JUMO digiLine hub

Bus line splitter for JUMO digiLine

Installation Instructions

20359000T94Z001K000

V1.01/EN/00664175

1.1 Safety signs

1.1.1 Warning symbols

DANGER!

This symbol indicates that **personal injury caused by electrical shock** may occur if the respective precautionary measures are not carried out.

WARNING!

This symbol in connection with the signal word indicates that **personal injury** may occur if the respective precautionary measures are not carried out.

CAUTION!

This symbol in connection with the signal word indicates that **material damage or data loss** will occur if the respective precautionary measures are not taken.

CAUTION!

This symbol indicates that **components could be destroyed** by electrostatic discharge (ESD = Electro Static Discharge) if the respective cautionary measures are not taken.

Only use the ESD packages intended for this purpose to return device inserts, assembly groups, or assembly components.

READ THE DOCUMENTATION!

This symbol, which is attached to the device, indicates that the associated **documentation for the device** must be **observed**. This is necessary to identify the nature of the potential hazard, and to take measures to prevent it.

1.1.2 Note symbols

NOTE!

This symbol refers to **important information** about the product, its handling, or additional use.

REFERENCE!

This symbol refers to **additional information** in other sections, chapters, or other manuals.

FURTHER INFORMATION!

This symbol is used in tables and indicates that **further information** is provided after the table.

DISPOSAL!

At the end of its service life, the device and any batteries present do not belong in the trash! Please ensure that they are **disposed of** properly and in an **environmentally friendly** manner.

1 Safety information

1.2 Intended use

The device described in these instructions is used to measure analytical process variables in liquids in an industrial environment as specified in the technical data. Other uses beyond those defined are not viewed as intended uses.

The device is built according to the relevant standards and directives as well as to the applicable safety regulations. Nevertheless, improper use, incorrect installation or configuration can result is erroneous measurements. Depending on the plant, this may cause unwanted control actions (e. g. overmetering) in the plant. Personal injury and property damage must be prevent through appropriate safety measures and safety devices provided by the customer.

To avoid danger, only use the device:

- for the intended use
- when in good order and condition
- In compliance with these instructions

WARNING!

Error during installation, mounting or configuration of JUMO sensors with digiLine electronics can disrupt proper execution of the downstream process or cause damage.

▶ For this reason, it is always necessary to provide safety devices that are independent of the device and to allow settings to be made only by technical personnel.

1.3 Qualification of personnel

This manual contains the necessary information for the intended use of the device described therein.

It is meant for technically qualified individuals who have been specially trained or have the appropriate know-how in the field of automation technology (measurement and control instrumentation).

Understanding and technically correct observance of the safety instructions and warnings contained in this manual are prerequisites for safe mounting, installation, and startup as well as safety during operation of the described device. Only qualified individuals have the required technical knowledge to interpret and put into practice the safety instructions and warnings used in this manual in any given situation.

2 Acceptance of goods, storage, and transport

2.1 Checking the delivery

- On delivery, ensure that the packaging and its contents are undamaged.
- Check the delivery for completeness against the packing slip and order confirmation.

Proceed as follows if external transport damage is visible:

- Do not accept the delivery or only conditionally.
- Note the extent of damage on the transport documents or on the delivery note of the freight forwarder.
- File a complaint.

2.2 Important information about storage and transport

- Store the device in a dry, clean environment. Observe the admissible ambient conditions (see "Technical data" chapter 7 "Technical data", page 29).
- Protect the device from shock during transport. The original packaging offers optimal protection.

2.3 Returning goods

If repairs are needed, return the device in clean condition and in its entirety.

Use the original packaging when returning the device.

2.3.1 Accompanying letter for repair

Please include the completed accompanying letter for repair when returning goods. Do not forget to state the following:

- Description of the application
- Description of the error that has occurred

The accompanying letter for repair is linked to www.jumo.de on the Internet under the heading Service & Support as follows:

Product Service > Repair Service > Return Devices

2.3.2 Decontamination Statement

As a certified company and in compliance with legal requirements, JUMO is required to handle all incoming products that come into contact with liquids in compliance with statutory regulations.

Before returning a device for repair or calibration:

- Remove all adhering residues of the substance measured.
  Pay special attention to grooves for seals and cracks where residues of the material being measured may adhere. This is especially important when the material being measured is a hazardous substance.

In addition to the accompanying repair letter, include the following in the return shipment:

- The completed and signed "Declaration Statement". Only then can the returned device be accepted.
  The Decontamination Declaration is linked on the Internet at www.jumo.de in the Service & Support section as follows: Product Service > Repair Service> Decontamination Declaration
- Special handling instructions, if these are necessary, e.g. a safety data sheet.

2.3.3 Protection against electrostatic discharge

(ESD = **e**lectro **s**tatic **d**ischarge)

To prevent damage from ESD, electronic assemblies, or components with a high internal resistance must be handled, packaged, and stored in an environment that protects against ESD. Measures that protect against electrostatic discharge and electric fields are described in DIN EN 61 340-5-1 and DIN EN 61 340-5-2 "Electrostatics – Part 5-2 – Protection of electronic devices from electrostatic phenomena".

