u>	\$306.00	Analog input module, 4-channel, current/voltage, 16-bit.
<u>UR20-4AI-RTD-DIAG</u>	\$386.00	Temperature input module, RTD, 4-channel, 16-bit resolution, input RTD type(s): Pt100, Pt200, Pt500, Pt1000, Cu10, Ni100, Ni120, Ni200, Ni500 and Ni1000.
<u>UR20-4AI-TC-DIAG</u>	\$386.00	Temperature input module, thermocouple, 4-channel, 16-bit resolution, input thermocouple type(s): J, K, T, N, E, R, S, B, L, U, C.
<u>UR20-2AO-UI-16</u>	\$242.00	Analog output module, 2-channel, current/voltage, 16-bit.
<u>UR20-4AO-UI-16</u>	\$379.00	Analog output module, 4-channel, current/voltage, 16-bit.
<u>UR20-4COM-IO-LINK</u>	\$301.00	IO-Link master, (4) IO-Link capable I/O points, up to (4) discrete I/O points, IO-Link v1.1.2 (compatible with v1.1.3), 2A, 0.5A/port, plastic housing, IP20.
<u>UR20-ES</u>	\$34.00	Empty slot module.
<u>UR20-PF-I</u>	\$57.00	Power feed module, 24 VDC. For use with Weidmüller UR20 series I/O systems. Introduces power into I/O terminals input power bus for power flow to the right.
<u>UR20-PF-O</u>	\$57.00	Power feed module, 24 VDC. For use with Weidmüller UR20 series I/O systems. Introduces power into I/O terminals output power bus for power flow to the right.
<u>UR20-EBK-ACC</u>	\$13.00	Weidmüller UR20 series screw-down end bracket, replacement. For use with 35mm DIN rail.

Configuration

The UR20 station is designed to be installed on a DIN rail (35 × 7.5mm or 35 × 15mm) made from steel or galvanized steel according to EN 60715.

- A maximum of sixteen (16) active modules may be installed in a station with an ECO coupler.
- Connected modules have to be considered as active modules when planning the remote station.
- A maximum of three (3) UR20-4COM-IO-LINK modules may be installed in a UR20 station.

A UR20 station may only be installed in this sequence (starting from the left/bottom):

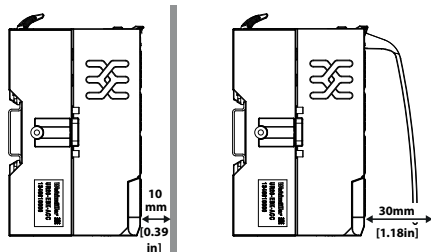
1. End bracket
2. Bus coupler
3. Modules
4. End plate and end bracket

Arrangement of passive modules

Passive modules consist of the power-feed module and empty slot module. In a UR20 station, a maximum of three passive modules may be installed directly behind each other, then an active module must follow. Any number of passive modules can be placed behind the last active module.

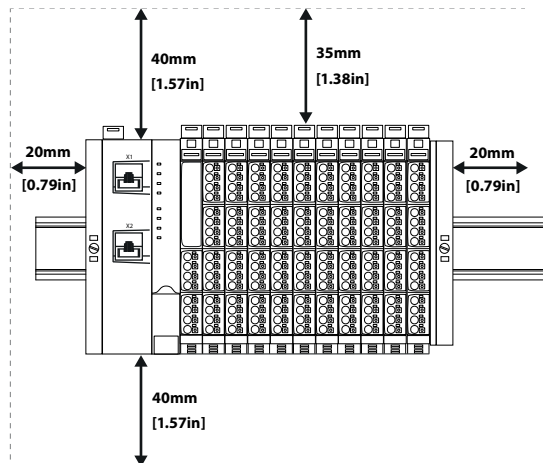
Mounting Clearances

The UR20 must be installed while observing the following minimum distances (see below).

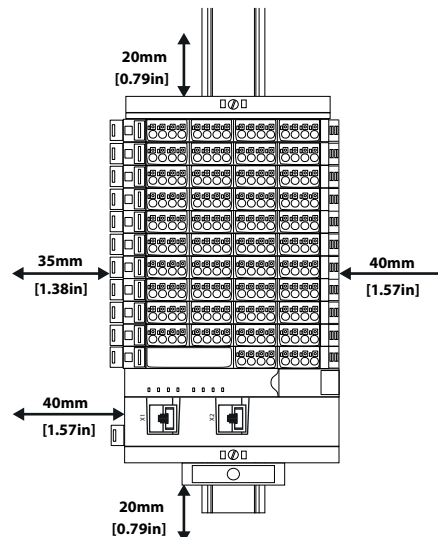


Door Clearance

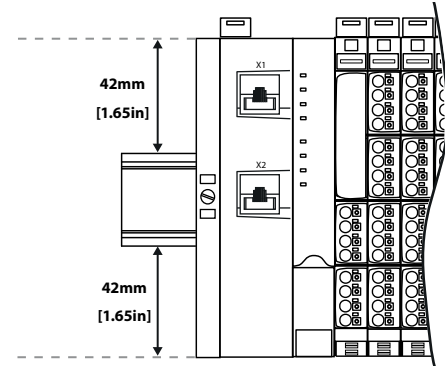
Horizontal Mounting Clearance



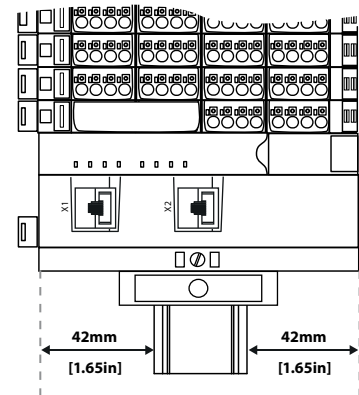
Vertical Mounting Clearance



DIN Rail Horizontal Mount



DIN Rail Vertical Mount





UR20 Fieldbus Couplers

UR20-FBC-EIP-ECO

The UR20-FBC-EIP-ECO fieldbus coupler is an EtherNet/IP™ device developed according to IEC 61158. The coupler is the head module for the UR20 system bus, to which up to 16 active UR20 modules can be connected.

- The EtherNet/IP coupler has two Ethernet ports, and the integrated switch supports a line network structure.
- The coupler can be accessed with a system-independent web server application via Ethernet. Thus all information, such as diagnostics, status values and parameters, can be read and all connected modules can be simulated or forced.
- The station's main power supply is integrated in the coupler.
- Power is supplied via a 4-pole connector.

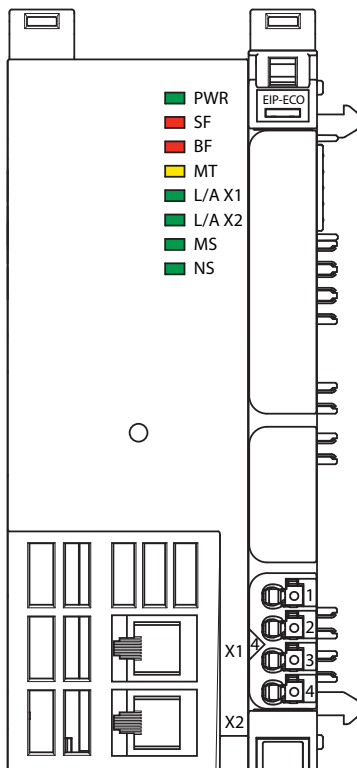


Technical Specifications - UR20-FBC-EIP-ECO		
Price		\$309.00
Drawing		PDF
System data		
Connection		2 x RJ-45
Configuration interface		Via RJ-45
Fieldbus protocol		EtherNet/IP
Process data (max)		2 x 494 byte
Parameter data (max)		16 x 64 byte
Diagnostic data (max)		16 x 47 byte
Number of modules (max active)		16
Fieldbus interface		Full/Half duplex, Auto MIDI/X, auto-negotiation
Transfer rate (max)		10/100 Mbps
Supply		
Supply voltage for system, inputs and outputs		24 VDC +20% / -15%
Feed-in current (max)	horizontal installation	10A (0–50 °C [32–122 °F])
	vertical installation	10A (0–45 °C [32–113 °F]) 8A (0–50 °C [32–122 °F])
Current consumption from system current path I_{sys}		61 mA
Temperature data		
Operation (horizontal installation)		0–50 °C [32–122 °F]
Operation (vertical installation)		0–45 °C [32–113 °F]
Storage, transport		–40 to +85 °C [–40 to +185 °F]
Connection data		
Type of connection		"PUSH IN"
Conductor cross-section		Single-wired, fine-wired: 0.14–1.5mm ² [AWG26–16]
Weight		
Weight (operational status)		242g

Environmental Specifications - UR20-FBC-EIP-ECO			
Degree of protection (IEC 60529)		IP20	
Flammability rating UL 94		V-0	
Material of power contacts and data contacts		Ni-Au, 3µm	
Humidity	Operation	95%, non-condensing as per IEC 61131-2	
	Storage, transport	95%, non-condensing as per IEC 61131-2	
Air pressure	Operation	≥ 795 hPa [11.5 psi] (altitude ≤ 2000m) as per IEC 61131-2	
	Storage, transport	≥ 700 hPa [10.2 psi] (altitude ≤ 3000m) as per IEC 61131-2	
Vibration resistance		5 Hz ≤ f ≤ 8.4 Hz: 3.5mm amplitude as per IEC 60068-2-6 8.4 Hz ≤ f ≤ 150 Hz: 1g acceleration as per IEC 60068-2-6	
Shock resistance		15g over 11 ms, half sinewave, as per IEC 60068-2-27	
Potential isolation	Test voltage	Max. 28.8V within one channel 500 VDC field/system (as per EN 60079-15:2017)	
	Pollution severity level	2 (as per DIN EN 60664-1:2008)	
	Overvoltage category	II (as per DIN EN 50178)	
Approvals		CE, RoHS, UKCA, cULus E141197	

See the UR20 user manual for the process-data mapping.

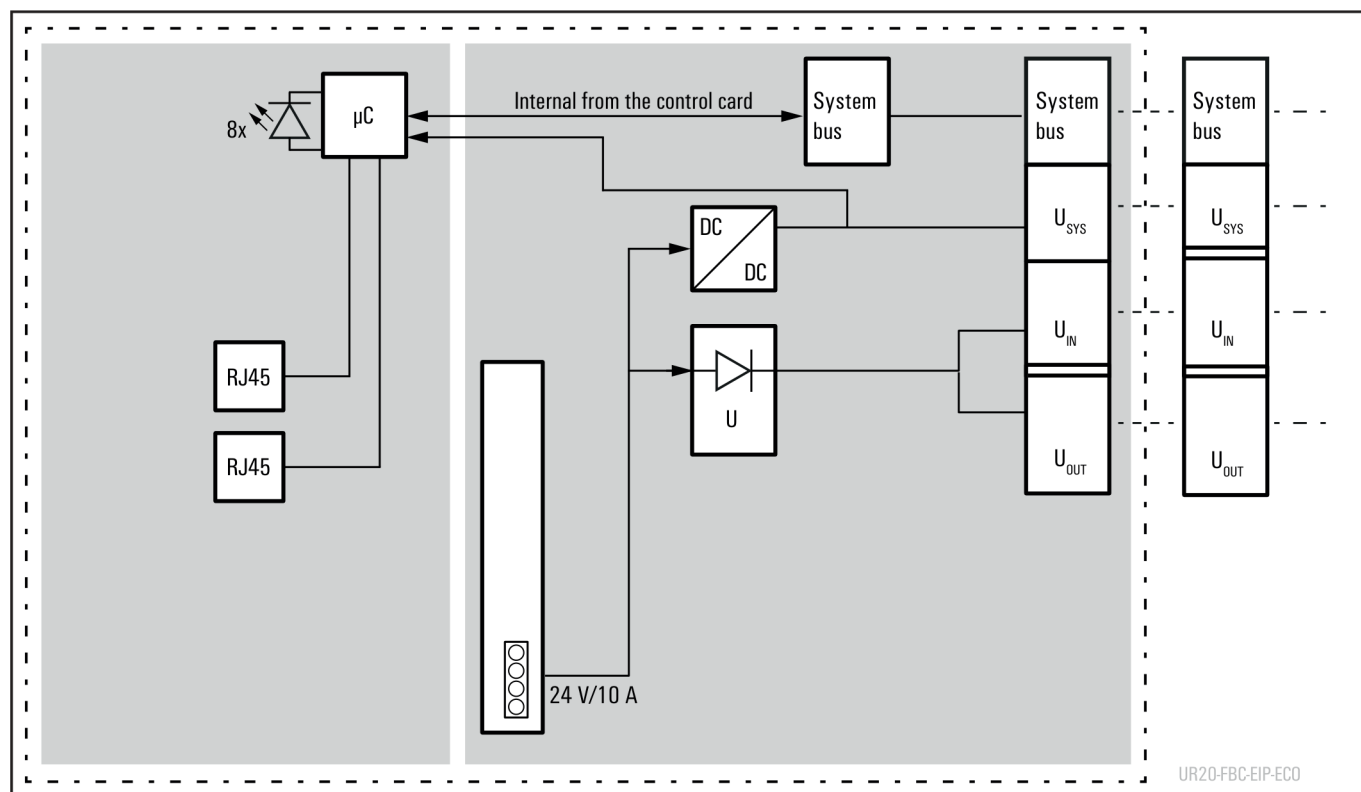
Status Indicators for UR20-FBC-EIP-ECO



LED	Description	Color	Meaning
PWR	Power LED	Green	Supply voltage connected
		Red	Coupler not yet started completely or hardware error
SF	Collective error	Red	Configuration error, or error in the coupler, or error in a module, or there is a new diagnostic message
		Red flashing	Station in Force mode
BF	Bus failure	Red	No connection to the fieldbus or watchdog time expired
		Red flashing	Configuration error, no connection to the control unit, or error in the parameter set, or firmware update is running, or IP address conflict
MT	Maintenance	Yellow	Error on the system bus or the fieldbus
L/A X1	Connection/Activity	Green/Yellow ¹	Connection established between port X1 of the coupler and another field device
		Green flashing/ Yellow flashing ¹	Data being exchanged on port X1
L/A X2	Connection/Activity	Green/Yellow ¹	Connection established between port X2 of the coupler and another field device
		Green flashing/ Yellow flashing ¹	Data being exchanged on port X2
MS	Module Status	Red	More than one module does not fit the start-up configuration
		Red flashing	One module does not fit the start-up configuration or there is a diagnostic alarm on at least one module
		Green	Ready for operation
		Green flashing	Coupler not configured
		Red/green flashing	LED self test during start
NS	Network Status	Off	No IP address assigned
		Red	IP address conflict
		Red flashing	Timeout of the exclusive owner connection
		Green	At least one EtherNet/IP connection is established
		Green flashing	No EtherNet/IP connection is established
		Red/green flashing	LED self test during start

