

JUMO variTRON 300

Automation System

Central Processing Unit



Operating Manual



70500300T90Z001K000

V10.00/EN/00748411/2025-12-10

Further information and downloads



jmo.to/705003-en

Table of contents

| | | |
|----------|---|-----------|
| 1 | Introduction | 6 |
| 1.1 | Safety information | 6 |
| 1.2 | Trademark information | 7 |
| 1.3 | Intended use | 7 |
| 1.4 | Qualification of personnel | 7 |
| 1.5 | Security | 7 |
| 1.6 | Acceptance of goods, storage, and transport | 8 |
| 1.6.1 | Checking the delivery | 8 |
| 1.6.2 | Important information about storage and transport | 8 |
| 1.6.3 | Returning goods | 8 |
| 1.6.4 | Disposal | 9 |
| 1.7 | Module overview | 10 |
| 1.7.1 | Central processing unit | 10 |
| 1.7.2 | Modules | 11 |
| 1.8 | Available technical documentation | 15 |
| 1.8.1 | Central processing unit | 15 |
| 1.8.2 | Input/output modules | 15 |
| 1.8.3 | Special modules | 16 |
| 1.8.4 | Panels | 17 |
| 1.8.5 | Power supply units | 17 |
| 1.9 | System version | 18 |
| 1.10 | Declaration of conformity | 18 |
| 2 | Description | 19 |
| 2.1 | Identifying the device version | 21 |
| 2.1.1 | Nameplate | 21 |
| 2.1.2 | Order details | 22 |
| 2.1.3 | Scope of delivery | 23 |
| 2.1.4 | Accessories | 24 |
| 2.2 | Device functions | 25 |
| 2.3 | Software | 26 |
| 3 | Mounting | 27 |
| 3.1 | General information on installation/dismounting | 27 |
| 3.2 | Installation/dismounting on DIN rail | 28 |
| 3.2.1 | Central processing unit | 29 |
| 3.3 | Dimensions | 31 |
| 4 | Electrical connection | 32 |
| 4.1 | Installation notes | 32 |
| 4.2 | Electrical isolation | 33 |

Table of contents

| | | |
|----------|---|-----------|
| 4.3 | Connection diagram | 33 |
| 4.3.1 | Display, operating, and connection elements | 34 |
| 4.3.2 | Voltage supply | 35 |
| 4.3.3 | Interfaces | 35 |
| 4.3.4 | Terminating resistors | 36 |
| 5 | Operation | 37 |
| 5.1 | General information | 37 |
| 5.2 | Device | 38 |
| 5.2.1 | Display and control elements | 38 |
| 5.2.2 | Device menu | 39 |
| 5.2.3 | User log-on | 43 |
| 5.2.4 | Reset to factory settings | 43 |
| 5.3 | Setup program | 44 |
| 5.3.1 | Start page | 44 |
| 5.3.2 | Project map | 45 |
| 5.3.3 | Project management | 46 |
| 5.3.4 | System bus HW assistant | 47 |
| 5.3.5 | Optional module (alias device address) | 49 |
| 5.3.6 | Wtrans HW assistant | 51 |
| 5.3.7 | Configuration | 53 |
| 5.3.8 | PLC application | 55 |
| 5.3.9 | PLC parameter definition | 56 |
| 5.3.10 | Languages | 57 |
| 5.3.11 | Data transfer | 59 |
| 5.3.12 | Messages | 62 |
| 5.3.13 | Connections | 63 |
| 5.4 | Web Services | 65 |
| 5.4.1 | Web Cockpit | 66 |
| 5.4.2 | CODESYS WebVisu/Remote TargetVisu | 80 |
| 5.4.3 | Other apps | 80 |
| 5.5 | JUMO smartWARE Evaluation | 81 |
| 6 | Configuration | 82 |
| 6.1 | General information | 82 |
| 6.2 | Network | 84 |
| 6.2.1 | Ethernet | 84 |
| 6.2.2 | Port configuration | 84 |
| 6.3 | Device manager | 85 |
| 6.3.1 | Customer-specific linearization | 86 |
| 6.3.2 | Display | 87 |
| 6.4 | Unit settings | 88 |
| 6.5 | System bus | 90 |
| 6.6 | Data carrier management | 91 |

Table of contents

| | | |
|----------|--------------------------------------|-------------|
| 6.7 | System status UI | .92 |
| 6.8 | Web server | .92 |
| 6.9 | Email | .93 |
| 6.10 | PLC configuration | .94 |
| 6.10.1 | Program generator | .94 |
| 6.10.2 | Analog variables | .98 |
| 6.10.3 | Digital variables | .98 |
| 6.11 | PLC parameters | .98 |
| 6.12 | Programs | .99 |
| 6.13 | CODESYS configuration | .101 |
| 6.14 | Recorder | .102 |
| 6.15 | Recording data export | .106 |
| 6.16 | Cloud gateway | .107 |
| 6.17 | Signal generator | .107 |
| 6.18 | Wtrans gateway | .108 |
| 6.19 | Node-RED | .109 |
| 6.20 | Batches | .110 |
| 7 | Startup | .112 |
| 8 | Annex | .119 |
| 8.1 | User rights | .119 |
| 8.1.1 | System version 7 | .119 |
| 8.1.2 | System version 8 | .121 |
| 8.2 | Technical data | .126 |
| 8.2.1 | Interfaces | .126 |
| 8.2.2 | Display | .128 |
| 8.2.3 | Electrical data | .128 |
| 8.2.4 | Housing and environmental conditions | .129 |
| 8.2.5 | Approval marks and certificates | .129 |
| 8.3 | PLC data | .130 |
| 8.4 | Buffer battery replacement | .132 |
| 8.5 | Open-source software | .135 |
| 8.6 | China RoHS | .136 |

1 Introduction

1.1 Safety information

General

This manual contains information that must be observed in the interest of your own safety and to avoid material damage. This information is supported by symbols which are used in this manual as indicated.

Please read this manual before starting up the device. Store this manual in a place that is accessible to all users at all times.

If difficulties occur during startup, please do not intervene in any way that could jeopardize your warranty rights!

Warning symbols



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.

Note symbols



NOTE!

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



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.

1.2 Trademark information

All trademarks and trade and company names used are the property of their rightful owners or authors.

1.3 Intended use

The device is designed for use in an industrial environment as specified in the technical data. Other uses beyond those defined are not viewed as intended uses.

The device has been manufactured in compliance with applicable standards and directives as well as the applicable safety regulations. Nevertheless, improper use may lead to personal injury or material damage.

To avoid danger, only use the device:

- For the intended use
- When in good order and condition
- When taking the technical documentation provided into account

Risks resulting from the application may arise, e.g. as the result of missing safety provisions or wrong settings, even when the device is used properly and as intended.

1.4 Qualification of personnel

The personnel deployed must meet the following requirements in all phases of the product lifecycle:

- Trained electrical, mechanical, and plant engineering personnel.
- Members of personnel are familiar with this documentation and the safety information and warnings it contains.

1.5 Security

The manufacturer only provides a warranty if the device is installed and used as described in this documentation. This device is equipped with security mechanisms that protect it against accidental changes to the device settings. Security measures that meet the operator's security standards and offer additional protection for the device and device data transmission must be applied by the operator themselves.

Reference is made to the Security Manual here, which regulates the following points:

- Intended use with regards to security
- Organizational measures regarding the handling of security measures by the operator
- Organizational measures by the manufacturer

⇒ JUMO variTRON 300 Security Manual – 70500000T95Z000K000

1 Introduction

1.6 Acceptance of goods, storage, and transport

1.6.1 Checking the delivery

- Ensure that the packaging and its contents are undamaged.
- Check the delivery for completeness against the packing slip and order details.
- Inform the supplier immediately if there is any damage.
- Store damaged parts until clarification is received from the supplier.

1.6.2 Important information about storage and transport

- Store the device in a dry, clean environment. Observe the admissible ambient conditions (see "Technical data")
- Protect the device from shock during transport
- The original packaging provides optimum protection for storage and transport

1.6.3 Returning goods

If repairs are needed, return the complete device in clean condition.
Use the original packaging to return goods.

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 and
- Description of the error that has occurred

The accompanying letter for repair (supplementary sheet for product returns) can be downloaded online from the manufacturer's website:

<http://productreturn.jumo.info>

Protection against electrostatic discharge (ESD)

(ESD = electrostatic discharge)

To prevent damage due to ESD, electronic modules or components must be handled, packaged, and stored in an ESD-protected environment. Measures that protect against electrostatic discharge and electric fields are described in DIN EN 61340-5-1 and DIN EN 61340-5-2 "Protection of electronic devices from electrostatic phenomena".

When sending back electronic modules or components, please note the following:

- 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 modules/components. These must consist of conductive plastics.

No liability can be assumed 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.
-

1.6.4 Disposal

Disposing of the packaging material

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

The country-specific laws and regulations for waste treatment and disposal must be observed.

Disposing of the device



DISPOSAL!

Devices and/or replaced parts (including batteries) should not be placed in the refuse bin at the end of their service life, but must be disposed of properly and in an environmentally friendly manner.

The device consists of materials that can be recycled by specialist recycling plants.

The country-specific laws and regulations for waste treatment and disposal must be observed.

1 Introduction

1.7 Module overview

1.7.1 Central processing unit

The central processing unit JUMO variTRON 300 along with the proven input and output modules (incl. controller module) as well as the router modules (primarily 1-port router module, 705043) form an overall system.

The central processing unit manages all configuration and parameter data in the overall system and makes a PLC available according to IEC 61131-3 (CODESYS V3.5) (extra code 224).

The PLC can be activated in different versions:

- CODESYS runtime system incl. CODESYS Remote TargetVisu and/or
- CODESYS Remote TargetVisu (extra code 280) and/or
- CODESYS WebVisu (extra code 281)

Commercially available panels that support the CODESYS Remote TargetVisu or CODESYS WebVisu functionality can be used for visualization. "Remote Target Visu" is required so that the central processing unit can provide the screen for the panel with "Remote Target Visu". Visualization is also possible via web browser. Visualizations have to be implemented with CODESYS resources.

An easy-to-use setup program is used for configuration. JUMO standard functions for CODESYS are provided in libraries (as of system version 6) and can be individually integrated into the customer application.

As from system version 5, the JUMO variTRON 300 central processing unit will optionally be available as a receiver for JUMO Wtrans transmitters, thereby enabling wireless measured value transmission.

| Module designation | Data sheet | Features |
|--|------------|--|
| JUMO variTRON 300 Central processing unit | 705003 | <ul style="list-style-type: none">• Process mapping for all connected input/output modules (incl. controller modules)• Display and keys to display the system status• USB host interface• OPC UA server (in conjunction with PLC)• Field bus interface (RS485; Modbus RTU in conjunction with PLC)• PROFINET IO controller (in conjunction with PLC)• Plug and Play for input/output module replacement• Battery-buffered real-time clock• Data evaluation with JUMO smartWARE Evaluation (as of system version 6) |

1.7.2 Modules

The proven controller, input or output modules from the article group 7050xx, and the new generation of the JUMO I/O system 7051xx are available as module variants. These include the analog input module with universal inputs for thermocouples, RTD temperature probes, and voltage or current standard signals. As a result, the same hardware can be used to precisely acquire and digitize a highly diverse range of process variables.

JUMO variTRON 300 enables simultaneous operation of up to 32 control loops so that it can also be used for sophisticated processes. On JUMO variTRON controller modules (7050xx), the inputs and outputs of each controller module can be individually expanded and modified using the expansion slots. The control loops here operate fully independently, which means they do not require resources from the central processing unit. The JUMO I/O system (7051xx) controller modules do not have expansion slots.

As of system version 9, thyristor power controllers can be integrated with JUMO system bus and in the PLC (CODESYS) via EtherCAT or PROFINET.

In addition, JUMO digiLine sensors for liquid analysis can be connected to the central processing unit.

Wireless measured value transmission

As from system version 5, the JUMO variTRON 300 central processing unit is also available with a wireless interface that enables wireless transmission of measured values. The transmitters of the JUMO Wtrans series are available as measuring probes (Wtrans T, Wtrans B, Wtrans p, Wtrans E01 as of system version 6). A maximum of 32 transmitters can be operated on the central processing unit.

During startup, the display of the RSSI value (Received Signal Strength Indicator) in the Web Cockpit is helpful as an indicator of the signal strength of a received radio telegram.

Input and output modules - 7050xx JUMO variTRON

| Module designation | Data sheet | Criteria |
|--------------------------------|------------|--|
| Multichannel controller module | 705010 | <ul style="list-style-type: none"> Up to 4 independently configurable PID control loops with a fast cycle time and proven control algorithms Independent operation Math and logic functions Counting input up to 10 kHz |
| Relay module 4-channel | 705015 | <ul style="list-style-type: none"> 4 relay outputs controlled via the system bus by digital signals Changeover contact in each case (230 V/3 A) Switching statuses are visualized with LEDs |
| Analog input module 4-channel | 705020 | <ul style="list-style-type: none"> 4 high-quality, user configurable analog inputs for RTD temperature probes, resistance transmitters, thermocouples, current 0(4) to 20 mA, voltage 0(2) to 10 V All inputs are galvanically isolated from each other Customer-specific linearization possible Limit value monitoring function Additional digital input |
| Analog input module 8-channel | 705021 | <ul style="list-style-type: none"> 8 high-quality analog inputs for RTD temperature probes Pt100, Pt500, Pt1000 in two-wire circuit Limit value monitoring function Additional digital input |

1 Introduction

| Module designation | Data sheet | Criteria |
|--|---------------------------|---|
| Analog output module 4-channel | 705025 | <ul style="list-style-type: none"> • 4 user configurable analog outputs 0(4) to 20 mA or 0(2) to 10 V • Adjustable output behavior in case a malfunction occurs |
| Digital input or output module 12-channel | 705030 | <ul style="list-style-type: none"> • 12 digital inputs or outputs • Each channel can be user configured as an input DC 0/24 V or output DC 24 V • Capacity per output: 500 mA • Switching statuses are visualized with LEDs |
| Digital input or output module 32-channel (as of system version 3) | 705031 | <ul style="list-style-type: none"> • 17 digital outputs • Up to 15 additional digital inputs or outputs • Capacity per output: 500 mA • Switching statuses are visualized with LEDs |
| Thyristor power controller type 70906x (as of system version 3) | 709061, 709062, 709063 | <ul style="list-style-type: none"> • For one-phase and three-phase operation • Continuous load current up to 250 A, load voltage up to 500 V • Different circuit variants, load types and operating modes can be implemented |

I/O modules - 7051xx JUMO I/O system

| Module designation | Data sheet | Criteria |
|------------------------------------|------------|--|
| Multichannel controller module | 705152 | <ul style="list-style-type: none"> • 2 variants • Up to 2 independently configurable PID control loops with a fast cycle time and proven control algorithms • Independent operation • PLC function due to ST code • Counting input up to 12.5 kHz |
| Analog input module 4-channel | 705113 | <ul style="list-style-type: none"> • 4 variants • 4 high-quality, user configurable analog inputs for RTD temperature probes, resistance transmitters, thermocouples, current 0(4) to 20 mA, voltage 0(2) to 10 V • All inputs are galvanically isolated from each other • Customer-specific linearization possible • Limit value monitoring function |
| Analog output module 4-channel | 705123 | <ul style="list-style-type: none"> • 4 user configurable analog outputs 0(4) to 20 mA or 0 to 10 V • Adjustable output behavior in case a malfunction occurs |
| Digital input module 16-channel | 705135 | <ul style="list-style-type: none"> • Digital signal DC 0/24 V • External voltage DC 24 V via potential-free contact • Max. 5 mA per input • Reference potential L- (GND) required |

1 Introduction

| Module designation | Data sheet | Criteria |
|-------------------------------------|------------|---|
| Digital output module 4-channel | 705143 | <ul style="list-style-type: none"> External voltage supply DC 24 V SELV Lateral supply via router module 4 relay outputs (changeover contact) Switching capacity <ul style="list-style-type: none"> - 3 A at AC 230 V - 3 A at DC 30 V |
| Digital output module 16-channel | 705145 | <ul style="list-style-type: none"> External voltage supply DC 24 V SELV Lateral supply via router module Output signal DC 0/24 V Max. 500 mA per output |

Special modules - 7050xx JUMO variTRON

| Module designation | Data sheet | Criteria |
|--|------------|--|
| Router module 2-port (as of system version 3) | 705041 | <ul style="list-style-type: none"> Arrangement on DIN rail (lateral system bus input and output) Is only intended for system bus expansion via RJ45 sockets on the front (2 × Bus Out) |
| Router module 3-port (as of system version 3) | 705042 | <ul style="list-style-type: none"> Use as first module on an additional DIN rail for connecting further modules (system bus input via RJ45 socket; system bus output on the side) Is also intended for expanding the system bus or increasing the system bus range via RJ45 sockets on the front (1 x Bus In, 2 × Bus Out) |
| Router module 1-port (as of system version 4) | 705043 | <ul style="list-style-type: none"> Use together with a JUMO variTRON 300 or JUMO variTRON 500 touch central processing unit for connecting the modules (system bus input via RJ45 socket; system bus output on the side) Is also intended for system bus expansion |

Special modules - 7051xx JUMO I/O system

| Module designation | Data sheet | Criteria |
|-----------------------------------|------------|---|
| Communication module 2-channel | 705162 | <ul style="list-style-type: none"> Use together with a system module on a JUMO variTRON 300, JUMO variTRON 500, or JUMO variTRON 500 touch central processing unit External voltage supply DC 24 V SELV und EtherCAT In via side plug connector Side socket for voltage supply^a and EtherCAT Out Interface 2 x RJ45 EtherCAT Out Alias device address can be set via DIP switch |

1 Introduction

| Module designation | Data sheet | Criteria |
|--------------------------------|------------|---|
| Communication module 3-channel | 705163 | <ul style="list-style-type: none"> • Use together with a system module on a JUMO variTRON 300, JUMO variTRON 500, or JUMO variTRON 500 touch central processing unit • External voltage supply DC 24 V SELV und EtherCAT In via side plug connector • Side socket for voltage supply^a and EtherCAT Out • Interface 1 x RJ45 EtherCAT In • Interface 2 x RJ45 EtherCAT Out • Alias device address can be set via DIP switch |
| System module | 705171 | <ul style="list-style-type: none"> • Connection of the I/O modules or communication modules 7051xx (voltage supply and system bus) to a central processing unit JUMO variTRON 500^b • External voltage supply DC 24 V SELV und EtherCAT In |

^a The 3-port module takes over the voltage supply at the start of a strand. In order to break the 8 A limit, a 2-port router can be used for supply again.

^b With the system module, mixed operation of JUMO variTRON modules (7050xx) and I/O modules (7051xx) is possible by placing the system module on the last 7050xx module and then adding on the 7051xx modules. The setup program displays where which modules can be arranged in the HW wizard. Mixed operation can also be carried out via the relevant router modules.

Panels

| Module designation | Data sheet | Criteria |
|--------------------------|------------|--|
| JUMO variTRON web panels | 705070 | <ul style="list-style-type: none"> • Versions for different requirements (e.g. Standard, Food & Beverage) • Screen sizes (diagonal) from 10.9 cm (4.3") to 54.6 cm (21.5") • TFT-touchscreen, capacitive or resistive |

Power supply units

| Module designation | Data sheet | Criteria |
|--------------------------------|------------|---|
| Power supply unit 705090/03-33 | 705090 | <ul style="list-style-type: none"> • AC 100 to 240 V wide-range input • Output: DC 24 V / 3.4 A |
| Power supply unit 705090/05-33 | 705090 | <ul style="list-style-type: none"> • AC 100 to 240 V wide-range input • Output: DC 24 V / 5 A |
| Power supply unit 705090/10-33 | 705090 | <ul style="list-style-type: none"> • AC 100 to 240 V wide-range input • Output: DC 24 V / 10 A |

1.8 Available technical documentation

The documentation for the automation system is addressed to plant manufacturers and users with specialist training and consists of the following documents (previous document number in brackets).

1.8.1 Central processing unit

| Product | Document | No. | Printed | PDF file |
|-------------------------|---------------------------|----------------|---------|----------|
| variTRON 300 | Data sheet | 70500300T10... | - | X |
| Central processing unit | Operating manual | 70500300T90... | - | X |
| | Installation Instructions | 70500300T94... | X | X |
| | Security Manual | 70500000T95... | - | X |

1.8.2 Input/output modules

7050xx JUMO variTRON

| Product | Document | No. | Printed | PDF file |
|---|---------------------------|--------------------------------|---------|----------|
| Multichannel controller module | Data sheet | 70501000T10... | - | X |
| | Operating manual | 70501000T90... (B 705010.0) | - | X |
| | Installation instructions | 70501000T94... (B 705010.4) | X | X |
| Relay module 4-channel | Data sheet | 70501500T10... | - | X |
| | Operating manual | 70501500T90... (B 705015.0) | - | X |
| | Installation instructions | 70501500T94... (B 705015.4) | X | X |
| Analog input module 4-channel | Data sheet | 70502000T10... | - | X |
| | Operating manual | 70502000T90... (B 705020.0) | - | X |
| | Installation instructions | 70502000T94... (B 705020.4) | X | X |
| Analog input module 8-channel | Data sheet | 70502100T10... | - | X |
| | Operating manual | 70502100T90... (B 705021.0) | - | X |
| | Installation instructions | 70502100T94... (B 705021.4) | X | X |
| Analog output module 4-channel | Data sheet | 70502500T10... | - | X |
| | Operating manual | 70502500T90... | - | X |
| | Installation instructions | 70502500T94... | X | X |
| Digital input and output module 12-channel | Data sheet | 70503000T10... | - | X |
| | Operating manual | 70503000T90... (B 705030.0) | - | X |
| | Installation instructions | 70503000T94... (B 705030.4) | X | X |
| Digital input and output module 32-channel (as of system version 3) | Data sheet | 70503100T10... | - | X |
| | Installation instructions | 70503100T94... | X | X |

1 Introduction

| | | | | |
|---|---|----------------|---|---|
| Thyristor power controller type 70906x (as of system version 3) | Operating manual (integration into the automation system) | 70500153T90... | - | X |
|---|---|----------------|---|---|

7051xx JUMO I/O system

| Product | Document | No. | Printed | PDF file |
|----------------------------------|---------------------------|----------------|---------|----------|
| Multichannel controller module | Data sheet | 70515200T10... | - | X |
| | Operating manual | 70515200T90... | - | X |
| Analog input module 4-channel | Data sheet | 70511300T10... | - | X |
| | Operating manual | 70511300T90... | - | X |
| Analog output module 4-channel | Data sheet | 70512300T10... | - | X |
| | Operating manual | 70512300T90... | - | X |
| Digital input module 16-channel | Data sheet | 70513500T10... | - | X |
| | Operating manual | 70513500T90... | - | X |
| | Installation instructions | 70513500T94... | X | X |
| Digital output module 4-channel | Data sheet | 70514300T10... | - | X |
| | Operating manual | 70514300T90... | - | X |
| | Installation instructions | 70514300T94... | X | X |
| Digital output module 16-channel | Data sheet | 70514500T10... | - | X |
| | Operating manual | 70514500T90... | - | X |
| | Installation instructions | 70514500T94... | X | X |

1.8.3 Special modules

7050xx JUMO variTRON

| Product | Document | No. | Printed | PDF file |
|---|---------------------------|----------------|---------|----------|
| Router module 2-port (as of system version 3) | Data sheet | 70504100T10... | - | X |
| | Installation instructions | 70504100T94... | X | X |
| Router module 3-port (as of system version 3) | Data sheet | 70504200T10... | - | X |
| | Installation instructions | 70504200T94... | X | X |
| Router module 1-port (as of system version 4) | Data sheet | 70504300T10... | - | X |
| | Installation instructions | 70504300T94... | X | X |

7051xx JUMO I/O system

| Product | Document | No. | Printed | PDF file |
|-----------------------------------|---------------------------|----------------|---------|----------|
| Communication module 2-channel | Data sheet | 70516200T10... | - | X |
| | Operating manual | 70516200T90... | - | X |
| | Installation instructions | 70516200T94... | X | X |
| Communication module 3-channel | Data sheet | 70516300T10... | - | X |
| | Operating manual | 70516300T90... | - | X |
| | Installation instructions | 70516300T94... | X | X |
| System module | Data sheet | 70517100T10... | - | X |
| | Operating manual | 70517100T90... | - | X |
| | Installation instructions | 70517100T94... | X | X |

1.8.4 Panels

| Product | Document | No. | Printed | PDF file |
|-----------------------------|------------|----------------|---------|----------|
| JUMO variTRON Web panels | Data sheet | 70507000T10... | - | X |

1.8.5 Power supply units

| Product | Document | No. | Printed | PDF file |
|----------------------------|---------------------------------|----------------|---------|----------|
| 24 V power supply units | Data sheet | 70509000T10... | - | X |
| | Operating instructions QS3.241 | | X | - |
| | Operating instructions QS5.241 | | X | - |
| | Operating instructions QS10.241 | | X | - |

1 Introduction

1.9 System version

The system version of the automation system is determined by the software version of the central processing unit.

Example composition of a version number for the central processing unit: 431.x.y.z.b

431 = basic number

x = major version (= system version)

y = minor version

z = patch version

b = build number

In this document, functions which depend on the system version are marked accordingly (e.g. "as of system version x").

1.10 Declaration of conformity



NOTE!

Hereby JUMO GmbH & Co. KG declares that the radio equipment type JUMO variTRON 300 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following Internet address: qr-705003-en.jumo.info



JUMO variTRON 300

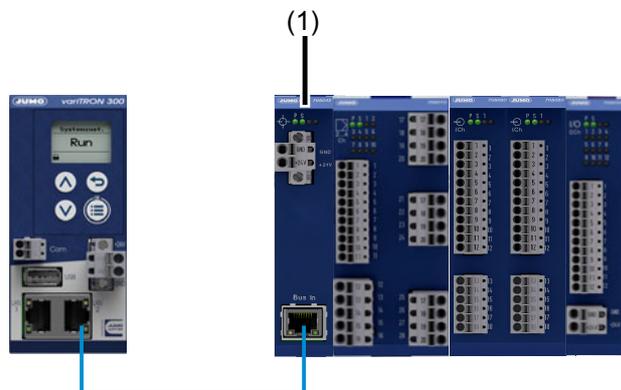
The central processing unit JUMO variTRON 300 is based on a new hardware platform with a 792 MHz processor (single core).

Due to the scalability of hardware and software, a modular, flexible, and above all sustainable hardware platform is available that is combined with a modern software architecture. Based on this new platform, innovative operating concepts can now be implemented using state-of-the-art display technologies.

The advantages at a glance:

- High speed performance
- Flexible operating philosophy
- Modern communication interfaces (e.g. OPC UA, MQTT)
- Integration of different fieldbus protocols such as PROFINET IO, EtherCAT, Modbus TCP/RTU, and BACnet/IP
- Easy integration of new software functions via PLC (CODESYS V3.5)
- Availability of function and visualization libraries (as of system version 6)
- Easy adaptation of hardware inputs and outputs
- Connection of the JUMO Wtrans transmitters (as of system version 5)
- Customized operation and visualization with several operator stations via CODESYS remote target visualization or web panels via web visualization (mixed operation is possible)
- Panels in various formats (portrait or landscape, 4:3 or 16:9)
- Web Cockpit

The central processing unit is connected to the router module using a standard network cable (see technical data or accessories). The voltage for the router module as well as the connected input and output modules is supplied at the router module. That way, the central processing unit and router module can also be mounted on different DIN rails (cable length max. 100 m).



- 1 Router module 1-port (705043), connected to JUMO variTRON 300 central processing unit (705003)

2 Description

Input/output modules

The proven input and output modules are available as module variants (type 7050xx; incl. controller module).

For example: the analog input module with universal inputs for thermocouples, RTD temperature probes, and voltage or current standard signals. As a result the same hardware can be used to precisely acquire and digitize a highly diverse range of process variables.

JUMO variTRON 300 enables simultaneous operation of up to 32 control loops so that it can also be used for sophisticated processes. Through expansion slots the inputs and outputs of each controller module can be individually expanded and adapted. The control loops here operate fully independently, which means they do not require resources from the central processing unit.

Thyristor power controllers can also be connected via EtherCAT or PROFINET. In addition, JUMO dig-iLine sensors for liquid analysis can be connected to the central processing unit.

Wireless transmission of measured values

As of system version 5, the central processing unit JUMO variTRON 300 is also available with a wireless interface that enables wireless transmission of measured values. The transmitters of the JUMO Wtrans series are available as measuring probes (Wtrans T, Wtrans B, Wtrans p; Wtrans E01 as of system version 6). A maximum of 32 transmitters can be operated on the central processing unit.

During startup, the display of the RSSI value (Received Signal Strength Indicator) in the Web Cockpit is helpful as an indicator of the signal strength of a received radio telegram.

2.1 Identifying the device version

2.1.1 Nameplate

Position

The nameplate (A) is affixed to the module case.