If you are returning electronic assemblies or components for repair:

- Pack sensitive components only in an environment providing protection against ESD. Workspaces such as this divert electrostatic charges to ground in a controlled manner and prevent static charges due to friction.
- Use only packaging intended specifically for ESD-sensitive assemblies/components. These must consist of conductive plastics.

Keep in mind that the manufacturer assumes no liability for damage caused by ESD.

CAUTION!

Electrostatic charges occur in non-ESD-protected environments.

Electrostatic discharges can damage modules or components.

▶ For transport purposes, use only the ESD packaging provided.

2.4 Disposal

Disposing of the device

DISPOSAL!
Devices and/or replaced parts should not be placed in the refuse bin at the end of their service life as they consist of materials that can be recycled by specialist recycling plants.

Dispose of the device and the packaging material in a proper and environmentally friendly manner.

For this purpose, observe the country-specific laws and regulations for waste treatment and disposal.

Disposing of the packaging material

The entire packaging material (cardboard packaging, inserts, plastic film, and plastic bags) is fully recyclable.

3.1 Introduction

Stern topology and stub lines with the JUMO digiLine hub

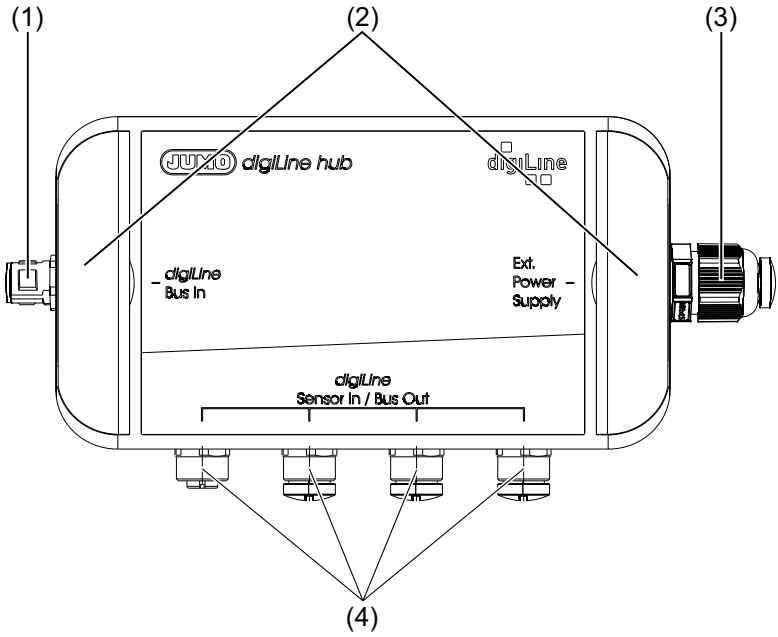
The JUMO digiLine hub permits the star-shaped connection of a group of up to 4 digital sensors in spatial proximity to one another. The bus line from the master is distributed by the JUMO digiLine hub to the individual sensors. This guarantees a clearly arranged and clean line installation. If a star topology with more than 4 digital sensors is to be realized, multiple JUMO digiLine hubs can be connected to one another, similar to a line topology. The inputs for the downstream hubs are connected to the outputs of the respective upstream hubs. With star topology involving multiple JUMO digiLine hubs, the connections between the hubs must be cabled with very short lines (e.g. 0.5 m).

In a line topology, the JUMO digiLine hub can also be used as a stub line splitter. In addition to the incoming and outgoing bus line, up to 3 digital sensors with up to 10 m long stub lines can be connected. The corresponding preassembled connecting cables are available from JUMO. Depending on the auxiliary energy demand, a power supply unit for supplying voltage to the digital sensors can be connected to the JUMO digiLine hub. The auxiliary energy requirement depends on the number and type of the sensors used.

3 Device Description

3.2 Device setup

JUMO digiLine hub with cover



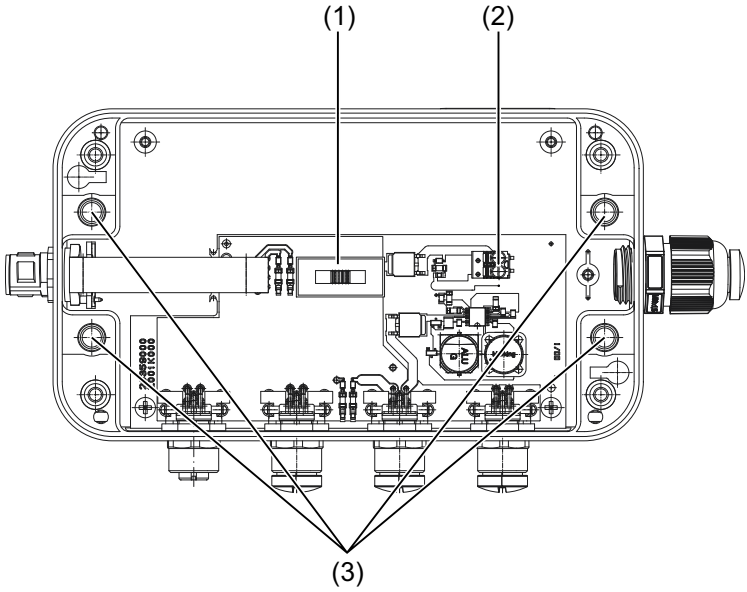
(1) 5-pole M12 plug connector (input) for connecting the digiLine bus line from the master or an output of another JUMO digiLine hub