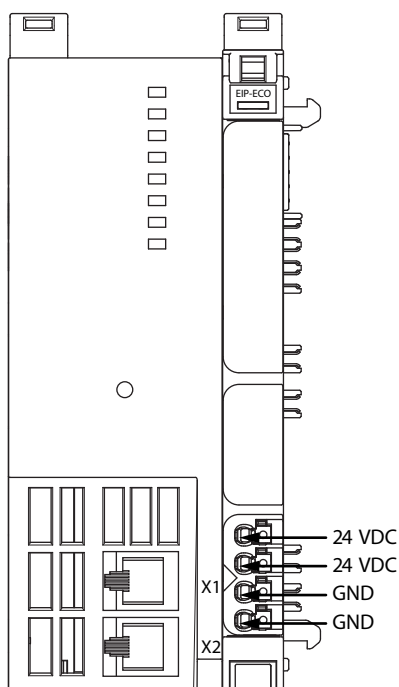
1 - Green: Transfer rate 100 Mbps, Yellow: Transfer rate 10 Mbps

Block Diagram



Block diagram - UR20-FBC-EIP-ECO

Terminal Connections



CAUTION: RISK OF MATERIAL DAMAGE! WHEN POWER SUPPLY CURRENT DEMAND WILL BE GREATER THAN 8A (>8A), ALL FOUR CONTACTS MUST BE CONNECTED WITH 1.5MM² WIRING.



UR20 Fieldbus Couplers

UR20-FBC-MOD-TCP-ECO

The UR20-FBC-MOD-TCP-ECO fieldbus coupler is a Modbus TCP device according to IEC 61158. As a head module of the UR20 system bus the coupler supports up to 16 active UR20 modules and up to 8 open multi-client connections.

- The two Ethernet ports form an unmanaged 2-port switch that supports a line network structure.
- The coupler can be accessed with a system-independent web server application via Ethernet. Thus all information, such as diagnostics, status values and parameters, can be read and all connected modules can be simulated or forced.
- The station's main power supply is integrated in the coupler.
- Power is supplied via a 4-pole connector.

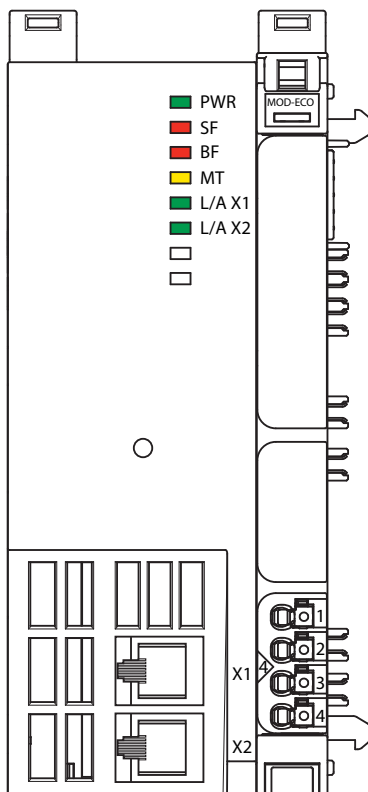


Technical Specifications - UR20-FBC-MOD-TCP-ECO		
Price		\$263.00
Drawing		PDF
System data		
Connection		2 x RJ-45
Configuration interface		Via RJ-45
Fieldbus protocol		Modbus TCP
Open multi-client connections (max)		8
Process data (max)		1 kB
Parameter data (max)		1 kB
Diagnostic data (max)		1 kB
Number of modules (max active)		16
Fieldbus interface		Full/Half duplex, Auto MIDI/X, autonegotiation
Transfer rate (max)		10/100 Mbps
Supply		
Supply voltage for system, inputs and outputs		24 VDC +20% / -15%
Max. feed-in current	horizontal installation	10A (0–50 °C [32–122 °F])
	vertical installation	10A (0–45 °C [32–113 °F]) 8A (0–50 °C [32–122 °F])
Current consumption from system current path I_{sys}		80 mA
Temperature data		
Operation (horizontal installation)		0–50 °C [32–122 °F]
Operation (vertical installation)		0–45 °C [32–113 °F]
Storage, transport		-40 to +85 °C [- 40 to +185 °F]
Connection data		
Type of connection		"PUSH IN"
Conductor cross-section		Single-wired, fine-wired: 0.14–1.5mm ² [AWG26–16]
Weight		
Weight (operational status)		242g

Environmental Specifications - UR20-FBC-MOD-TCP-ECO			
Degree of protection (IEC 60529)		IP20	
Flammability rating UL 94		V-0	
Material of power contacts and data contacts		Ni-Au, 3µm	
Humidity	Operation	95 %, non-condensing as per IEC 61131-2	
	Storage, transport	95 %, non-condensing as per IEC 61131-2	
Air pressure	Operation	≥ 795 hPa [11.5 psi] (altitude ≤ 2000 m) as per IEC 61131-2	
	Storage, transport	≥ 700 hPa [10.2 psi] (altitude ≤ 3000 m) as per IEC 61131-2	
Vibration resistance		5 Hz ≤ f ≤ 8.4 Hz: 3.5mm amplitude as per IEC 60068-2-6 8.4 Hz ≤ f ≤ 150 Hz: 1g acceleration as per IEC 60068-2-6	
Shock resistance		15g over 11 ms, half sinewave, as per IEC 60068-2-27	
Potential isolation	Test voltage	Max. 28.8 V within one channel 500 VDC field/system (as per EN 60079-15:2017)	
	Pollution severity level	2 (as per DIN EN 60664-1:2008)	
	Overvoltage category	II (as per DIN EN 50178)	
Approvals		CE, RoHS, UKCA, cULus E141197	

See the UR20 user manual for the process-data mapping.

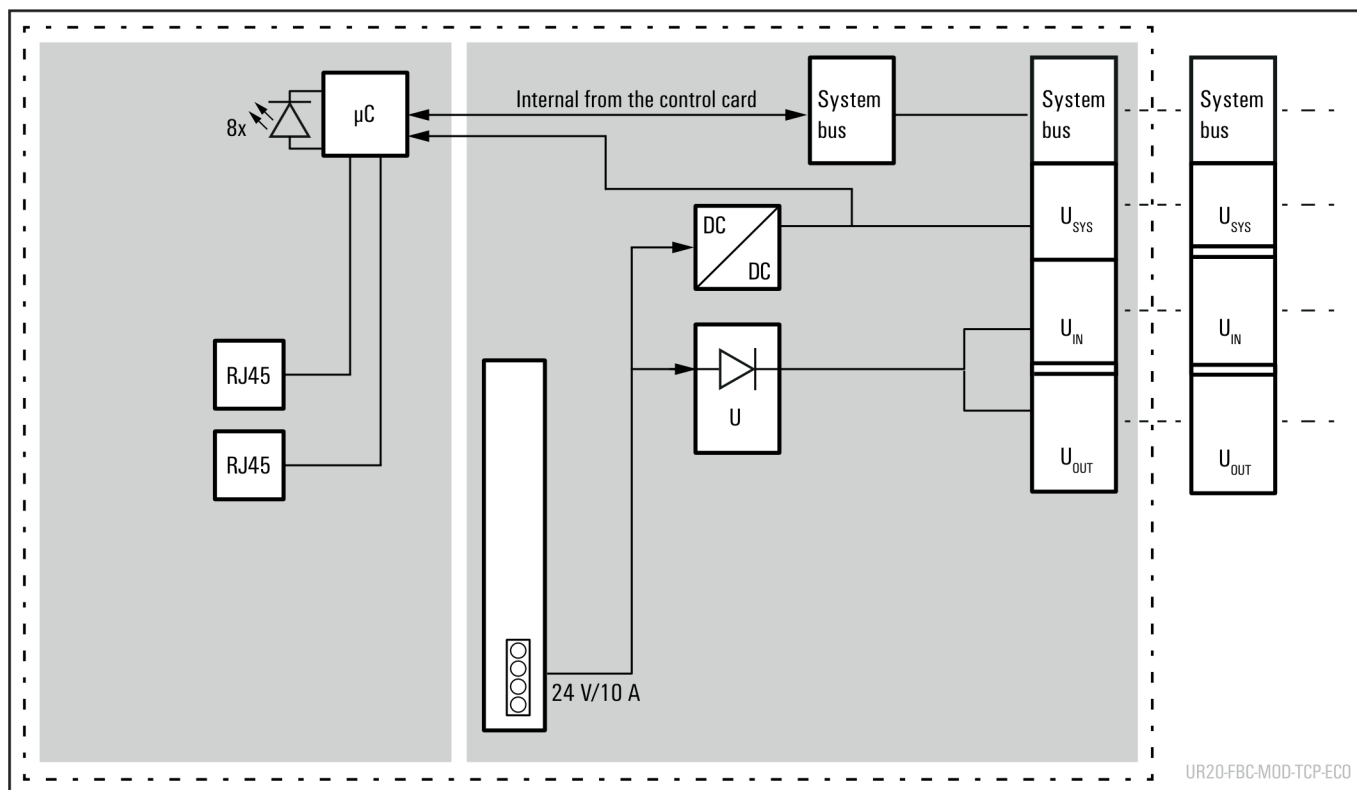
Status Indicators for UR20-FBC-MOD-TCP-ECO



LED	Description	Color	Meaning
PWR	Power LED	Green	Supply voltage connected
		Red	Coupler not yet started completely or hardware error
SF	Collective error	Red	Configuration error, or error in the coupler, or error in a module, or there is a new diagnostic message
		Red flashing	Station in Force mode
BF	Bus failure	Red	No connection to the fieldbus or watchdog time expired
		Red flashing	Configuration error, no connection to the control unit, or error in the parameter set, or firmware update is running, or IP address conflict
MT	Maintenance	Yellow	Error on the system bus or the fieldbus
L/A X1	Connection/Activity	Green / Yellow ¹	Connection established between port X1 of the coupler and another field device
		Green flashing / Yellow flashing ¹	Data being exchanged on port X1
L/A X2	Connection/Activity	Green / Yellow ¹	Connection established between port X2 of the coupler and another field device
		Green flashing / Yellow flashing ¹	Data being exchanged on port X2

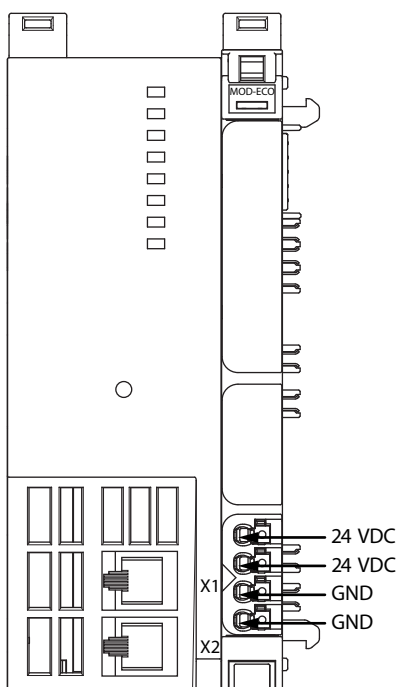
1 - Green: Transfer rate 100 Mbps, Yellow: Transfer rate 10 Mbps

Block Diagram



Block diagram - UR20-FBC-MOD-TCP-ECO

Terminal Connections



CAUTION: RISK OF MATERIAL DAMAGE! WHEN POWER SUPPLY CURRENT DEMAND WILL BE GREATER THAN 8A (>8A), ALL FOUR CONTACTS MUST BE CONNECTED WITH 1.5MM² WIRING.



UR20 Fieldbus Couplers

UR20-FBC-EC-ECO

The UR20-FBC-EC-ECO fieldbus coupler is an EtherCAT device certified by the EtherCAT Technology Group. The coupler is the head module for the UR20 system bus, to which up to 16 active UR20 modules can be connected.