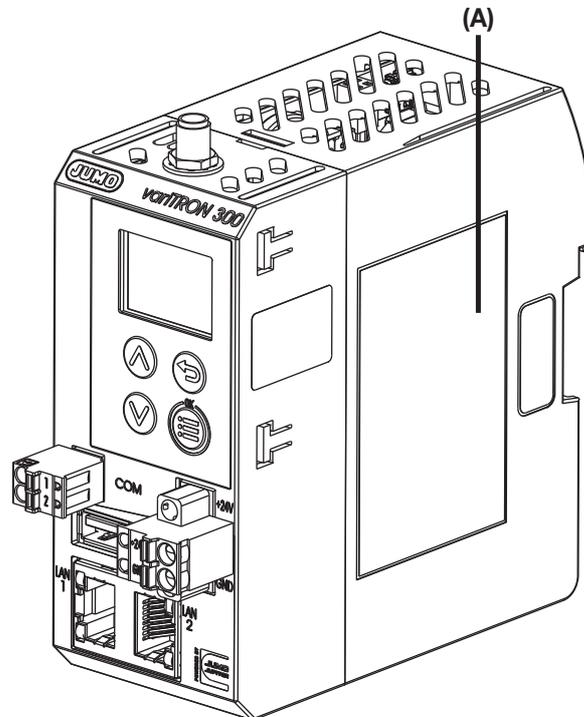


Table of contents

The nameplate contains important information. This includes:

| Description | Designation on the nameplate | Example |
|--------------------|------------------------------|----------------------------|
| Device type | Type | 705003/01008-00-36/000.224 |
| Part no. | TN | 00123456 |
| Fabrication number | F-Nr. | 0070033801220500006 |
| Voltage supply | - | DC 24 V, +25/-20 % |

Device type (Typ)

Compare the specifications on the nameplate with the order.

Identify the supplied device version using the order details (order code).

Part no. (TN)

The part no. uniquely identifies an article in the catalog. It is important for communication between the customer and the sales department.

Fabrication number (F-Nr.)

The fabrication number indicates, among other things, the date of manufacture (year/week).

Example: F-Nr = 00700338012**20**500006

The characters in question are digits 12, 13, 14, and 15 (from the left).

The device was therefore produced in the 50th week of 2020.

2 Description

2.1.2 Order details

| | |
|------------------------------------|---|
| (1) Basic type | |
| 705003 | Central processing unit type 705003 (2 × Ethernet (RJ45), 1 × USB host, 1 × RS485), program generator, Node-RED, math and logic module ^a , ST code for controller module ^b , communication protocols (PROFINET IO-Controller, Modbus RTU / TCP Master/Slave, OPC UA Server ^c , EtherCAT Master, BACnet/IP) |
| (2) Basic type extension 1 | |
| 0 | Single core CPU |
| (3) Basic type extension 2 | |
| 1 | RAM 512 MB |
| (4) Basic type extension 3 | |
| 1 | eMMC 2 GB ^d |
| (5) Version | |
| 8 | Standard with default settings |
| (6) Wireless interface | |
| 00 | Without interface |
| 10 | Wtrans 868.4 MHz (Europe) |
| 20 | Wtrans 915 MHz (USA, Australia, Canada, New Zealand, etc.) |
| (7) Voltage supply | |
| 36 | DC 24 V +25/-20 %, SELV |
| (8) Extra codes^e | |
| 062 | DNV® approval ^f |
| 224 | PLC according to IEC 61131-3 (CODESYS V3.5; necessary to operate the device as a PLC) ^g |
| 280 | CODESYS Remote TargetVisu ^{g, h} |
| 281 | CODESYS WebVisu ^g |

^a Activation for all connected controller modules (705010).

^b Available for all controller modules of the type 705152.

^c OPC UA Server: Available as of system version 7.

^d Flexible allocation between system data and application data.

^e The central processing unit can be extended with various functions through extra codes. For performance reasons, it may not be possible to use all functions (extra codes) at the same time, depending on the specific application. The JUMO variTRON 500 central processing unit (type 705002) is available as a higher-performance device. Your contact person in Technical Sales will be happy to advise you on selecting the appropriate central processing unit for your application.

^f Not in combination with wireless interface. The power supply unit used must also have a DNV® approval (e.g. type 705090).

^g This function can be used free of charge for 30 minutes in demo mode.

^h Only in conjunction with extra code 224.

Order code (1) (2) (3) (4) (5) (6) (7) (8)
 705003 / 0 1 1 - 8 - - 36 / 224 , ...^a

Order example 705003 / 0 1 1 - 8 - 00 - 36 / 224

^a List further extra codes in sequence, separated by commas.

2.1.3 Scope of delivery

| |
|--|
| 1 central processing unit, type 705003, in the ordered version |
| 1 lambda/4-antenna (only for device with wireless interface) |
| 1 installation instructions |

2 Description

2.1.4 Accessories

| Designation | Part no. |
|---|----------|
| Extra codes (activations): | |
| PLC according to IEC 61131-3 (CODESYS V3.5; necessary to operate the device as a PLC) | 00724988 |
| Remote TargetVisu | 00724990 |
| CODESYS WebVisu | 00724991 |
| | |
| USB to Ethernet converter ^a : | |
| TP-Link UE300 USB to Gigabit LAN Converter ^b (as of system version 8) | 30047695 |
| | |
| Network cable ^a : | |
| RJ45 patch cable SF/UTP, length 0.3 m | 00747472 |
| RJ45 patch cable S/FTP, Cat. 6A, length 1.5 m | 00666324 |
| RJ45 patch cable S/FTP, Cat. 6A, length 3 m | 00666326 |
| RJ45 patch cable S/FTP, Cat. 6A, length 5 m | 00665966 |
| RJ45 patch cable S/FTP, Cat. 6A, length 10 m | 00666327 |
| | |
| Accessories for wireless interface ^a : | |
| Antenna cable, length 1 m, impedance 50 ohm with preconfigured screw-type connection, T _{max.} 85 °C | 00710813 |
| Antenna cable, length 3 m, impedance 50 ohm with preconfigured screw-type connection, T _{max.} 85 °C | 00482646 |
| Antenna cable, length 5 m, impedance 50 ohm with preconfigured screw-type connection, T _{max.} 85 °C | 00490066 |
| Antenna cable, length 5 m, impedance 50 ohm with preconfigured screw-type connection, T _{max.} 125 °C | 00660378 |
| Antenna cable, length 10 m, impedance 50 ohm with preconfigured screw-type connection, T _{max.} 85 °C | 00490068 |
| Antenna cable, length 10 m, impedance 50 ohm with preconfigured screw-type connection, T _{max.} 125 °C | 00511870 |
| Antenna holder for wall mounting with antipole for lambda/4 antenna | 00482648 |
| Lambda/4 antenna with waterproof, permanently connected cable, length 10 m, T _{max.} 125 °C | 00757047 |
| Lambda/4-antenna, impedance 50 ohm, T _{max.} 125 °C | 00757039 |
| Amplifier ZX60-0916LN, packaged (ambient temperature -25 to +125 °C) | 00715285 |
| | |
| Starter kits ^c : | |
| variTRON 300 starter kit | |

^a The accessories are not part of the device approvals.

^b This USB to Ethernet converter with RTL8153 chipset has been tested by the manufacturer. Other USB to Ethernet converters with the same chipset should also be usable, as well as converters with the following chipsets: Realtek RTL8150, RTL8152, RTL8153ASIX AX88xxx based, AX88179, AX-88178ASMSC LAN95XX based.

^c Ordering is only possible via the contact person at the manufacturer.

2.2 Device functions

Recorder – recording of process data

As of system version 6, the JUMO variTRON 300 central processing unit has a function for acquiring process data as a standard feature. This allows up to 60 analog or digital channels (signals) to be logged. The channels are combined into groups for this purpose.

By grouping the channels, the user can, for example, create a separate group for each plant or log signals with a different memory cycle. The grouping of channels is also the basis for acquiring batches.

The process data is stored in the central processing unit before this data is transferred to the Datastore for storage. The Datastore is part of the JUMO smartWARE Evaluation software, which is used to visualize and evaluate the data. A fee-based license is required for this purpose. Visualization using only the central processing unit is not possible.

Acquisition of batches

As of system version 6, the scope of the JUMO variTRON 300 central processing unit also includes the acquisition of batches. Up to 10 batches can therefore be logged at the same time.

The batch data is acquired together with the channels (signals) of the assigned groups and the event messages.

The batches are also only temporarily stored in the central processing unit. Storage, visualization, and evaluation are then carried out with the JUMO smartWARE Evaluation software. A fee-based license is also required for this purpose (number of batches).

2 Description

2.3 Software

JUMO Cloud

The IoT platform for process visualization as well as data acquisition, evaluation, and archiving enables worldwide access to measurement data using common web browsers. The JUMO Cloud is characterized by a high degree of security as well as valuable visualization, alarm, and planning functions.

Further information on the JUMO Cloud:

qr-en-cloud.jumo.info

JUMO smartWARE SCADA

The JUMO smartWARE SCADA software provides easy access to measurement data using conventional web browsers. It offers functions for process visualization as well as for evaluation of the acquired data. The software also supports manufacturing and work processes with valuable visualization, alarm, and planning functions.

Further information on the JUMO smartWARE SCADA software:

qr-en-scada.jumo.info

JUMO smartWARE Evaluation

JUMO smartWARE Evaluation is intended for evaluating and visualizing process data from the JUMO variTRON system. The process data can be evaluated in customizable dashboards based on time or batch and transferred into reports (e.g. PDF, Excel®, CSV).

Further information on the JUMO smartWARE Evaluation software:

qr-en-evaluation.jumo.info

3.1 General information on installation/dismounting



DANGER!

With multichannel controller module 705010, 705152 and relay module 705015, 705143, the load circuits from relay or solid state relay outputs can be operated with a dangerous electrical voltage (e.g. 230 V).

There is a risk of electric shock.

- ▶ Prior to the installation/dismounting of these modules or the removal of the module insert, the load circuits are to be disconnected from the voltage and the terminal strips are to be removed from the module. This work must only be performed by qualified personnel.



WARNING!

The modules must never be installed in areas with an explosion hazard.

Explosion hazard.

- ▶ The entire system must only be used outside of areas with an explosion hazard.

Mounting site

All modules have protection type IP20 and are only intended for use in fireproof control cabinets or switch boxes. The mounting site should be virtually vibration-free. Electromagnetic fields caused by equipment such as motors or transformers should be avoided.

Type 705070 panels are designed for installation in a panel cut-out. Information on the protection type and other technical data can be found in data sheet 705070.

Climatic conditions

The ambient temperature and the relative humidity at the mounting site must correspond to the technical data. Aggressive gases and vapors have a negative effect on the operating life of the modules. The mounting site must be free from dust, powder, and other suspended matter so that the cooling slots do not become blocked.

DIN rail

All modules are mounted on a DIN rail according to DIN EN 60715 (35 mm × 7.5 mm × 1 mm). For reasons of stability, the spacing of the fastening screws for the DIN rail should not exceed 200 mm. The minimum distances for the modules that are specified in the module-specific installation or operating instructions must be observed.

Installation position

The DIN rail should be mounted horizontally so that all modules are arranged vertically. Otherwise the admissible ambient temperature range will be restricted.

Space requirement

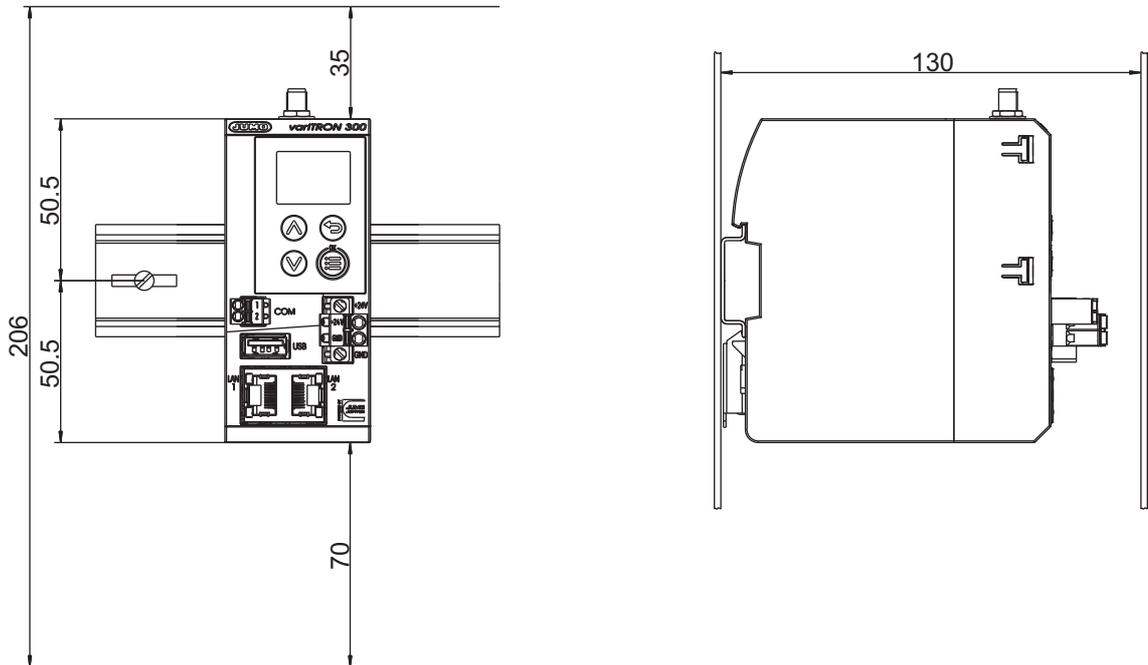
The modules require the minimum distances shown in the following figure for the purpose of installation/dismounting and for future maintenance or replacement. In the event of shorter distances the minimum bending radius of the cables, the performance of the electrical installation, and the clear arrangement of the plant are no longer guaranteed.

Cleaning

Only use a dry cloth for cleaning the modules (protection type IP20).

3 Mounting

Minimum distances



NOTE!

The upper minimum distance 35 mm is sufficient to connect a cable to the antenna socket. If the antenna is connected directly to the antenna socket, a minimum distance of 100 mm is required.

3.2 Installation/dismounting on DIN rail

All modules in the system are intended for installation on a DIN rail according to DIN EN 60715 (35 mm × 7.5 mm × 1 mm).

The following must always be installed on the left side at the start of the DIN rail:

- A central processing unit *or*
- A router module 705042 (or 705043) *or*
- A 3-channel communication module 705163

These connect the input or output modules to the voltage supply and the system bus.



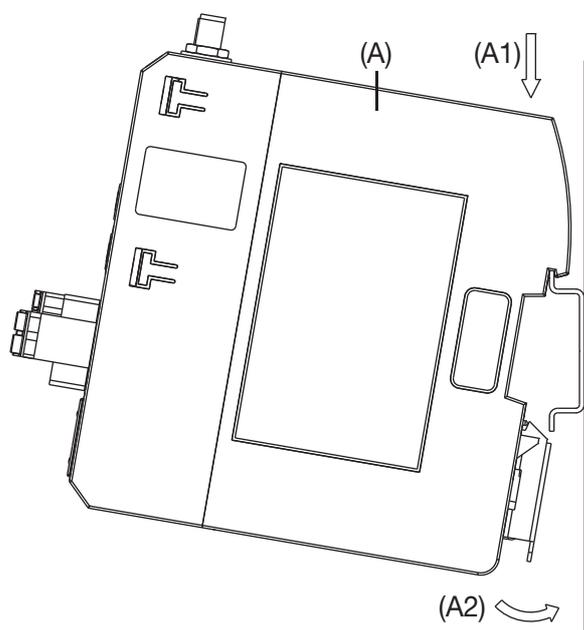
NOTE!

To determine the required minimum width of the DIN rail, the widths of the individual modules must be added (see technical data of the modules in the respective data sheet or the module-specific installation instructions).

The widths of the cover (17.5 mm) and both end brackets (9.5 mm each) should also be taken into consideration: $17.5 \text{ mm} + 2 \times 9.5 \text{ mm} = 36.5 \text{ mm}$.

3.2.1 Central processing unit

Installation of the central processing unit



Process:

1. Mount the central processing unit (A) on the DIN rail from above (A1).
2. Pivot the central processing unit (A) downwards until it snaps into place (A2).

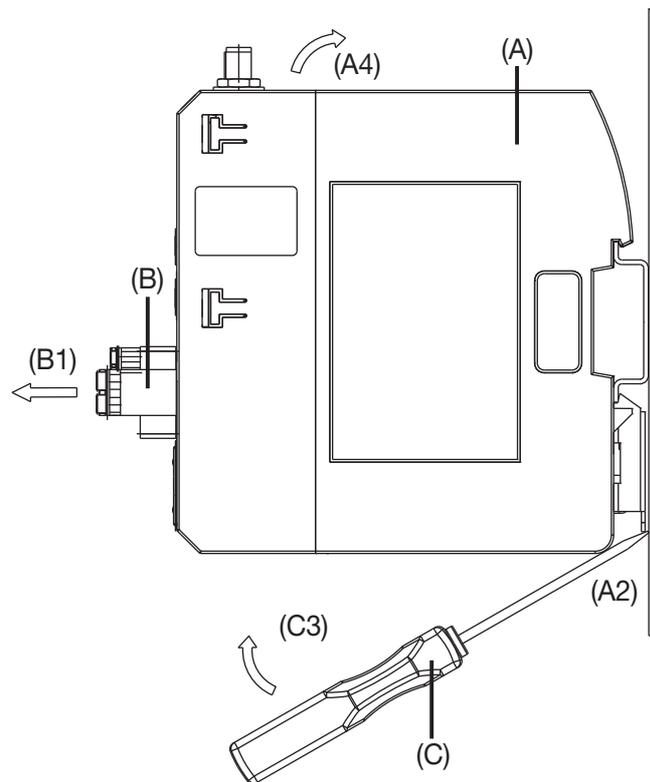


NOTE!

If necessary, activate the terminating resistors of the RS485 interface before installation (see chapter "Electrical connection")!

3 Mounting

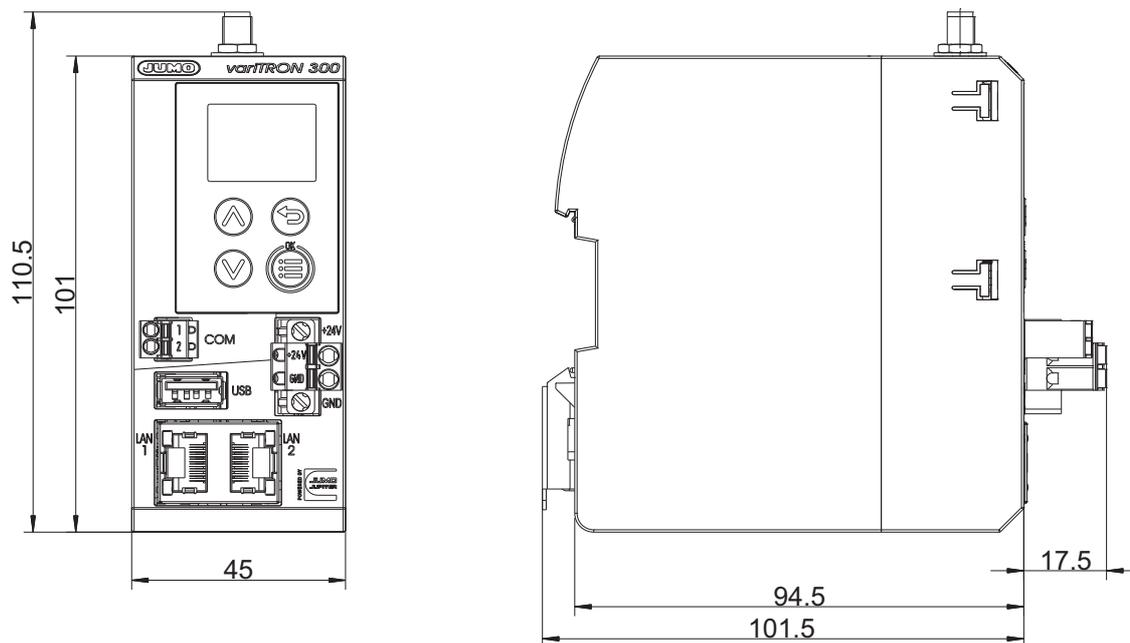
Dismounting of the central processing unit



Process:

1. Remove the connecting cables if required (interfaces).
2. If required, use a screwdriver to release the wired terminal (B) of the central processing unit (A) and pull off toward the front (B1).
3. Insert a suitable screwdriver (C) into the unlocking slot of the central processing unit (A2) and press upward (C3).
4. Pivot the central processing unit (A) upward off the DIN rail (A4) and remove it.

3.3 Dimensions



4 Electrical connection

4.1 Installation notes



NOTE!

These installation notes apply for the entire automation system and, on some occasions, are only applicable for a specific module. The respective connection diagram shows the context.

Requirements for personnel

- Work on the modules must only be carried out to the extent described and, like the electrical connection, only by qualified personnel.
- Before plugging and unplugging connecting cables, it must be ensured that the acting person is electrostatically discharged (e.g. by touching grounded metallic parts).

Cables, shielding, and grounding

- When selecting the cable material, when installing, and when performing the electrical connection of the module, the regulations of DIN VDE 0100 "Erection of low voltage installations" or the respective national regulations (e.g. on the basis of IEC 60364) are to be observed.
- At maximum load, certain cables must be heat resistant up to at least 80 °C. The corresponding notes in the connection diagram of the affected modules must be observed.
- Route input, output, and supply lines separately and not parallel to one another.
- Only use shielded and twisted probe and interface cables. Do not route the lines close to current-carrying components or cables.
- For temperature probes, ground the shielding on one side in the control cabinet.
- Do not perform loophroughs on the grounding cables, but instead route the cables individually to a shared grounding point in the control cabinet. In doing so, ensure that the cables are as short as possible.

Ensure that the potential equalization is correct.

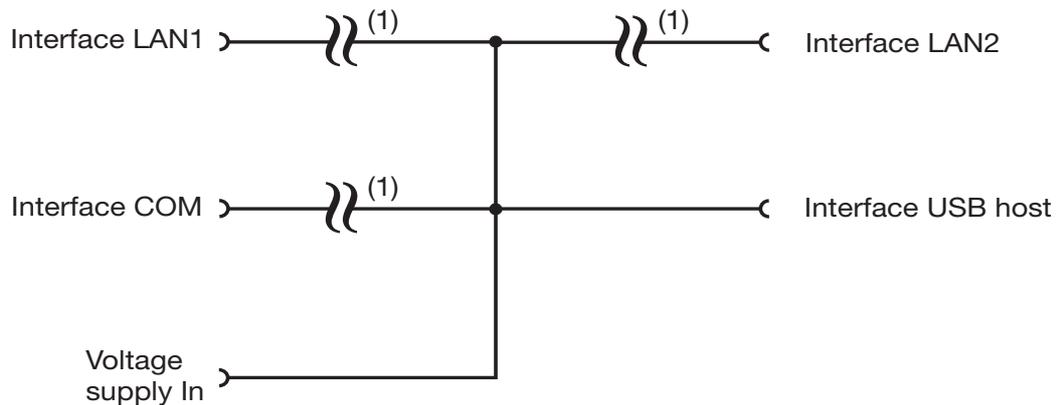
Electrical safety

- Isolate power supply units from the voltage supply on the primary side if there is a risk of touching parts with dangerous electrical voltage (e.g. 230 V) during active use.
- The fuse rating of the power supply units on the primary side should not exceed a value of 10 A (inert).
- With modules that have relay or solid state relay outputs, the load circuits can be operated with a dangerous electrical voltage (e.g. 230 V). Disconnect load circuits from the voltage supply during installation/dismounting and electrical connection.
- In order to prevent the destruction of the relay or solid state relay outputs in the event of an external short circuit in the load circuit, the load circuit should be fuse-protected to the maximum admissible output current.
- The modules are not suitable for installation in potentially explosive areas.
- In addition to a faulty installation, incorrectly set values on the module could also impair the correct function of the following process. Therefore, ensure that safety devices independent of the module (e.g. overpressure valves or temperature limiters/monitors) are available and that it is only possible for qualified personnel to define settings. Please observe the corresponding safety regulations in this context.

References to other information

- The electromagnetic compatibility meets the standards and regulations cited in the technical data.
- Sometimes USB interface and power supply are not electrically isolated. In general, please observe the device-specific information on galvanic isolation.

4.2 Electrical isolation



1 Functional galvanic isolation for connection of SELV or PELV electrical circuits.

4.3 Connection diagram



CAUTION!

At maximum load, the temperature may exceed 60 °C at the terminals "+24 V" and "GND" (voltage supply In).

As a result the insulation of the cable may be damaged.

- ▶ The cable must be heat resistant up to at least 80 °C.



NOTE!

Only copper conductors are allowed to be connected to the terminals.



NOTE!

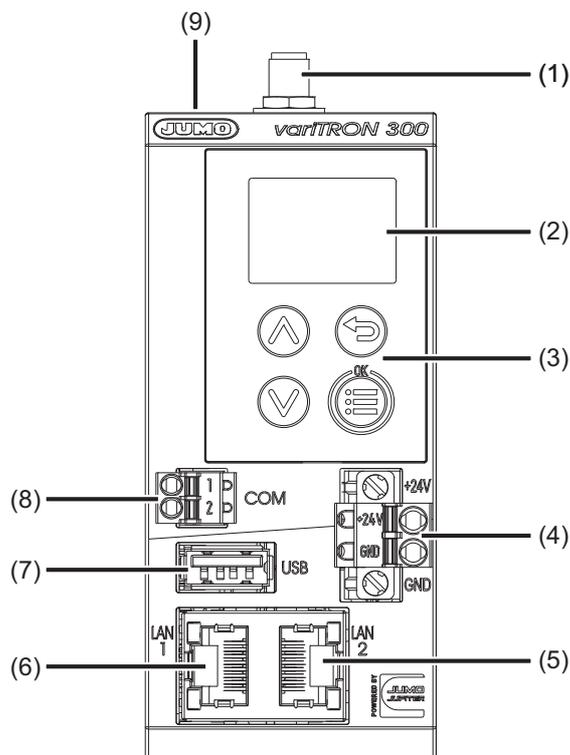
Use within the scope of DNV approval:

The module must be supplied by a power supply unit that also has DNV approval. Further modules of the automation system may be operated at this power supply unit. Other devices must not be connected to this power supply.

4 Electrical connection

4.3.1 Display, operating, and connection elements

This overview shows the position of the display, operating, and connection elements. The assignment to individual functions is illustrated in the following sections.



- (1) Antenna connector
- (2) Display
- (3) Control elements
- (4) Voltage supply DC 24 V
- (5) Interface LAN2
- (6) Interface LAN1
- (7) USB host interface
- (8) RS485 interface
- (9) Switches for terminating resistors (RS485), inside the housing

4 Electrical connection

4.3.2 Voltage supply

| Connection | Designation | Number | Symbol and terminal designation |
|-------------------|---------------|--------|---------------------------------|
| Voltage supply In | +24 V and GND | (4) | |

4.3.3 Interfaces

| Connection | Designation | Number | Connection element | Assignment |
|------------------------|-------------|----------|-----------------------|--|
| Antenna (optional) | | (1) | SMA socket | |
| Ethernet | LAN1, LAN2 | (6), (5) | | 1 TX+ Transmission data + 2 TX- Transmission data - 3 RX+ Received data + 6 RX- Received data - |
| USB host | USB | (7) | USB socket type A | |
| Serial interface RS485 | COM | (8) | Terminal strip 2-pole | 1 TxD+/RxD+ Transmission/received data + 2 TxD-/RxD- Transmission/received data - |



NOTE!

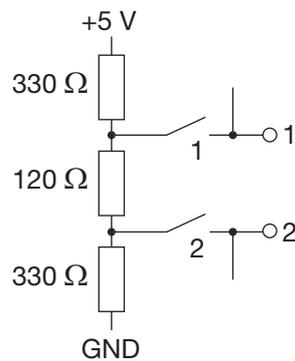
Only SELV or PELV circuits may be connected to the interfaces.

The connection cables of the Ethernet interfaces may only run inside the building.

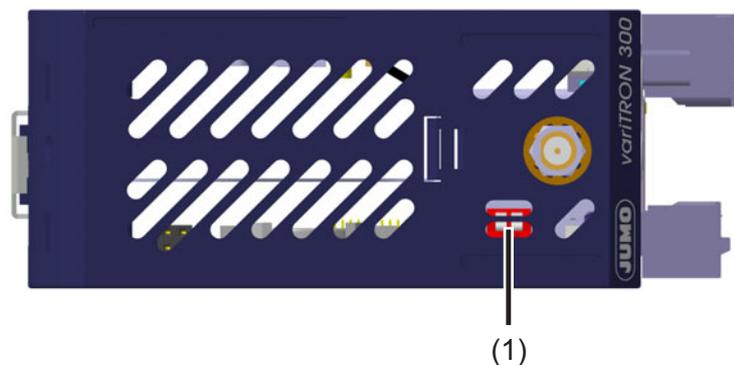
4 Electrical connection

4.3.4 Terminating resistors

The terminating resistors of the RS485 interface are deactivated per default. To activate them, switches 1 and 2 must be closed.



The switches are located inside the housing and are accessible through the ventilation slots (1).



Switch position: up = open, down = closed



NOTE!