(2) Screw covers

(3) Cable inlet for supply voltage from a DC 24 V power supply unit

(4) 5-pole M12 socket (outputs) for connecting digital sensors on JUMO and other JUMO digiLine hubs (see chapter 6.2.3 "Connection examples", page 24)

JUMO digiLine hub opened



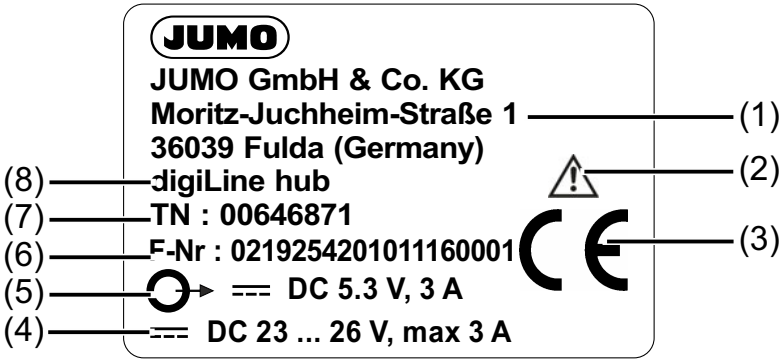
(1) Switch for configuring the bus voltage supply (see chapter 6.2.1 "Bus voltage supply", page 21)
(2) plug-in connection terminal for the voltage supply from a DC 24 V power supply unit
(3) Fastening holes

3 Device Description

4.1 Nameplate

The nameplate on the device enclosure identifies the device version. It is located on the outside of the enclosure at the top.

Example of a nameplate



(1) Manufacturer's address

(2) Information symbol (Read documentation!)
⇨
chapter 1.1 "Safety signs", page 5

(3) Approval mark

(4) Voltage supply for supplying from a separate power supply unit

(5) Output voltage of the internal voltage regulator for supplying from a separate power supply unit or a DC 24 V via the input of the JUMO digiLine hub
⇨
chapter 6.2.1 "Bus voltage supply", page 21

(6) Fabrication number

(7) Part number

(8) Device designation

4 Identifying the device version

4.2 Order details

	(1)	Basic type
	203590	JUMO digiLine hub

	(1)
Order code	
Order example	203590

4.3 Scope of delivery

Basic type
JUMO digiLine hub
4 spacer sleeves for mounting screws
1 plug for cable fitting
3 plugs for M12 sockets
Installation instructions

4.4 Accessories

Accessories

Basic type	Part no.
JUMO M12 digiLine master connecting cable[a] 5-pole, A-coded, 10 m long	00638341
JUMO M12-digiLine master connecting cable[a] 5-pole, A-coded 5 m long	00638337
JUMO M12-digiLine master connecting cable[a] 5-pole, A-coded 1.5 m long	00638333
JUMO M12 connecting cable five-pole 15 m	00638324
JUMO M12 connecting cable five-pole 10 m	00638322
JUMO M12 connecting cable five-pole 5 m	00638315
JUMO M12 connecting cable five-pole 1.5 m	00638313
JUMO M12 connecting cable 5-pole 0.5 m	00638312
JUMO Y-splitter 5-pole	00638327
JUMO power supply unit for JUMO digiLine hub	00661597
JUMO M12 terminating connector	00461591
Weather protection canopy	00401169
Top hat rail assembly set	00648758
Pipe assembly set	00648759

[a] For connection to masters with screw or spring-cage terminals; prepare one end of the cable with a 5-pole M12 plug and the other end with ferrules.

5.1 Important information

DANGER!

- The device must never be installed in potentially-explosive areas! Explosion hazard.

5.2 Mounting site and climatic conditions

Mounting site

When determining the mounting site, it is important to ensure that the device specifications are respected. The relevant tables containing details of case specifications can be found in the chapter entitled "Technical Data". The device must not be exposed to any severe shocks or permanent vibrations. Electromagnetic fields caused by equipment such as motors or transformers must be avoided!