- The EtherCAT coupler has two Ethernet ports and the integrated switch supports a line network structure.
- The coupler can be accessed with a system-independent web server application via Ethernet. Thus, all information, such as diagnostics, status values and parameters, can be read and all connected modules can be simulated or forced.
- To access the coupler via Ethernet, a controller is required that supports the EoE protocol (Ethernet over EtherCAT). EoE must be activated in the controller and a valid IP address for the coupler must be assigned in the controller configuration (see documentation for the controller used).
- The station's main power supply is integrated in the coupler.
- Power is supplied via a 4-pole connector.

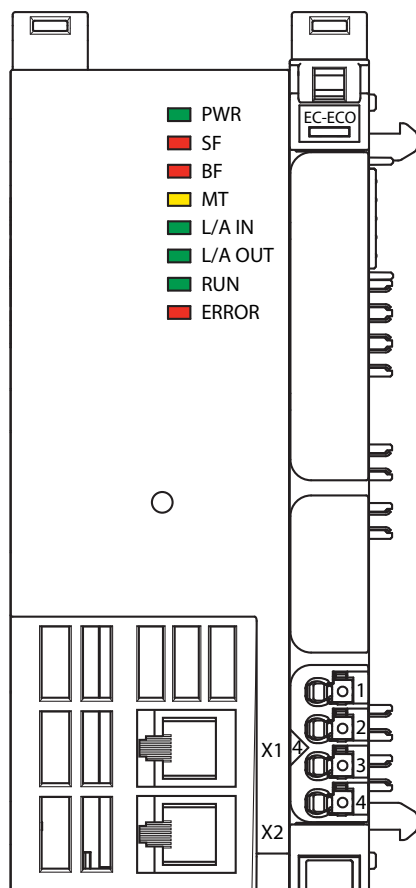


Technical Specifications - UR20-FBC-EC-ECO		
Price		\$263.00
Drawing		PDF
System data		
Connection		2 x RJ-45
Fieldbus protocol		EtherCAT
Process data (max)		1024 byte
Parameter data (max)		16 x 64 byte
Diagnostic data (max)		16 x 50 byte
Number of modules (max active)		16
Configuration interface		Using web server or ESI file
Transfer rate (max)		100 Mbps
Supply		
Supply voltage for system, inputs and outputs		24 VDC +20% / -15%
Max. feed-in current	horizontal installation	10A (0–50 °C [32–122 °F])
	vertical installation	10A (0–45 °C [32–113 °F]) 8A (0–50 °C [32–122 °F])
Current consumption from system current path I_{sys}		80 mA
Temperature data		
Operation (horizontal installation)		0–50 °C [32–122 °F]
Operation (vertical installation)		0–45 °C [32–113 °F]
Storage, transport		-40 to +85 °C [-40 to +185 °F]
Connection data		
Type of connection		"PUSH IN"
Conductor cross-section		Single-wired, fine-wired: 0.14–1.5mm ² [AWG26–16]
Weight		
Weight (operational status)		242g

Environmental Specifications - UR20-FBC-EC-ECO			
Degree of protection (IEC 60529)		IP20	
Flammability rating UL 94		V-0	
Material of power contacts and data contacts		Ni-Au, 3µm	
Humidity	Operation	95 %, non-condensing as per IEC 61131-2	
	Storage, transport	95 %, non-condensing as per IEC 61131-2	
Air pressure	Operation	≥ 795 hPa [11.5 psi] (altitude ≤ 2000 m) as per IEC 61131-2	
	Storage, transport	≥ 700 hPa [10.2 psi] (altitude ≤ 3000 m) as per IEC 61131-2	
Vibration resistance		5 Hz ≤ f ≤ 8.4 Hz: 3.5mm amplitude as per IEC 60068-2-6 8.4 Hz ≤ f ≤ 150 Hz: 1g acceleration as per IEC 60068-2-6	
Shock resistance		15g over 11 ms, half sinewave, as per IEC 60068-2-27	
Potential isolation	Test voltage	Max. 28.8 V within one channel 500 VDC field/system (as per EN 60079-15:2017)	
	Pollution severity level	2 (as per DIN EN 60664-1:2008)	
	Overvoltage category	II (as per DIN EN 50178)	
Approvals		CE, RoHS, UKCA, cULus E141197	

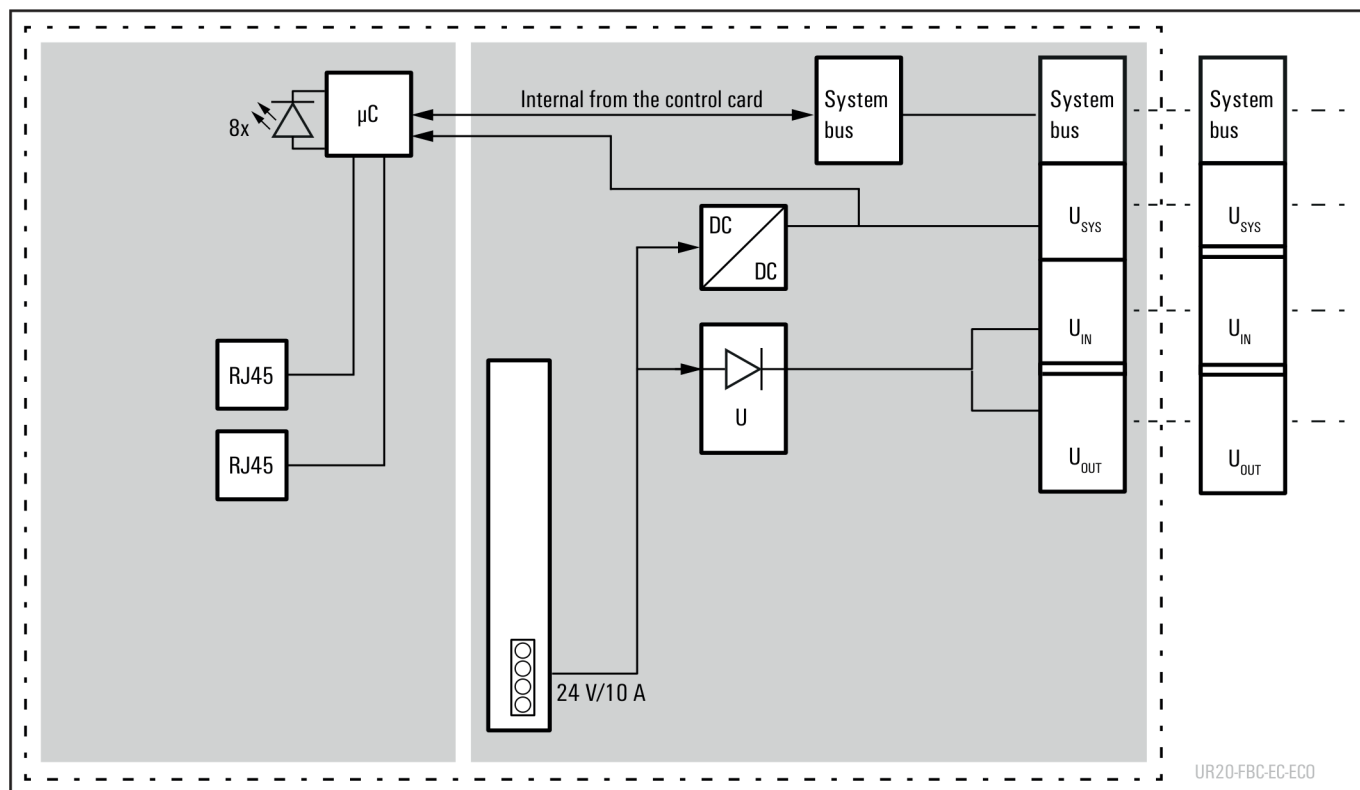
See the UR20 user manual for the process-data mapping.

Status Indicators for UR20-FBC-EC-ECO



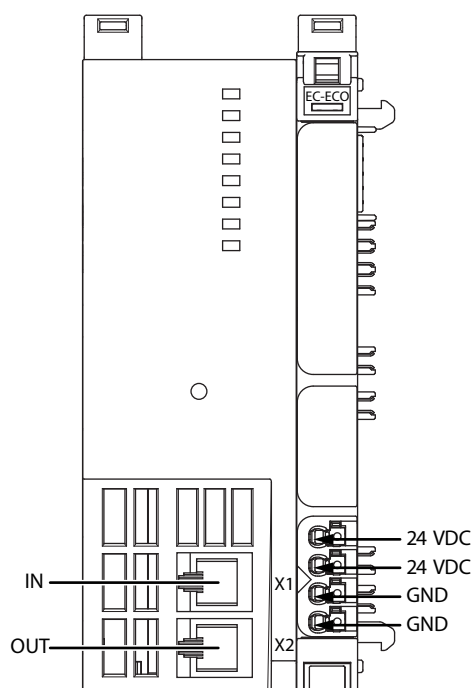
LED	Description	Color	Meaning
PWR	Power LED	Green	Supply voltage connected
		Red	Coupler not yet started completely or hardware error
SF	Collective error	Red	Configuration error, or error in the coupler, or error in a module, or there is a new diagnostic message
		Red flashing	Station in Force mode
BF	Bus failure	Red	No connection to the fieldbus
		Red flashing	Configuration error, no connection to the control unit, or error in the parameter set, or firmware update is running
MT	Maintenance	Yellow	Error on the system bus or the fieldbus
L/A IN	Connection/Activity	Green	Connection established between port 1 of the coupler and another field device
		Green flashing	Data being exchanged on port 1
L/A OUT	Connection/Activity	Green	Connection established between port 2 of the coupler and another field device
		Green flashing	Data being exchanged on port 2
RUN	Coupler state	Off	INIT
		Green flashing	PRE-OPERATIONAL
		Green lights up briefly	SAFE-OPERATIONAL
		Green	OPERATIONAL
ERROR	Internal error	Red	Critical error in the coupler
		Red lights up briefly	Error in coupler application
		Red lights up briefly twice	Output Syncmanager Watchdog expired
		Red flashing	Configuration error

Block Diagram



Block diagram - UR20-FBC-EC-ECO

Terminal Connections



CAUTION: RISK OF MATERIAL DAMAGE! When power supply current demand will be greater than 8A (>8A), all four contacts must be connected with 1.5mm² wiring.



UR20 Fieldbus Couplers

UR20-FBC-PN-ECO

The UR20-FBC-PN-ECO fieldbus coupler is a PROFINET I/O device certified by the PROFINET user organization. The coupler is the head module for the UR20 system bus, to which up to 16 active UR20 modules can be connected.

- The PROFINET coupler has two Ethernet ports, and the integrated switch supports a line network structure.
- The coupler can be accessed with a system-independent web server application via Ethernet. Thus, all information, such as diagnostics, status values and parameters, can be read and all connected modules can be simulated or forced.
- In order to access the coupler via Ethernet, an IP address for the coupler must be configured in the controller (see documentation for the controller used).
- The station's main power supply is integrated in the coupler.
- Power is supplied via a 4-pole connector.

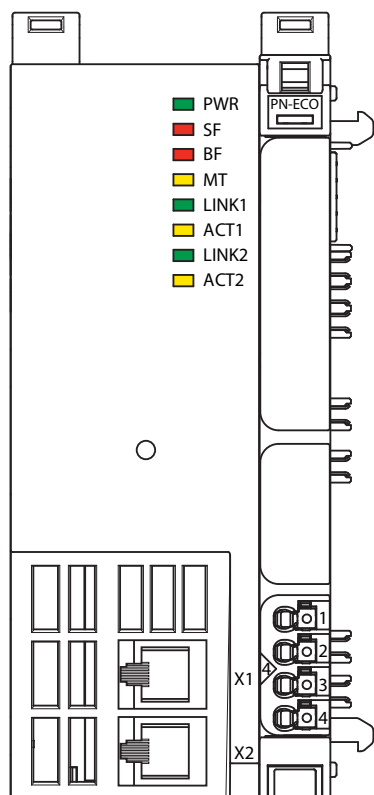


Technical Specifications - UR20-FBC-PN-ECO		
Price		\$315.00
Drawing		PDF
System data		
Connection		2 x RJ-45
Configuration interface		Via RJ-45
Fieldbus protocol		PROFINET I/O (RT)
Redundancy protocol		Media Redundancy Protocol (MRP)
Input data width (max)		512 byte
Output data width (max)		512 byte
Parameter data (max)		4362 byte
Diagnostic data (max)		1408 byte
Number of modules (max active)		16 active
Transfer rate (max)		100 Mbps
Start-up		> 1s
Supply		
Supply voltage for system, inputs and outputs		24 VDC +20% / -15%
Max. feed-in current	horizontal installation	10A (0–50 °C [32–122 °F])
	vertical installation	10A (0–45 °C [32–113 °F]) 8A (0–50 °C [32–122 °F])
Current consumption from system current path I_{sys}		80 mA
Temperature data		
Operation (horizontal installation)		0–50 °C [32–122 °F]
Operation (vertical installation)		0–45 °C [32–113 °F]
Storage, transport		-40 to +85 °C [- 40 to +185 °F]
Connection data		
Type of connection		"PUSH IN"
Conductor cross-section		Single-wired, fine-wired: 0.14–1.5mm ² [AWG26–16]
Weight		
Weight (operational status)		242g