To ensure fault-free operation, terminating resistors are required at the beginning and end of an RS485 transmission path.

5.1 General information

The following options are available to operate the device:

- Configuration of the device with the setup program
- Operation on the device
- Use of the JUMO Web Cockpit with the "Web Cockpit", the "Recorder View" (only with JUMO variTRON 500 und JUMO variTRON 500 touch), "CODESYS WebVisu" and "Other apps" in a web browser. The "Other apps" tile takes you directly to the JUMO Help Center.
- Use of the "JUMO smartWARE Evaluation" web application using a web browser

The various options for operating the device differ in terms of the scope of the functions they support.

IP address

In order to access the device using the setup program or a web browser, the IP address of the device is required. The IP address of the Ethernet interface concerned can be found using the **device menu**:

Applications > Main menu > Device info > Ethernet > LANx

A user does not need to be logged on to do this (dependent on rights).

The Ethernet settings may need to be changed beforehand using the device menu:

Applications > Main menu > Configuration > Ethernet > LANx

Network

- Method: Automatic
- Check Obtain DNS server IP automatically

A user does not need to be logged on to do this (as of system version 8; dependent on rights).

The default setting is that DHCP is active.

User log-on

Please use the following details to log on for startup purposes:

- Username: Master
- Password: 9200

The password should be changed after completing the startup at the latest.

The password must be entered again each time the user logs on.

Hardware configuration

In order to start up a system that comprises the device (central processing unit) and other system components (modules), the system's hardware configuration needs to be created using the **setup program**. This cannot be done using the device menu or the web application.

If the hardware is incorrectly configured, a bus error will be displayed.

Startup

Procedure during startup:

⇒ chapter 7 "Startup", Page 112

Device-specific information in this chapter

All information in this chapter fundamentally applies to the devices JUMO variTRON 300 (705003), JUMO variTRON 500 (705002), and JUMO variTRON 500 touch (705004). Differences between the devices will be mentioned at the relevant points if necessary for the use of this manual. Device-specific sections or subchapters are also used where required.

5 Operation

5.2 Device



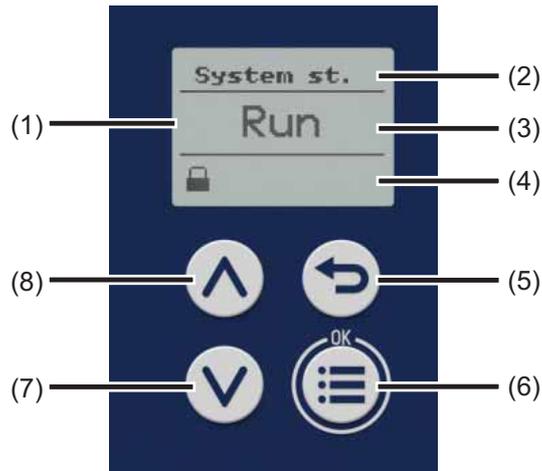
CAUTION!

Danger due to electrostatic discharge!

Touching the connection elements can destroy the device.

- ▶ The operator must discharge himself electrostatically before operating the device.

5.2.1 Display and control elements



- 1 Display in basic status
- 2 Title of display
- 3 Display of system status or system bus status
- 4 Display of log-on status or event, e.g. using icons (see table)
- 5 "Back" key (in menu: back to previous menu level, exit editing mode without making a change)
- 6 "Menu/OK" key (call up main menu, switch to submenu/level, switch to editing mode, exit editing mode with a change made, confirm entry or change)
- 7 "Down" key (in menu: reduce value, select next menu item, parameter, or value; in basic status: switch between displaying the system status and the system bus status)
- 8 "Up" key (in menu: increase value, select previous menu item, parameter, or value; in basic status: switch between displaying the system status and the system bus status)

Icons (display in basic status)

| Icon designation | Depicted as | Meaning |
|---|-------------|---|
| Logon status (position 1 = left) | | User is not logged on. |
| | | User is logged on. |
| Alarm status (position 2) | | There is at least one malfunction (but no alarm). |
| | | There is at least one alarm. |
| External medium (position 3) | | An external medium has been connected (USB port). |
| Transfer of configuration (position 4) | | Configuration is being transferred (setup program). |

| Icon designation | Depicted as | Meaning |
|--|---|--|
| CODESYS online status (position 5) |  | The CODESYS programming system has been connected to the device. |

5.2.2 Device menu

To access the device menu from the start screen, press the "Menu/OK" key.

The following overview shows the menu levels where individual functions can be configured (by selecting or entering data) or information is shown. The information that is shown on the device display depends on the user's rights.

Beyond this, there are functions that can only be configured with the setup program or the web application; these functions are not listed here.

If you need further information on the individual functions, please see the subsequent chapters in this manual (see cross-references).

User management

| Sub-menu 1 | Sub-menu 2 | Sub-menu 3 |
|------------------|---|------------|
| Logon (log in) | User (to be selected), password (to be entered) | --- |
| Logoff (log out) | --- | --- |

⇒ chapter 5.2.3 "User log-on", Page 43

System status

| Sub-menu 1 | Sub-menu 2 | Sub-menu 3 |
|--|------------|------------|
| Change the system status Selection options: Run, Stop, Reset, Reset (Cold), Reset (Origin), Reboot system | --- | --- |

⇒ chapter "Device information", Page 70

Configuration

| Sub-menu 1 | Sub-menu 2 | Sub-menu 3 |
|--------------------------------------|---------------------|---|
| Device manager | Device settings | Device language (selection) |
| | | Start-up behavior (selection options: Run, Stop, Last status) |
| | | Partition change after [x] start-up errors (to be entered) |
| | Device designations | Device name (display) |
| | | DNS name (display) |
| | Time zone/NTP | Time zone (selection) |
| | | NTP active (selection) |
| Max. round-trip time (to be entered) | | |

5 Operation

| Sub-menu 1 | Sub-menu 2 | Sub-menu 3 |
|------------------|---|--|
| Ethernet | LAN1 | Method (selection options: Manual, Automatic) |
| | | IP address (to be entered) |
| | | Subnet mask (to be entered) |
| | | Standard gateway (to be entered) |
| | | DNS server IP (obtain automatically; selection options: False, True) |
| | DNS server (entry of IP address) | |
| | LANx | see LAN1 |
| Web server | HTTP (selection options: Active, Inactive, Redirect to HTTPS) | --- |
| | HTTP port number (to be entered) | --- |
| | HTTPs port number (to be entered) | --- |
| System status UI | Screensaver | Function (selection options: Off, On) |
| | | Waiting period (idle time) (to be entered, in milliseconds) |

⇒ chapter "Configuration", Page 74

Device info

| Sub-menu 1 | Sub-menu 2 | Sub-menu 3 |
|--------------------|--|---|
| Device information | Device | Device name (display) |
| | | Date and time (display) |
| | | Total root volume memory (display) |
| | | Product group (display) |
| | | Recorder service ID (display) |
| | | Certification number (inspection number) (display) |
| | | Fabrication number (production number) (display) |
| | Hardware versions | (dependent on what hardware is fitted to the device) Submenu 4 displays: – Hardware type – Comment – LP ID – Compatibility index – Hardware version |
| | | Software versions |
| | Version type (display) | |
| | Operating system version (display) | |
| | Application building version (display) | |
| | Software version (display) | |
| System status | System status (display) | --- |
| Ethernet | LAN1 | IP address (display) |
| | | Transfer rate (display) |
| | | MAC address (display) |
| | | DNS server (display) |
| | | Standard gateway (display) |
| | | Subnet mask (display) |
| | LANx | see LAN1 |

⇒ chapter "Device information", Page 70

Service

| Sub-menu 1 | Sub-menu 2 | Sub-menu 3 |
|----------------------------|--|------------|
| Device manager | Activate debug interface (selection) As of system version 6: An automatically generated SSH password is stored in the event list (valid until power off). | --- |
| Certificate administration | Remove certificates (selection) | --- |
| Email | Send email (selection) | --- |

5 Operation



CAUTION!

The SSH password gives the user unrestricted access to the operating system (root privileges).

Changes at the operating system level can result in the device functions developed and tested by JUMO being inadmissibly changed. JUMO accepts no liability for this.

- ▶ The user is responsible for all changes he makes at the operating system level.
-

Removable media

This menu item is provided if a USB flash drive has been connected.

| Sub-menu 1 | Sub-menu 2 | Sub-menu 3 |
|---|---|------------|
| Remove hardware Must be run before the USB flash drive is removed! | --- | --- |
| Import configuration | --- | --- |
| Export configuration | --- | --- |
| Firmware update | --- | --- |
| Export debug data | --- | --- |
| Export license request (as of system version 4) | Functions (extra codes) that can be enabled. A separate request file (license request) must be exported for each function. | --- |
| Import license file (as of system version 4) | If several functions are available, they must be enabled one after the other. A separate response file (license file) is required for each function. | --- |

5.2.3 User log-on

Logon

- 1) Press the "Menu/OK" key to open the device menu.
- 2) Switch to the submenu "User administration > Logon".
- 3) Select the user from the list and press the "Menu/OK" key to confirm.
- 4) Enter the password: Select the 1st digit by pressing the "Up" or "Down" key and press the "Menu/OK" key to confirm.
- 5) Enter the subsequent digits of the password one after the other.
- 6) Once you have entered the last digit, press the "Menu/OK" key again.

Logoff

- 1) Press the "Menu/OK" key to open the device menu.
- 2) Switch to the submenu "User administration > Logoff".
- 3) Press the "Menu/OK" key.

5.2.4 Reset to factory settings

To perform a reset to default settings, first switch off the device (device disconnected from the voltage supply), then simultaneously press the "Menu/OK" (6) and "Down" (7) keys, and then switch the device back on (restore the voltage supply). When doing so, press and hold the keys until the display's backlight has been activated.



CAUTION!

Reset to default settings

All data will be deleted. All settings will be reset to the default settings (JUMO), including the user administration settings (user "Master", password "9200").

- ▶ Back up the hardware configuration and settings beforehand using the setup program.
-



NOTE!

Resetting to factory settings also removes the extra codes (chargeable functions). For this reason, the files for enabling the extra codes (also referred to as license files or FeatureResponse files) should be stored after initial receipt in such a way that they are available again for transfer to the device after a factory reset (see Web Cockpit > Service).

5 Operation

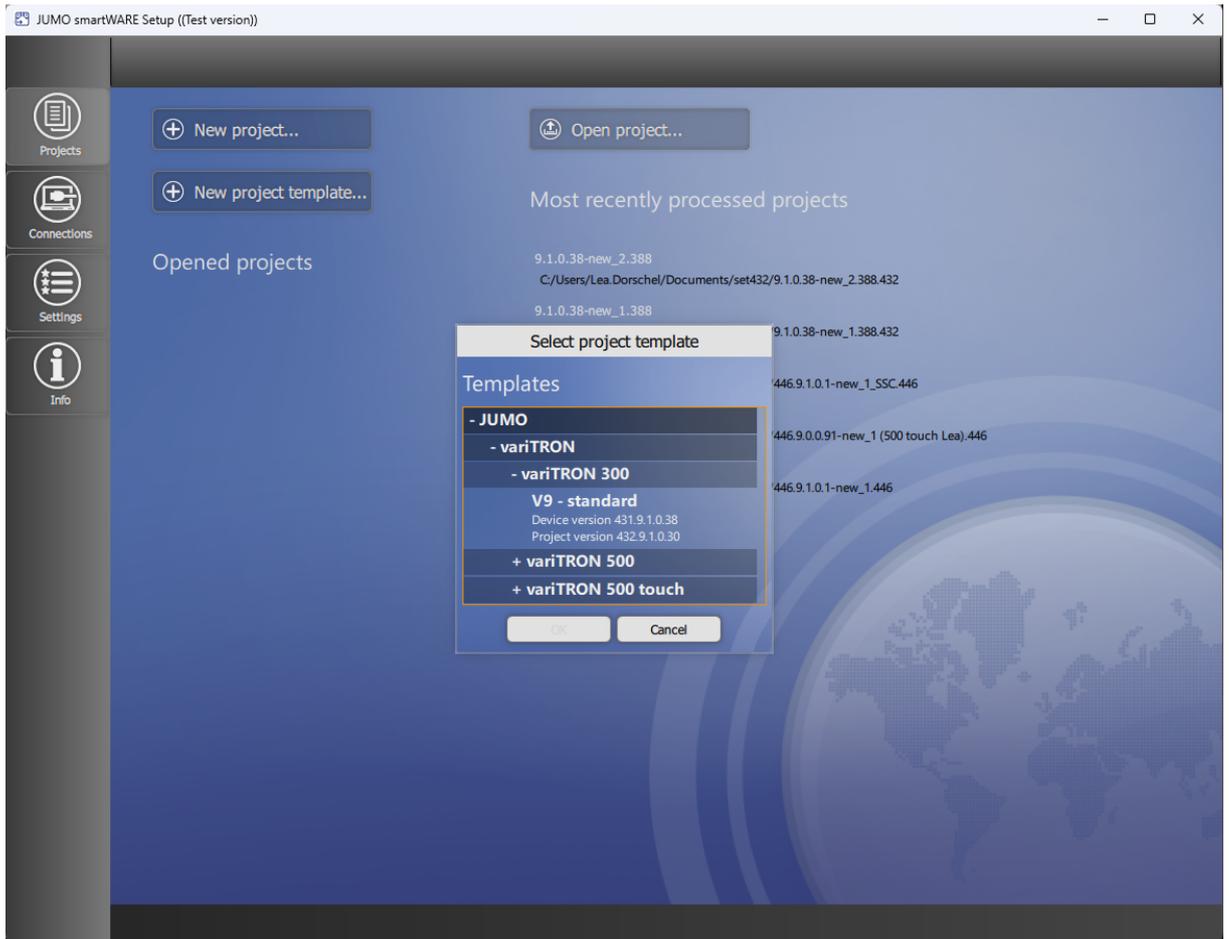
5.3 Setup program

5.3.1 Start page

The setup program is used to create new projects and edit existing projects.

The "Projects" window contains corresponding buttons. If applicable, the most recently edited and opened projects are also shown. These are likewise provided in the form of buttons for opening the respective project or switching to a project that is already open.

When creating a new project, a project template must be selected that depends on the device type and version of the device software. If necessary, the version of the setup program must also be taken into account.



Functions provided in the left-hand bar (also known as the "application bar"):

- Projects: Create new project, import new project template (as of system version 8), open existing project
- Connections: Configure and manage connections to devices
- Settings: Select the language of the setup program
- Info: Display information about the setup program

The bar at the bottom also displays opened projects (in the form of "project maps").

NOTE!



Before a device (or system) can be put into operation, the setup program must be used to create a project and transfer it to the device. The first step is to define the hardware configuration for the device (type and arrangement of hardware modules). The connection to the device must also first be configured before the project can be transferred.

5.3.2 Project map

Create project using individual functions

The functions are combined in a project folder known as a project map.



The following functions are available within a project:

- **Project management:** Display the name and path of the project file, enter the designation and description of the project
- **HW-Assistent Systembus:** Define the hardware configuration for the entire system
- **Wtrans hardware assistant** (only for JUMO variTRON 300 and JUMO variTRON 500 touch): Define the hardware configuration for the entire system
- **Configuration:** Configure the device (central processing unit) and modules and determine their parameters
- **PLC application:** Determine the start parameters for the CODESYS PLC programming system, start the PLC configuration process (CODESYS)
- **PLC parameter definition:** The function is only available if the Configuration and Process Value Editor (CPVE) is installed determine the start parameters for the CPVE, start the CPVE
- **Languages:** Select the project language and device languages, export and import languages (texts)
- **Data transfer:** Establish a connection to a device, data transfer to/from the device, import and export the configuration
- **Messages** (as of system version 6): Display and edit project messages (acknowledge; other actions may be required)

You can access these functions using the tiles in the window and using the functions in the bar at the top (also known as the "project bar"). Selecting the "Project map" function takes the user back to the overview of functions.

5 Operation

5.3.3 Project management

Display project information, enter designation and description of the project, convert project



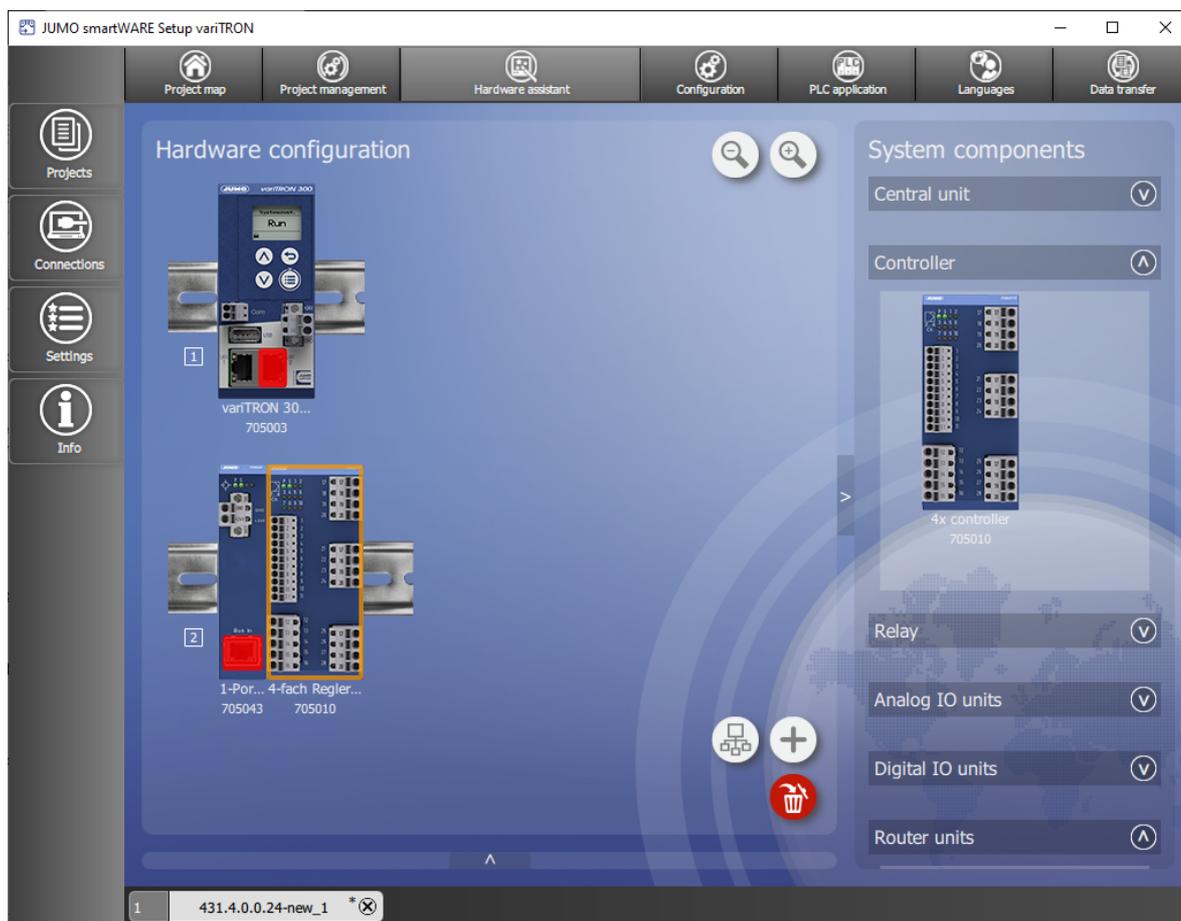
Parameters/functions:

- File name (non-editable): Project file name that was automatically assigned when creating the project.
- Path (non-editable): Path under which the project file has been saved.
- Project version (non-editable): Version of the setup project
- Device version (non-editable): Version of the device software
- Project designation (button): Opens a window for entering a designation for the project (in several languages).
- Description: Input field for providing a more detailed description of the project (in one language)
- Convert project (button): Convert project into the same or a higher system version (select project template); note messages!
- Validate project (button): Note messages!
- HTML export – export project into html format.

To change the file name and, if applicable, the file path, select the "Save as..." button.

5.3.4 System bus HW assistant

Defining the hardware configuration for the entire system



The window is separated into three areas:

- Hardware configuration
- System components
- Settings

To increase the size of the "Hardware configuration" area, the "System components" and "Settings" areas can be hidden by clicking the relevant button (right arrow/downward arrow).

Hardware configuration



NOTE!

As part of the hardware configuration, system components from the tried-and-tested JUMO variTRON series (7050xx) and the JUMO I/O system (7051xx) can be used separately or in combination. An adapter module 705171 must be used in the event of combined use of modules of JUMO variTRON (7050xx) and the JUMO I/O system (7051xx).

The "Hardware configuration" area shows the device (in this case the JUMO variTRON 300 touch central processing unit) and, if applicable, all previously added system components (modules). The view can be enlarged or reduced using the zoom function ("+" and "-" magnifying glass icons).

Since the variTRON 300 central processing unit does not have any side connections for voltage supply and system bus, a router module is required (primarily 1-port router module) to connect other modules. This router module must be placed on an additional DIN rail in the setup program. In a real system, it can be arranged on the same DIN rail as the central processing unit.

5 Operation

In the setup program, the connection between the router module and the central processing unit is established in the same way as the connection between router modules (see the following description). In the real system, a commercially available network cable is used (min. CAT5, S/FTP; connection to the LAN2 socket of the central processing unit).

The position of a module on the DIN rail can be changed by dragging and dropping the module accordingly.

Once selected, a module can be removed using the "Recycle bin" button or by pressing the Delete key on the keyboard (you can select the module by clicking on it; you can also navigate using the left/right arrow keys on the keyboard).

With the "+" button, the first DIN rail is adopted into the configuration. If necessary, additional DIN rails can be added (scroll down in the window to make the DIN rail visible). You can switch between the DIN rails using the Up/Down arrow keys on the keyboard. Empty DIN rails can be removed again using the "X" button.

The "Bus Scan" button is used to scan the system bus of the connected device and load the hardware configuration into the setup project.

System components

The "System components" area lists all available system components (open the drop-down menu by clicking on it). A distinction is made here between the central processing unit and the modules (controller, relay, analog IO units, digital IO units, router units). A thyristor power controller, adapter module for the I/O system, and end plates are available under "Various". A module can be added to the hardware configuration by dragging and dropping it or by double-clicking on the module. The central processing unit is specified by the setup program when creating a new project. The setup program displays the possible position of the system component as a white placeholder on the DIN rail. If the setup program does not display a white placeholder, it is not technically possible to use the component in this position. The position of a module on the DIN rail can be changed by dragging and dropping the module accordingly.



NOTE!

A maximum of 8 modules (up to system version 9) can be connected (router modules 7050xx and communication modules 7051xx do not count).

A maximum of 16 modules (as of system version 10) can be connected (router modules 7050xx and communication modules 7051xx do not count).

For this purpose, the transferred process values must be reduced to the minimum (active) in the process value map for the connection modules under Configuration > System bus > <Module name> > Device settings > Process values.

Settings

The "Settings" area displays information on the system component that is currently selected and enables certain settings to be configured:

- Product group number (non-editable)
- Designation (button): Opens a window for entering a designation for the system component (in several languages)
- Module label: Tag name for the system component (editable; can no longer be changed once the hardware configuration has been applied)
- Expansion slot (dependent on the module): For selecting the option (open the drop-down menu by clicking on it)
- Optional module (alias device address): ⇨ chapter 5.3.5 "Optional module (alias device address)", Page 49



NOTE!

If the hardware configuration is created with the "Bus scan" function, the setting of the rotary coding switches in the setup project must be checked in the case of a 3-port router module (705042) or 2-channel (705162)/3-channel (705163) I/O system communication module. If necessary, the setting must be changed before the configuration is sent to the device.

Router units

If the hardware configuration contains router units (router modules), these units must be connected with one another. To do so, proceed as follows (also applies to the connection between the variTRON 300 central processing unit and router module):

1. Click on a router module.
The free RJ45 sockets are depicted by a green border.
2. Double-click on a free socket (or on the "Start connection" connector icon on the right next to the socket).
*On the router module on the other DIN rail, suitable free sockets are depicted by a flashing green border. A distinction is automatically made here between inputs (Bus In) and outputs (Bus Out).
Please note: To cancel, click on the "Delete connection" x icon on the right next to the socket.*
3. Click on a free socket on the other router module (or on the "Close connection" connector icon on the right next to the socket).
*The connection between the two sockets is established (color change).
Please note: To delete the connection, click on the "Delete connection" x icon on the right next to one of the two sockets (or remove a router module)*
4. If necessary, establish connections to other router modules (connections are depicted by different colors for the relevant RJ45 sockets).

5.3.5 Optional module (alias device address)

Basic differences between the mandatory module and optional module

Mandatory module:

- The module must be available.
- The position of the module must correspond to the hardware arrangement in the setup program.

Optional module:

- Only router modules can be configured as the head module of an HC group (hot connect group or optional module group) (assignment of an alias device address).
- The router module and the components of its HC group (optional modules) need not be available.
- All input or output modules connected to it are also optional modules.
- Router modules connected to it are optional modules.
- Due to the alias device address, a router module is always uniquely identifiable within the system.
- The router module can be defined in the setup program with a fixed or a variable position on the system bus.

Differences at system start and during operation

System start:

- If a mandatory module causes a problem (module defective or not available, wrong position), the system will not start.
- The HC group must be completely available or completely missing. If only part of the HC group is available, the system will not start.

5 Operation

During operation:

- If a mandatory module fails or is removed, the entire system goes into the "Stop" state.
- If an optional module is used, the system continues to run.
- The HC group can be removed from the system and also connected again (hot connect functionality). If a part of the HC group is removed, the remaining modules of this HC group continue to run.

Configuration of optional modules

When creating a project with the setup program (hardware arrangement), all modules are initially mandatory modules. To form a line with optional modules (HC group), the relevant (upstream) router module must be configured as an optional module:

- 2-port router module (705041)

The "Optional" parameter must be set to TRUE (red) in the setup program.

The alias device address is fixed (0x200). Within a system, only a single 2-port router module can be configured as an optional module.

Connected router modules are then also automatically optional modules (they do not have to be configured as optional modules themselves).

- 3-port router module (705042)

The rotary coding switches on the module must be used to set an alias device address (address not equal to 0). The same address must be set in the setup program using the parameters with the same name (rotary coding switch 10x, rotary coding switch 1x). If the settings do not match, the router module is not recognized on the system bus.

Note: if the alias device address 0 is set in the setup program, the address set on the router module is irrelevant (the addresses are not compared). The router module is then a mandatory module.

The alias device address is freely selectable, but must be unique within the system.

All input or output modules connected to the router module and any additional router modules are then also optional modules.

The router module as an optional module can also be operated at a system bus output that is not defined in the hardware arrangement. To prevent this possibility, the parameter "Fixed position" must be set to TRUE (red). Then the connection is only possible at the specific RJ45 socket of the specific router module as it corresponds to the hardware arrangement.

- 1-port router module (705043)

The "Optional" parameter must be set to TRUE (red) in the setup program.

The alias device address is fixed (0x100). Within a system, only a single 1-port router module can be configured as an optional module.

All input or output modules connected to the router module are then also optional modules.

The router module as an optional module can also be operated at a system bus output that is not defined in the hardware arrangement. To prevent this possibility, the parameter "Fixed position" must be set to TRUE (red). Then the connection is only possible at the specific RJ45 socket of the specific router module as it corresponds to the hardware arrangement.

- 2-channel (705162) and 3-channel (705163) I/O system communication module

An alias device address (ECAT ID) can be set via the DIP switch in order to use the communication module as a so-called optional module. The alias device address is freely selectable, but must be unique within the system.

5.3.6 Wtrans HW assistant

Select Wtrans transmitters (wireless measured value transmission)



The window is separated into three areas:

- Transmitter configuration
- System components
- Settings

To increase the size of the "Transmitter configuration" area, the "System components" and "Settings" areas can be hidden by clicking the relevant button (right arrow/downward arrow).

Transmitter configuration

The "Transmitter configuration" area shows all previously added system components (Wtrans transmitters). The transmitters can be placed next to each other and under each other (self-expanding grid, scroll function horizontal and vertical). The view can be enlarged or reduced using the zoom function ("+" and "-" magnifying glass icons).

The position of a transmitter can be changed by dragging and dropping the module accordingly.

Once selected, a transmitter can be removed using the "Recycle bin" button or by pressing the Delete key on the keyboard (you can select the transmitter by clicking on it; you can also navigate using the left/right arrow keys on the keyboard).

System components

The "System components" area lists all available transmitters (open the drop-down menu by clicking on it). A transmitter can be added to the transmitter configuration by dragging and dropping it or by double-clicking on the transmitter.