Climatic conditions

The ambient temperature and the relative humidity at the mounting site must correspond to the technical data.
⇨ chapter 7 "Technical data", page 29

Installation position

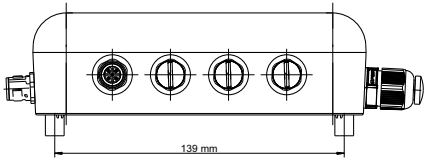
The device must be installed vertically with the M12 sockets of the outputs facing downwards.
⇨ chapter 7 "Technical data", page 29

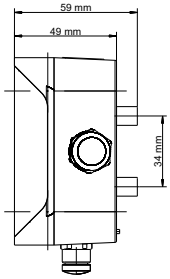
Space requirement

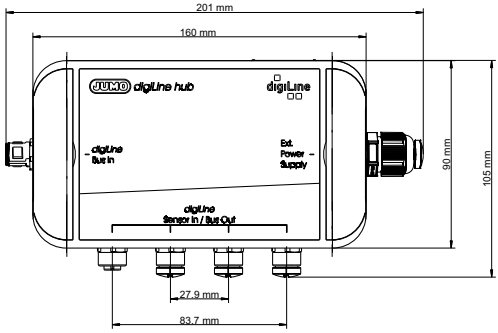
Ensure adequate access to the region around the sockets, plug connectors and cable entry points. The minimum bending radius of the cables must be taken into account!
⇨ chapter 7 "Technical data", page 29

5 Mounting

5.3 Dimensions

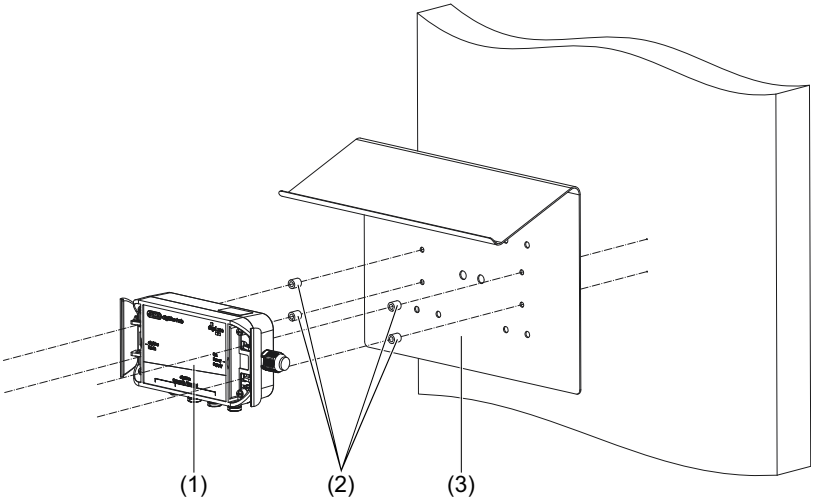






5.4 Mounting

Surface mounting with/without weather protection canopy

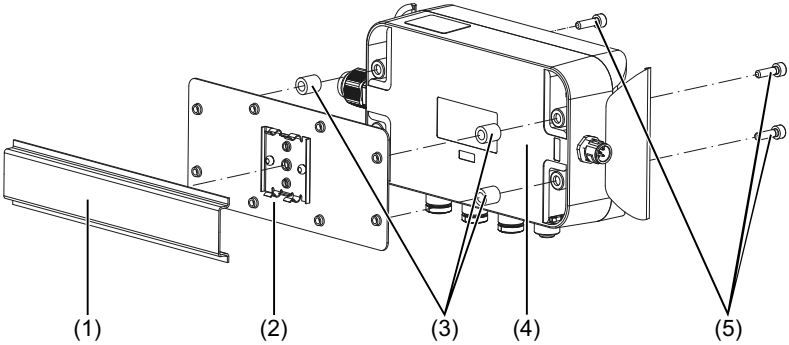


(1) JUMO digiLine hub with screw covers opened
(2) Spacer sleeves from the JUMO digiLine hub scope of delivery
(3) Weather protection canopy (see chapter 4.4 "Accessories", page 14)

Procedure for surface mounting

1. Mark the fastening holes. Observe the dimensions (see chapter 5.3 "Dimensions", page 16) and leave enough space around the cable entries, connectors, and sockets to permit routing of cables.
2. Open the two lateral screw covers on the front of the device.
3. Insert suitable mounting screws through the mounting holes and push the spacer sleeves from the JUMO digiLine hub scope of delivery over the screw thread.
4. Use the screws to fasten the JUMO digiLine hub in the mounting holes, as shown in the drawing above with/without weather protection canopy. The weather protection canopy is available from JUMO as an option (see chapter 4.4 "Accessories", page 14).
5. Close the screw covers by pushing carefully by hand until the covers engage.