Environmental Specifications - UR20-FBC-PN-ECO			
Degree of protection (IEC 60529)		IP20	
Flammability rating UL 94		V-0	
Material of power contacts and data contacts		Ni-Au, 3µm	
Humidity	Operation	95 %, non-condensing as per IEC 61131-2	
	Storage, transport	95 %, non-condensing as per IEC 61131-2	
Air pressure	Operation	≥ 795 hPa [11.5 psi] (altitude ≤ 2000 m) as per IEC 61131-2	
	Storage, transport	≥ 700 hPa [10.2 psi] (altitude ≤ 3000 m) as per IEC 61131-2	
Vibration resistance		5 Hz ≤ f ≤ 8.4 Hz: 3.5mm amplitude as per IEC 60068-2-6 8.4 Hz ≤ f ≤ 150 Hz: 1g acceleration as per IEC 60068-2-6	
Shock resistance		15g over 11 ms, half sinewave, as per IEC 60068-2-27	
Potential isolation	Test voltage	Max. 28.8 V within one channel 500 VDC field/system (as per EN 60079-15:2017)	
	Pollution severity level	2 (as per DIN EN 60664-1:2008)	
	Overvoltage category	II (as per DIN EN 50178)	
Approvals		CE, RoHS, UKCA, cULus E141197	

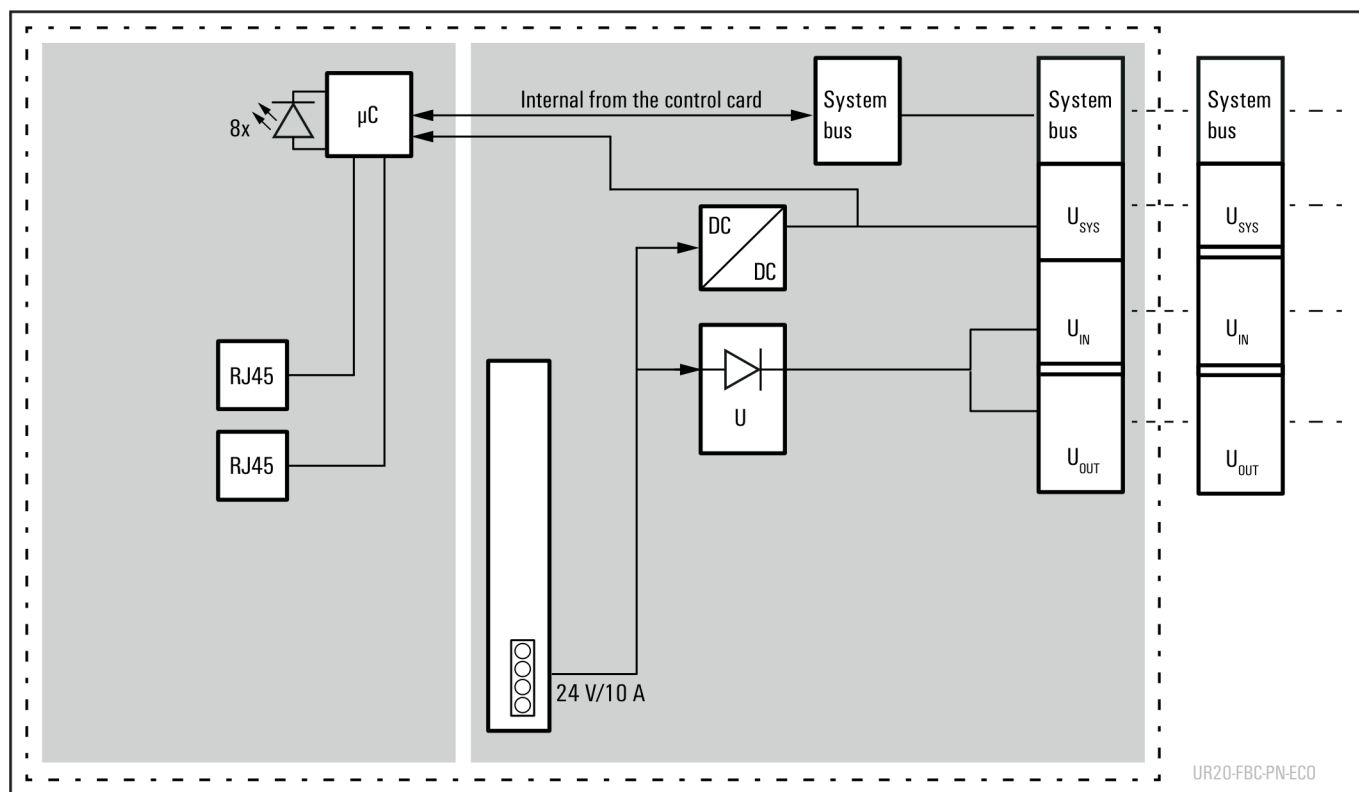
See the UR20 user manual for the process-data mapping.

Status Indicators for UR20-FBC-PN-ECO



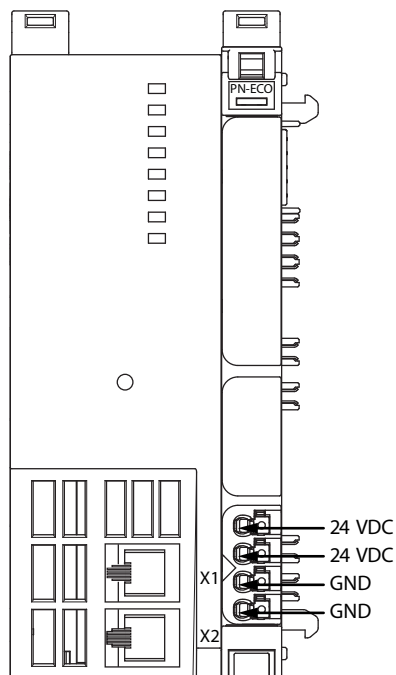
LED	Description	Color	Meaning
PWR	Power LED	Green	Supply voltage connected
		Red	Coupler not yet started completely or hardware error
SF	Collective error	Red	Configuration error, or error in the coupler, or error in a module, or there is a new diagnostic message
		Red flashing	Station in Force mode
BF	Bus failure	Red	No connection to the fieldbus
		Red flashing	Configuration error, no connection to the control unit, or error in the parameter set, or firmware update is running
MT	Maintenance	Yellow	Error on the system bus or the fieldbus
LINK1	Connection	Green	Connection established between port 1 of the coupler and another field device
ACT1	Active	Yellow	Data being exchanged on port 1
LINK2	Connection	Green	Connection established between port 2 of the coupler and another field device
ACT2	Active	Yellow	Data being exchanged on port 2

Block Diagram



Block diagram - UR20-FBC-PN-ECO

Terminal Connections



CAUTION: RISK OF MATERIAL DAMAGE! WHEN POWER SUPPLY CURRENT DEMAND WILL BE GREATER THAN 8A (>8A), ALL FOUR CONTACTS MUST BE CONNECTED WITH 1.5MM² WIRING.



UR20 Digital Input Modules

UR20-8DI-P-3W

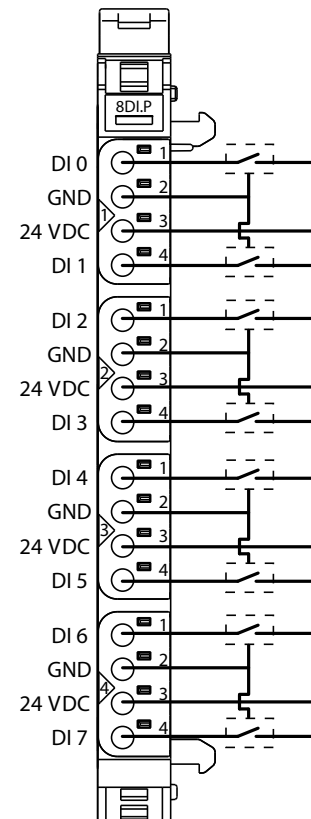
The digital input module UR20-8DI-P-3W can detect up to 8 binary control signals. Two sensors can be connected to each connector using a 2-wire or 3-wire connection. A status LED is assigned to each channel. The module electronics supply the connected sensors with power from the input current path (I_{IN}).

- For use with dry contact or PNP type sensors.



Technical Specifications - UR20-8DI-P-3W	
Price	\$88.00
Drawing	PDF
Inputs	
Number	8
Input type	P-switching (sinking inputs), for Type 1 and Type 3 sensors as per IEC 61131-2
Input filter	Input delay adjustable from 0 to 40 ms
Low input voltage	< +5V referred to 0V of the input power supply U_{IN}
High input voltage	> +11V referred to 0V of the input power supply U_{IN}
Sensor supply	max. 2A per plug, total max. 8A
Sensor connection	2-wire, 3-wire
Reverse polarity protection	Yes
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	< 30 mA + sensor supply current
Weight	
Weight (operational status)	83g

Terminal Connections





UR20 Digital Input Modules

UR20-8DI-N-3W

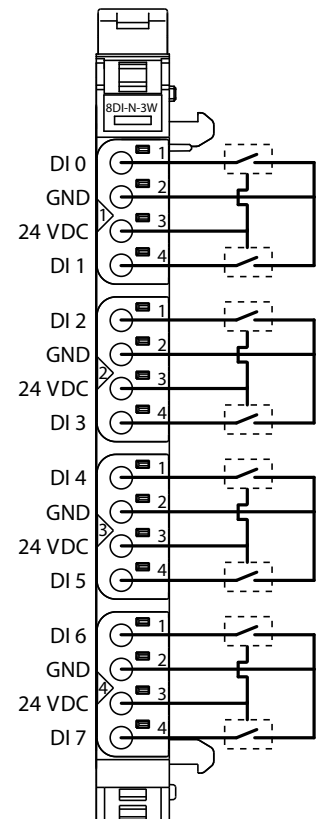
The digital input module **UR20-8DI-N-3W** can detect up to 8 binary control signals. Two sensors can be connected to each connector using a 2-wire or 3-wire connection. The inputs are N-switching (sourcing). A status LED is assigned to each channel. The module electronics supply the connected sensors with power from the input current path (I_{IN}).

- For use with dry contact or NPN type sensors.



Technical Specifications - UR20-8DI-N-3W	
Price	\$96.00
Drawing	PDF
Inputs	
Number	8
Input type	N-switching (sourcing inputs), for Type 1 and Type 3 sensors as per IEC 61131-2
Input filter	Input delay adjustable from 0 to 40 ms
Low input voltage	> +5V referred to +24V of the input power supply U_{IN}
High input voltage	< -11V referred to +24V of the input power supply U_{IN}
Sensor supply	Max. 2A per plug, total max. 8A
Sensor connection	2-wire, 3-wire
Reverse polarity protection	Yes
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	< 20 mA + sensor supply current
Weight	
Weight (operational status)	83g

Terminal Connections





UR20 Digital Input Modules

UR20-16DI-P

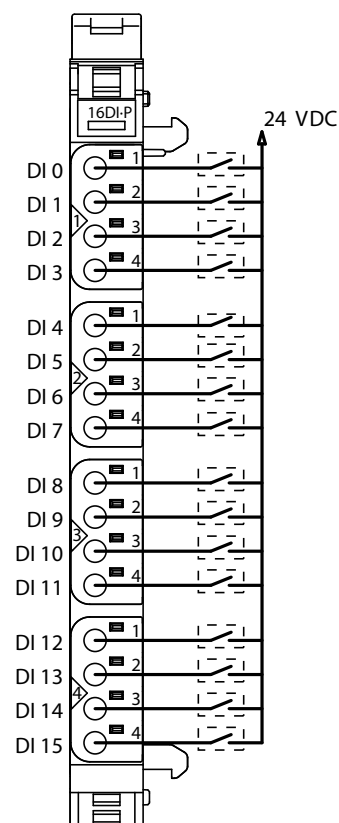
The UR20-16DI-P digital input module can detect up to 16 binary control signals. Four sensors can be connected to each connector in a 1-wire connection. A status LED is assigned to each channel. The connected sensors must be supplied with power from the input current path I_{IN} .

- For use with dry contact or PNP type sensors.

Technical Specifications - UR20-16DI-P	
Price	\$117.00
Drawing	PDF
Inputs	
Number	16
Input type	P-switching (sinking inputs), for Type 1 and Type 3 sensors as per IEC 61131-2
Input filter	Input delay adjustable from 0 to 40 ms
Low input voltage	< +5V referred to 0V of the input power supply U_{IN}
High input voltage	> +11V referred to 0V of the input power supply U_{IN}
Sensor supply	No
Sensor connection	1-wire
Reverse polarity protection	Yes
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	< 25 mA
Weight	
Weight (operational status)	87g



Terminal Connections





UR20 Digital Input Modules

UR20-16DI-N

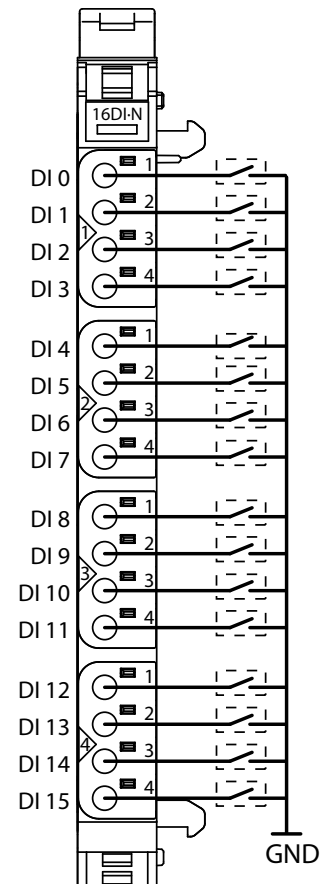
The UR20-16DI-N digital input module can detect up to 16 binary control signals. Four sensors can be connected to each connector in a 1-wire connection. The inputs are N-switching (sourcing). A status LED is assigned to each channel. The connected sensors must be supplied with power from the input current path I_{IN} (e.g., with potential distribution modules).