5 Operation

Settings

The "Settings" area displays information on the system component that is currently selected and enables certain settings to be configured:

- Product group number (non-editable)
- Module label: Tag name for the system component (editable; can no longer be changed once the hardware configuration has been applied)
- Module designation (button): Opens a window for entering a designation for the system component (in several languages)

5.3.7 Configuration

Configure the device (central processing unit) and modules and determine their parameters



5 Operation

The "Configuration" area comprises the following areas (device-specific example shown):

- Network: Ethernet and port configuration
- Device manager: Device settings (device language, start-up behavior, partition change), device designations, time zone/NTP, date and time, customer-specific linearization (as of system version 5)
- Unit settings: Definition of the SI units used in the application
- System bus: Master (settings relating to the system bus; see below), module... (module-specific configuration parameters; see below)
- Data carrier management (as of system version 7): Use of network drives
- System status UI (only with JUMO variTRON 300 and JUMO variTRON 500): Screensaver (activation and waiting period)
- User interface (only for JUMO variTRON 500 touch): Setting the boot logo, activation of screensaver, setting of screen brightness and screen orientation
- Web server: Activation, HTTP or HTTPS, port numbers
- Email: Settings for sending emails
- PLC configuration: Configuration of program generators, analog and digital variables (as of system version 5)
- PLC Parameter: Display of the configuration structures created using the Configuration and Process Value Editor (CPVE)
- Programs: Creation of programs using the program editor (setpoint values, operating contacts)
- CODESYS configuration: Definition of the automatic storage interval for retain data
- Recorder: Definition of groups and customization of the group-specific display modes
- Recording data export (as from system version 6): Configuration of the connection to the database
- Cloud gateway: Configuration of the connection to JUMO Cloud (as of system version 4)
- Signal generator: Specification of analog and digital signals within the system
- Wtrans gateway (only with JUMO variTRON 300 and JUMO variTRON 500 touch): Settings for using the JUMO Wtrans transmitters (as of system version 5)
- Node-RED (as of system version 4): Activation of the development tool Node-RED
- Batches (as of system version 6): Configuration of batch reporting

Details can be found in the "Configuration" chapter.

⇒ chapter 6 "Configuration", Page 82



NOTE!

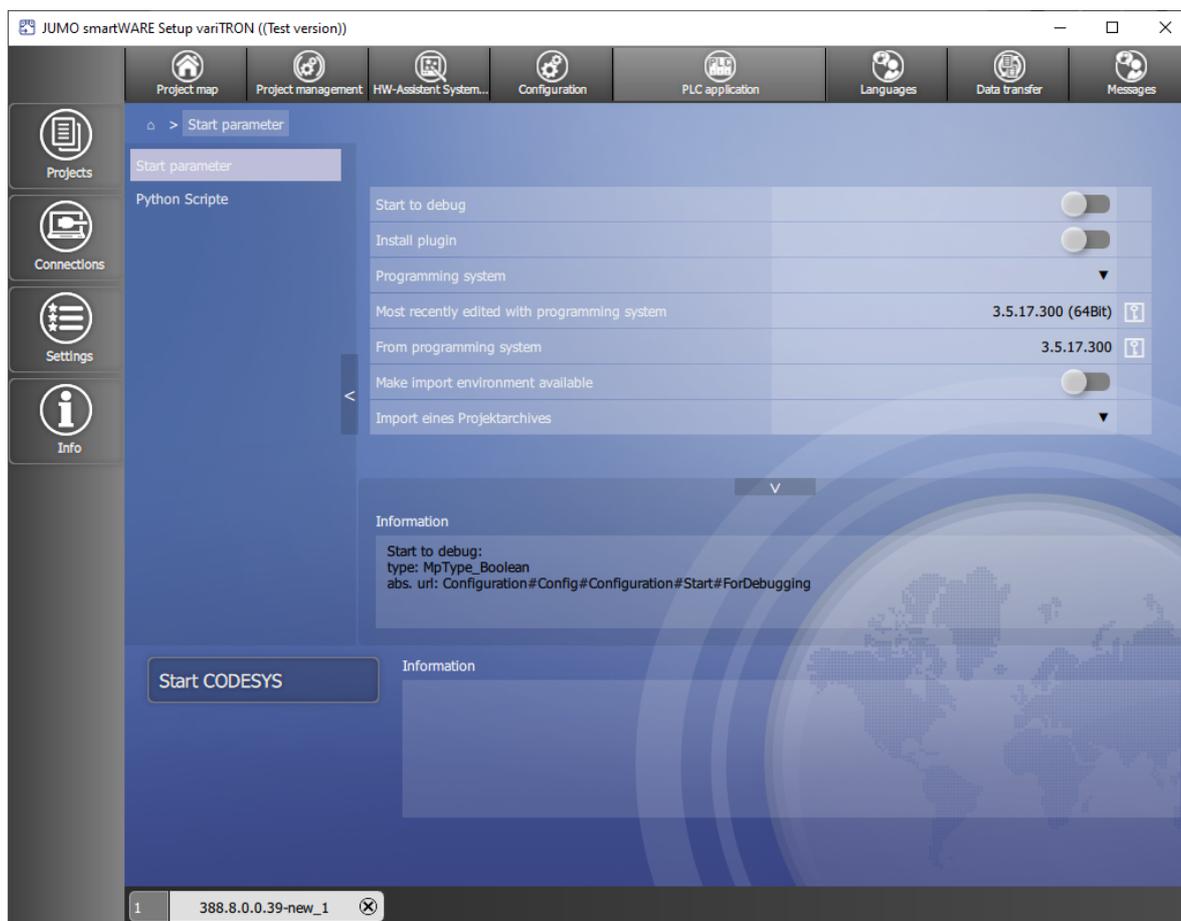
The settings configured under "System bus > Master" influence the transfer of data via the system bus. Sub-optimal settings here will disrupt or even interrupt communication within the system. For this reason, these parameters are only permitted to be modified by a service engineer from the device manufacturer (or by someone acting on their instructions).

The process of configuring the modules (controllers, relays, analog IO units, digital IO units) is described in the operating manual for the respective module.

⇒ chapter 1.8 "Available technical documentation", Page 15

5.3.8 PLC application

Determine the start parameters for the CODESYS PLC programming system, start CODESYS



Parameters/functions:

- Start to debug: Start CODESYS without a newly created device description (the compilation process is not run again before logon, the program is not stopped when logging on to the target system)
- Install plugin: Newly initialize the CODESYS plug-in (e.g., after uninstalling and reinstalling CODESYS)
- Programming system: Select the CODESYS version (drop-down menu)
- Most recently edited with programming system (display only): Most recently used CODESYS version
- As of programming system (display only): Version of the CODESYS runtime system in the device during the last execution
- Provide import environment: Provide texts from the "PLC Parameter" configuration area for import (after starting the PLC configuration)
- Import of a project archive (as of system version 8): Select CODESYS file of type ".projectarchive" for import.

To start the programming system, click the "Start CODESYS" button.

5 Operation

5.3.9 PLC parameter definition

Determine the start parameters for the CPV Editor (CPVE), start the CPVE

This function is only available if the CPV Editor has been installed.



NOTE!

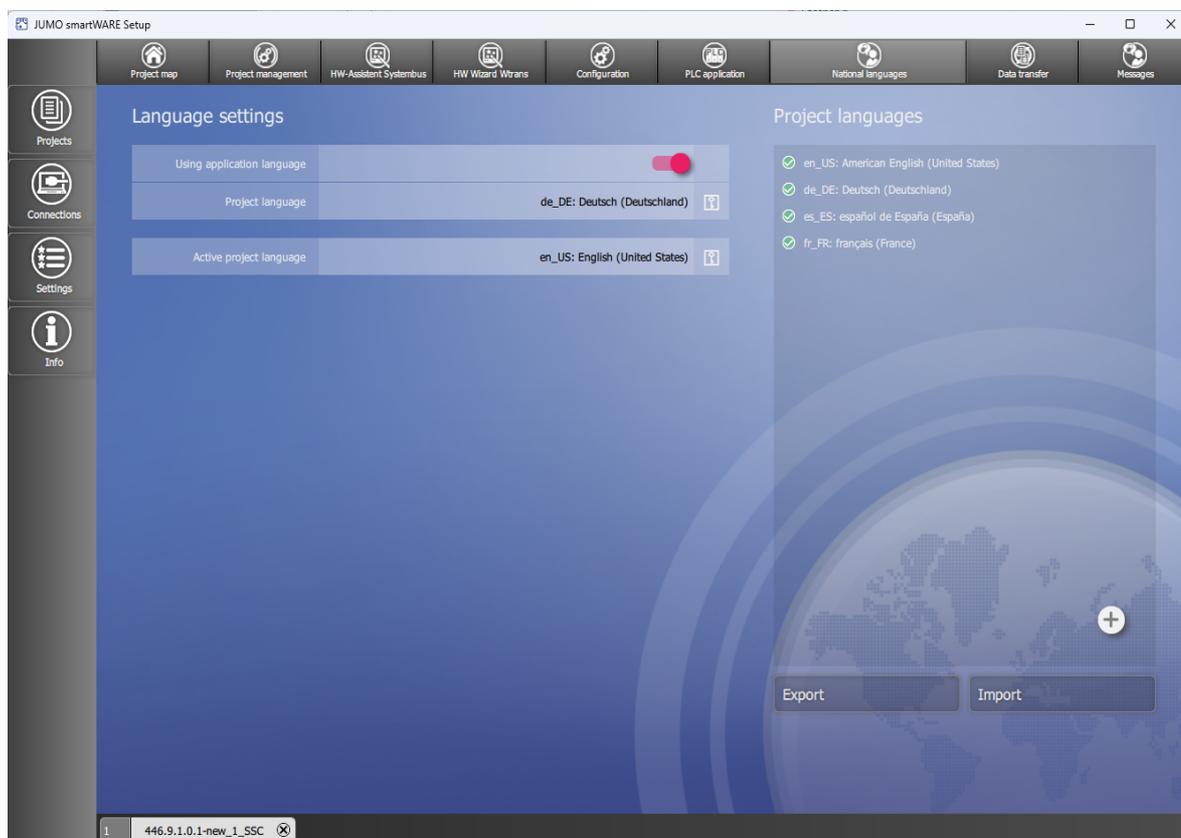
The CPV Editor is used to create customer-specific configuration and process data.

The CPV Editor requires specific knowledge and is intended for use by the manufacturer only (service that is subject to a fee).

A description of the CPV Editor is not included in this operating manual.

5.3.10 Languages

Select the project language and device languages, export and import languages (texts), edit languages



Language settings

Parameters/functions:

- Use application language: Use the language of the setup program as the project language
- Project language (button; not active if the application language is being used): Select the project language from the list (drop-down menu)
- Active project language (cannot be set here): Displays the current project language

5 Operation

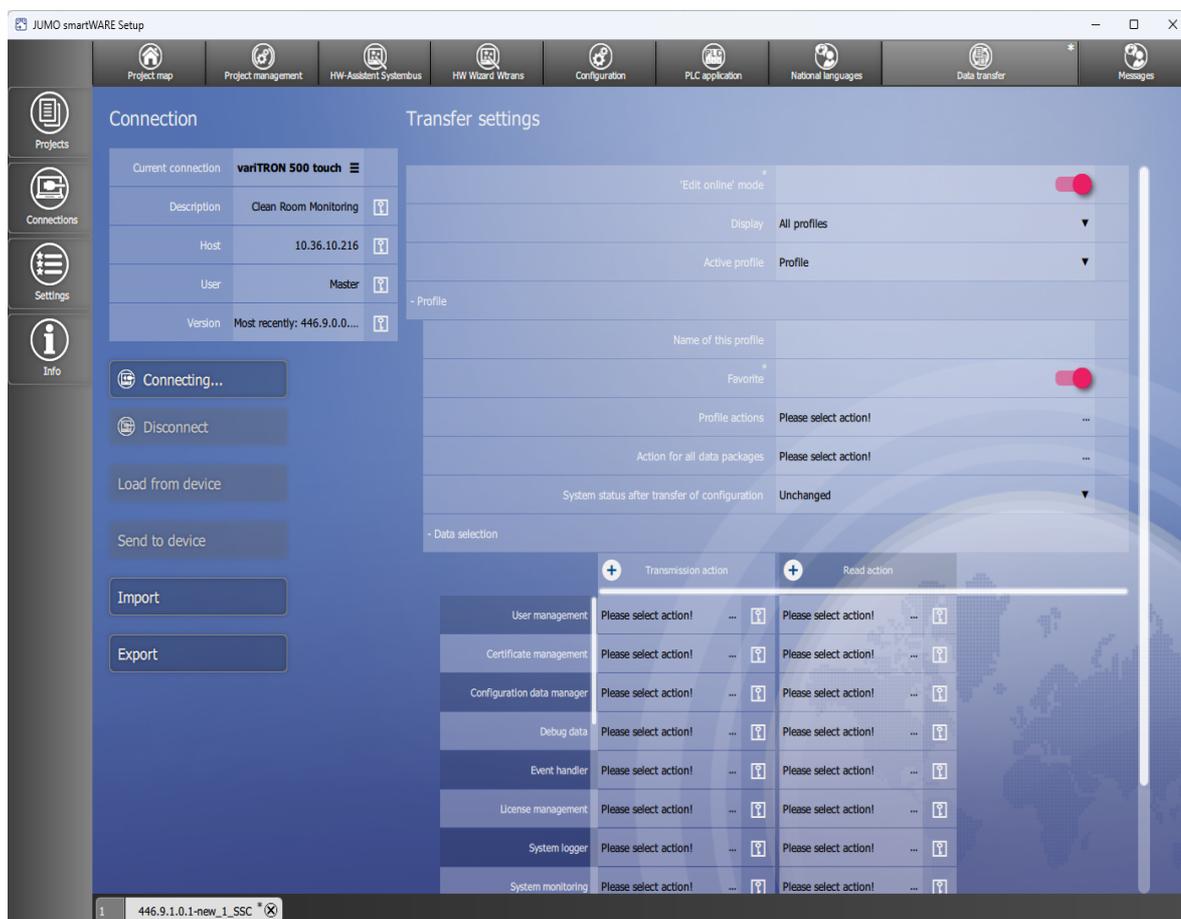
Project languages

Parameters/functions:

- List: Project languages which are available for selection as the device language
 - Language selected (checked): Language can be selected in the device
 - "+" button: Add another language to the list of project languages
 - Delete a project language: Click on the "x" icon after the highlighted language
- Export: Export texts from a language to a language file (*.ts) for translation
 - Select the source language for the translation (the language "Standard" exports all default texts of the so-called development language)
 - Select the target language (if necessary, add your desired target language to the list of project languages beforehand)
- Import: Import translated texts (source language > target language) from a language file (*.ts)
 - Open a language file: Select the language file from the file directory (the source language, target language, and number of texts are displayed)
 - Load a language file: Import texts (the number of texts before and after the import is displayed)
- Start Linguist (only if the Configuration and Process Value Editor – CPVE is installed):
Edit language files with the "Qt Linguist" editor
 - File > Open: Select, open, and edit language file from the file directory

5.3.11 Data transfer

Establish a connection to a device, data transfer to/from the device, import and export the configuration



Connection

Parameters/functions:

- **Current connection (button):** Displays the current connection; if necessary, select a different connection from the list
- **Description (cannot be edited here):** Description of the current connection
- **Host (cannot be edited here):** IP address of the device
- **User (cannot be edited here):** User name for logging on to the device
- **Version (cannot be edited here):** Device software of the connected device
- **Connecting...:** Establish a connection to the device
- **Disconnect:** Break the connection
- **Load from device:** Load a configuration from the device into the setup program
- **Send to device:** Send a configuration from the setup program to the device
- **Import:** Select a configuration file (.jcf) from the file directory on the PC and import it into the setup program
- **Export:** Save a configuration as a file (.jcf) in the file directory on the PC

In order for a connection to be available for selection here, it must first be configured using the "Connections" function (application bar).

5 Operation

Transfer settings

Parameters/functions:

- System state after configuration transfer (as of system version 5):
 - Unchanged: After the transfer, the device returns to the system state it had before the transfer.
 - STOP: The device remains in the "Stop" system state after transmission.
- Complete configuration: All data packets are transferred.
- Selective configuration: Only the selected data packets (or parts thereof) are transferred.
 In order to send a data packet (send it to the device) or export it (to a file), select the data packet concerned using the button (= red).
 In order to extract a data packet (load it from the device) or import it (from a file), select the relevant option from the drop-down menu:
 - Do not transfer: The data packet concerned is not transferred.
 - Only visible values of known parameters: Only the values of existing parameters are applied in the setup project. The structure is not modified.
 - Structure and values (only for "Bus" and "PLC Parameter"): In the case of the PLC parameters, by selecting this option you can apply a PLC parameter structure that is already in the device in the setup project.
Caution! The PLC parameter structure that is already in the project will therefore be lost.
 - Only values of known parameters (only for "PLC Parameter"): The structure of the PLC parameters is not modified in the setup project. However, known parameters in the project structure are applied from the device structure.
 - Only modify structure (only for "PLC Parameter"): The structure in the setup project is adjusted to the structure of the device. However, existing parameters are not modified.
- Complete configuration including device-specific data (as of system version 3): In addition, device-specific data is transmitted, for example device ID, IP address, password, activation of options.
- Selective configuration including device-specific data (as of system version 3): In addition, device-specific data is transmitted (see above).



NOTE!

The default settings are suitable for most application scenarios and should only be modified by experienced users.



CAUTION!

While the configuration is being sent to the device, it goes into the "Stop" system state.

This interrupts the processing of the PLC application.

- ▶ The user must ensure that this does not have any negative effects on the ongoing operation of the plant.

Default settings (as of system version 7):

Transfer type for sending or export: Selective configuration

Transfer type for extraction or import: Selective configuration

| Data packet | Send/export | Extract/import |
|--|-------------|----------------------------------|
| User management (AccessControlManager) | No (= gray) | Do not transfer |
| Device manager | Yes (= red) | Only values for known parameters |
| System bus | Yes (= red) | Only values for known parameters |
| Data carrier management (as of system version 7) | No (= gray) | Do not transfer |

| Data packet | Send/export | Extract/import |
|--|--------------------|----------------------------------|
| Port configuration (as of system version 8) | Yes (= red) | Only values for known parameters |
| Ethernet | Yes (= red) | Only values for known parameters |
| System user interface (only with JUMO variTRON 500 touch) | Yes (= red) | Only values for known parameters |
| Web server | Yes (= red) | Do not transfer |
| Email | Yes (= red) | Only values for known parameters |
| PLC configuration | Yes (= red) | Only values for known parameters |
| CODESYS configura- tion | Yes (= red) | Do not transfer |
| PLC parameter | Yes (= red) | Only values for known parameters |
| PLC parameter 2 up to PLC parameter 4 (as of system version 7) | Yes (= red) | Only values for known parameters |
| Programs | Yes (= red) | Only values for known parameters |
| System status UI (only with JUMO variTRON 300, JUMO variTRON 500) | Yes (= red) | Only values for known parameters |
| Real-time processing (as of system version 6) | Yes (= red) | Only values for known parameters |
| Recording data export (as of system version 6) | Yes (= red) | Only values for known parameters |
| Cloud gateway (as of system version 4) | Yes (= red) | Only values for known parameters |
| Wtrans gateway (only with JUMO variTRON 300, JUMO variTRON 500 touch) | Yes (= red) | Only values for known parameters |
| Node-RED (as of system version 3) | No (= gray) | Do not transfer |
| Batches (as of system version 6) | Yes (= red) | Only values for known parameters |

5 Operation

5.3.12 Messages

Display and act on project messages

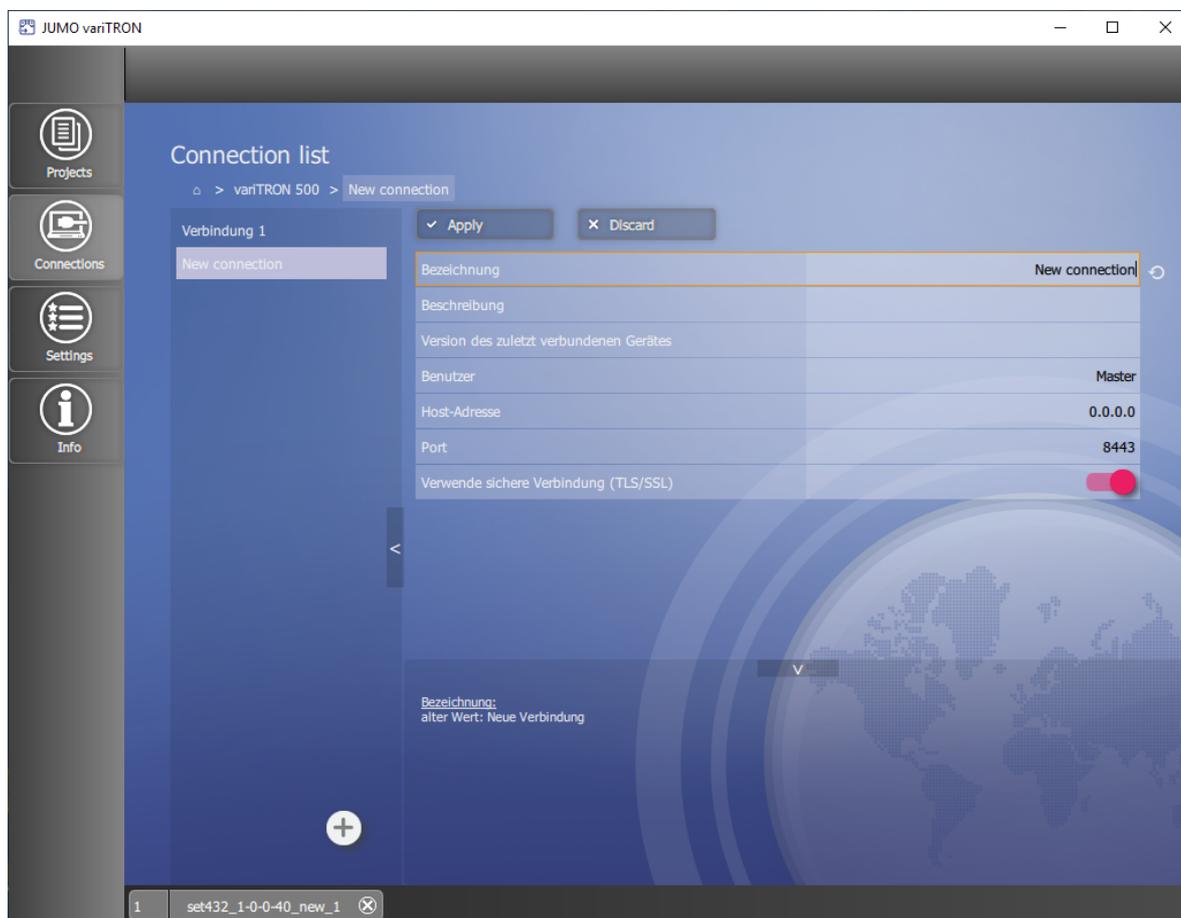


Project messages that require user action (acknowledge message, perform further actions if necessary) are displayed here.

5.3.13 Connections

Connection list

Configure a connection to a device; overview of all configured connections



Parameters/functions:

- Designation (editable): Freely selectable designation for the connection
- Description (editable): Text for a more detailed description of the connection
- Version of most recently connected device: Version number of the device software
- User (editable): User name for logging on to the device
- Host address (editable): IP address of the device
- Port (editable; default setting is 443): Port number for the connection using the setup program
- Use secure connection (TLS/SSL): FALSE (gray = no), TRUE (red = yes, default setting)
This setting affects the port numbers for the connection (see above). The following port numbers have been assigned per default: 80 for FALSE (HTTP), 443 for TRUE (HTTPS).
⇒ chapter 6.8 "Web server", Page 92
If a port number is changed in the configuration, it must also be changed here under "Port".
- Discard: Discard all data entries made
- Apply: Save all values

The left-hand side of this window lists all configured connections along with their designation. You can add another connection using the "+" button. To remove a connection, click the "x" in the area with the designation (this is activated when the cursor is on the area).

5 Operation

If applicable, the old value of the parameter that has just been changed is shown at the bottom of this window. Clicking the "Back" button (circular arrow) after the line containing the changed parameter (above) discards your data entry.

Both areas can be hidden by clicking the relevant button (arrow).

5.4 Web Services

Web Services enables the device to be accessed using a web browser. The landing page provides system information and multiple web applications such as Web Cockpit and WebVisu with its tiles. The following web browsers are supported: Mozilla Firefox, Google Chrome, Microsoft Edge, Opera

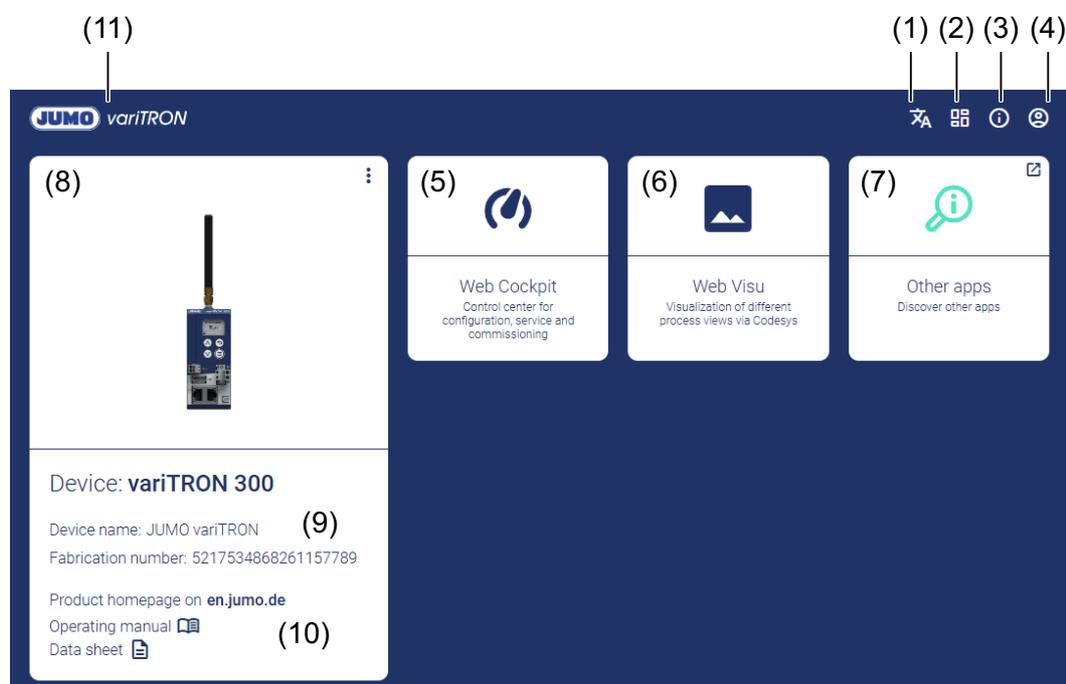


NOTE!

JUMO has successfully tested the aforementioned web browsers using Microsoft® Windows® 10. If you use a different web browser or another operating system, JUMO cannot guarantee that the function will work correctly.

To start the web application, you need to enter the device's IP address in the address line of the web browser (example: 10.178.59.209). The IP address is displayed on the device connected by LAN under "/Applications/System management/Device info/Ethernet/LAN1 or LAN2".

The web browser accesses the device with HTTPS (Hypertext Transfer Protocol Secure) via an encrypted connection. You will need your user name and password to log on to the device. Once you have successfully logged on, the JUMO Web Services landing page is shown.



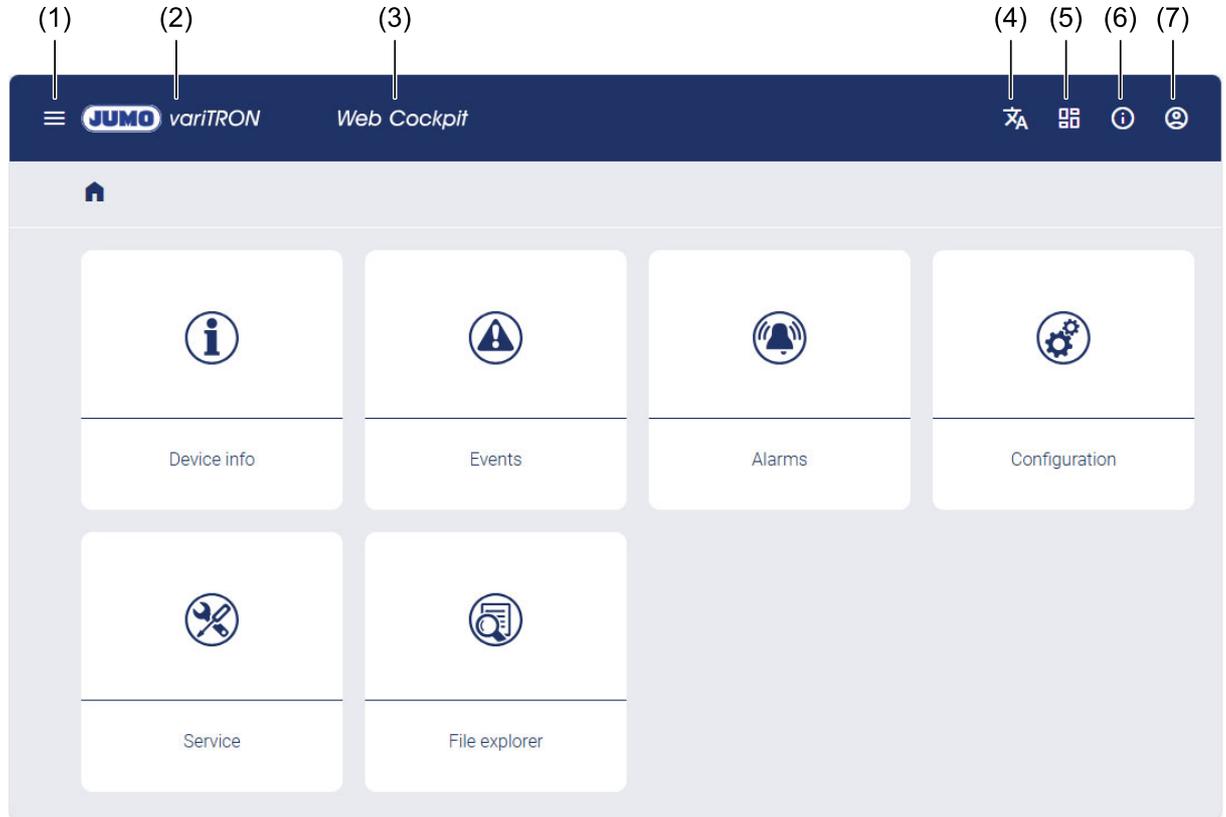
| | | | |
|---|--|----|---|
| 1 | National language selection | 7 | Link to JUMO Help Center |
| 2 | Direct access to the landing page functions | 8 | Info tile |
| 3 | Links to various information <ul style="list-style-type: none"> • Web application version info • License information • Link to JUMO Help Center | 9 | Device name and fabrication number display |
| 4 | <ul style="list-style-type: none"> • Info about the logged-in user • Flash display • Log out | 10 | Links to <ul style="list-style-type: none"> • JUMO product homepage • Operating manual and data sheet |
| 5 | Opens the Web Cockpit | 11 | Return to landing page |
| 6 | Only for devices with CODESYS WebVisu: Opens the CODESYS WebVisu of the device in the browser | | |

5 Operation

5.4.1 Web Cockpit

The Web Cockpit is a web application that enables operation similar to operation on the device. Operation in the Web Cockpit is higher performance and expanded to include several extra functions.