DIN-rail mounting

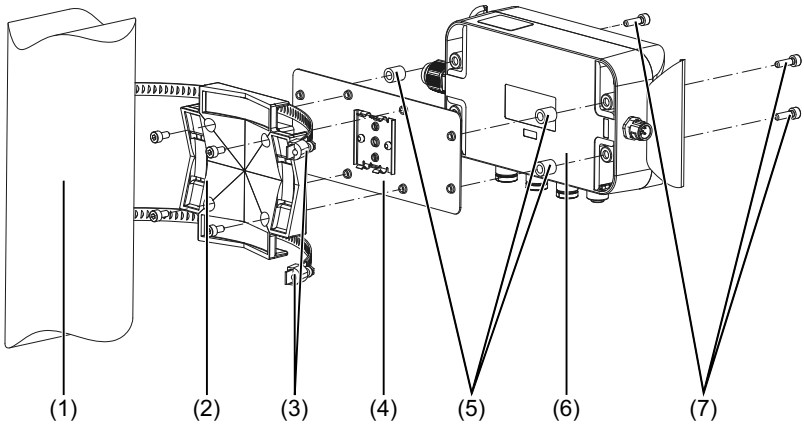


(1) DIN-rail
(2) DIN rail adapter from the DIN rail mounting kit scope of delivery
(see chapter 4.4 "Accessories", page 14)
(3) Spacer sleeves from the JUMO digiLine hub scope of delivery
(4) JUMO digiLine hub
(5) M4 × 16 cylinder head screws from the DIN rail mounting kit scope of delivery
(see chapter 4.4 "Accessories", page 14)

Procedure for DIN-rail mounting

1. Open the two lateral screw covers on the front of the device.
2. Insert the mounting screws (M4 × 16 cylinder head screws) from the DIN rail mounting kit scope of delivery through the mounting holes and push the spacer sleeves from the JUMO digiLine hub scope of delivery over the screw thread.
3. Use the screws to fasten the JUMO digiLine hub to the DIN rail adapter of the DIN rail mounting kit, as shown in the drawing above. Optionally, the DIN rail mounting kit can be combined with the weather protection canopy (see chapter 4.4 "Accessories", page 14). Analogous to surface mounting, this is then inserted between JUMO digiLine hub and DIN rail adapter and firmly screwed to the JUMO digiLine hub to the DIN rail adapter.
4. Close the screw covers by pushing carefully by hand until the covers engage.
5. Hook the JUMO digiLine hub with the DIN rail adapter in the DIN rail, and allow all detent lugs of the DIN rail adapter to engage by pushing on the enclosure in the DIN rail.

Pipe mounting



(1) Pipe/mast
(2) Pipe mount from the pipe mounting kit scope of delivery (see chapter 4.4 "Accessories", page 14)
(3) Pipe clamp from the pipe mounting kit scope of delivery (see chapter 4.4 "Accessories", page 14)
(4) DIN rail adapter from pipe mounting kit scope of delivery
(see chapter 4.4 "Accessories", page 14)
(5) Spacer sleeves from the JUMO digiLine hub scope of delivery
(6) JUMO digiLine hub
(7) M4 × 16 cylinder head screws from the pipe mounting kit scope of delivery
(see chapter 4.4 "Accessories", page 14)

Procedure for pipe mounting

1. Open the two lateral screw covers on the front of the device.
2. Insert the mounting screws (M4 × 16 cylinder head screws) from the pipe mounting kit scope of delivery through the mounting holes and push the spacer sleeves from the JUMO digiLine hub scope of delivery over the screw thread.
3. Use the screws to fasten the JUMO digiLine hub to the DIN rail adapter of the pipe mounting kit, as shown in the drawing above. Optionally, the pipe mounting kit can be combined with the weather protection canopy (see chapter 4.4 "Accessories", page 14). Analogous to surface mounting, this is then inserted between JUMO digiLine hub and DIN rail adapter and firmly screwed to the JUMO digiLine hub to the DIN rail adapter.
4. Close the screw covers by pushing carefully by hand until the covers engage.
5. Attach the pipe mount with the pipe clamps from the pipe mounting kit scope of delivery to the pipe/mast as shown in the drawing.
6. Hook the JUMO digiLine hub with the DIN rail adapter in the DIN rail of the pipe mount, and allow all detent lugs of the DIN rail adapter to engage by pushing on the enclosure in the DIN rail.

5 Mounting

6.1 Installation notes

CAUTION!

Disconnecting the digiLine bus line and/or removing the terminating resistors and terminating connectors during operation will disrupt the digiLine bus

Possible consequences include bus problems with loss of the sensor values on the bus involved and damage to the associated serial interface on the master.

▶ Before changing the bus cable and disconnecting the bus termination, the master should be switched off.

6.2 Connection diagram

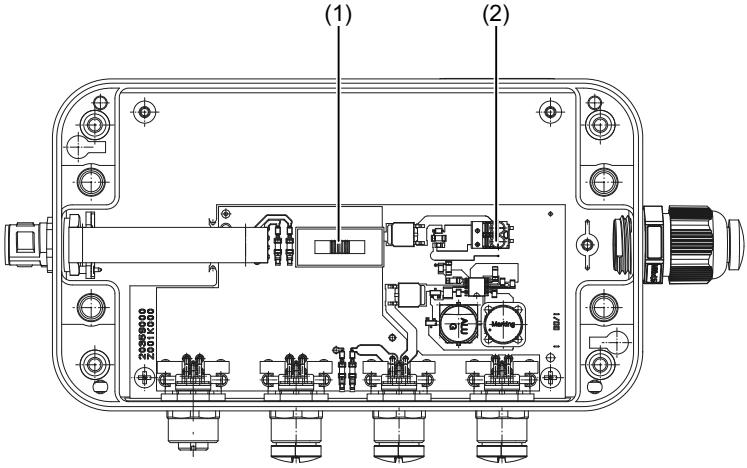
General information

The line installation of the digital sensors are, with few exceptions, made using preassembled bus connecting cables. Wiring work is required only to connect to the respective master. Otherwise, all connections are made using plug connectors. The pin assignment shown here is intended primarily to provide an overview and serve as an aid when troubleshooting.