- For use with dry contact or NPN type sensors.



Technical Specifications - UR20-16DI-N	
Price	\$125.00
Drawing	PDF
Inputs	
Number	16
Input type	N-switching (sourcing inputs), for Type 1 and Type 3 sensors as per IEC 61131-2
Input filter	Input delay 3 ms
Low input voltage	> +5V referred to +24V of the input power supply U_{IN}
High input voltage	< -11V referred to +24V of the input power supply U_{IN}
Sensor supply	No
Sensor connection	1-wire
Reverse polarity protection	Yes
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	< 15 mA
Weight	
Weight (operational status)	88g

Terminal Connections





UR20 Digital Output Modules

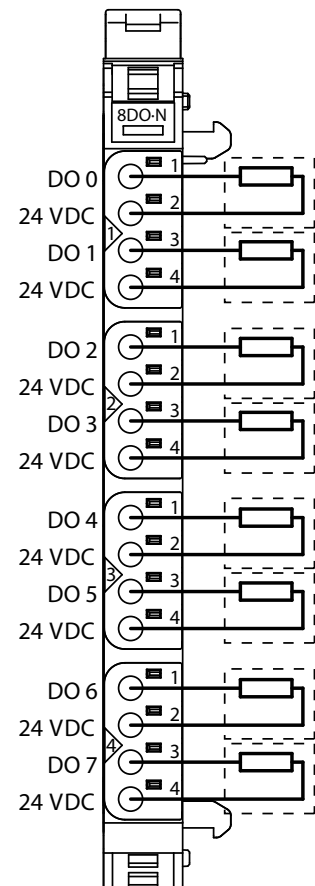
UR20-8DO-N

The UR20-8DO-N digital output module can control up to 8 actuators each with a maximum of 0.5A. One actuator can be connected to each connector using a 2-wire connection. The outputs are N-switching (sinking). A status LED is assigned to each channel. The outputs are supplied with power from the output current path (I_{OUT}).



Technical Specifications - UR20-8DO-N	
Price	\$100.00
Drawing	PDF
Outputs	
Number	8
Output type	N-switching (sinking outputs)
Type of load	Ohmic, inductive, lamp load
Response time	Low → high max. 100µs; high → low max. 250 µs
Max. output current	Per channel / per module: 0.5A / 4A
Breaking energy (inductive)	150 mJ per channel
Switching frequency	Ohmic load (min. 47Ω): 1 kHz Inductive load (DC 13): 0.2 Hz without free-wheeling diode 1 kHz with suitable free-wheeling diode Lamp load (12W): 10 Hz
Actuator connection	2-wire
Short-circuit-proof	Yes
Protective circuit	Constant current with thermal switch-off and automatic restart
Response time of the current limiting circuit	<100 µs
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from output current path I_{OUT}	15 mA + load
Weight	
Weight (operational status)	87g

Terminal Connections





UR20 Digital Output Modules

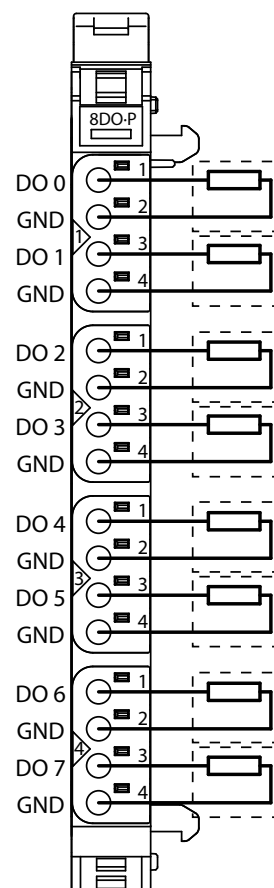
UR20-8DO-P

The UR20-8DO-P digital output module can control up to 8 actuators each with a maximum of 0.5A. Actuators can be connected to each connector in a 2-wire connection. A status LED is assigned to each channel. The outputs are supplied with power from the output current path (I_{OUT}).



Technical Specifications - UR20-8DO-P	
Price	\$92.00
Drawing	PDF
Outputs	
Number	8
Output type	P-switching (sourcing outputs)
Type of load	Ohmic, inductive, lamp load
Response time	Low → high max. 100 µs; high → low max. 250 µs
Max. output current	Per channel / per module: 0.5A / 4A
Breaking energy (inductive)	150 mJ per channel
Switching frequency	Ohmic load (min. 47Ω): 1 kHz Inductive load (DC 13): 0.2 Hz without free-wheeling diode 1 kHz with suitable free-wheeling diode Lamp load (12W): 10 Hz
Actuator connection	2-wire
Short-circuit-proof	Yes
Protective circuit	Constant current with thermal switch-off and automatic restart
Response time of the current limiting circuit	<100 µs
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from output current path I_{OUT}	30 mA + load
Weight	
Weight (operational status)	87g

Terminal Connections





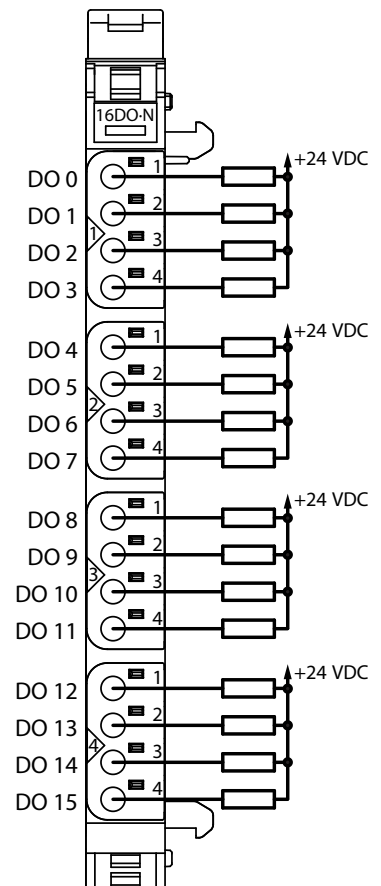
UR20 Digital Output Modules

UR20-16DO-N

The UR20-16DO-N digital output module can control up to 16 actuators each with a maximum of 0.5A. Four actuators can be connected to each connector. The outputs are N-switching (sinking). A status LED is assigned to each channel. The outputs are supplied with power from the output current path (I_{OUT}).



Terminal Connections



Technical Specifications - UR20-16DO-N	
Price	\$150.00
Drawing	PDF
Outputs	
Number	16
Output type	N-switching (sinking outputs)
Type of load	Ohmic, inductive, lamp load
Response time	Low → high max. 100 μs; high → low max. 250 μs
Max. output current	Per channel / per module: 0.5A / 8A
Breaking energy (inductive)	150 mJ per channel
Switching frequency	Ohmic load (min. 47Ω): 1 kHz Inductive load (DC 13): 0.2 Hz without free-wheeling diode 1 kHz with suitable free-wheeling diode Lamp load (12W): 10 Hz
Actuator connection	1-wire
Short-circuit-proof	Yes
Protective circuit	Constant current with thermal switch-off and automatic restart
Response time of the current limiting circuit	<100 μs
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from output current path I_{OUT}	30 mA + load
Weight	
Weight (operational status)	89g



UR20 Digital Output Modules

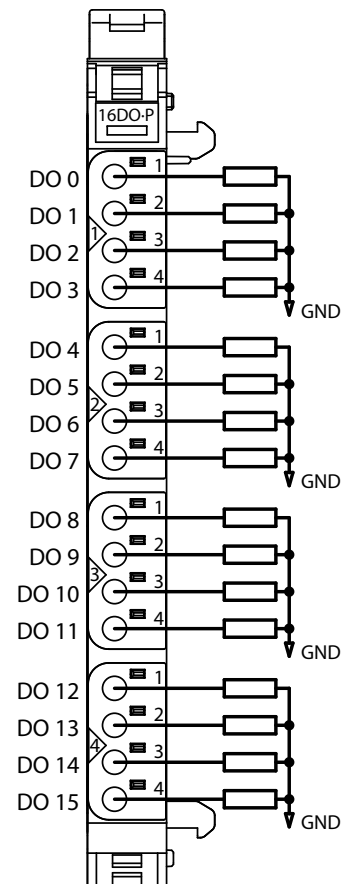
UR20-16DO-P

The UR20-16DO-P digital output module can control up to 16 actuators each with a maximum of 0.5A. Four actuators can be connected to each connector. The outputs are P-switching (sourcing). A status LED is assigned to each channel. The outputs are supplied with power from the output current path (I_{OUT}).



Technical Specifications - UR20-16DO-P	
Price	\$141.00
Drawing	PDF
Outputs	
Number	16
Output type	P-switching (sourcing outputs)
Type of load	Ohmic, inductive, lamp load
Response time	Low → high max. 100 µs; high → low max. 250 µs
Max. output current	Per channel / per module: 0.5A / 8A
Breaking energy (inductive)	150 mJ per channel
Switching frequency	Ohmic load (min. 47Ω): 1 kHz Inductive load (DC 13): 0.2 Hz without free-wheeling diode 1 kHz with suitable free-wheeling diode Lamp load (12W): 10 Hz
Actuator connection	1-wire
Short-circuit-proof	Yes
Protective circuit	Constant current with thermal switch-off and automatic restart
Response time of the current limiting circuit	<100 µs
Module diagnosis	Yes
Individual channel diagnosis	No
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from output current path I_{OUT}	25 mA + load
Weight	
Weight (operational status)	83g

Terminal Connections





UR20 Digital I/O Modules

UR20-8DIO-P-3W-DIAG

Each of the eight channels of the digital I/O module UR20-8DIO-P-3W-DIAG can be configured to be an input or an output. A status LED is assigned to each channel. Up to two sensors or actuators can be connected to each connector using a 2-wire or 3-wire connection.

- The digital inputs are specified 24 VDC Type 1 and 3 as per IEC 61131-2. The sensor supply is limited to 0.3A per connector and fused by a self-resetting fuse. The individual channel diagnosis monitors the sensor supply for overcurrent >0.3A.
- The individual channel diagnosis monitors switched outputs for overload and unswitched outputs for load (line break detection). The outputs have a maximum output current of 0.5A at 24 VDC and are short-circuit-proof. An output will only be switched if the output voltage is below the line break detection threshold (see technical data).
- The module electronics supply the connected sensors and actuators with power from the output current path (I_{OUT}).



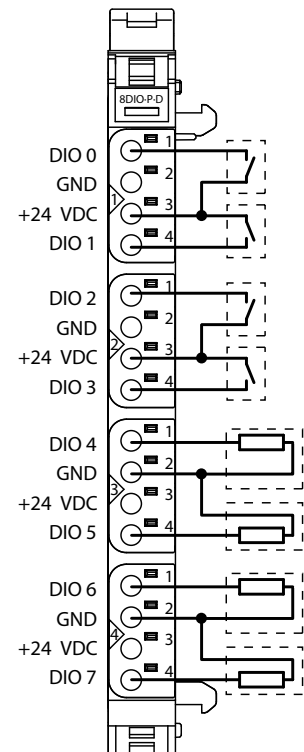
Technical Specifications - UR20-8DIO-P-3W-DIAG

Price	\$137.00
Drawing	PDF
Inputs	
Number	8
Input type	P-switching, for Type 1 and Type 3 sensors as per IEC 61131-2
Input filter	Input delay adjustable from 0 to 40 ms
Low input voltage	< +5V referred to 0V of the output power supply U_{OUT}
High input voltage	> +11V referred to 0V of the output power supply U_{OUT}
Sensor supply	≤ 0.3A per connector; limited electronically
Protective circuit	Constant current with thermal switch-off and automatic restart
Sensor connection	2-wire, 3-wire
Reverse polarity protection	No, input voltage below -10V can destroy the module
Module diagnosis	Yes
Individual channel diagnosis	Only auxiliary voltage output
Outputs	
Number	8
Type	P-switching
Type of load	Ohmic, inductive, lamp load
Response time	Typ. 120 μs
Max. output current	Per channel / per module: 0.5A / 4A
Breaking energy (inductive)	150 mJ per channel
Switching frequency	Ohmic load (min. 47Ω): 1 kHz; Inductive load (DC 13): 0.2 Hz without free-wheeling diode, 1 kHz with suitable free-wheeling diode; Lamp load (12W): 10 Hz
Actuator connection	2-wire, 3-wire
Actuator supply	See sensor supply
Short-circuit-proof	Yes
Protective circuit	Constant current with thermal switch-off and automatic restart
Response time of the current limiting circuit	<100 μs
Module diagnosis	Yes
Individual channel diagnosis	Yes, overcurrent monitoring > 0.5A, line break detection
Line break detection	Threshold typ. 3.3V (load resistance > 6 kΩ)
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from output current path I_{OUT}	34 mA + sensor supply + load
Weight	
Weight (operational status)	90g



CAUTION: THE INPUT VOLTAGE MUST BE ABOVE -10V OR THE MODULE CAN BE DESTROYED.