Start page



The functions in the landing page header have been expanded to include three functions on the Web Cockpit homepage. The Web Cockpit functions can be called up using both the tiles on the homepage and via the Web Cockpit menu.

| | | | |
|---|--|---|---|
| 1 | Opens the Web Cockpit menu – see below | 5 | Web applications – see details below |
| 2 | Return to landing page | 6 | Links to various information <ul style="list-style-type: none">• Web application version info• License information |
| 3 | Return to the Web Cockpit homepage | 7 | User – see details below |
| 4 | National language selection | | |

| Designation | Description |
|---|---|
| Device info | <p>Status, versions, certificates...</p> <ul style="list-style-type: none"> • Certificate management (display certificates) • Cloud gateway (status, version) • Recording data export (export status, version) • Display device information • License management (display extra codes) • Display Ethernet parameters • Real-time processing (display information on data recording) • PLC application (display information) • PLC runtime environment (display information) • System monitoring (battery, storage, temperatures, voltage values) • Display and change the system status (Run, Stop, etc.) • Only with JUMO variTRON 300 and JUMO variTRON 500 touch: Wtrans gateway (version, radio frequency, Wtrans transmitter) |
| Events | <p>Events, alarms, audit trail, etc.</p> <ul style="list-style-type: none"> • Messages (events) shown in a list • Plain-text search • Filter by message type (type) • Filter by keywords • Delete messages/update list |
| Alarms | <p>Alarms, acknowledgment, etc.</p> <ul style="list-style-type: none"> • Messages shown in a list • Filter by message type • Filter by alarm or fault • Plain-text search • Acknowledge alarms/update list |
| Configuration | <p>Configure modules, etc.</p> <ul style="list-style-type: none"> • Configure device • Configure connected modules (system bus) |
| Service | <p>System bus, users, firmware</p> <ul style="list-style-type: none"> • EtherCAT (system bus): Display information on the master and slaves (modules); perform actions • Only with JUMO variTRON 300 and JUMO variTRON 500 touch: Wtrans gateway (status of the transmitters) • User management: Create users, assign roles • Import configuration: Transfer configuration file (.jcf) to the device • Extract configuration: Extract configuration from the device and save it as a file (.jcf) • Function activation: Activate extra codes • Firmware: Update the device firmware • Log list: Extract log entries from the device • Debug: Extract debug data from the device and create a debug file (.jdf) • Import or replace certificates • Screenshot, create device screenshot |
| File explorer (as of system version 7) | <p>Files and folders</p> <ul style="list-style-type: none"> • Files in "Shared Folder" • Create folder, upload files, update view |

5 Operation

"Menu" button

The functions on the homepage can also be accessed using the "Menu" button:

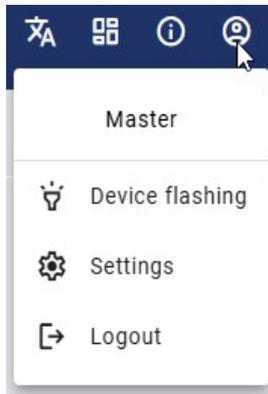


Selecting the menu item "System bus" accesses the function "Service > System bus" directly.

Only with JUMO variTRON 300 and JUMO variTRON 500 touch: The function "Service > Wtrans gateways" is called up directly using the menu item "Wtrans gateway".

"User" button

The previous functions (except information and license information) are available under the "User" (right) button.



| Designation | Description |
|-----------------|--|
| Master | The user name of the logged-on user is displayed here. |
| Device flashing | The device display flashes (in particular if multiple JUMO variTRONs are used for identification). |
| Settings | Change password |
| Logout | Log off user |

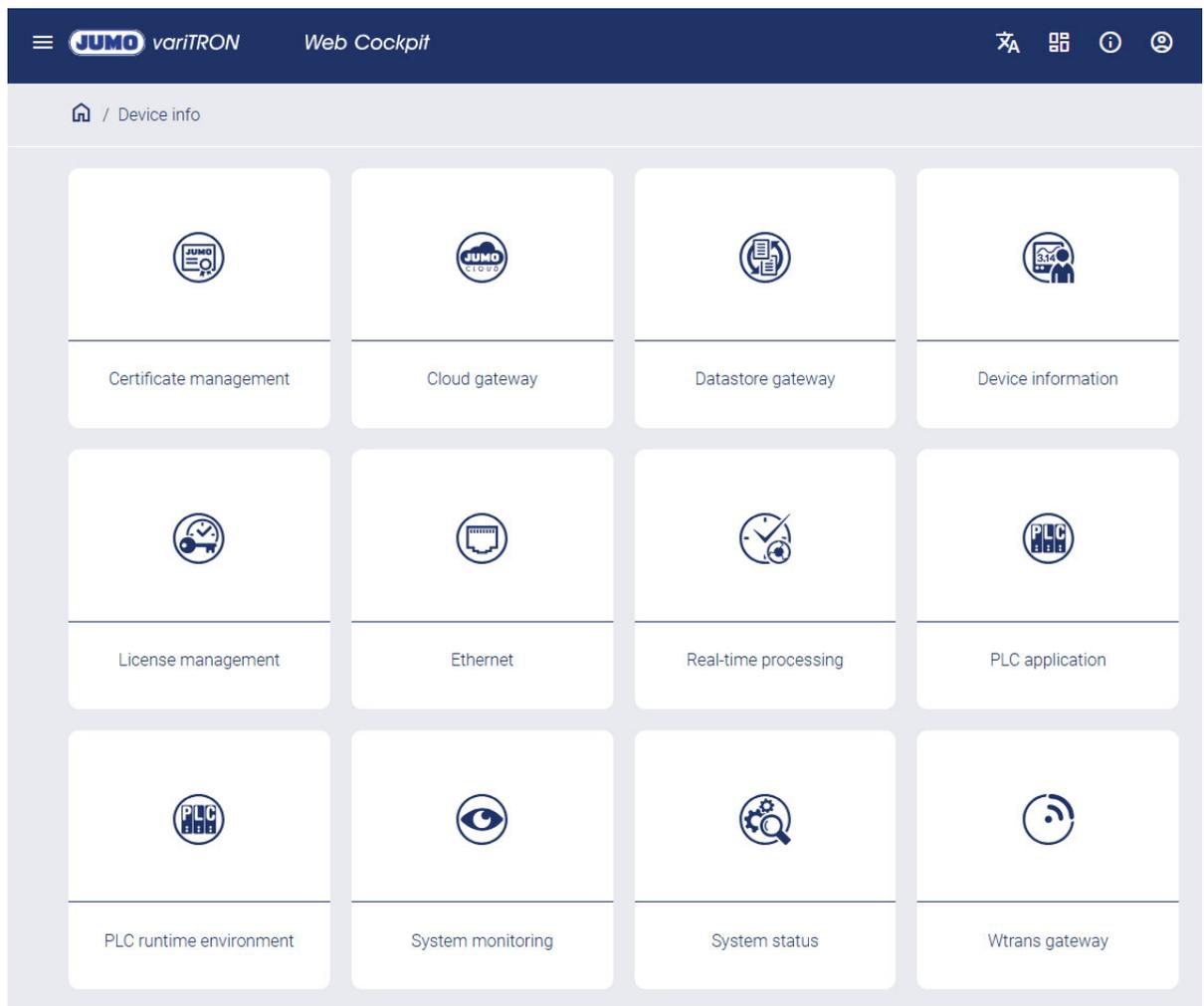
"Web applications" button



Using the new "Web applications" button, the user can switch to other active web applications (for example "CODESYS WebVisu").

5 Operation

Device information



Certificate management

The following certificates are displayed here:

- Data recording
- Web gateway

Cloud gateway

There are the two tiles "State" and "Version". The cloud gateway's status and memory usage are displayed under "State". "Version" displays the cloud gateway version.

The following functions are displayed under the "State" tile:

- DELETE CONFIG. (as of system version 8.1)
 - Deletes the configuration received from the server (signals and data connections).
- CLEAR BUFFER (as of system version 8.1)
 - Deletes the buffered data.
- DELETE ALL (CLEAR)
 - Deletes the buffered data and the configuration received from the server.
- REBOOT
 - Restarts the cloud gateway.

Recording data export

There are the "Export Status", "Export information", and "Version" tiles. Configuration is carried out in the setup program.

The following information is available under "**Export Status**":

- Memory usage / data export active or inactive
- Storage location on the web / date of the last export
- Recording: Status of the data recording and date and time of the last recording.

New function as of system version 8: Manual export of the recorded data (for example for backing up before a firmware update). The date of the last export is displayed.

The "Delete data record" function can be used to delete the recorded data.

The following information is available under "**Export information**":

- Export status: Memory usage / data export active or inactive
- Database information also under "Database"
 - Level
 - Number of channel entries
 - Number of process data entries
 - Number of group configurations
 - Number of DeviceDescription entries
 - Max. ID for cyclical data
 - Current export ID (cyclical)

The database version is displayed under the "**Version**" tile.

Device information

There are the "Device", "Hardware versions", and "Software versions" tiles.

The device name, device-specific numbers, and version numbers for hardware and software components in the device are displayed here.

Information on the connected modules is not displayed here. This information can be accessed using the function "Service > System bus".

License management

The CODESYS extra codes and their statuses are displayed under the "Extra code" tile (active = extra code is active and can be used).

Ethernet

Information on the Ethernet interfaces LAN1, LAN2 and, if necessary, LAN3 is displayed here. The LAN1 and LAN2 tiles are available as standard. Values are only displayed for active LAN connections.

Real-time processing

Information on the data recording (thread runtime, cycle counter, timeout counter, wakeup deviation) is displayed under the "Data recording" tile.

The "Reset time measurement" function can be used to reset and restart the time measurement.

PLC application

The versions of the PLC applications are displayed under the "Versions" tile.

PLC runtime environment

Version information on the PLC runtime environment and the status of the exception handler are displayed here.

System monitoring

There are the "Battery status", "Memory", "Performance", and "Temperature" tiles here.

5 Operation

Information on the system battery status, memory usage, CPU and RAM utilization, and CPU temperature is displayed here.

Memory and temperature tiles: The "Reset drag indicator" function can be used to reset the resettable minimum and maximum values.

System status

The current system status is displayed here.

Corresponding functions are available to change the system status:

- REBOOT SYSTEM (as of system version 5)
 - Restart of the central processing unit.
- ORIGIN RESET
 - An "Origin" reset resets the system bus (master restarts, data of the modules on the bus is loaded again) and deletes the bus configuration.
 - The PLC performs a full reset, which means that the PLC program and the retain area¹ are deleted (see CODESYS documentation on origin (full reset) of PLC).
 - An event message is issued (origin reset).
- COLD RESET
 - The PLC performs a cold start, which means that the retain area¹ is deleted (see CODESYS documentation on PLC cold start).
 - An event message is issued (cold start reset).
- RESET
 - The PLC performs a warm start, which means that the retain area¹ is retained (see CODESYS documentation on PLC warm start).
 - An event message is issued (warm start reset).
- STOP
- RUN

Wtrans gateway (only with JUMO variTRON 300 and JUMO variTRON 500 touch)

Information on the Wtrans gateway is displayed here (version, radio frequency; Wtrans transmitter: e.g. transmitter ID, battery state, RSSI value; measured value, transmission interval).

¹ JUMO variTRON 300: Retain handling only possible via sync in CODESYS (JUMO Library available as of system version 6).

JUMO variTRON 500 touch: Retain handling only possible via sync in CODESYS (JUMO Library available as of system version 6) and with basic type extension 5 = "without UPS".

Events

The screenshot displays the 'Events' section of the JUMO variTRON Web Cockpit. At the top, there is a search bar and two dropdown menus for 'Type' and 'Keywords'. Below these, it indicates 'Entries: 393'. The main area contains a list of event messages, each with a timestamp, a title, a type icon, and details like 'User', 'Type', 'Module name', and 'Keywords'. On the right side of the list, there are two circular buttons: a blue one with a refresh symbol and a red one with a trash can symbol.

Event messages are extracted from the device and listed in chronological order here.

The information shown can be filtered by message type (alarm, audit trail, malfunction, event). It is also possible to search for specific keywords and run a full-text search.

The "Refresh" function (button) refreshes the list.

The "Delete" function (button) deletes all entries from the list in the device.



NOTE!

The different types of event messages are organized in a common ring buffer. In the event that old entries are overwritten, it is usually ensured that audit trail messages remain stored for at least 14 days.

Alarms

Alarm messages are extracted from the device and listed in chronological order here.

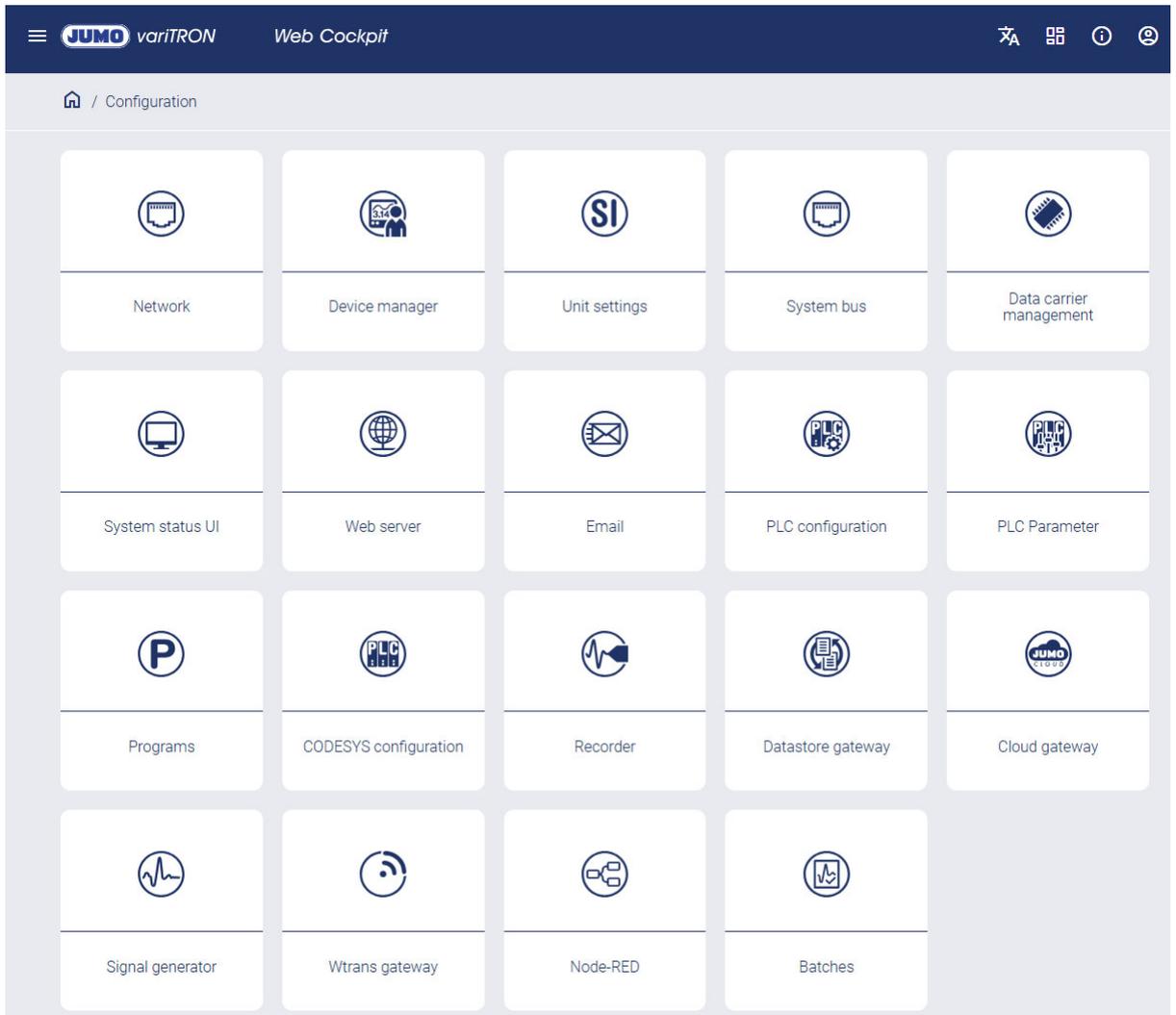
The information shown can be filtered by message type (alarm, malfunction). It is also possible to search for specific keywords and run a full-text search.

The "Refresh" function (button) refreshes the list.

The "Confirm" function (button) acknowledges an alarm. For this purpose, the relevant alarm must be selected (ticked) beforehand.

5 Operation

Configuration



The following sections are merely intended to provide an overview of the functions which are configured under the respective tile.

The process of configuring the individual functions in the central processing unit (master) is described in detail in the "Configuration" chapter in this document.

⇒ chapter 6 "Configuration", Page 82

The process of configuring the modules (controllers, relays, analog IO units, digital IO units) is described in the operating manual for the respective module.

⇒ chapter 1.8 "Available technical documentation", Page 15

Network

The Ethernet interface LAN1 and, if applicable, other Ethernet interfaces (LANx) are configured here.

The Ethernet interface (LANx) to be used as the PROFINET port (available as of system version 8) is selected under "Port configuration".

Device manager

Here, device settings are configured (device language, start-up behavior, partition change), device designations are assigned, the time zone and time server are selected, and the date and time are manually set. The customer-specific linearization is also configured here (as of system version 5). The colors for displaying alarms can be defined under "Display".

Unit settings

The SI units used in the system can be defined and set here.

System bus

The "Master" tile is where settings relating to the transfer of data via the system bus are configured.



NOTE!

The settings configured under "Master" influence the transfer of data via the system bus. Sub-optimal settings here will disrupt or even interrupt communication within the system. For this reason, these parameters are only permitted to be modified by a service engineer from the device manufacturer (or by someone acting on their instructions).

The modules connected via the system bus are each depicted by a separate tile, which takes the user to the module configuration.

Data carrier management

Settings for the use of network drives are configured here (available as of system version 7).

System status UI

The screensaver is configured here.

Web server

The web server function is configured here.

Email

The settings for sending emails are configured here.

PLC configuration

Here, the units for absolute and relative temperature values are determined (for the PLC application), the program generators configured, and settings for analog and digital variables made (as of system version 5).

PLC parameters

If applicable, PLC parameters are defined here.

Programs

Programs (setpoint values, operating contacts) are created here using the program editor.

CODESYS configuration

The storage interval for CODESYS data can be activated here and the time interval set.

Recorder

The process values to be recorded are selected here and the data recording configured. The signals of the connected sensors can be organized into groups. 10 groups are created as standard.

A maximum of 8 analog and 8 digital signals can be visualized per group. Additional signals can be saved in the group, but cannot be visualized as a live trend.

5 Operation

There are the following setting options for each group:

- Parameters
- Diagram view
- Analog channels
- Digital channels
- Standard operation
- Event operation
- Time operation

Recording data export

The connection to the database is configured and activated here (available as of system version 6).

Cloud gateway

The connection to the JUMO Cloud is configured here (available as of system version 4).

Signal generator

Analog and digital signals within the system are specified here and various signal parameters set.

Wtrans gateway

Settings for the use of JUMO Wtrans transmitters are made here (available as of system version 5).

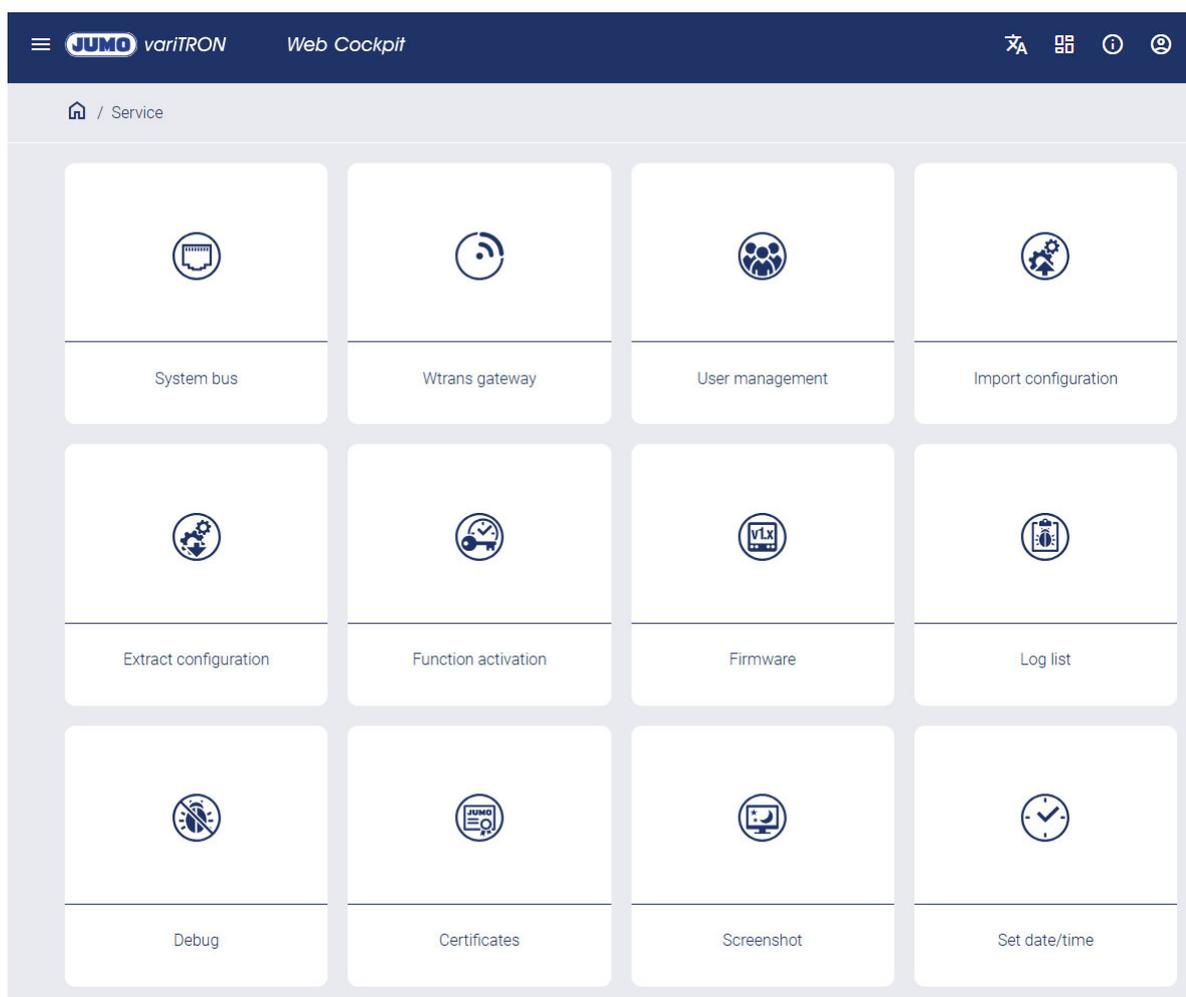
Node-RED

Use of the Node-RED development tool is activated here.

Batches

Batch logging is configured here (available as of system version 6).

Service



System bus

Information on the system bus master and the slaves is displayed here, for example:

- Actual and target status (system bus status)
- Device address and alias address
- Available ports (system bus interfaces)
- Hardware and software version
- Assignment of expansion slots

The following functions are available:

- Bus topology mode active (as of system version 5): Only for service purposes; displays the actual hardware configuration.
- Debug output active: Only for service purposes
- Reset: System bus restart
- Stop/Run: Switchover of the system bus status (Safe-Operational/Operational; independent of system status)
- Reset statistics

5 Operation



CAUTION!

If the bus topology mode is activated in the "Operational" system bus status, the system bus goes to the "Initialization" status.

The cyclical transmission of values is therefore interrupted.

► Only use this function for service purposes!

Wtrans gateway (only with JUMO variTRON 300 and JUMO variTRON 500 touch)

Information on the Wtrans transmitters is displayed here (e.g. status, transmitter ID, battery state, RSSI value).

User management

Users are created and assigned user rights here.

The user rights are defined in what are known as roles, which represent typical remits such as administrator or operator. Users are assigned rights by assigning them the relevant role. Users can also be assigned more than one role.

⇒ chapter 8.1 "User rights", Page 119

Installing configuration

A configuration file (.jcf) is selected and transferred to the device here.

Once the configuration has been successfully transferred, the device restarts.

Reading configuration

The configuration is extracted from the device and saved as a configuration file (.jcf) here.

Function activation

Extra codes are activated here.

Extra codes are additional functions which are usually subject to a fee.



NOTE!

The files for activating extra codes (also called license files or FeatureResponse files) should be stored after they are first received so that they are available again for transmission to the device after a factory reset.

Firmware

The device's firmware is updated here.

For this purpose, switch the device to the status "Stop". Then select a firmware file (.raucb) and transfer it to the device. Afterward, create a new hardware configuration for the system (connected modules) using the setup program and transfer it to the device.

As an option, a configuration file (.jcf) can also be selected and transferred to the device here.

As of system version 8.2, there is also the option of adopting the current configuration (must be compatible with the firmware).

Log list

Log entries are extracted from the device and listed here.

The information shown can be filtered by entry type (information, warning, error, event, audit trail message, alert, malfunction). It is also possible to run a full-text search.

Debug

Debug data is extracted from the device here.

The file containing the debug data (.jdf) can be saved locally on the PC and sent to the manufacturer for analysis purposes.

Use of a USB flash drive



NOTE!

It is also possible to update the firmware, import and extract the configuration (import, export), and extract the debug data using a USB flash drive.

⇒ chapter 5.2.2 "Device menu", Page 39

Certificates

Certificates can be added or replaced here

Device screenshot

Screenshots of the screen of the JUMO variTRON 500 touch can be made here. The graphic is provided in the download folder of the computer being used.

Set date/time

The date and time can be set here if NTP (⇒ "Time zone/NTP ", Page 85) is inactive. If NTP is active, time synchronization is carried out automatically and manual editing is not possible.

File explorer

Files and subfolders located in the Shared Folder are displayed here.

The files are available for download in the web browser (click on the file).

As of system version 8, the following functions are available (as buttons or in the context menu):

- Create new folder, rename, open, delete
- Download folder (as ZIP file)
- Upload, download, delete file(s)

In a CODESYS application, the shared folder can be accessed via the relative path **../ShareJumo**.

5 Operation

5.4.2 CODESYS WebVisu/Remote TargetVisu

The device supports CODESYS WebVisu or CODESYS Remote TargetVisu. By clicking the CODESYS WebVisu tile, visualizations created with CODESYS can be displayed in the browser of the connected PC/laptop and used to operate the system. For visualization by means of a browser, extra code 281 (WebVisu) is required; for visualization via CODESYS Remote TargetVisu, extra code 280 must be selected.

In principle, visualization can also take place on a JUMO web panel connected via Ethernet or a web panel that supports CODESYS visualization.

5.4.3 Other apps

The "Other apps" tile opens a browser window that you can use to access the JUMO Help Center. A QR code or a link is available for this.