6.2.1 Bus voltage supply

Voltage supply selector switch

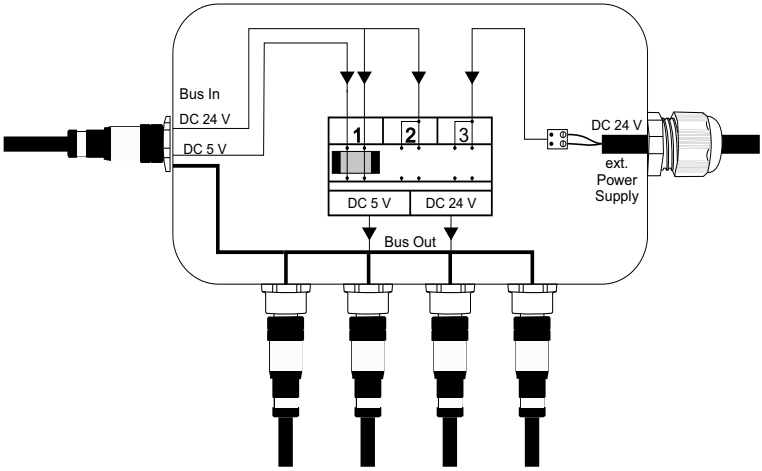
The JUMO digiLine hub permits either the bus voltage supply from the master or from a separate power supply unit (optional), which is connected to the terminals in the JUMO digiLine hub provided for this purpose. If the master is unable to provide an adequate bus voltage supply, the bus voltage supply must be provided from the separate power supply unit. The JUMO digiLine hub accommodates a voltage supply selector switch with 3 switch positions.



(1) Voltage supply selector switch
(2) Connection terminal for external DC 24 V power supply unit

6 Electrical connection

Select the correct voltage supply in accordance with the diagram below and move the voltage supply switch to the corresponding switch position.

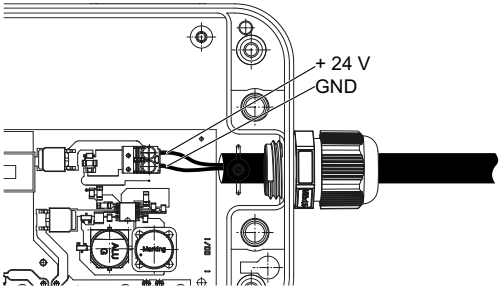


Switch position 1: DC 24 V and DC 5 V supply through the master
The master supplies both DC 24 V and DC 5.3 V. The voltages are connected directly to the 24 V conductor and 5 V conductor of the bus line respectively.

Switch position 2: DC 24 V supply through the master
The master supplies DC 24 V. In the JUMO digiLine hub, this voltage is connected directly to the 24 V conductor of the bus line. The 5 V conductor is also supplied with DC 5.3 V (DC 24 V converted to DC 5.3 V by the internal voltage regulator).

Switch position 3: Supply through separate power supply unit
An external power supply unit supplies DC 24 V via the terminals provided in the JUMO digiLine hub. In the JUMO digiLine hub, this voltage is connected directly to the 24 V conductor of the bus line. The 5 V conductor is also supplied with DC 5.3 V (DC 24 V converted to DC 5.3 V by the internal voltage regulator).

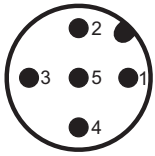
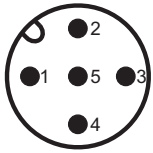
Connection of a separate DC 24 V power supply unit



The electrical connection for supplying from a separate DC 24 V power supply unit(see chapter 4.4 "Accessories", page 14) is made at the connection terminals inside the device. The supply line is fed through the cable gland on the right side of the device and connected in accordance with the wiring diagram above.

6.2.2 Terminal assignment

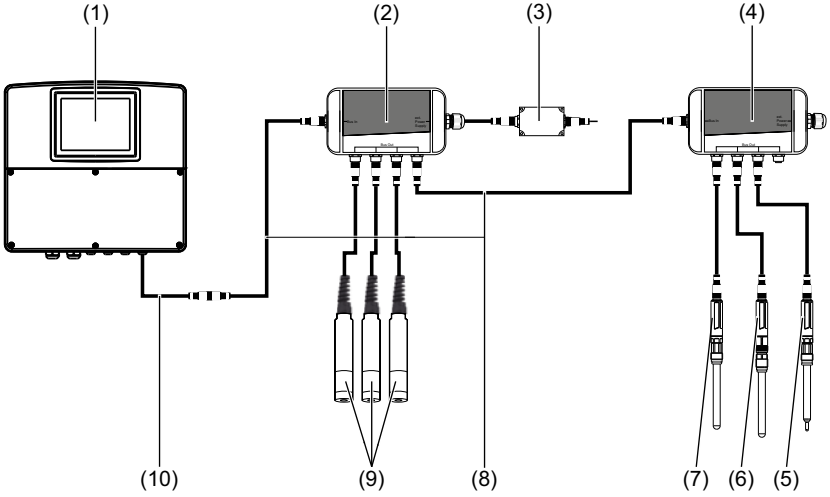
Variant with 5-pole M12 plug connector, A-coded