Terminal Connections





UR20 Relay Output Modules

UR20-4RO-CO-255

The digital relay output module UR20-4RO-CO-255 can control up to 4 actuators each with a maximum of 6A. Each connector features a potential-free changeover contact. A status LED is assigned to each channel. The relay coils are supplied with power from the output current path (I_{OUT}).

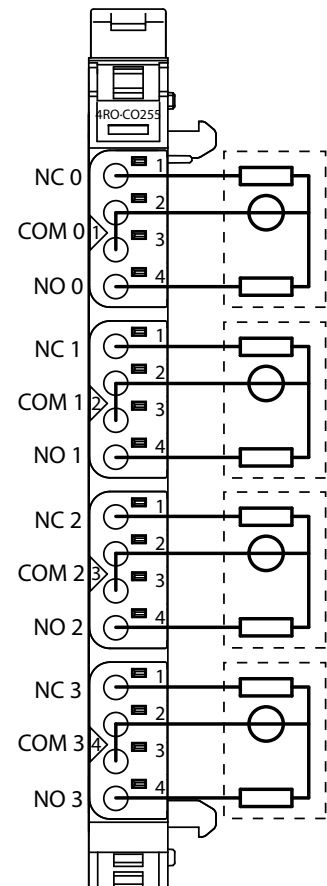
When using relay modules UR20-4RO-CO-255 in explosive atmosphere:

- The device must be installed in an environment free of condensation, corrosives and conductive dust.
- If the switching or input voltage exceeds 63V, a transient protection device must be provided that limits the transients to a peak voltage of 500V or less.
- Because relays wear, you must ensure that the temperature does not exceed the limits of temperature class T4. A contact resistance of more than 110 mΩ will be considered as a fault.



Technical Specifications - UR20-4RO-CO-255	
Price	\$145.00
Drawing	PDF
Outputs	
Number	4
Type	C0 contact
Response time	20 ms
Max. output current	5A per channel at 60 °C / 6A at 55 °C 20A per module at 60 °C / 24A at 55 °C
Switching frequency	5 Hz max.
Short-circuit-proof	No
Protective circuit	Requires an external 6A slow-blow fuse
Service life with AC-15 load and 1-A switching current	>300000 switching cycles
Module diagnosis	Yes
Individual channel diagnosis	No
Max. switching voltage	255 VAC, UL: 277 VAC, 277 VDC corresponding to derating curve (see UR20 manual for derating)
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from output current path I_{OUT}	4 mA + 4 mA per active relay
Weight	
Weight (operational status)	106g

Terminal Connections





UR20 Analog Input Modules

UR20-2AI-SG-24-DIAG

The UR20-2AI-SG-24-DIAG strain gauge module is an analog input module designed to connect force sensors working with strain gauges. Thus weights, torques or vibrations can be exactly measured. You can calibrate the module through its parameters. Using the web server, the module can be calibrated and password protected. The calibration setting will then be documented. The tare function can be triggered individually for each channel either via a digital input or via software.

- Several sensors can be connected in parallel to each of the two channels in 4-wire or 6-wire technique as long as their input impedance is within the permissible sensor load.
- The resolution is 24 bits per channel with a 0.01% accuracy of the full scale.
- A status LED is assigned to each channel.
- The module electronics supply the connected sensors with power from a potential that is galvanically isolated from the input current path (I_{IN}).
- The inputs are protected against voltage surges and overcurrent.
- Voltages that exceed $\pm 30V$ may cause the destruction of the module.
- The module provides single-channel diagnosis with channel-related error diagnostic and line break detection.



CAUTION: VOLTAGES THAT EXCEED $\pm 30V$ MAY CAUSE THE DESTRUCTION OF THE MODULE.

Technical Specifications - UR20-2AI-SG-24-DIAG	
Price	\$468.00
Drawing	PDF
Analog Inputs	
Number	2
Sensor connection	4-wire, 6-wire, parameterizable
Input value	Differentially, to evaluate a strain gauge full bridge
Conversion time	5 to 800 ms
Conversion rate	1.25 to 200 samples per second
Conversion method	Sigma-Delta
Operation mode	Continuous conversion
Bandwidth input filter	> 500 Hz (3 dB)
Resolution	24 Bit per channel
Data type output	32 Bit signed integer
Measurement range	± 150 mV
Supported sensor sensitivity	0.5–30 mV/V, parameterizable
Overload	> 5%
Output on overload	0x7FFFFFFF
Input impedance signal	> 100 M Ω
Input impedance sense	> 200 k Ω
Accuracy (customer calibration) ¹	$\pm 0.01\%$ FSR (100 ppm)
Accuracy (factory calibration) ¹	$\pm 0.05\%$ FSR (500 ppm)
Accuracy (-20 to +60 °C)	
Accuracy during interference	$\pm 1\%$ FSR
Temperature coefficient	< 5 ppm/K
Nonlinearity	< 50 ppm
Repeat accuracy (after 2h of operation)	< 20 ppm
Common mode rejection ratio (CMRR) at 2.5 VDC ± 1.5 V/50 Hz ¹	> 120 dB
Crosstalk attenuation	> 120 dB

1 - With conversion time ≥ 80 ms and sensor sensitivity > 2 mV/V

Continued on next page

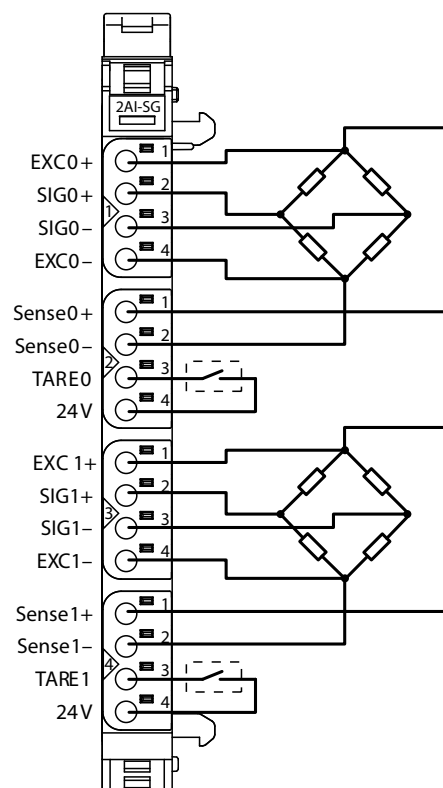
UR20 Analog Input Modules

Technical Specifications - UR20-2AI-SG-24-DIAG

(continued)

Insulation rated voltage between power path and bus	50 VDC
Insulation rated voltage between power path and signal	50 VDC
Sensor excitation voltage	5 VDC $\pm 0.2V$
Permissible sensor load	85–5000 Ω
Short-circuit-proof	Yes
Module diagnosis	Yes
Individual channel diagnosis	Yes, line break detection, short circuit detection, overload
Common potential between channels	EXC 0- and EXC 1-
Calibration interval	Max. 1 year
Calibration capability	Yes
Digital Inputs	
Number	2
Input type	Type 1 and Type 3 as per IEC 61131-2
Input filter	10 ms fixed
Input voltage low	< 5V
Input voltage high	> 11V
Permissible load of auxiliary voltage	< 10 mA
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	< 35 mA (75 mA at nominal load)
Weight	
Weight (operational status)	90g

Terminal Connections



Terminal Assignments

Terminal	Assignment	Function/Connection
1.1	EXC 0+	AI0: Excitation +
1.2	SIG 0+	AI0: Signal +
1.3	SIG 0-	AI0: Signal -
1.4	EXC 0-	AI0: Excitation -
2.1	Sense 0+	AI0: Sense +
2.2	Sense 0-	AI0: Sense -
2.3	TARE 0	DI0: Digital input (tare)
2.4	24V	DI0: 24 VDC (for the digital input only)
3.1	EXC 1+	AI1: Excitation +
3.2	SIG 1+	AI1: Signal +
3.3	SIG 1-	AI1: Signal -
3.4	EXC 1-	AI1: Excitation -
4.1	Sense 1+	AI1: Sense +
4.2	Sense 1-	AI1: Sense -
4.3	TARE 1	DI1: Digital input (tare)
4.4	24V	DI1: 24 VDC (for the digital input only)



UR20 Analog Input Modules

UR20-2AI-UI-16

The UR20-2AI-UI-16 analog input module can measure up to 2 analog sensors with $\pm 10V$, $\pm 5V$, $0-10V$, $0-5V$, $2-10V$, $1-5V$, $0-20\text{ mA}$ or $4-20\text{ mA}$. The resolution is 16 bit per channel.

- Sensors can be connected to each connector in a 2-wire, 3-wire, or 3-wire connection + FE.
- The measurement range is defined using parameterization.
- A status LED is assigned to each channel.
- The module electronics supply the connected sensors with power from the input current path (I_{IN}).
- The inputs are protected against voltage surges and overcurrent.
- Voltages that exceed $\pm 30\text{ V}$ may cause the destruction of the module. As a protection against overcurrent, the module temporarily switches to voltage mode.

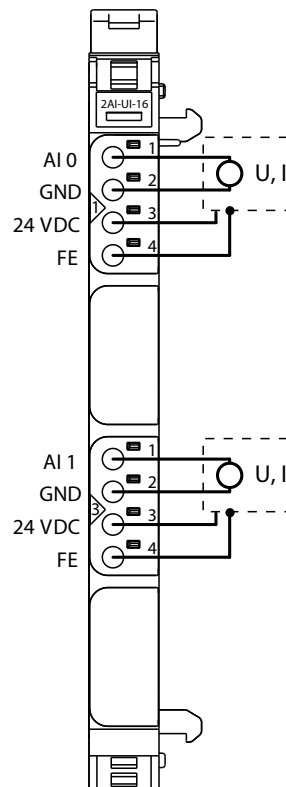


CAUTION: VOLTAGES THAT EXCEED $\pm 30V$ MAY CAUSE THE DESTRUCTION OF THE MODULE.

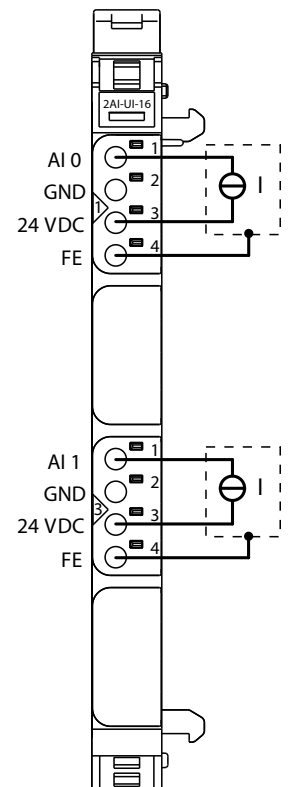


Technical Specifications - UR20-2AI-UI-16		
Price		\$220.00
Drawing		PDF
Inputs		
Number		2
Input values	Voltage	0–5V, $\pm 5V$, 0–10V, $\pm 10V$, 1–5V, 2–10V
	Current	0–20 mA, 4–20 mA
Resolution		16 bits
Accuracy		0.1% max. at 25 °C $\pm 50\text{ ppm/K}$ max. temperature coefficient Max. +10 mV/A: additional inaccuracy in the voltage mode due to sensor power supply current
Sensor supply		Max. 2A per plug, total max. 4A
Sensor connection		2-wire, 3-wire, 3-wire + FE
Conversion time		1 ms
Internal resistance		U: typ. 100 k Ω I: < 50 Ω
Reverse polarity protection		Yes
Short-circuit-proof		Yes
Response time of the protective circuit		< 50 ms
Module diagnosis		Yes
Individual channel diagnosis		No
Supply		
Supply voltage for system, inputs and outputs		24 VDC +20% / -15%
Current consumption from system current path I_{SYS}		8 mA
Current consumption from input current path I_{IN}		25 mA + sensor supply current
Weight		
Weight (operational status)		96g

Terminal Connections



3/4 sensor with signal wiring and sensor supply via module electronics



2-wire sensor loop powered by module electronics



UR20 Analog Input Modules

UR20-4AI-UI-16

The UR20-4AI-UI-16 analog input module can record up to 4 analog sensors with $\pm 10V$, $\pm 5V$, $0-10V$, $0-5V$, $2-10V$, $1-5V$, $0-20\text{ mA}$ or $4-20\text{ mA}$. The resolution is 16 bit per channel.

- Sensors can be connected to each connector in a 2-wire, 3-wire or 3-wire connection + FE.
- The measurement range is defined using parameterization.
- A status LED is assigned to each channel.
- The module electronics supply the connected sensors with power from the input current path (I_{IN}).
- The inputs are protected against voltage surges and overcurrent.
- Voltages that exceed $\pm 30V$ may cause the destruction of the module. As a protection against overcurrent, the module temporarily switches to voltage mode.