The Help Center is an individual website on which JUMO provides further information on the following topics:

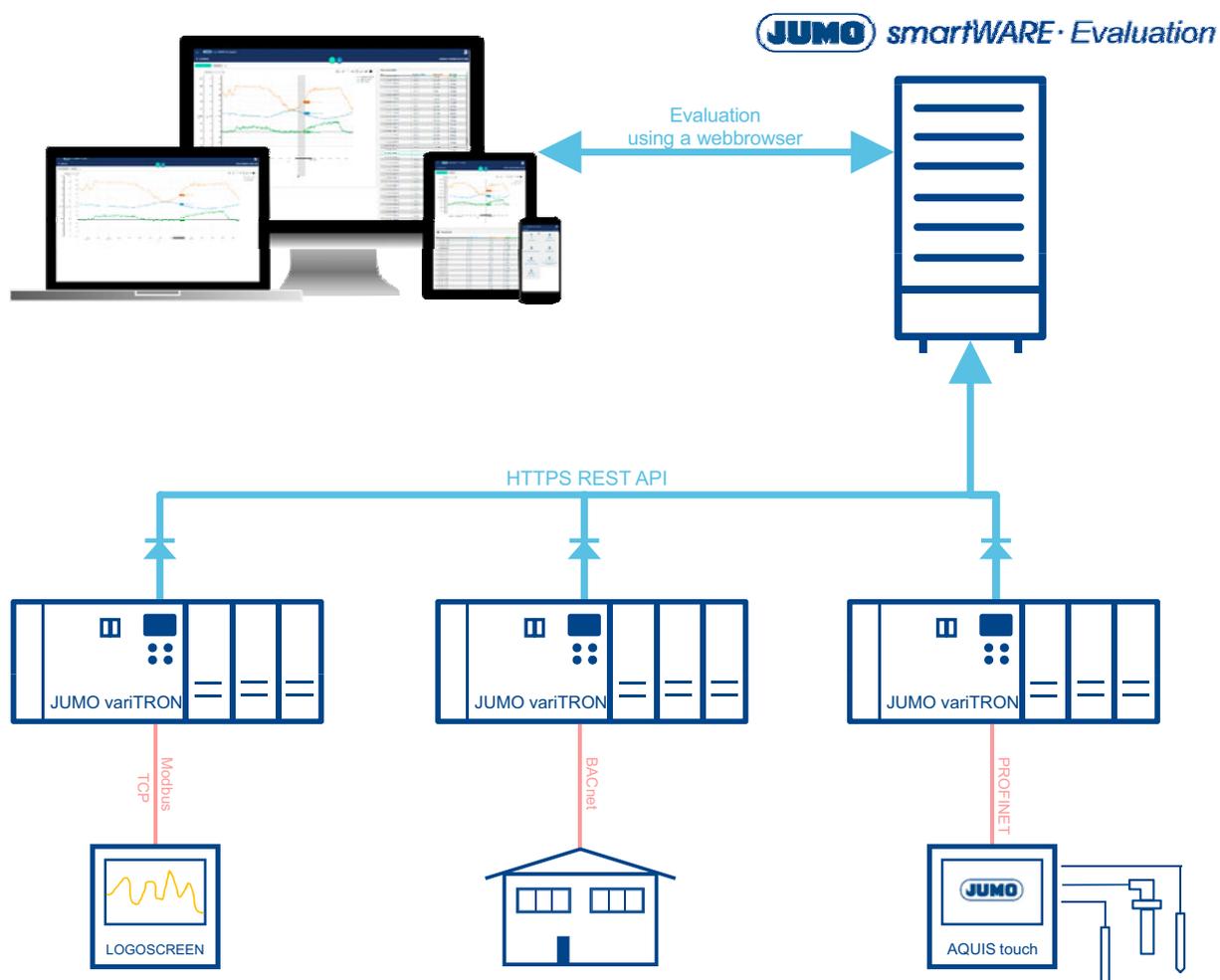
- JUMO Cloud
- JUMO smartWARE SCADA
- JUMO smartWARE Evaluation
- JUMO smartWARE Program
- JUMO variTRON

The information is continuously updated.

5.5 JUMO smartWARE Evaluation

JUMO smartWARE Evaluation is intended for evaluating and visualizing recorded process data from the JUMO variTRON system. The process data can be evaluated in customizable dashboards based on time or batch and transferred into reports (e.g. PDF, Excel®, CSV).

The figure shows a potential configuration and connection of multiple automation systems.



Details can be found on the data sheet 701840 available on the JUMO website.
 JUMO smartWARE Evaluation is available at the following website:
<https://eval2.jumo.digital>

Do you need support?

If you need more information, simple explanations, training courses or support on the JUMO smartWARE Evaluation, there are a range of options available to you from JUMO.



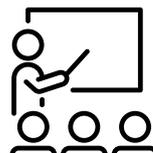
JUMO Help Center
 Detailed documentation



Technical Support
 Questions and information



JUMO Engineering



JUMO Campus
 Training courses



YouTube channel
 Explanatory videos

6 Configuration

6.1 General information

As a basic principle, the device can be configured on the device itself, as well as using the setup program or the "Web Cockpit" web application. However, these configuration options differ in terms of the function areas that can be configured.

The following table provides an overview of which function areas are configurable by which means (= X).

| Function area | Device with LCD display | Device with TFT screen | Setup program | Web application |
|---|-------------------------|------------------------|---------------|-----------------|
| Network | X | X | X | X |
| Device manager | X ^a | X ^a | X | X |
| Unit settings | | | X | X |
| System bus | | | X | X |
| Data carrier management | | | X | X |
| System status UI (LCD display, only with JUMO variTRON 300 and 500) | X | | X | X |
| User interface (TFT screen, only with JUMO variTRON 500 touch) | | X | X | X |
| Web server | X | X | X | X |
| Email | | | X | X |
| PLC configuration | | | X | X |
| PLC parameters ^b | | | X | X |
| Programs | | | X | X |
| CODESYS configuration | | | X | X |
| Recorder | | | X | |
| Recording data export | | | X | X |
| Cloud gateway | | | X | X |
| Signal generator | | | X | X |
| Wtrans gateway (only with JUMO variTRON 300 and variTRON 500 touch) | | | X | X |
| Node-RED | | | X | X |
| Batches | | | X | X |

^a Several functions are not available.

^b PLC parameters can only be created in the setup under "PLC parameter definition" via CPVE.



NOTE!

The functions HW-Assistent (for defining the hardware configuration for the system), PLC application (for defining the start parameters and starting the programming system), and Languages (for defining the project language, and exporting and importing languages) are only available in the setup program.

Device with LCD display (JUMO variTRON 300, JUMO variTRON 500): If the configuration has been changed on the device, this change will not take effect until you confirm the query "Save settings" using the "Menu/OK" key.

Device with TFT screen (JUMO variTRON 500 touch):

= Save settings

= Cancel without adopting changes

In the web application, selecting "Save" ensures the device applies a change that was made to the configuration. The change is not applied if you select "Exit".

In the setup program, the changed configuration must be transferred to the device in order for the change to take effect.

If applicable, the default settings are shown in **bold** in the following tables.

6 Configuration

6.2 Network

6.2.1 Ethernet

LAN1

| Parameter | Selection/data input | Description |
|------------------|--|---|
| Method | | Method for assigning the IP address |
| | Manual | The IP address must be assigned manually. |
| | Automatic | The IP address is obtained from a DHCP server. |
| IP address | 0.0.0.0 to 255.255.255.255 | Manually assigned IP address The IP address may need to be requested from the administrator in question. |
| Subnet mask | 0.0.0.0 to 255.255.255.255 (255.255.0.0) | Subnet mask if the IP address is manually assigned The structure of the subnet mask may need to be requested from the responsible administrator. |
| Standard gateway | 0.0.0.0 to 255.255.255.255 | IP address of the standard gateway (router) if the IP address is manually assigned The IP address of the standard gateway may need to be requested from the administrator in question. |
| DNS server IP | | Obtain DNS server IP automatically |
| | Off (FALSE) | The IP address must be assigned manually (see below). |
| | On (TRUE) | The IP address is obtained automatically. |
| DNS server | 0.0.0.0 to 255.255.255.255 | Manually assigned IP address of the DNS server The IP address may need to be requested from the administrator in question. |

LANx

Additional (optional) LAN interfaces may be provided depending on the device. The setting options are identical to those for LAN1.

6.2.2 Port configuration

Each of the LAN connections LAN1, LAN2, or LAN3 can be configured separately here.

| Parameters | Selection/input | Description |
|-----------------|---------------------|--|
| Port management | | Select how the relevant port (LANx, device-dependent) is to be used. |
| | No selection | No use type is set for the relevant port. |
| | PROFINET device | The relevant port is used as a PROFINET port. |
| | Ethernet/IP | The relevant port is used as an Ethernet/IP interface. |

6.3 Device manager

Device settings

| Parameter | Selection/data input | Description |
|--|----------------------|---|
| Device language | Select language | Language in which the texts are shown on the device display. Texts that do not have a translation in the selected language are displayed in English or German (or, if applicable, in the so-called developer language). |
| Start-up behavior | | System status that is adopted by the device once it switches on: |
| | Run | "Run" system status |
| | Stop | "Stop" system status |
| | Last status | Last system status before the switch-off |
| Partition change after [x] start-up errors | 5 to 50 | After [x] errors during the boot process, the device boots from the secondary partition (backup partition). Afterwards there is a one-time possibility to boot from the primary partition again with REBOOT SYSTEM. If this fails, a software update is required. Possible errors during the boot process: <ul style="list-style-type: none"> • Error in the device software • Interruption of the voltage supply |

Device designations

| Parameter | Selection/data input | Description |
|-------------|---|--|
| Device name | Enter text (or use existing text) | Designation of the device The device name is used in the web application, in the setup program, and, if applicable, in other PC programs. It can also be used by DeviceScan and the CODESYS application, for example for identification purposes. |
| DNS name | Enter text (or use existing text) The DNS name must not be used more than once in the network. | Name by which the device can be identified and addressed in the network. The name set per default is unique as it comprises the product group number and the MAC address. |

Time zone/NTP

| Parameter | Selection/data input | Description |
|------------|----------------------|--|
| Time zone | Select time zone | Time zone in which the device is operated. |
| NTP active | | The device's time settings can be synchronized with a time server using the Network Time Protocol (NTP). |
| | Yes | Synchronization is active. |
| | No | Synchronization is not active. |

6 Configuration

| Parameter | Selection/data input | Description |
|----------------------------------|---|---|
| Server 1 Server 2 Server 3 | Enter the address of the time server (or use an existing address) Example: de.pool.ntp.org | Up to three time servers can be entered. The server list is processed top down, in other words, the next time server on the list is only queried if the previous server is unreachable. It must be ensured that the server name is resolved to an IP address via a DNS server (see Configuration > Ethernet). |
| Maximum round-trip time | 0 bis 99999 (5) | Maximum time in seconds between the client's request and the server's response (for local time server). |

6.3.1 Customer-specific linearization

You can use the customer-specific linearization to create a customized linearization characteristic line for analog values. Two procedures are available for this: formulas or grid values (value pairs).

Temperature values must always be specified in °C. In general, use the measuring units without prefixes (e.g. A instead of mA).

Formula

Customer-specific linearization is specified using a polynomial. The polynomial is calculated for the entire linearization range.

Example (4th order polynomial): $y = X4 \cdot x^4 + X3 \cdot x^3 + X2 \cdot x^2 + X1 \cdot x + X0$

| Parameter | Selection/data input | Description |
|------------------------------|-----------------------------------|--|
| Name | Enter text (or use existing text) | Designation of linearization |
| Measuring range start (Ymin) | -99999 to 99999 (0) | Start value of the y axis |
| Measuring range end (Ymax) | -99999 to 99999 (100) | End value of the y axis |
| Decimal places | 0 to 6 (4) | Number of decimal places |
| Polynomial: | | |
| X0 | -99999 to 99999 (0) | Absolute component of the polynomial (point of intersection with the y axis) |
| X1 | -99999 to 99999 (1) | Coefficient of the linear component (x) |
| X2 | -99999 to 99999 (0) | Coefficient of the quadratic component (x ²) |
| X3 | -99999 to 99999 (0) | Coefficient of the cubic component (x ³) |
| X4 | -99999 to 99999 (0) | Coefficient of the quartic component (x ⁴) |
| ... | -99999 to 99999 (0) | (max. up to 20th order) |

Grid values

Customer-specific linearization is specified by entering up to 200 grid points (pairs of values X/Y). The value of X stands for the physical measured value (e.g., voltage in V, current in A, or resistance in ohm; depending on the sensor type) and the value of Y stands for the linearized value (e.g., temperature in °C).

| Parameter | Selection/data input | Description |
|-------------------------|-----------------------------------|--|
| Name | Enter text (or use existing text) | Designation of linearization |
| Decimal places | 0 to 6 (4) | Number of decimal places |
| Grid values: | | |
| Measured value (X) | -99999 to 99999 (0) | Value of the relevant grid point on the x axis |
| Linearized value (Y) | -99999 to 99999 (0) | Value of the relevant grid point on the y axis |

6.3.2 Display

The colors for displaying alarm 1 and alarm 2 can be defined under "Display". Clicking on the field with the color symbol opens a pop-up window. You can either select the provided colors by clicking or by entering a hexadecimal code for the color to be displayed in the "HEX" field.

1. Navigate to the Configuration - Device manager - Display menu item.
2. Click on the button on the right next to the color symbol.
The "Color selection" pop-up window opens.
3. Click the color you want or, if known, enter the relevant hexadecimal code in the "HEX" field.
The point next to the field "HEX" displays the selected color and the relevant hexadecimal code.
4. Confirm the selection by clicking on "OK".
The color symbol in the button switches to the selected color.
5. Click the "Apply" button.
The display color has been changed

6 Configuration

6.4 Unit settings

Units

These settings are relevant for the automatic conversion performed when the temperature unit is changed (°C/°F) (relates only to the PLC application).

| Parameters | Selection/input | Description |
|------------------------------|------------------------|---|
| Absolute temperature setting | | Unit for temperature value |
| | °C | Degrees Celsius |
| | °F | Degrees Fahrenheit |
| | K | Kelvin |
| Relative temperature setting | | Unit for temperature difference |
| | °C | Degrees Celsius |
| | °F | Degrees Fahrenheit |
| | K | Kelvin |
| Pressure setting | mbar | Millibar |
| | bar | bar |
| | N/m ² | Newton per square meter |
| | psi | Pound force per square inch |
| | Pa | Pascal |
| | hPa | |
| | kPa | Kilopascal |
| | MPa | Megapascal |
| Resistance setting | μΩ | Microohm |
| | mΩ | Milliohm |
| | Ω | Ohm |
| | kΩ | Kiloohm |
| | MΩ | Megaohm |
| Ratio | % | Percent |
| | ‰ | Per thousand |
| | ppm | Parts per million |
| Mixing ratio setting | g/kg | Gram per kilogram |
| | gr/lb | grains per pound grain = 0.0648 g pound = 453.59237 g (avoirdupois pound) |
| Absolute humidity setting | g/m³ | g per cubic meter |
| | g/ft ³ | g per cubic foot |
| Relative humidity setting | %rH | Percent relative humidity |
| Current setting | μA | Microampere |
| | mA | Milliampere |
| | A | Ampere |
| | kA | Kiloampere |
| Voltage setting | μV | Microvolt |
| | mV | Millivolt |
| | V | Volt |
| | kV | Kilovolt |

6 Configuration

| Parameters | Selection/input | Description |
|---------------------------|--|--------------------------------------|
| Time setting | μs | Microsecond |
| | ms | Millisecond |
| | s | Second |
| | min | Minute |
| | h | Hour |
| Memory size setting | B | Byte |
| | kB | Kilobyte |
| | MB | Megabyte |
| | GB | Gigabyte |
| Specific enthalpy setting | kJ/kg | Kilojoule per kilogram |
| | BTU/lb | British Thermal Unit per pound |
| Flow setting | m^3/s | Cubic meter per second |
| | l/s | Liters per second |
| | l/min | Liters per minute |
| | l/h | Liters per hour |
| | cm^3/s | Cubic centimeters per second |
| | m^3/h | Cubic meters per hour |
| | ft^3/min | Cubic feet (28.316 l) per minute |
| | ft^3/h | Cubic feet per second |
| | usgal/min | US gallons (3.785 l) per min |
| | usgal/h | US gallons per hour |
| | impgal/min | Imperial gallons (4.54609 l) per min |
| | impgal/h | Imperial gallons per hour |
| Volume setting | m^3 | Cubic meter |
| | l | Liter |
| | cm^3 | Cubic centimeter |
| | ft^3 | Cubic foot |
| | usgal | US gallon |
| | impgal | Imperial gallon |
| Speed setting | m/s | Meters per second |
| | km/h | Kilometers per hour |
| | mph | Miles (1609.344 m) per hour |
| Conductivity setting | $\mu\text{S}/\text{cm}$ | Microsiemens per centimeter |
| | mS/cm | Millisiemens per centimeter |
| | S/m | Siemens per meter |
| Frequency setting | Hz | Hertz |
| | kHz | Kilohertz |
| | MHz | Megahertz |
| | GHz | Gigahertz |
| | 1/min | One per minute |
| | 1/h | One per hour |

6 Configuration

6.5 System bus

Master

| Parameter | Selection/data input | Description |
|---|----------------------|---|
| Max. repetitions (max. no. of re-tries) | 5 to 10 | Maximum number of times a faulty frame is repeated before the system bus switches to the status "Stop". |
| Continuation after system bus error (run after s. bus err.) | | The device can continue automatically as soon as a system bus error that previously occurred is no longer present. |
| | Inactive | No continuation The device or the system bus must be manually switched back to the status "Run". For example, the system bus can be separately switched to the status "Stop" (Safe-Operational) or "Run" (Operational) in the web application using the function "Service > System bus". |
| | Active | Continuation The device automatically switches back to the status "Run". |
| Ignore system start | | The system bus status can be independent of the current system status (device status). This may be required if a CODESYS application first needs to perform extensive initialization before the system bus is permitted to switch to the status "Run". |
| | Inactive | The system bus status follows the system status. |
| | Active | When the system starts, the system bus remains in the status "Stop", regardless of the system status. The system bus must be separately switched to the status "Run". This can be done in the CODESYS application (CmpSystembus), or performed manually in the web application (Service > System bus). |



NOTE!

The settings configured under "Master" influence the transfer of data via the system bus. Sub-optimal settings here will disrupt or even interrupt the communication within the system. For this reason, these parameters are only permitted to be modified by a service engineer from the device manufacturer (or by someone acting on their instructions).

Modules

The process of configuring the modules (controller, relay, analog IO units, digital IO units) is described in the operating manual for the respective module.

⇒ chapter 1.8 "Available technical documentation", Page 15

If used together with a type JUMO variTRON CPU, the description of the NV connecting list provided in the manual does not apply. In this case, all external connections (connections running via the system bus) must be realized in the PLC application.

6.6 Data carrier management

Network drives

Here up to 5 network drives are mounted under Linux (available as of system version 7).

| Parameter | Selection/data input | Description |
|---|---------------------------------------|---|
| Name | Enter text (only ASCII characters) | Designation for the network drive Examples: Drive1, Drive2 |
| Network path | Enter text (only ASCII characters) | Network path of the drive Examples: //Server/NetDrive, //Server/NetDrive2 |
| File system | SMB/CIFS | Network file system SMB/CIFS is supported up to and including version 3.1.1. To use a specific version, it must be specified as an additional mount option (vers=x.x). |
| Log on as guest (as of system version 8) | Off (FALSE) On (TRUE) | Username and password are required for logon. Logon without user name and password |
| User name (as of system version 8) | Enter text | User name for access to the network drive |
| Password (as of system version 8) | Enter text | Password for access to the network drive |
| Additional mount options | Enter text | Additional options for mounting the drive under Linux The options are to be entered separated by commas. Example (public drive, SMB/CIFS in version 1.0): guest,user=,vers=1.0 |



NOTE!

As of system version 7, access to the file system on USB storage media via CODESYS is also supported.

6 Configuration

6.7 System status UI

This function area relates to the configuration of the device display.

Screensaver

| Parameter | Selection/data input | Description |
|--------------------------------|----------------------------|---|
| Function | | Activate screen switch-off |
| | Off | The function is inactive. |
| | On | The screen is switched off once the waiting period has elapsed. |
| Waiting period (s) (idle time) | 10 to 3600 (900) | Waiting period in seconds |

6.8 Web server

| Parameters | Selection/input | Description |
|-------------------------------|----------------------------|--|
| HTTP | | The web server can always be reached via HTTPS; HTTP can be activated in addition. |
| | Active | HTTP is active in addition to HTTPS. |
| | Inactive | HTTP is not active. |
| | Redirect to HTTPS | HTTP is active, but there is an immediate redirect to HTTPS. |
| HTTP port number | 0 to 65535 (80) | Port number for HTTP |
| HTTPS port number | 0 to 65535 (443) | Port number for HTTPS |
| Path to user-defined website | custom | Link is specified when using a user-specific website |
| CODESYS WebVisu compatibility | | Move slider to the right to activate compatibility mode |

6.9 Email

| Parameter | Selection/data input | Description |
|--------------------|---|---|
| SMTP server | Enter address (smtp.example.de) | Address (URL) of the email server for SMTP |
| Port | 0 to 65535 (25) | Port number of the email server for SMTP The port number is dependent on the email provider and the type of encryption (usually: TLS = 465, StartTLS = 587). |
| User account | Enter designation (user@example.de) | Designation of the user account (user name) for logging on to the email server |
| Authentication | | Authentication at logon to email server |
| | None | No authentication |
| | Password | Authentication using password |
| Password | Enter password | Password for authentication |
| Encryption | | Type of encryption between email client and email server (depending on the email provider) |
| | None | Unencrypted transfer |
| | StartTLS | TLS where the connection is unencrypted to begin with (encryption takes place while the connection is being established) |
| | SSL/TLS | Transport Layer Security |
| Check certificates | | Check SSL/TLS certificates |
| | No | No check |
| | Yes | Certificates are checked. |
| Sender | Enter designation (device@example.de) | Email address as sender address |

6 Configuration

6.10 PLC configuration

6.10.1 Program generator

Nine independent program generators are available in the device as standard, meaning that nine programs can run asynchronously and independently from each other.

With the extra code 001, the program generator is supplemented with the JUMO variTRON Program Editor. The operating manual for the JUMO variTRON Program Editor is available online in the JUMO Help Center.

General

| Parameters | Selection/input | Description |
|----------------------------------|-----------------------------------|---|
| Name of program generator | Enter text (or use existing text) | Designation of program generator |
| Function | Inactive | The program generator is switched off. |
| | Program generator | The program generator is controlled by a program. |
| | Fixed-setpoint generator | The program generator operates as a fixed-setpoint generator. In this case, the setpoint values for the basic status or manual mode are used. |
| Program start | Program start | The program starts at the first programmed setpoint value. |
| | Actual value | The program starts at the point at which the setpoint value corresponds to the current actual value. |
| | Time | A start time specified for program start is adopted as the start time in a 24 h program. Example: Start time: 06:00:00; 24 h program from 00:00 to 24:00: The program starts at 6 a.m. and runs until midnight. |
| Response at out of range (O-o-R) | | Behavior of the program generator in case of measuring range underflow and overflow (out of range) |
| | Continuation | Program continues to run. |
| | Program stop | The program is stopped. |

6 Configuration

| Parameters | Selection/input | Description |
|--------------------------------|-----------------------------------|---|
| Power off | | Behavior of the program generator when the power failure is over. |
| | Cancellation | The program is aborted; the program generator enters basic status. |
| | Continuation | The program continues running from the point that it was at when the power failed. |
| | Standstill | The program is stopped (program generator stays in automatic mode). The program can be continued or canceled by means of operation. |
| | Continuation at x % | If the difference in the actual value (before and after the power failure) is less than or equal to x %, the program continues running from the point that it was at when the power failed. If this is not the case, the program generator enters standstill. |
| | Continuation at actual value | The program continues running at the actual value; consideration is given to whether the program profile had a positive or negative slope at the time of the power failure. |
| Start with time | | The program can be started at a specific time (entry of date and time by means of operation). |
| | No | Immediate program start (e.g., by means of operation or digital signal) |
| | Yes | Program start at a specific time |
| Actual value difference | 0 to 100 | The maximum admissible difference between the actual value before and after the power failure for the program to continue running. |
| End signal (s) | 0 to 32767 | Length of the program end signal |
| Events (Program start, ...) | | Activate the event message for the relevant event. |
| | Off (FALSE) | No event message |
| | On (TRUE) | The event is entered in the event list. |
| Event text | Enter text (or use existing text) | This text is entered in the event list in the case of an event. |

Setting of setpoint values: setpoint specification

| Parameters | Selection/input | Description |
|--|---|---|
| Setpoint value 01 to setpoint value 30 | | Specification of whether a change made to the setpoint value should take the form of a step or a ramp. |
| | Setpoint value step | Setpoint value change as step |
| | Setpoint value ramp | Setpoint value change as ramp |
| | End value for setpoint value ramp 1 to End value for setpoint value ramp 10 | The relevant setpoint value acts as the end value for the ramp function of the setpoint value (1 to 10) which is selected here. If there is no end value specified in a program section, then the program generator works in accordance with its configuration (setpoint step or setpoint ramp). |

6 Configuration

Setting of setpoint values: setpoint limits

| Parameters | Selection/input | Description |
|---|-----------------------------------|---|
| Decimal places | Auto | The number of decimal places is selected automatically. |
| | XXXXXp | No decimal place |
| | XXXXpX | One decimal place |
| | XXXpXX | Two decimal places |
| | XXpXXX | Three decimal places |
| | XpXXXX | Four decimal places |
| Lower tolerance band limit | | |
| Minimum | -99999 to 99999 | Admissible minimum value for the lower tolerance band limit |
| Maximum | -99999 to 99999 | Admissible maximum value for the lower tolerance band limit |
| Upper tolerance band limit | | |
| Minimum | -99999 to 99999 | Admissible minimum value for the upper tolerance band limit |
| Maximum | -99999 to 99999 | Admissible maximum value for the upper tolerance band limit |
| Setpoint value 01 to setpoint value 30 | | |
| Designation | Enter text (or use existing text) | Designation of the setpoint value |
| Minimum | -99999 to 99999 | Admissible minimum setpoint value |
| Maximum | -99999 to 99999 | Admissible maximum setpoint value |

Setting of setpoint values: setpoint values for manual mode

| Parameters | Selection/input | Description |
|--|------------------------|---|
| Lower tolerance value | -99999 to 99999 | Lower value of the tolerance band |
| Upper tolerance value | -99999 to 99999 | Upper value of the tolerance band |
| Setpoint value 01 to setpoint value 30 | -99999 to 99999 (0) | Value of the setpoint value concerned |
| Contact 01 to contact 32 | | Position of the operating contact concerned |
| | Off (FALSE) | Contact not active |
| | On (TRUE) | Contact active |

Setting of setpoint values: setpoint values for basic status

| Parameters | Selection/input | Description |
|-----------------------|------------------------|-----------------------------------|
| Lower tolerance value | -99999 to 99999 | Lower value of the tolerance band |
| Upper tolerance value | -99999 to 99999 | Upper value of the tolerance band |

6 Configuration

| Parameters | Selection/input | Description |
|--|------------------------|---|
| Setpoint value 01 to setpoint value 30 | -99999 to 99999 (0) | Value of the setpoint value concerned |
| Contact 01 to contact 32 | | Position of the operating contact concerned |
| | Off (FALSE) | Contact not active |
| | On (TRUE) | Contact active |

Setting of setpoint values: setpoint value units

| Parameters | Selection/input | Description |
|--|----------------------|--|
| Setpoint value 01 unit to setpoint value 30 unit | | Unit of the setpoint value concerned |
| | No unit | |
| | Absolute temperature | Temperature value |
| | Relative temperature | Temperature difference |
| | Relative humidity | Relative humidity |
| | Ratio | Ratio of two values A and B (A / B) in percent |
| | Hours | Hours |
| | Minutes | Minutes |
| Seconds | Seconds | |

Names of operating contacts

| Parameters | Selection/input | Description |
|--|-----------------------------------|--|
| Name of operating contact 01 to Name of operating contact 32 | Enter text (or use existing text) | Designation of the operating contact concerned |

Tolerance band monitoring

| Parameters | Selection/input | Description |
|----------------------------------|-----------------------------------|---|
| Alarm type | Inactive | Tolerance band monitoring is not active. |
| | Event | The tolerance band breach is entered as an event in the event list. |
| | Alarm | The tolerance band breach is entered as an alarm in the event list and alarm list. |
| Alarm active at | High | Alarm active at High (1 = actual value outside the tolerance band) |
| | Low | Alarm active at Low (0 = actual value within the tolerance band) |
| Event text | Enter text (or use existing text) | This text is entered in the relevant list in the event of the tolerance band breach. |
| Stop if tolerance range exceeded | | In the event of a tolerance band breach, the program can be stopped until the state has passed. |
| | Yes | The program is stopped. |
| | No | The program is not stopped. |

6 Configuration

6.10.2 Analog variables

These settings concern the use of analog variables (analog PLC outputs) for functions that have been realized in the device firmware (e.g. data recording). 120 analog variables for customization are available.

| Parameters | Selection/input | Description |
|---------------|--|---|
| Name | Enter text (or use existing text) | Designation of the variables concerned |
| Unit | Select signal type and unit from the list (drop-down menu) | Signal type and unit of the variables concerned |
| Display start | -99999 to 99999 (0) | Lower limit of display range |
| Display end | -99999 to 99999 (100) | Upper limit of display range |

6.10.3 Digital variables

These settings concern the use of digital variables (digital PLC outputs) for functions that have been realized in the device firmware (e.g. data recording). 120 digital variables for customization are available.

| Parameters | Selection/input | Description |
|------------|-----------------------------------|--|
| Name | Enter text (or use existing text) | Designation of the variables concerned |

6.11 PLC parameters

The configuration structures that were individually created using the CPV Editor (CPVE) are displayed here.