Pin	Potential	Symbol
1	+5 V (supply to JUMO digiLine electronics)	Connector  Socket 
2	+24 V (for sensors with the required DC 24 V supply)	
3	GND	
4	RS485 B (RxD/TxD-)	
5	RS485 A (RxD/TxD+)	

6.2.3 Connection examples

Line topology with JUMO digiLine hubs as a stub line splitter and bus supply from separate power supply unit

The installation example of an aeration tank is displayed. JUMO digiLine hubs act as stub line splitters inside bus cabling in a line topology. The stub lines to the sensors must not be longer than 10 m. The sensors take their voltage supply (DC 5 V) from the JUMO digiLine hub, the power supply unit being supplied via the bus cabling.



(1) JUMO digiLine master (JUMO AQUIS touch S/P)

(2) JUMO digiLine hub with 4× M12 sockets and 1× M12 plug connector, each 5-pole, A-coded; DC 24 V supply from separate power supply unit and voltage supply selector switch in switch position 3 (see chapter 6.2.1 "Bus voltage supply", page 21)

(3) separate DC 24 V power supply unit for the voltage supply to the JUMO digiLine-bus system

(4) JUMO digiLine hub with 4× M12 sockets and 1× M12 plug connector, each 5-pole, A-coded; DC 24 V supply from separate power supply unit via upstream JUMO digiLine hub and voltage supply selector switch in switch position 2 (see chapter 6.2.1 "Bus voltage supply", page 21)

(5) JUMO compensation thermometer with 5-pole JUMO digiLine electronics
Order example: Compensation thermometer 201085/89-1005-21-120 with
JUMO digiLine-T: 202705/30/86-530

(6) JUMO pH sensor with 5-pole JUMO digiLine electronics
Order example: pH sensor 201021/10/12-04-22-120/000 with
JUMO digiLine pH: 202705/10/86-530

(7) JUMO redox sensor with 5-pole JUMO digiLine electronics
Order example: redox sensor 201026/10/22-04-22-120 with
JUMO digiLine-ORP: 202705/20/86-530

(8) JUMO M12 connecting cable, 5-pole and A-coded for cabling the JUMO digiLine hubs in a line topology; the required total line lengths between master and JUMO digiLine bus can be achieved by combining multiple M12 connecting cables. When planning the line lengths, heed the information regarding cable planning in the Annex of the operating manual for the JUMO AQUIS touch S/P.

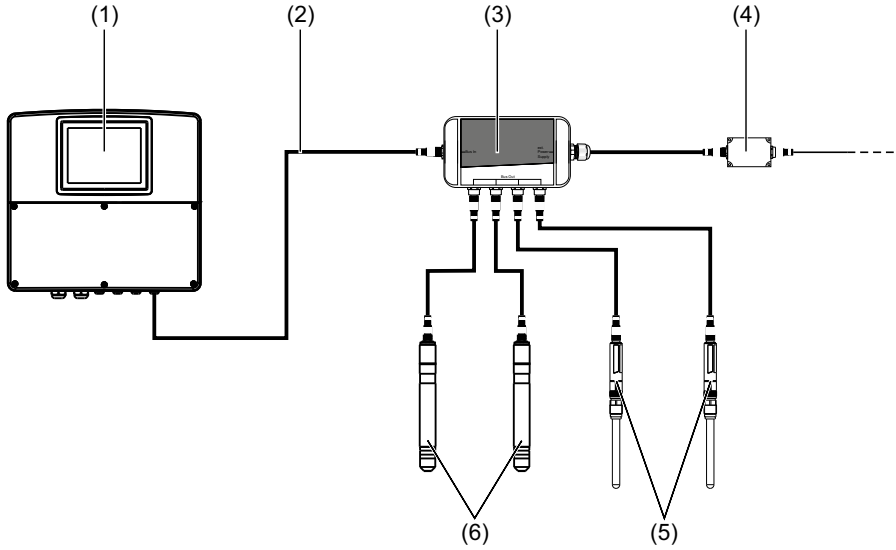
(9) 3× digital sensors, type JUMO ecoLine O-DO via 5-pole M12 cable sockets to fixed cables of 10 m in length

(10) JUMO digiLine master connecting cable with exposed wire ends at one end for connection to devices with screw or spring-cage terminals (see Accessories); connection is described in the operating manual of the JUMO AQUIS touch S/P.