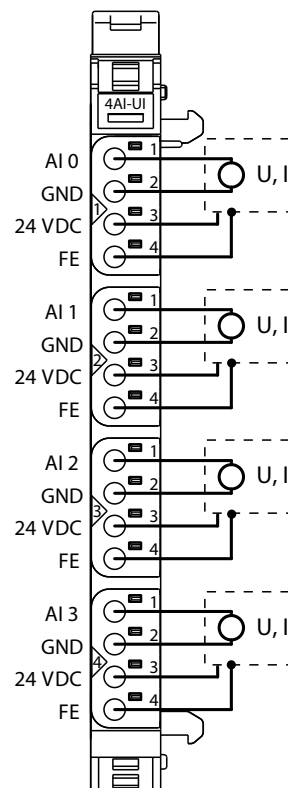


CAUTION: VOLTAGES THAT EXCEED $\pm 30V$ MAY CAUSE THE DESTRUCTION OF THE MODULE.

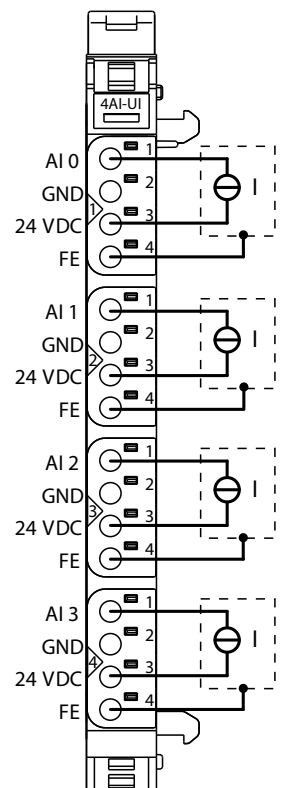


Technical Specifications - UR20-4AI-UI-16		
Price		\$306.00
Drawing		PDF
Inputs		
Number		4
Input values	Voltage	$0-5V$, $\pm 5V$, $0-10V$, $\pm 10V$, $1-5V$, $2-10V$
	Current	$0-20\text{ mA}$, $4-20\text{ mA}$
Resolution		16 bits
Accuracy		0.1% max. at $25\text{ }^{\circ}\text{C}$ $\pm 50\text{ ppm/K}$ max. temperature coefficient Max. $+10\text{ mV/A}$: additional inaccuracy in the voltage mode due to sensor power supply current
Sensor supply		Max. 2A per plug, total max. 8A
Sensor connection		2-wire, 3-wire, 3-wire + FE
Conversion time		1 ms
Internal resistance		U: typ. $100\text{ k}\Omega$ I: $\sim 42\Omega$
Reverse polarity protection		Yes
Short-circuit-proof		Yes
Response time of the protective circuit		$< 50\text{ ms}$
Module diagnosis		Yes
Individual channel diagnosis		No
Supply		
Supply voltage for system, inputs and outputs		$24\text{ VDC} + 20\% / -15\%$
Current consumption from system current path I_{SYS}		8 mA
Current consumption from input current path I_{IN}		$25\text{ mA} + \text{sensor supply current}$
Weight		
Weight (operational status)		96g

Terminal Connections



3/4 sensor with signal wiring and sensor supply via module electronics



2-wire sensor loop powered by module electronics



UR20 Analog Input Modules

UR20-4AI-RTD-DIAG

The analog input module UR20-4AI-RTD-DIAG can detect up to 4 analog resistance thermometers. The resolution is 16 bit per channel.

- A sensor can be connected to each connector in a 2-wire, 3-wire or 4-wire connection.
- Mixed operation using different sensors as well as different connection methods is possible.
- Sensor type and temperature range are set using parameterization.
- A status LED is assigned to each channel.
- The inputs are protected against voltage surges and overcurrent. Voltages that exceed $\pm 30V$ may cause the destruction of the module.
- The module provides individual channel diagnosis with channel related error messages.

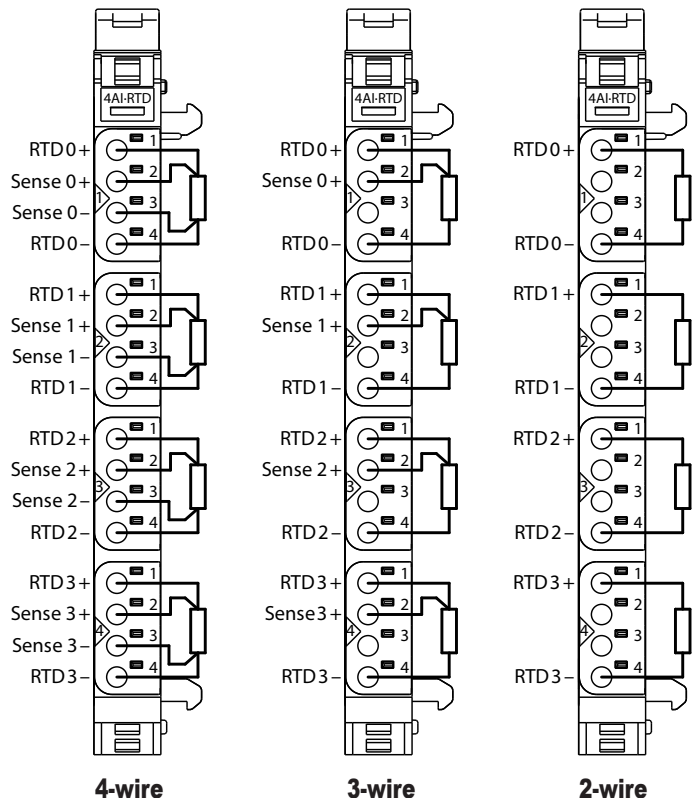


CAUTION: VOLTAGES THAT EXCEED $\pm 30V$ MAY CAUSE THE DESTRUCTION OF THE MODULE.



Technical Specifications - UR20-4AI-RTD-DIAG	
Price	\$386.00
Drawing	PDF
Inputs	
Number	4
Sensor types	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni 200, Ni500, Ni1000, Cu10, 40 Ω , 80 Ω , 150 Ω , 300 Ω , 500 Ω , 1 k Ω , 2 k Ω , 4 k Ω
Resolution	16 bits
Accuracy	Max. 0.2% FSR / 0.3% FSR for Ni sensors / 0.6% FSR for Cu10
Sensor connection	2-wire, 3-wire, 4-wire
Sensor current	Depending on the sensor type 0.75 mA (Pt100, Ni100, Ni120, Cu10, 40 Ω , 80 Ω , 150 Ω , 300 Ω) or 0.25 mA (Pt200, Pt500, Pt1000, Ni200, Ni500, Ni1000, 500 Ω , 1 k Ω , 2 k Ω , 4 k Ω)
Max. wire resistance / measurement range	2.5 Ω /40 Ω , 5 Ω /80 Ω , 10 Ω /150 Ω and Cu10, 25 Ω in all other measurement ranges
Temperature coefficient	± 50 ppm/K max.
Temperature range	-200 to +850 °C [-328 to +1562 °F]
Conversion time	36 to 240 ms, adjustable
Common mode input voltage range	Channel to channel: max. $\pm 2V$ Channel to voltage supply: max. $\pm 50V$
Reverse polarity protection	Yes
Module diagnosis	Yes
Individual channel diagnosis	Yes
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	< 20 mA
Weight	
Weight (operational status)	91g

Terminal Connections





UR20 Analog Input Modules

UR20-4AI-TC-DIAG

The analog input module UR20-4AI-TC-DIAG can detect up to 4 analog thermocouple sensors or voltages between ± 15 mV and ± 2 V. The resolution is 16 bit per channel.

- Sensor type and temperature range are set using parameterization.
- Mixed operation using different sensors is possible.
- For each channel, an internal or external cold-junction compensation (CJC) can be parameterized.
- A status LED is assigned to each channel.
- The inputs are protected against voltage surges and overcurrent.
- Voltages that exceed ± 30 V may cause the destruction of the module.
- The module provides individual channel diagnosis with channel related error messages.

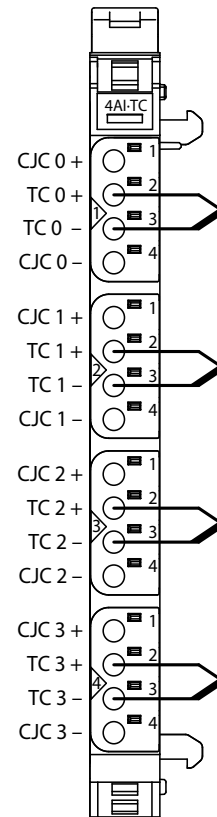


CAUTION: VOLTAGES THAT EXCEED ± 30 V MAY CAUSE THE DESTRUCTION OF THE MODULE.

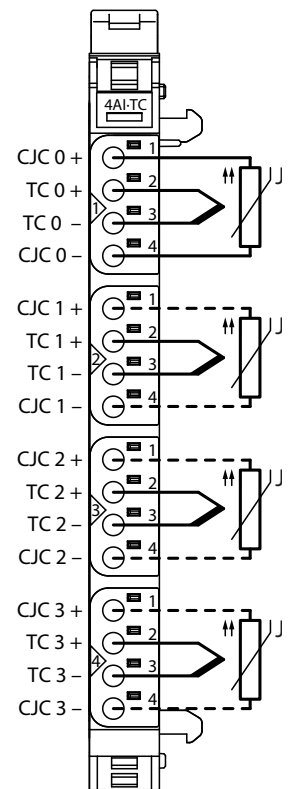


Technical Specifications - UR20-4AI-TC-DIAG	
Price	\$386.00
Drawing	PDF
Inputs	
Number	4
Sensor types	J, K, T, B, N, E, R, S, L, U, C, mV
Resolution	16 bits
Accuracy	Conversion time ≥ 80 ms: $10 \mu\text{V} + 0.1\%$ of voltage measurement range (without cold-junction measurement error)
Sensor connection	2-wire
Sensor current	0.25 mA for the cold-junction compensation with a Pt1000
Cold-junction compensation	Internal and external (Pt1000), internal accuracy ≤ 3 K
Temperature coefficient	± 50 ppm/K max.
Temperature range	-200 to $+2315$ °C [-328 to 4199 °F]
Conversion time	36 to 240 ms, adjustable
Common mode input voltage range	Channel to channel: max. ± 2 V Channel to voltage supply: max. ± 50 V
Internal resistance	$> 1 \text{ M}\Omega$
Reverse polarity protection	Yes
Module diagnosis	Yes
Individual channel diagnosis	Yes
Supply	
Supply voltage for system, inputs and outputs	24 VDC $+20\%$ / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	20 mA
Weight	
Weight (operational status)	86g

Terminal Connections



Internal CJC



External CJC



UR20 Analog Output Modules

UR20-2AO-UI-16

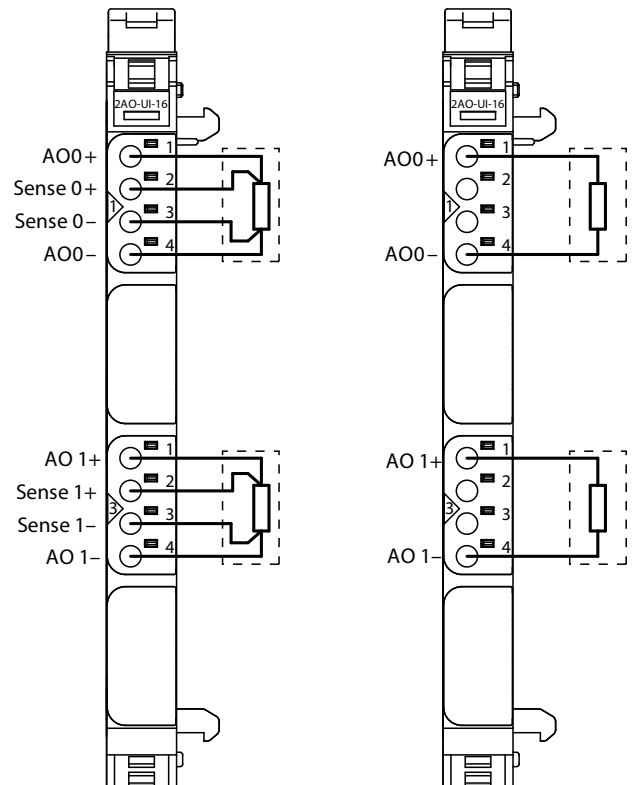
The analog output module UR20-2AO-UI-16 can control up to 2 analog actuators with $\pm 10V$, $\pm 5V$, $0-10V$, $0-5V$, $2-10V$, $1-5V$, $0-20\text{ mA}$ or $4-20\text{ mA}$. The resolution is 16 bit per channel.

- An actuator can be connected to each connector in a 2-wire or 4-wire connection.
- The internal switching is carried out automatically.
- The output range is defined using parameterization.
- A status LED is assigned to each channel.
- The outputs are supplied with power from the output current path I_{OUT} .
- The outputs are decoupled from the system bus I_{SYS} , but there is no potential isolation to the output current path I_{OUT} .