This configuration data can be used in the setup program, in the web application, and in the CODESYS application.



NOTE!

The CPV Editor requires specific knowledge and is intended for use by the manufacturer only (service that is subject to a fee).

6.12 Programs

Each program (each program plan) can consist of a maximum of 200 program sections. Up to 30 setpoint values and up to 32 operating contacts can be used in each program section.

Tolerance band monitoring can be set up for the first setpoint value. This means that the relevant actual value is monitored; if it leaves the tolerance band, the program is stopped until it returns to a value that is within the tolerance band (depending on configuration).

A total of up to 300 programs can be managed in a program pool.

A program generator is required to execute a program. A program can also be assigned multiple program generators.

Program header

| Parameter | Selection/data input | Description |
|---------------------------------|--|--|
| Program GUID | Enter ID (0) | ID for uniquely identifying the program (length: 64 bits) |
| Program name | Enter text (or use existing text) | Designation of the program |
| Program information | Enter text (or use existing text) | Description of the program |
| Pictogram name | Select pictogram | Pictogram (icon) for graphical identification marking of the program |
| Favorite | | Programs marked as favorites are placed at the start of the program start menu. If there is more than one favorite, the program number is the decisive criterion (in ascending order). |
| | No | Program is not a favorite |
| | Yes | Program is a favorite |
| Repetitions | | Cyclic program repetition |
| | Inactive | The program is not repeated (only one program run). |
| | Endless | The program is repeated endlessly. |
| | Number | The program is repeated as many times as is specified by the parameter "Number of repetitions". |
| Program assignment (allocation) | -9223372036854775808 to 9223372036854775807 (0) | Number (length: 64 bits) for assigning a program to a plant or a group. This number can be used in the customer-specific application to group similar programs. |
| Number of repetitions | 0 to 99999 | Number of program repetitions |
| Assignment (allocation) | | Selection of program generators to be used to execute the program. |
| | Off (FALSE) | Program generator not selected |
| | On (TRUE) | Program generator selected |

6 Configuration

Program channel

| Parameter | Selection/data input | Description |
|---|--|---|
| Number of sections | 0 to 200 | Number of program sections that the program generator is to process. |
| Program section 1 to Program section 200 | | |
| Process step (procedural step) (available as of system version x) | 0 to 200 | The process step specifies the limits of the section time and defines which setpoint values are available. |
| Section time (hh:mm:ss) | 00:00:00 to 99:59:59 | Duration of program section As from system version x: The section time must be within the limits specified by the process step. |
| RS (Repeat section) Start section | 1 to 200 | Number of the program section that is to be repeated together with the following sections. |
| NoC (Number of cycles) Number of cycles | 0 to 999 | Number of repetitions of a program section (or multiple linked program sections) |
| Setpoint value 01 to Setpoint value 30 | -1000000 to 1000000 The limits depend on the admissible minimum and maximum setpoint values of the program generator. | Setpoint values in the program section As from system version x: Only the setpoint values approved in the process step can be used. |
| Tol high | -1000000 to 1000000 (0) The limits depend on the admissible minimum and maximum upper limit of the tolerance band for the program generator. | Upper limit value for tolerance band monitoring of setpoint value 01 |
| Tol low | -1000000 to 1000000 (0) The limits depend on the admissible minimum and maximum lower limit of the tolerance band for the program generator. | Lower limit value for tolerance band monitoring of setpoint value 01 |
| Operating contact 01 to 32 | | Operating contacts in the program section |
| | Off (FALSE) | Operating contact is not active. |
| | On (TRUE) | Operating contact is active. |

6.13 CODESYS configuration

| Parameters | Selection/input | Description |
|------------------|---------------------|---|
| RetainAutoSync | Active | Retain data is automatically synchronized in the retain memory in the storage interval ^a . |
| | Inactive | No retain data is synchronized ^b . |
| Storage interval | 1 to 86400 s (5) | CODESYS configuration storage interval |

^a If the retain data is to be synchronized in the retain memory (backup through power off) outside the storage interval, this can be carried out through access via the CODESYS component.

^b The user is responsible for the synchronization. This can be carried out through access via the CODESYS component. If no synchronization takes place, this can result in loss of the retain data.

6 Configuration

6.14 Recorder

The JUMO variTRON system has an integrated recorder, which records process data. The Recorder View is available using the extra code 276 "Recorder App". It enables process data from the JUMO variTRON system to be visualized as a live trend in a curve diagram. The recorded process data is archived and evaluated with JUMO smartWARE Evaluation ⇒ [Data sheet 701840](#).



NOTE!

In addition to archiving and evaluating process data with JUMO smartWARE Evaluation, it is possible to transmit the data to the JUMO Cloud or to JUMO smartWARE SCADA.

Groups

The process data is stored in so-called groups. The device has a total of 10 groups. In each group, up to 8 analog and 8 digital signals can be displayed as a live trend in the curve diagram (prerequisite: extra code 276 is activated).

Overall, the JUMO variTRON 300 can record up to 60 analog or digital signals. The JUMO variTRON 500 and JUMO variTRON 500 touch can record up to 240 analog or digital signals. The signals can be divided across the groups as desired.



NOTE!

The user must ensure that the maximum number of channels is not exceeded (60 or 240). The sum of analog and digital channels of all groups is decisive for this.

If the maximum number of channels is exceeded during the configuration of a group, this results in the complete group not being recorded. In the event of configuration with the Web Cockpit, an error message is entered directly in the event list.



NOTE!

In order to transmit the saved process data to JUMO smartWARE Evaluation for archiving or evaluation, the recording data export must be configured.

Parameters

| Parameters | Selection/input | Description |
|---------------------------------------|-----------------|--|
| Name | Enter text | Designation of the group The designation is displayed in the visualization (Recorder View and JUMO smartWARE Evaluation). |
| Recording (as of system version 8) | Normal | Amount of data saved in a memory cycle Not only the measured value, but also metadata such as minimum value, maximum value, average value (avg.), validity (Valid/Invalid), measuring range underflows (Under), and measuring range overflows (Over) are saved. |
| | Compact | Only the current value is saved. This saves on memory capacity in both JUMO variTRON and JUMO smartWARE Evaluation. |

Diagram view

| Parameters | Selection/input | Description |
|------------------------|----------------------|--------------------------------------|
| Measured value display | Min. value | The minimum value is displayed. |
| | Max. value | The maximum value is displayed. |
| | Current value | The current value is displayed. |
| | Mean value | The mean value is displayed. |
| Alignment | Horizontal | Horizontal alignment of the diagram. |
| | Vertical | Vertical alignment of the diagram. |

Analog channels

The display of the analog signals in the curve diagram of the Recorder View is set here (e.g. channel color).



NOTE!

A key symbol after an entry indicates that the entry is blocked for input. The entry can be edited if a valid analog signal is configured at the input using a selector.

| Parameters | Selection/input | Description |
|--|-----------------------------------|---|
| Input signal | Select signal from selector | Analog signal System version 5: Analog PLC outputs (analog values 001 to 120) As of system version 6: Additional analog signals available (values of system monitoring, process values of the modules). |
| Designation | Enter text (or use existing text) | Designation of the signal |
| Replace designation | Inactive Active | If active: The channel designation is automatically displayed in JUMO smartWARE Evaluation. |
| Start of display range | -99999 to 99999 (0) | Lower limit of display range |
| End of display range | -99999 to 99999 (100) | Upper limit of display range |
| Replace display parameters | Inactive Active | If active: The display parameters are automatically used in JUMO smartWARE Evaluation. |
| Scaling type | | Scaling of the y axis |
| | Linear | Linear |
| | Logarithmic | Logarithmic |
| Channel color | | Any color can be set by selecting a color or entering a hexadecimal value. |
| Setting the number format for the analog value | | |
| Decimal place | Auto | The system sets the number format automatically |
| | XXXXXp | Display of the value without decimal place |
| | XXXXpX | Display of the value with a decimal place |
| | XXXpXX | Display of the value with two decimal places |
| | XXpXXX | Display of the value with three decimal places |
| | XpXXXX | Display of the value with four decimal places |

6 Configuration

| Parameters | Selection/input | Description |
|---------------|-----------------|--|
| Number format | Decimal | Display as decimal value |
| | Exponential | Display as exponential value |
| Recorder View | Active | If "Active", the analog signals are displayed as a live trend in the curve diagram. A maximum of 8 analog signals and 8 digital signals can be displayed per group. If there are 10 groups, a total of up to 80 analog signals and 80 digital signals are therefore possible. |

Digital channels

The display of the digital signals in the curve diagram of the Recorder View is set here (e.g. channel color).

| Parameters | Selection/input | Description |
|---------------------|---------------------------------|--|
| Input signal | Select signal from selector | Setting of the digital input signal |
| Designation | Enter text or use existing text | Designation of the signal |
| Replace designation | Inactive | If active: |
| | Active | The channel designation is automatically displayed in JUMO smartWARE Evaluation. |
| Channel color | | Any color can be set by entering a hexadecimal value. |
| Recorder View | Active | If "Active", the analog signals are displayed as a live trend in the curve diagram. A maximum of 8 analog signals and 8 digital signals can be displayed per group. If there are 10 groups, a total of up to 80 analog signals and 80 digital signals are therefore possible. |

Standard operation

Storage operation is switched on/off for the group and the memory cycle set here.

| Parameters | Selection/input | Description |
|-------------------------|---|---|
| Memory status | | Activation of data recording |
| | On | The data is recorded at the configured interval. |
| | Off | Data recording is not active. |
| Memory cycle [hh:mm:ss] | 00:00:01 to 24:00:00 (00:00:05) | Recording interval Time interval at which the values of the analog and digital signals of the group are stored for evaluation. |

Event operation

Settings for event operation are configured here.

Event operation has the highest priority of all three operating modes.

| Parameters | Selection/input | Description |
|-----------------------|-----------------------------|---|
| Control signal | Select signal from selector | Digital signal (binary signal) that starts and stops event operation. |
| Post-trigger time [s] | 0 to 10 (0) | Extends event operation after which the control signal was deactivated. |

6 Configuration

| Parameters | Selection/input | Description |
|----------------------------|------------------------------------|---|
| Memory cycle [hh:mm:ss] | 00:00:01 to 24:00:00 (00:00:01) | Recording interval Time interval at which the values of the analog and digital signals of the group are stored for evaluation. |

Time operation

A period of time in which the data recording is to take place can be set here.

Time operation has higher priority compared with standard operation, but lower priority than event operation.

| Parameters | Selection/input | Description |
|----------------------------|------------------------------------|---|
| Begin [hh:mm:ss] | 00:00:00 to 23:59:59 (00:00:00) | Time at which time operation is started. Begin = End: Time operation is inactive. |
| End [hh:mm:ss] | 00:00:00 to 23:59:59 (00:00:00) | Time at which time operation ends. |
| Memory cycle [hh:mm:ss] | 00:00:01 to 24:00:00 (00:00:01) | Recording interval Time interval at which the values of the analog and digital signals of the group are stored for evaluation. |

Recorded values

The following values are determined within a recording interval:

- Current value (current value at the end of the interval)
- Measured value status (status of the current value according to NAMUR NE107)
- Minimum value (for digital signal: number of low values (logical 0))
- Maximum value (for digital signal: number of high values (logical 1))
- Average value (for digital signal: number of high values in relation to the number of low values)
- Number of values with measuring range underflow
- Number of values with measuring range overflow
- Number of valid values
- Number of invalid values

6 Configuration

6.15 Recording data export

Recording data export

Here the connection to the JUMO smartWARE Evaluation (Datastore) is configured and activated (available as of system version 6). In the Datastore, the recorded process data is stored. The data is then available for evaluation with JUMO smartWARE Evaluation (as of system version 6).

| Parameters | Selection/input | Description |
|--------------------------|--|--|
| Data export | | Export of the recorded process data |
| | Inactive | The function is switched off. |
| | Active | The function is active. Activates the data export function, meaning data can be exported via USB or http/https. |
| Export to data server | | Activates the automatic export of data via http to the Datastore at the set interval (period). |
| | Active | |
| | Inactive | |
| Datastore URL | Enter the URL of the Datastore of JUMO smartWARE Evaluation (<host>/store) | The URL is usually entered as follows: (host/store) Example: 10.12.54.18/store or eval2.jumo/store Depending on the port configuration of JUMO smartWARE Evaluation, it must also be specified too. If the ports of JUMO smartWARE Evaluation are configured differently to 80/443, <Hostname>:<Port>/store<IP address>:<Port>/store must be entered. For further information ⇒ Operating manual for JUMO smartWARE Evaluation . |
| Encryption | | A setting can be made to determine whether the data is sent to the Datastore via http (unencrypted) or via https (TLS encryption). Depending on this, it may be necessary to enter the correct port in the Datastore. |
| | No | No data encryption occurs |
| | SSL/TLS | SSL/TLS encryption (https) |
| API key | | An API key can optionally be defined in the Datastore that restricts data export to devices which also use it. This API key must be entered in the device here if the relevant Datastore defines one. |
| Period [hh:mm:ss] | 00:01:00 to 24:00:00 (00:15:00) | Interval at which the recorded data is transferred to the Datastore. |
| Memory alarm limit value | 0 to 100 % (20 %) | Warning threshold for the remaining database storage capacity for process data. When it is reached, an alarm is generated. |

6.16 Cloud gateway

Here the connection to the JUMO Cloud is configured (available as of system version 4). Before this, the device must be configured as a data source in the JUMO Cloud.

As of system version 8, the connection to a SCADA system is also configured here.

| Parameter | Selection/data input | Description |
|------------------------------|----------------------|---|
| Connection to cloud or SCADA | | Activation of the cloud gateway |
| | Inactive | Gateway is not active. |
| | Active | Gateway is activated. |
| Target server | | Selection of the destination server |
| | JUMO Cloud | The JUMO Cloud is used. |
| | SCADA (individual) | The destination server is determined by an individual URL (JUMO smartWARE SCADA, compatible third-party systems). |
| SCADA URL for configuration | Enter URL | Individual URL for connecting to a SCADA system (configuration) |
| SCADA URL for MQTT | Enter URL | Individual URL for connecting to a SCADA system (MQTT broker) |
| Ignoring server certificate | Inactive | In the case of HTTPS connections, this parameter must be set to active, as otherwise no connection will be established. Only HTTPS connections to JUMO Cloud are possible. |
| | Active | |
| Device ID | Enter device ID | ID used by the device (data source) to authenticate itself to the JUMO Cloud or the SCADA system. The ID is generated in the JUMO Cloud or in the SCADA system and must be entered here. |
| Password | Enter password | Password used by the device (data source) to authenticate itself to the JUMO Cloud or the SCADA system. The password is generated in the JUMO Cloud or in the SCADA system and must be entered here. |

6.17 Signal generator

Analog and digital signals within the system are specified here and various signal parameters set.

6 Configuration

6.18 Wtrans gateway

Settings for using the JUMO Wtrans transmitters are made here (available as of system version 5).

General

| Parameter | Selection/data input | Description |
|-----------------|----------------------|--|
| Radio frequency | | Wtrans radio frequency (MHz) |
| | 868.4 | Europe |
| | 912.6 to 917.4 | America, Australia, Canada and New Zealand |

Wtrans transmitter

These settings are required for each transmitter selected in the Wtrans hardware configuration (Wtrans hardware assistant in the Setup program).

| Parameter | Selection/data input | Description |
|---|--|---|
| General | | |
| Name | Enter text (or use existing text) | Transmitter designation |
| Transmitter ID | 0 to 99999 | ID of the Wtrans transmitter The unique ID set on the transmitter side must also be set here to identify the transmitter. |
| Radio timeout | 2 to 20 | Number of radio telegrams not received, which leads to timeout detection. The set transmission interval of the transmitter is transmitted with the radio telegram. When the first telegram is received, this value is saved in the receiver and the radio timeout monitoring function is activated. If no new telegram is received throughout the entire timeout period, the measured value is set to "no input value" and the "Radio timeout" alarm is activated. |
| Analog processing | | |
| Name (for Wtrans E01; as of system version 6) | Enter text (or use existing text) | Designation of measured value |
| Factor | -99999 to 99999 (1) | Factor for correction of the measured value |
| Offset | -99999 to 99999 (0) | Offset value for correction of the measured value |
| Linearization | Select linearization from selector (customer-specific linearization: formula or grid points) | Linearization for the measured value Configuration of linearization: Configuration > Device manager > Customer-specific linearization |

NOTE!



Wtrans B (707060) with thermocouple: With system version 5, only types J, K, and B are supported. With system version 6, all types except MoRe5-MoRe41 and W3Re-W26Re are supported.

6.19 Node-RED

The graphical development tool Node-RED is available as standard, but has to be activated before it is used.

| Parameters | Selection/input | Description |
|---------------------------|-----------------|---|
| Node-RED development tool | | Activation of Node-RED in the central processing unit |
| | Inactive | Node-RED is not active. |
| | Active | Node-RED is active and can be used with a web browser. The IP address of the central processing unit and /nodered have to be entered to start Node-RED: http://<IP address>/nodered |



NOTE!

If Node-RED is active, the tile Node-RED is shown on the device homepage (IP address) once Node-RED has completely started.

6 Configuration

6.20 Batches

Batch logging is configured here (available as of system version 6).

The batch data is displayed together with the channels of the assigned groups and the event messages in the batch visualizations (evaluation with JUMO smartWARE Evaluation).

The maximum number of batches that can be recorded depends on the device (JUMO variTRON 300: 10 batches; JUMO variTRON 500 and JUMO variTRON 500 touch: 20 batches). However, the number of licensed batches is decisive for the evaluation of the recorded batches (fee-based licenses for JUMO smartWARE Evaluation).



NOTE!

If no group has been assigned to the batch (or none of the assigned groups is active), only event messages are recorded.



NOTE!

With the JUMO variTRON 300, the user must ensure that the maximum number of 10 batches is not exceeded.

If the maximum number of batches is exceeded during configuration, this will result in the batch in question not being recorded. In case of configuration with the Web Cockpit, a fault message is immediately entered into the event list.



NOTE!

The configuration must not be changed during an ongoing batch reporting process. Otherwise, there is a risk that the batch documentation will become unusable.

General information

| Parameter | Selection/data input | Description |
|--|-----------------------------------|---|
| Batch active | Off (FALSE) | Batch reporting is not active. |
| | On (TRUE) | Batch reporting is active and can be started. |
| Batch application (batch name) | Enter text (or use existing text) | Assignment or designation of the batch |
| Control signal | Select signal from selector | Signal that is used to start (high active) and stop batch reporting. |
| Response to power interruption (behavior after power interruption) | Continuation | Batch reporting is continued. |
| | Abort | Batch reporting is stopped. The batch is completed with the last recorded data (before the power failure). |
| Group allocation | Select group from selector | Group that is assigned to the batch. All groups can be assigned to one batch. |

Batch lines

For each batch, up to 10 lines can be defined for the batch report.

| Parameter | Selection/data input | Description |
|-----------|-----------------------------------|--|
| ID | Enter text (or use existing text) | Designation (ID) of the relevant line of the batch report (e.g. for use in the PLC application) The identifier must be unique within a batch. |

6 Configuration

| Parameter | Selection/data input | Description |
|--------------------------|-----------------------------------|---|
| Text left column | Enter text (or use existing text) | Text in the left column of the batch report. The left column contains the designation for the content of the right column. |
| Contents of right column | | Text or text source for the right line of the batch report |
| | Empty | No text |
| | Default text | Text from the "Default text" parameter |
| | Batch name | The batch name is used (see "General" section). |
| | Batch number | The batch number is used together with the text from "Default text". The batch number is incremented at the end of batch reporting. |
| | Batch start | Start (date and time) of batch reporting |
| | Batch end | End (date and time) of batch reporting |
| Delete line | Batch duration | Duration of batch reporting (time difference between batch start and batch end) |
| | | Only for "Default text": The parameter decides whether a text edited during batch reporting is replaced again by the text specified in the configuration after the batch has been completed. |
| | Off (FALSE) | Text changes are retained. |
| | On (TRUE) | The original text (default text) is used for the next batch reporting. |
| Default text | Enter text (or use existing text) | The text is used in the batch report if the text in the right column is composed of "Default text" or "Batch number". |
| Editable | | This parameter enables editing of the text within the current batch report. |
| | Off (FALSE) | The text in the right column can only be edited by changing the "Default text". |
| | On (TRUE) | The text in the right column can be changed - for the current batch report. Depending on the "Delete line" parameter, the configured text can be automatically reactivated after the batch is completed. |

Batch number

| Parameter | Selection/data input | Description |
|---------------------|----------------------|---|
| Batch number offset | 0 to 2147483647 | The automatic batch numbering starts with the offset value. |

7 Startup

By means of a summary list, this chapter describes the basic procedure to be followed when initially starting up the automation system. This list is intended to enable experienced users to get started quickly.

Requirements

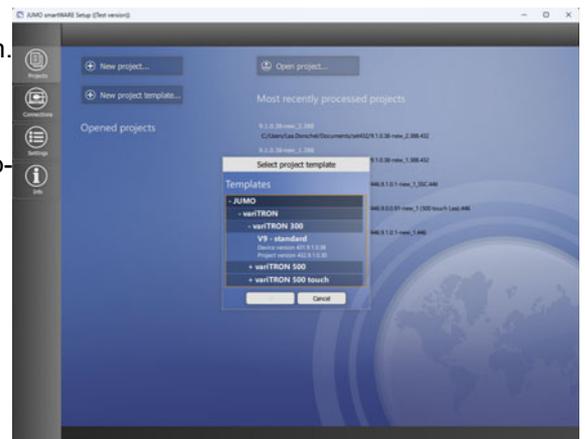
- The work required to mount the entire system – comprising the CPU (also referred to as the "device" here) and the connected modules – and establish its electrical connections is complete (incl. establishing the network connection via the Ethernet interface).
- The network includes a DHCP server from which the CPU obtains its IP address (otherwise this address must be assigned manually; see "Configuration > Ethernet").
- The setup program has been installed and started on a PC that is also connected to the network.

Process

1. Connect central processing unit via LAN1 with the system bus.
2. Establish voltage supply.
The boot process starts and ends with the start picture being displayed.
The display must show "System status Run".



3. Switch to the PC/laptop with the installed JUMO smartWARE Setup program and start the program.
4. Click the "+ New project" button.
The "Select project template" dialog opens.
5. Select project template for the relevant central processing unit and system version and confirm with "OK".
The setup program switches to the project folder.



6. Switch to the "Project management" tab.
7. Click the "Save as..." button and save the project under a significant name.
8. Switch to the "HW-Assistent Systembus" tab.
The setup program opens the window HW-Assistent Systembus. The window is separated into 3 areas:- Hardware configuration- System components- Settings
The previously selected central processing unit is shown in the upper area of the "Hardware configuration" area.
9. Click on the "+" symbol at bottom right of the "Hardware configuration" area.
The program adds a virtual DIN rail below.



**NOTE!**

If a central processing unit was connected to an existing bus topology, the hardware arrangement can be loaded with a bus scan (network symbol at the bottom right).

**NOTE!**

The modules can be found in the HW-Assistent Systembus in the "System components" area. They can be used to configure the control system:

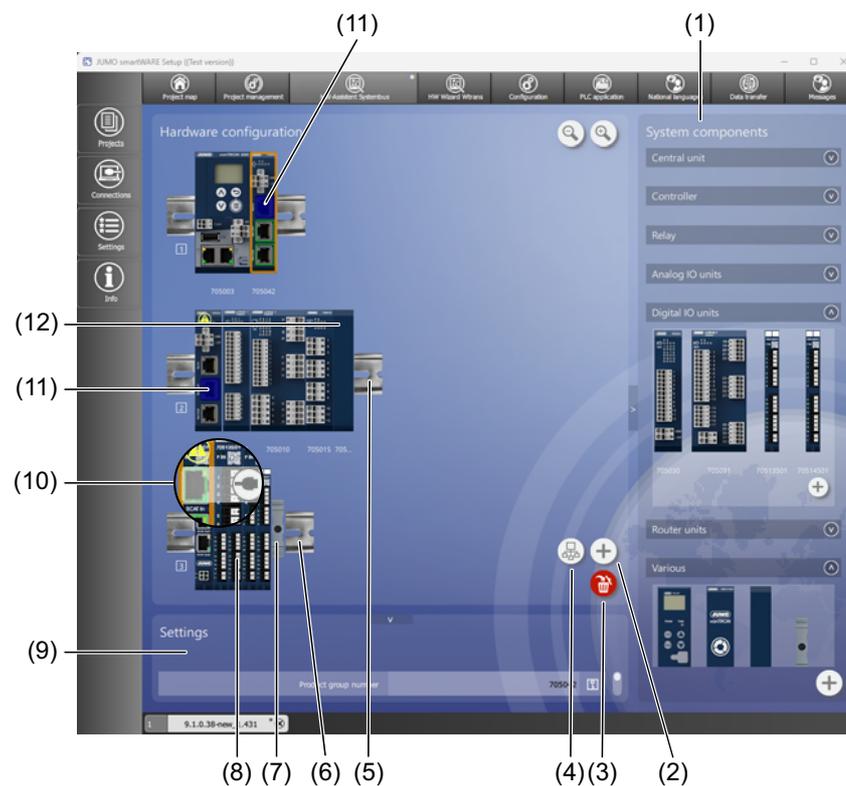
- Central processing unit
- Controller
- Relay
- Analog IO units
- Digital IO units
- Router units
- Various; thyristor power controller (JUMO TYA200), adapter plates, end plates

The system components are arranged in drop-down menus and can be arranged on the central processing unit or DIN rail using drag and drop.

A router unit, a JUMO variTRON module from the 7050xx series, or the system module 705171 from the I/O series can be placed as the first module downstream of the central processing unit.

In addition to the components displayed in the HW-Assistent Systembus, compatible third-party components can be included in the control system configuration with the JUMO system bus.

7 Startup

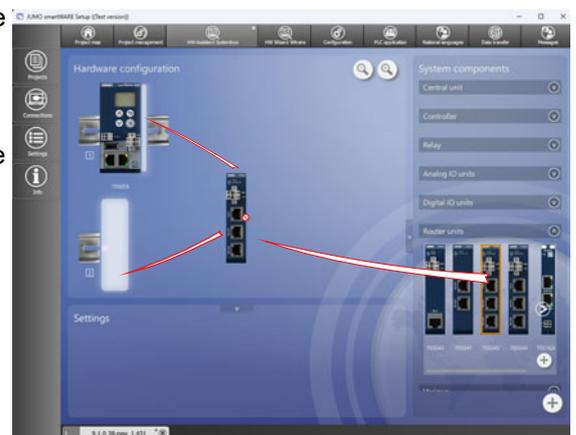


| | | | |
|----|--|----|---------------------------------|
| 1 | System components area | 2 | "+" add DIN rail button |
| 3 | "Delete module" button | 4 | "Bus scan" button |
| 5 | First DIN rail | 6 | Optional second DIN rail |
| 7 | End plate JUMO I/O modules (7051xx) | 8 | JUMO I/O modules (7051xx) |
| 9 | "Settings" area, individual settings for modules | 10 | Establish system bus connection |
| 11 | Already established system bus connection (marked in color) | 12 | End plate JUMO variTRON |

10. Open drop-down menu for router units and drag the desired module onto the DIN rail.

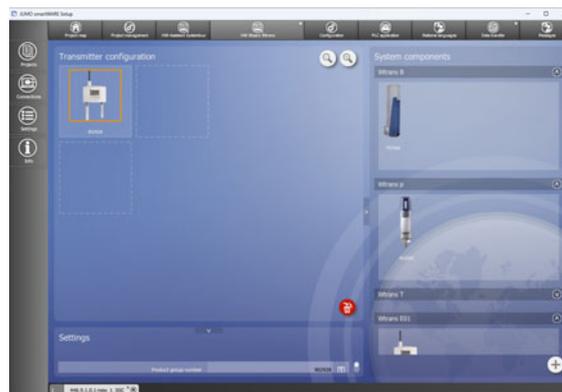
First, a 1-port router module (705043) or 3-port router module (705042) or, if modules from the JUMO I/O series are used, the 3-port router module (70516301) must be used.

Once the module is grabbed with the mouse, the white field displays where it can be placed on the DIN rail.



11. Arrange modules on the DIN rail.
If required, select expansion slots of the module in the "Settings" area for controller modules.
12. If required, add additional DIN rail.
See step 11.