6 Electrical connection

Star splitting with JUMO digiLine hubs and bus supply from separate power supply unit

The connection of 4 digital sensors via 5-pole M12 plug connections to a JUMO AQUIS touch S/P is displayed. The bus cabling is constructed with 1 JUMO digiLine hub in a star topology. The sensors take their voltage supply (DC 5 V and DC 24 V) from the JUMO digiLine hub via the bus cabling. In this installation variant, the JUMO digiLine hub is supplied from a separate power supply unit. The number of digital sensors that can be integrated into a digiLine system is shown in the operating manual for the JUMO master concerned.



(1) JUMO digiLine master (JUMO AQUIS touch S/P)

(2) JUMO digiLine master connecting cable with exposed wire ends at one end for connection to devices with screw or spring-cage terminals (see Accessories); connection is described in the operating manual of the JUMO AQUIS touch S/P.

(3) JUMO digiLine hub with 4× M12 sockets and 1× M12 plug connector, each 5-pole, A-coded; DC 24 V supply from separate power supply unit and voltage supply selector switch in switch position 3 (see chapter 6.2.1 "Bus voltage supply", page 21)

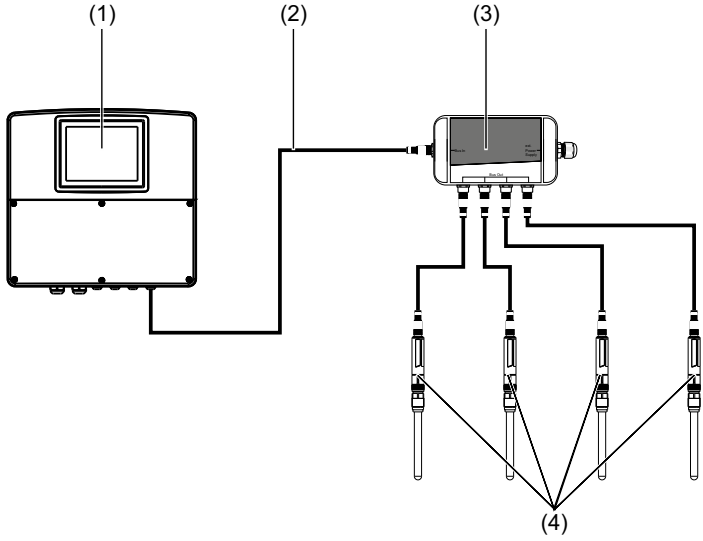
(4) separate DC 24 V power supply unit for the voltage supply to the digiLine-bus system

(5) Sensors with 5-pole JUMO digiLine electronics; the connection to the JUMO digiLine hub is made via M12 connecting cables, 5-pole and A-coded

(6) digital sensors with 5-pole M12 plug connections; the connection to the JUMO digiLine hub is made via M12 connecting cables, 5-pole and A-coded

Star splitting with JUMO digiLine hubs and bus supply from the digiLine master

The connection of 4 digital sensors via 5-pole M12 plug connections to a JUMO AQUIS touch S/P. The bus cabling is constructed with 1 JUMO digiLine hub in a star topology. The sensors take their voltage supply (DC 5 V and DC 24 V) from the master via the bus cabling. The number of digital sensors that can be integrated into a digiLine system is shown in the operating manual for the JUMO master concerned.



(1) JUMO digiLine master (JUMO AQUIS touch S/P)

(2) JUMO digiLine master connecting cable with exposed wire ends at one end for connection to devices with screw or spring-cage terminals (see Accessories); connection is described in the operating manual of the JUMO AQUIS touch S/P.

(3) JUMO digiLine hub with 4× M12 sockets and 1× M12 plug connector, each 5-pole, A-coded; DC 24 V and DC 5 V supply from the JUMO AQUIS touch S/P and voltage supply selector switch in switch position 1 (see chapter 6.2.1 "Bus voltage supply", page 21)

(4) digital sensors with 5-pole JUMO digiLine electronics; the connection to the JUMO digiLine hub is made via M12 connecting cables, 5-pole and A-coded

6 Electrical connection

7.1 Electrical data

Voltage supply[a]	DC 23 to 26 V, max. 3A (SELV or PELV)
Electromagnetic compatibility (EMC)	DIN EN 61326-1
Interference emission	Class B
Interference immunity	Industrial requirements
Protection rating	Protection rating III

[a] The bus voltage supply can be taken from the digiLine master. In this case, the JUMO digiLine hub splits the voltage supplies supplied at the input to the outputs. Alternatively, the bus voltage supply can be realized by means of the internal voltage regular in the JUMO digiLine hub. In this case, the JUMO digiLine hub requires a voltage supply from an optional DC 24 V power supply unit (see chapter 4.4 "Accessories", page 14). The voltage supply for the JUMO digiLine bus must be rated as SELV or PELV in accordance with DIN EN 61140.

7.2 Case

Material	ASA LURAN
Ambient temperature	-20 to +65 °C
Storage temperature	-20 to +65 °C
Resistance to climatic conditions	Relative humidity < 92% annual average, no condensation
Protection type	IP66
Operating position	vertical with M12 sockets of the outputs facing downwards

7 Technical data

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