Technical Specifications - UR20-2AO-UI-16		
Price		\$242.00
Drawing		PDF
Outputs		
Number		2
Output levels	Voltage	$0-5V$, $\pm 5V$, $0-10V$, $\pm 10V$, $1-5V$, $2-10V$
	Current	$0-20\text{ mA}$, $4-20\text{ mA}$
Response time		1 ms for 2 channels
Resolution		16 bits
Accuracy		0.1% FSR max., 0.05% FSR typ.
Temperature coefficient		30 ppm/K
Max. error between T_{min} and T_{max}		$\pm 0.24\%$ FSR
Monotonicity		Yes
Crosstalk between the channels		$\pm 0.001\%$ FSR max.
Repeat accuracy		$< \pm 1\text{ mV RMS}$
Voltage load resistance		$\geq 1\text{ k}\Omega$
Current load resistance		$\leq 600\Omega$
Actuator connection		Automatic detection: 2-wire (current and voltage) or 4-wire (voltage)
Short-circuit-proof		Yes
Module diagnosis		Yes
Individual channel diagnosis		No
Substitute value		Yes
Supply		
Supply voltage for system, inputs and outputs		24 VDC $+20\%$ / -15%
Current consumption from system current path I_{SYS}		8 mA
Current consumption from output current path I_{OUT}		56 mA
Weight		
Weight (operational status)		83g

Terminal Connections





UR20 Analog Output Modules

UR20-4AO-UI-16

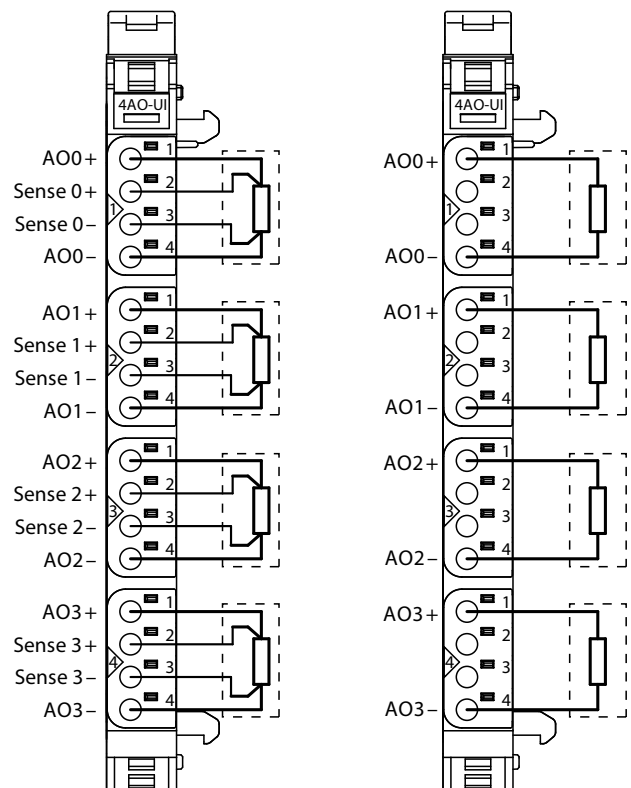
The analog output module UR20-4AO-UI-16 can control up to 4 analog actuators with $\pm 10V$, $\pm 5V$, $0-10V$, $0-5V$, $2-10V$, $1-5V$, $0-20\text{ mA}$ or $4-20\text{ mA}$. The resolution is 16 bit per channel.

- An actuator can be connected to each connector in a 2-wire or 4-wire connection, the internal switching is carried out automatically.
- The output range is defined using parameterization.
- A status LED is assigned to each channel.
- The outputs are supplied with power from the output current path I_{OUT} .
- The outputs are decoupled from the system bus I_{SYS} , but there is no potential isolation to the output current path I_{OUT} .



Technical Specifications - UR20-4AO-UI-16		
Price		\$379.00
Drawing		PDF
Outputs		
Number		4
Output levels	Voltage	$0-5V$, $\pm 5V$, $0-10V$, $\pm 10V$, $1-5V$, $2-10V$
	Current	$0-20\text{ mA}$, $4-20\text{ mA}$
Response time		1 ms for 4 channels
Resolution		16 bits
Accuracy		0.1% FSR max., 0.05% FSR typ.
Temperature coefficient		30 ppm/K
Max. error between T_{min} and T_{max}		$\pm 0.24\%$ FSR
Monotonicity		Yes
Crosstalk between the channels		$\pm 0.001\%$ FSR max.
Repeat accuracy		$< \pm 1\text{ mV RMS}$
Voltage load resistance		$\geq 1\text{ k}\Omega$ (at $> 50^\circ\text{C}$ ambient temperature: max. 25 mA total sensor current)
Current load resistance		$\leq 600\Omega$
Actuator connection		Automatic detection: 2-wire (current and voltage) or 4-wire (voltage)
Short-circuit-proof		Yes
Module diagnosis		Yes
Individual channel diagnosis		No
Substitute value		Yes
Supply		
Supply voltage for system, inputs and outputs		24 VDC $+20\%$ / -15%
Current consumption from system current path I_{SYS}		8 mA
Current consumption from output current path I_{OUT}		110 mA
Weight		
Weight (operational status)		83g

Terminal Connections





UR20 Communication Modules

UR20-4COM-IO-LINK

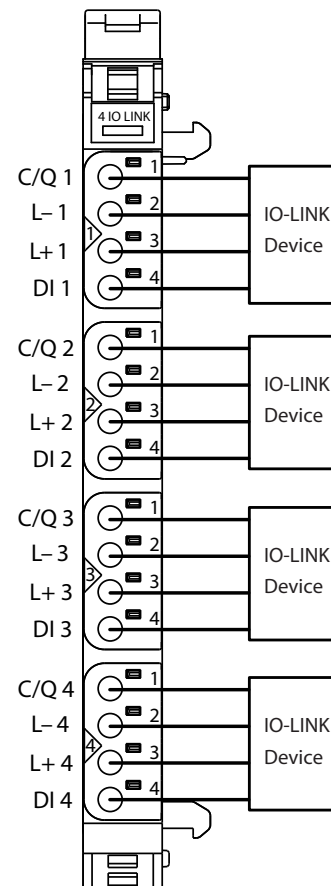
The UR20-4COM-IO-LINK communication module is an IO-Link master according to the IO-Link specification v1.1.2. One IO-Link device can be connected to each connector. The IO-Link devices must conform to port class A.

- One digital input can be used additionally with each connector.
- Process data are exchanged with the connected IO-Link device via each IO-Link port.
- Additionally acyclic data can be exchanged through the same port (diagnostic data, parameter data, status information data).
- The parameter data of the connected IO-Link devices can be stored in the master module, where they are managed by a parameterizing server (data-storage). This makes it easy to change the IO-Link master or a single IO-Link device (from IO-Link specification V1.1 on).
- The four communication channels can be used as digital inputs or outputs together with standard field devices.
- A status LED is assigned to each channel.
- The module electronics supply the connected devices with power from the input current path (I_{IN}).
- The inputs are protected against voltage surges and overcurrent. Voltages that exceed $\pm 30V$ may cause the destruction of the module.



CAUTION: VOLTAGES THAT EXCEED $\pm 30V$ MAY CAUSE THE DESTRUCTION OF THE MODULE.

Terminal Connections



Technical Specifications - UR20-4COM-IO-LINK	
Price	\$301.00
Drawing	PDF
Inputs	
Number	4
Type	IO-Link as per IEC 61131-9
Transfer rate	4.8/38.4/230.4 kbps, depending on the connected IO-Link device
Output current C/Q (in DO mode)	0.1A
Input type C/Q (in DI mode)	Type 1 and Type 3 as per IEC 61131-2
Output current L+	0.5A per channel, total max. 2A
Line break detection	Yes
Short-circuit-proof	Yes
Module diagnosis	Yes
Individual channel diagnosis	Yes
Supply	
Supply voltage for system, inputs and outputs	24 VDC +20% / -15%
Current consumption from system current path I_{SYS}	8 mA
Current consumption from input current path I_{IN}	25 mA + sensor supply
Weight	
Weight (operational status)	88g



UR20 Power-Feed Modules

UR20-PF-I

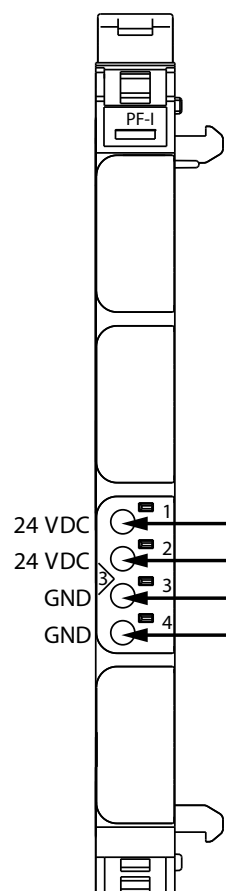
Power-feed modules are used to refresh the current paths and isolate the power supply. The UR20 station's main power supply is always fed in via the coupler. A power-feed module UR20-PF-I must be connected if the current demand of the series of input modules is greater than 10A.

- The maximum feed-in current in the input current path via the 4-pole connector is 10A.
- Power-feed modules are passive modules without fieldbus communication, therefore they are not considered during configuration.
- In a UR20 station, a maximum of three passive modules may be installed directly behind each other, then an active module must follow.
- Any number of passive modules can be placed behind the last active module.
- Passive modules are the power-feed module and the empty slot module.



Technical Specifications - UR20-PF-I	
Price	\$57.00
Drawing	PDF
Supply	
Supply voltage for input modules	24 VDC +20% / -15%
Maximum feed-in current for input modules	10A
Current consumption from input current path I_{IN}	10 mA
Weight	
Weight (operational status)	76g

Terminal Connections





UR20 Power-Feed Modules

UR20-PF-O

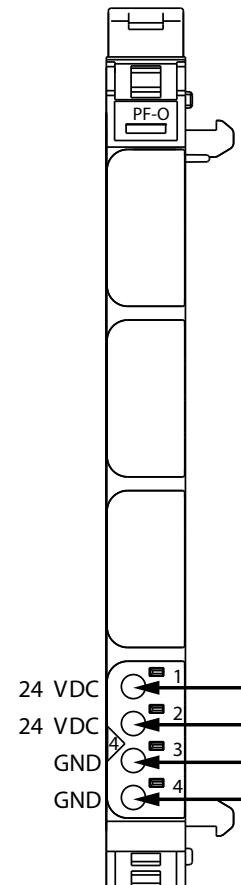
Power-feed modules are used to refresh the current paths and isolate the power supply. The UR20 station's main power supply is always fed in via the coupler. A power-feed module **UR20-PF-O** must be connected if the current demand of the series of output modules is greater than 10A.

- The maximum feed-in current in the output current path via the 4-pole connector is 10A.
- Power-feed modules are passive modules without fieldbus communication, therefore they are not considered during configuration.
- In a UR20 station, a maximum of three passive modules may be installed directly behind each other, then an active module must follow.
- Any number of passive modules can be placed behind the last active module.
- Passive modules are the power-feed module and the empty slot module.



Technical Specifications - UR20-PF-O	
Price	\$57.00
Drawing	PDF
Supply	
Supply voltage for output modules	24 VDC +20% / -15%
Maximum feed-in current for output modules	10A
Current consumption from output current path I_{OUT}	10 mA
Weight	
Weight (operational status)	76g

Terminal Connections





UR20 Module Specifications

Environmental Specifications - UR20 I/O Modules		
Degree of protection (IEC 60529)		IP20
Flammability rating UL 94		V-0
Material of power contacts and data contacts		Ni-Au, 3µm
Temperature	Operation	-20 + 60 °C [-4 to +140 °F]
	Storage, transport	-40 to +85 °C [-40 to +185 °F]
Humidity	Operation	95%, non-condensing as per IEC 61131-2
	Storage, transport	95%, non-condensing as per IEC 61131-2
Air pressure	Operation	≥ 795 hPa [11.5 psi] (altitude ≤ 2000 m) as per IEC 61131-2
	Storage, transport	≥ 700 hPa [10.2 psi] (altitude ≤ 3000 m) as per IEC 61131-2
Vibration resistance		5 Hz ≤ f ≤ 8.4 Hz: 3.5mm amplitude as per IEC 60068-2-6 8.4 Hz ≤ f ≤ 150 Hz: 1g acceleration as per IEC 60068-2-6
Shock resistance		15g over 11 ms, half sinewave, as per IEC 60068-2-27
Potential isolation	Test voltage	Max. 28.8V within one channel 500 VDC field/system (as per EN 60079-15:2017)
	Pollution severity level	2 (as per DIN EN 60664-1:2008)
	Overvoltage category	II (as per DIN EN 50178)
Approvals		CE, RoHS, UKCA, cULus E141197



UR20 Accessories

UR20 Accessories

The accessories listed below are available for use with any UR20 system.

Part Number	Price	Description	Drawing
UR20-EBK-ACC	\$13.00	Weidmüller UR20 series screw-down end bracket, replacement. For use with 35mm DIN rail.	PDF
UR20-ES	\$34.00	Weidmüller UR20 series filler module.	PDF



[UR20-EBK-ACC](#)



[UR20-ES](#)



UR20 Software

UR20 Software

The u-mation software contains a configurator for IO-Link devices.

You can use the IO-Link configurator to configure the IO-Link devices. You can carry out the following functions for test purposes, during commissioning or service work:

- Create and export IO-Link device configurations.
- Parameterize IO-Link devices during ongoing operation.
- Read out identification data, process data and diagnostics of IO-Link devices.

You can run the u-mation configurator in two ways. You can install a setup version or run a portable version without installation.

With both versions of the u-mation configurator you can open project files (.ucc) in the software with Open project and Open file. The setup version can also open .ucc files from the file system.



Part	Price	Description
<u>UR20-IOLINK-SW</u>	\$0.00	Weidmüller UR20 series Windows configuration software, free download only. For use with UR20-4COM-IO-LINK IO-Link master. Requires PC Ethernet port.