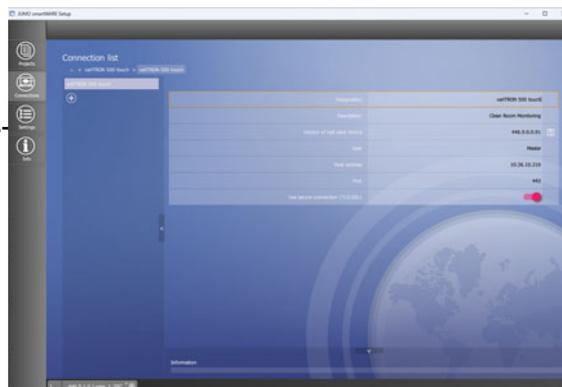
13. Establish system bus connection.
14. If required, switch to "HW-Assistent Wtrans".
15. If required, save modified hardware configuration.
16. Drag Wtrans component used on the central processing unit into the dashed border in the "Transmitter configuration" area using drag and drop.



17. Click the "Connections" tab on the left in the program.

The program switches to the connection list.

18. As required, add/change specifications for the designation, description, user (**Master**), host address, and port (**443**).
Confirm changes by clicking "Apply".



19. Call up project folder and click the "Data transfer" tile.

20. Click the "Connecting..." button.

The setup program connects to the central processing unit.

21. Click the "Send to device" button.

The setup program sends the current configuration to the central processing unit.

22. Check the status LED of all modules.

The status LED will light up steady green as soon as the system bus has the status "Operational".



7 Startup

23. Switch to the "Configuration" tab in the setup program.
- Configure digital and analog inputs and outputs.
 - If necessary, configure the controller function of the controller module (incl. controller parameters).
 - If necessary, configure other functions (e.g., limit value monitoring function, setpoint values).

If setpoint value programs are being used:
Configure central processing unit:

- Configure program generator (Configuration > PLC configuration)
 - Create program (Configuration > Programs)
24. If used, configure Wtrans transmitter (Configuration > Wtrans gateway):
- Select radio frequency.
 - Set transmitter ID and value for wireless timeout.
 - If necessary, set parameters for processing the transmitted measured value (factor, offset, linearization).
25. Optional: Create the CODESYS application
Setup program > PLC application
- Select and apply the appropriate CODESYS version.
 - Start CODESYS.
 - Create the CODESYS application.
26. Optional: Use existing CODESYS application.
Product page: qr-705003-en.jumo.info or [JUMO Software Download Center](#)
- Download "*JUMO variTRON 300Visu template*"



The CODESYS application or the Visu template must match the system version of the device used.

27. Optional: Setting up data recording without using CODESYS
- Setup program > HW-Assistent Systembus:
 - Change module designation if necessary.
 - Setup program > Configuration > Recorder > Groups > Group xx:
 - Assign a meaningful designation for the group.
 - Assign input signals (process values) to the analog and digital channels.
 - Set memory status and memory cycle.



- Setup program > Configuration > Recording data export > Recording data export:
 - Configure and activate connection to the database (Datastore) (condition for data recording).
28. Optional: Setting up data recording using CODESYS
- Setup program > HW-Assistent Systembus:
 - Note the module label.
 - Setup program > Configuration > Recorder > Groups > Group xx:
 - Assign a meaningful designation for the group.
 - Assign input signals (process values; in system version 5 only PLC outputs) to the analog and digital channels.
 - Set memory status and memory cycle.
 - CODESYS application: Connect (map) input signals of the modules with PLC outputs
 - I/O image of the module: Assign the input signal (channel) to a self-created variable.
 - I/O image of the PLC manager: Assign the PLC output (channel) to another self-created variable.
 - Link both variables together in the PLC program (PLC_PRG).
 - If necessary, create a table for documentation, which contains the linked signals (input signal > PLC output).
 - Setup program > Configuration > Recording data export > Recording data export:
 - Configure and activate connection to the database (Datastore) (condition for data recording).
29. After creating the CODESYS application, transfer it to the setup project and close CODESYS if applicable.
30. Transfer the project to the central processing unit:
Setup program > Project > Data transfer
- Send the configuration (incl. CODESYS application) to the central processing unit ("Send to device").



NOTE!

For debugging in the CODESYS application, it is possible to connect "online" to the PLC. In this way, for example, the states of variables can be checked or values can be changed without stopping the application. Before CODESYS is started from the setup program, the option "Start to debug" must be activated. After that, the connection with the PLC can be established in the CODESYS programming environment.

7 Startup

If the CODESYS application is changed while the PLC is running, the "Login with online change" option must be selected in the CODESYS programming environment during transfer. If the change is to be retained in the CPU during power off, the "Update boot application" option must also be activated.



NOTE!

Certain changes made to the configuration (e.g., changes to the hardware configuration) will cause the CPU to restart.

Further information

The JUMO Help Center provides further information, especially on the following topics:

- JUMO Cloud
- JUMO smartWARE SCADA
- JUMO smartWARE Evaluation (as of system version 6)

<https://www.en.helpcenter-jumo.net>

8.1 User rights

8.1.1 System version 7

The information in this chapter applies to system version 7.

User

The following users are created per default:

| User name | Password | Assigned role |
|--|----------|--|
| Master | 9200 | <ul style="list-style-type: none"> • Administrator • BatchAdmin • ConfigurationRead • ConfigurationWrite • Controller • SystemStatusUi • SystemUi • VisuTemplateAdmin • WebUi |
| UnregisteredUser This user must not be deleted! | | <ul style="list-style-type: none"> • ReadOnly |

A user can be edited, and it can also be removed. Likewise, the user's password can also be changed. The function  is used to create a new user.



NOTE!

Due to the restricted possibilities for displaying and entering data on the device display, users with the right "SystemStatusUi" can only be assigned simple passwords. To prevent these passwords from being cracked via the web application, these users must not also be given the right "WebUi".

Roles

The following roles are defined per default:

- Administrator
- ReadOnly (do not delete this role)
- SystemStatusUi (do not delete this role)
- WebUi (do not delete this role)
- SystemUi (do not delete this role)
- ConfigurationRead
- ConfigurationWrite

The following table shows the roles defined per default and the rights they confer (= X).

8 Annex

| Administrator | ReadOnly | SystemStatusUi | WebUi | SystemUi | ConfigurationRead | ConfigurationWrite | Right | Description |
|---------------|----------|----------------|-------|----------|-------------------|--------------------|---------------------------|--|
| X | | | | | | | AdvancedSettings | (for future use) |
| X | X | | | | | | DeviceInformationRead | Read device information |
| X | | | | | | | EventlistRead | Read event list |
| | | | | | X | | x.Configuration.Read | Read configuration (several single rights) |
| | | | | | | X | x.Configuration.Write | Write configuration (several single rights) |
| X | | | | | | | FirmwareUpdate | Perform a firmware update |
| X | | | | | | | SystemStateControl | Change the system status |
| X | | | | | | | BusControl | Change the system bus status (Stop, Start, Reset statistics) |
| X | | | | | | | CertificateAdministration | Manage certificate |
| X | X | | | | | | DebugDataRead | Read debug data |
| X | | | | | | | DebugInterfaceActivation | Activate SSH interface (only possible on the device) |
| X | | | | | | | RecorderAdministration | Delete data base |
| X | | | | | | | AlarmAcknowledgement | Acknowledge alarm |
| X | | | | | | | DebugDataDelete | Delete debug data |
| X | | | | | | | EventlistDelete | Delete event list |
| X | | | | | | | UserManagement | Manage users |
| X | X | | | | | | CodesysUi | Visibility of the user in the CODESYS UI |
| | | X | | | | | SystemStatusUi | Visibility of the user in the device display (only for JUMO variTRON 300 and 500) When assigning this right, take into account the restricted possibilities for displaying and entering data on the device display (user name, password). |
| | | | | X | | | SystemUi | Visibility of the user in the device display (only for JUMO variTRON 500 touch) |
| | | | X | | | | WebUi | Logon in the "Web Cockpit" web application |

A role can be edited, and it can also be removed.

The function  is used to define a new role

When editing a role, it is also possible to add your own rights (using the "add" function), which can be used in the CODESYS application by means of the "CmpAccessControlManager" library.

8.1.2 System version 8

The specifications in this chapter apply as of system version 8.

User

The following users are created per default:

| Username | Password | Assigned role |
|--|----------|--|
| Master | 9200 | <ul style="list-style-type: none"> AdministratorRole CodesysUiRole LcdUiRole TftUiRole WebUiRole |
| User1 | 1 | <ul style="list-style-type: none"> UserRole CodesysUiRole LcdUiRole TftUiRole WebUiRole |
| Service | 9200 | <ul style="list-style-type: none"> ServiceDisplayRole CodesysUiRole LcdUiRole TftUiRole WebUiRole |
| UnregisteredUser This user must not be deleted! | | <ul style="list-style-type: none"> ReadOnlyRole |

A user can be edited, and it can also be removed. Likewise, the user's password can also be changed.

The  function is used to create a new user.



NOTE!

Due to the restricted possibilities for displaying and entering data on the device display, users with the right "SystemStatusUi" can only be assigned simple passwords. To prevent these passwords from being cracked via the web application, these users must not also be given the right "WebUi".

Roles

The following roles are defined per default:

- AdministratorRole
- UserRole
- ReadOnlyRole (do not delete this role)
- ServiceDisplayRole
- LcdUiRole (previously: SystemStatusUi; do not delete this role)
- TftUiRole (previously: SystemUi); do not delete this role)
- WebUiRole (do not delete this role)
- CodesysUiRole (do not delete this role)

The following tables show the roles defined per default and the rights they confer (= X).

8 Annex

| AdministratorRole | UserRole | ReadOnlyRole | ServiceDisplayRole | LcdUIRole | TftUIRole | WebUiRole | CodesysUIRole | Right | Description |
|-------------------|----------|--------------|--------------------|-----------|-----------|-----------|---------------|---------------------------|--|
| X | X | | | | | | | AlarmAcknowledgement | Acknowledge alarm |
| X | | | X | | | | | BusControl | Change the system bus status (Stop, Start, Reset statistics) |
| X | | | | | | | | CertificateAdministration | Manage certificate |
| X | X | X | X | | | | | ConfigurationRead | Read configuration This right is necessary for the assignment of a special configuration right. |
| X | X | X | X | | | | | ConfigurationWrite | Write configuration This right is necessary for the assignment of a special configuration right. |
| X | (X) | (X) | (X) | | | | | x.Configuration.Read | Read special configuration The special configuration rights are listed in the following table. |
| X | (X) | (X) | (X) | | | | | x.Configuration.Write | Write special configuration The special configuration rights are listed in the following table. |
| X | | | | | | | | DebugDataDelete | Delete debug data |
| X | X | X | X | | | | | DebugDataRead | Read debug data |
| X | | | X | | | | | DebugInterfaceActivation | Activate SSH interface (only possible on the device) |
| X | X | X | X | | | | | DeviceInformationRead | Read device information |
| X | | | | | | | | EventlistDelete | Delete event list |
| X | X | | | | | | | EventlistRead | Read event list |
| X | | | X | | | | | FirmwareUpdate | Perform a firmware update |
| X | | | | | | | | RecorderAdministration | Delete database |
| X | | | X | | | | | SystemStateControl | Change the system status |
| X | | | | | | | | UserManagement | Manage users |
| | | | | X | | | | SystemStatusUi | Visibility of the user in the device display (only with JUMO variTRON 300 and 500) When assigning this right, take into account the restricted possibilities for displaying and entering data on the device display (username, password). |
| | | | | | X | | | SystemUi | Visibility of the user in the device display (only with JUMO variTRON 500 touch) |
| | | | | | | X | | WebUi | Logging into the "Web Cockpit" web application |
| | | | | | | | X | CodesysUi | Visibility of the user in the CODESYS UI |

Special configuration rights:

| AdministratorRole | UserRole | ReadOnlyRole | ServiceDisplayRole | Right | Description |
|-------------------|----------|--------------|--------------------|--|---|
| X | | | | AccessControlManager.Configuration.Read | Read settings for users, roles, and rights |
| X | | | | AccessControlManager.Configuration.Write | Write settings for users, roles, and rights |
| X | X | X | | BatchManager.Configuration.Read | Read settings for batch control |
| X | X | X | | BatchManager.Configuration.Write | Write settings for batch control |
| X | | | | CertificateHandler.Configuration.Read | Read settings for certificate management (e.g. for Node-RED, HTTPS) |
| X | | | X | CertificateHandler.Configuration.Write | Write settings for certificate management (only texts) |
| X | | | | CloudGatewayBackend.Configuration.Read | Read settings for the connection to the JUMO Cloud |
| X | | | | CloudGatewayBackend.Configuration.Write | Write settings for the connection to the JUMO Cloud |
| X | X | | X | ConfigurationDataManager.Configuration.Read | Export configuration (e.g. on USB flash drive) or extract in the Web Cockpit |
| X | | | X | ConfigurationDataManager.Configuration.Write | Import configuration (e.g. from USB flash drive) or import in the Web Cockpit |
| X | | | | DataBaseManagement.Configuration.Read | Read settings for recording data export |
| X | | | | DataBaseManagement.Configuration.Write | Write settings for recording data export |
| X | | | X | DebugDataManager.Configuration.Read | Read settings for debug data (only texts) |
| X | | | X | DebugDataManager.Configuration.Write | Write settings for debug data (only texts) |
| X | X | X | X | DeviceManager.Configuration.Read | Read settings for device manager |
| X | X | | X | DeviceManager.Configuration.Write | Write settings for device manager |
| X | X | X | X | DeviceManager.UnitManagerConfiguration.Read | Read settings for units |
| X | X | | X | DeviceManager.UnitManagerConfiguration.Write | Write settings for units |
| X | | | | EmailManager.Configuration.Read | Read settings for sending emails |
| X | | | | EmailManager.Configuration.Write | Write settings for sending emails |
| X | | | | EtherCatGateway.Configuration.Read | Read settings for system bus |
| X | | | | EtherCatGateway.Configuration.Write | Write settings for system bus |
| X | | | | EventlistHandler.Configuration.Read | Read settings for events (only texts) |
| X | | | | EventlistHandler.Configuration.Write | Write settings for events (only texts) |
| X | | | | LicenceManager.Configuration.Read | Read settings for licenses (only texts) |
| X | | | | LicenceManager.Configuration.Write | Write settings for licenses (only texts) |
| X | | | | NodeRedBackend.Configuration.Read | Read settings for Node-RED |
| X | | | | NodeRedBackend.Configuration.Write | Write settings for Node-RED |
| X | X | X | X | PeripheryManager.Configuration.Read | Read settings for Ethernet |
| X | | | X | PeripheryManager.Configuration.Write | Write settings for Ethernet |
| X | X | X | X | PeripheryManager.PortManagement.Read | Read settings for Ethernet port management |
| X | | | X | PeripheryManager.PortManagement.Write | Write settings for Ethernet port management |

8 Annex

| AdministratorRole | UserRole | ReadOnlyRole | ServiceDisplayRole | Right | Description |
|-------------------|----------|--------------|--------------------|---|---|
| X | | | | RealTimeScheduler.Configuration.Read | Read settings for real-time processing (e.g. groups) |
| X | | | | RealTimeScheduler.Configuration.Write | Write settings for real-time processing (e.g. groups) |
| X | | | | SpsConfigurationManager.Codesys.Read | Read CODESYS application |
| X | | | | SpsConfigurationManager.Codesys.Write | Write CODESYS application |
| X | | | | SpsConfigurationManager.Configuration.Read | Read settings for PLC configuration |
| X | | | | SpsConfigurationManager.Configuration.Write | Write settings for PLC configuration |
| X | | | | SpsConfigurationManager.Parameter.Read | Read application-specific PLC settings 1 (PLC parameter) |
| X | | | | SpsConfigurationManager.Parameter.Write | Write application-specific PLC settings 1 (PLC parameter) |
| X | | | | SpsConfigurationManager.Parameter2.Read | Read application-specific PLC settings 2 (PLC parameter 2) |
| X | | | | SpsConfigurationManager.Parameter2.Write | Write application-specific PLC settings 2 (PLC parameter 2) |
| X | | | | SpsConfigurationManager.Parameter3.Read | Read application-specific PLC settings 3 (PLC parameter 3) |
| X | | | | SpsConfigurationManager.Parameter3.Write | Write application-specific PLC settings 3 (PLC parameter 3) |
| X | | | | SpsConfigurationManager.Parameter4.Read | Read application-specific PLC settings 4 (PLC parameter 4) |
| X | | | | SpsConfigurationManager.Parameter4.Write | Write application-specific PLC settings 4 (PLC parameter 4) |
| X | X | | | SpsConfigurationManager.Programs.Read | Read settings for programs |
| X | X | | | SpsConfigurationManager.Programs.Write | Write settings for programs |
| X | | | | StorageManager.Configuration.Read | Read settings for data carrier management (network drives) |
| X | | | | StorageManager.Configuration.Write | Write settings for data carrier management (network drives) |
| X | | | X | SystemLogger.Configuration.Read | Read settings for system logger (only texts) |
| X | | | X | SystemLogger.Configuration.Write | Write settings for system logger (only texts) |
| X | | | | SystemObserver.Configuration.Read | Read settings for system monitoring (only texts) |
| X | | | | SystemObserver.Configuration.Write | Write settings for system monitoring (only texts) |
| X | | | | SystemStatusManager.Configuration.Read | Read settings for system status manager (only texts) |
| X | | | | SystemStatusManager.Configuration.Write | Write settings for system status manager (only texts) |

| AdministratorRole | UserRole | ReadOnlyRole | ServiceDisplayRole | Right | Description |
|-------------------|----------|--------------|--------------------|---|---|
| X | X | | X | SystemStatusUi.Configuration.Read | Read settings for system status UI (device display); only with devices with LCD display such as JUMO variTRON 300 and 500 |
| X | X | | X | SystemStatusUi.Configuration.Write | Write settings for system status UI (device display) (see above) |
| X | | X | | SystemUi.Configuration.Read | Read settings for system UI (device screen); only with devices with TFT display such as JUMO variTRON 500 touch |
| X | | X | | SystemUi.Configuration.Write | Write settings for system UI (device screen) (see above) |
| X | | | | SystemUpdateManager.Configuration.Read | Read settings for firmware update (only texts) |
| X | | | | SystemUpdateManager.Configuration.Write | Write settings for firmware update (only texts) |
| X | | | | WTransGateway.Configuration.Read | Read settings for Wtrans gateway |
| X | | | | WTransGateway.Configuration.Write | Write settings for Wtrans gateway |
| X | | | X | WebGatewayBackend.Configuration.Read | Read settings for web server |
| X | | | X | WebGatewayBackend.Configuration.Write | Write settings for web server |

A role can be edited, and it can also be removed.

The function  is used to define a new role.

When editing a role, it is also possible to add your own rights (using the "Add" function), which can be used in the CODESYS application by means of the "CmpAccessControlManager" library.

8 Annex

8.2 Technical data

8.2.1 Interfaces

| | |
|--|---|
| <p>USB host</p> <p>Designation</p> <p>Type</p> <p>Number</p> <p>Device category</p> <p>Application</p> <p>Data rate</p> <p>Max. current</p> | <p>USB</p> <p>A (socket)</p> <p>1</p> <p>Mass Storage Class, Communications Device Class – Ethernet Control Module (as of system version 8)</p> <p>Connecting a USB flash drive or a USB to Ethernet converter (as of system version 8)</p> <p>Low Speed, Full Speed, Hi-Speed</p> <p>500 mA</p> |
| <p>Ethernet</p> <p>Designation</p> <p>Type</p> <p>Number</p> <p>Protocol</p> <p>Application</p> <p>Transfer rate</p> <p>Connecting cable</p> <p>Cable length</p> | <p>LAN1, LAN2</p> <p>RJ45</p> <p>2</p> <p>TCP, IPv4, HTTP(S)</p> <p>Via CODESYS as an option: Modbus TCP, PROFINET IO-Controller, EtherCAT Master, OPC UA Server, BACnet/IP, Ethernet/IP (as of system version 10)</p> <p>Communication with:</p> <ul style="list-style-type: none"> - PC (setup program, web browser) - Mail server - Modbus TCP Master/Slave - - PROFINET IO-Device - EtherCAT Slave - OPC UA Client - BACnet/IP Server/Client - JUMO system bus via JUMO variTRON router modules (LAN2 only) <p>10 Mbit/s, 100 Mbit/s</p> <p>Network cable, at least CAT5 (S/FTP)</p> <p>Up to 100 m</p> |
| <p>RS485 (serial interface)</p> <p>Designation</p> <p>Type</p> <p>Number</p> <p>Application</p> <p>Protocol</p> <p>Data format</p> <p>Transfer rate</p> | <p>Com</p> <p>Removable terminal strip, 2-pole with PUSH IN technology</p> <p>1</p> <p>Fieldbus applications, communication via modem with a PC or with a mail server</p> <p>Via CODESYS: Modbus RTU Master/Slave</p> <p>8/1/n, 8/1/e, 8/1/o</p> <p>9600 Bd, 19200 Bd, 38400 Bd</p> |

| | |
|--|--|
| <p>Wireless interface (optional, as of system version 5)</p> | |
| <p>Antenna connector</p> | <p>SMA socket</p> |
| <p>Radio frequency</p> | <p>868.4 MHz (Europe) or 915 MHz (USA, Australia, Canada, New Zealand, etc.)</p> |
| <p></p> | <p>In the 915 MHz frequency band (912.6 MHz to 917.4 MHz) one of 10 fixed frequencies can be set.</p> |
| <p>Open air range</p> | <p>300 m with 868.4 MHz or 200 m with 915 MHz</p> |
| <p></p> | <p>Range when using the antenna holder for wall mounting with 3 m long antenna cable; when mounting the antenna directly to the receiver, a reduction in the range must be taken into account.</p> |
| <p>Erforderlicher RSSI value for error-free transmission</p> | <p>> -90 (with stationary transmitter)</p> |
| <p></p> | <p>The RSSI value is an indicator of the strength of the received signal (theoretical value range: -120 to 0).</p> |
| <p>Application</p> | <p>Receiver for JUMO Wtrans transmitters (wireless measured value transmission)</p> |
| <p>Compatible transmitters</p> | <p>Wtrans T (902930), Wtrans B (707060), Wtrans p (402060), Wtrans E01 (902928) as of system version 6</p> |
| <p></p> | <p>Not supported thermocouple types with Wtrans B: MoRe5-MoRe41, W3Re-W26Re</p> |

8 Annex

8.2.2 Display

| | |
|------------|-------------------------|
| Type | LCD, monochrome |
| Resolution | 96 × 64 pixels (8 rows) |

8.2.3 Electrical data

| | |
|--|--|
| Voltage supply (terminals +24 V and GND) Symbol (see nameplate) Connection |  At the front (removable terminal strip, 2-pole with PUSH IN technology) |
| Voltage Residual ripple | DC 24 V +25/-20 % SELV 5 % |
| Current consumption | Max. 280 mA (at DC 19.2 V) |
| Power consumption | Max. 5.6 W |
| Conductor cross section on terminals +24 V and GND Wire or stranded wire without ferrule Stranded wire with ferrule 2 × stranded wire with twin ferrule with plastic collar Stripping length | Min. 0.2 mm ² , max. 2.5 mm ² Min. 0.25 mm ² , max. 2.5 mm ² Min. 0.5 mm ² , max. 1.5 mm ² (both stranded wires with identical cross section) 10 mm |
| Conductor cross section on terminals 1 and 2 (COM) Wire or stranded wire without ferrule Stranded wire with ferrule Stripping length | Min. 0.14 mm ² , max. 1.5 mm ² Without plastic collar: min. 0.25 mm ² , max. 1.5 mm ² With plastic collar: min. 0.25 mm ² , max. 0.5 mm ² 9 mm |
| Electrical safety | According to DIN EN 61010-1:2020 Overvoltage category III, pollution degree 2 |
| Protection rating | III |
| Electromagnetic compatibility (EMC) Interference emission Interference immunity | Acc. to DIN EN 61326-1:2022 Class A – only for industrial use – Industrial requirement |
| Radio frequency spectrum 868.4 MHz 915 MHz (912.6 MHz to 917.4 MHz) | Acc. to ETSI EN 300 220-1 and ETSI EN 300 220-2 Acc. to FCC - Title 47 CFR Part 15 and ANSI C63.4 |
| Buffer battery service life | Typically 6 years (lithium battery) Observe error messages on battery status in the event list (battery almost empty, battery empty)! |

8.2.4 Housing and environmental conditions

| | |
|--------------------------------------|--|
| Case type | Plastic case for DIN rail mounting in the control cabinet (indoor use); DIN rail acc. to DIN EN 60715, 35 mm × 7.5 mm × 1 mm |
| Dimensions (W × H × D) | 45 mm × 101 mm × 101.5 mm (without connection elements) |
| Weight (fully fitted, incl. antenna) | Approx. 215 g |
| Protection type | IP20, according to DIN EN 60529 |
| Ambient temperature range | -20 to +55 °C |
| Storage temperature range | -40 to +70 °C |
| Resistance to climatic conditions | Relative humidity ? 90 % annual average without condensation (climate class 3K3 acc. to DIN EN 60721-3-3 with extended temperature and humidity range) |
| Site altitude | Up to 2000 m above sea level |
| Vibration | Acc. to DIN EN 60068-2-6, table C.2 |
| Amplitude | 0.15 mm from 10 to 58.1 Hz |
| Acceleration | 20 m/s ² from 58.1 to 150 Hz |
| Shock | Acc. to DIN EN 60068-2-27, table A.1 |
| Peak acceleration | 150 m/s ² |
| Shock duration | 11 ms |

8.2.5 Approval marks and certificates

| | |
|----------------------------------|--|
| c UL us | |
| Test facility | Underwriters Laboratories |
| Certificate/certification number | E201387 |
| Inspection basis | UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.) |
| Valid for | All types |
| DNV | |
| Test facility | DNV |
| Certificate/certification number | TAA000016N |
| Inspection basis | Class Guideline DNV-CG-0339 |
| Valid for | Type without wireless interface; a power supply unit with DNV type approval is required (e.g. type 705090) |

8 Annex

8.3 PLC data

System times

| | Typical |
|---|---|
| Adjustable PLC cycle time (Task) ^a Adjustable task cycles are not limited on the device side. If and where necessary, CODESYS restrictions in this regard must be observed (see documentation for CODESYS). | 125 ms (factory setting when creating an IEC task) |
| System bus cycle time for - Multichannel controller module - Analog input module 4-channel - Analog input module 8-channel - Analog output module 4-channel | 30 ms |
| System bus cycle time ^b for - Relay module 4-channel - Digital input/output module 12-channel - Digital input/output module 32-channel | 10 ms |
| Sampling rate | |
| - Multichannel controller module ^a | 50 ms |
| - Analog input module 4-channel ^a | 50 ms |
| - Analog input module 8-channel ^a | 375 ms |
| - Analog output module 4-channel ^a | 20 ms |
| - Relay module 4-channel ^b | 0 ms |
| - Digital input/output module 12-channel ^b | 0 ms |
| - Digital input/output module 32-channel ^b | 0 ms |
| Detection of a module failure for - Multichannel controller module - Analog input module 4-channel - Analog input module 8-channel - Analog output module 4-channel | 100 to 750 ms |
| Detection of a module failure for - Relay module 4-channel - Digital input/output module 12-channel - Digital input/output module 32-channel | 25 ms |

^a Asynchronous with system bus

^b Synchronous with system bus

IEC tasks

Assignment of IEC tasks:

- 0 to 15: RT task
- 6 to 32: Normal priority
- Factory setting: Priority 31

Details are to be found in the CODESYS documentation.



NOTE!

The device does not have an integrated UPS. In case of a power failure, the IEC tasks are not terminated in a defined manner. The retain data is saved regularly as part of the factory boot project (cycle time 1 s). This realization is to be adapted by the user to his requirements. The backup should be realized by a regular synchronization of the data within a CODESYS application. The required cycle time and, if necessary, other parameters must also be defined by the user.

Memory for customer-specific PLC programs

The available memory space for customer-specific PLC programs (program code, data, retain data) is dynamic and depends on how much free memory is available in the device.

The free memory is displayed in the system monitoring (Device info > System monitoring > Memory). However, this memory must not be used completely, as the system will then no longer run stably.

8 Annex

8.4 Buffer battery replacement



CAUTION!

The device contains a buffer battery that is used for data buffering when the device is in switched off mode or if the power fails. The operating life of the battery is typically 6 years. If the battery is low, this is indicated by a fault message in the event list ("Battery almost empty").

Danger of data loss!

- ▶ Replace battery in time.
-



CAUTION!

Incorrect handling may result in damage or malfunctions.

This compromises the function of the central processing unit or the system as a whole.

- ▶ Only qualified personnel are permitted to replace the buffer battery. The country-specific requirements regarding changes to an electrical device must be observed. Before replacement, the system must be shut down and isolated from the power supply.
-



CAUTION!

Electronic components may be damaged by electrostatic discharge.

This compromises the function of the central processing unit or the system as a whole.

- ▶ Work may only be carried out at a grounded workstation and in compliance with the relevant safety measures.
-



NOTE!

Only replace the battery with the following battery type (available from the manufacturer of the device):

Battery manufacturer: RENATA

Type: CR2032 MFR

Temperature range: -30 to +85 °C



WARNING!

Use of an unsuitable battery type

Risk of fire or explosion!

- ▶ Only replace the battery with the battery type specified above.
-



WARNING!

Improper handling of the battery (lithium button cell)

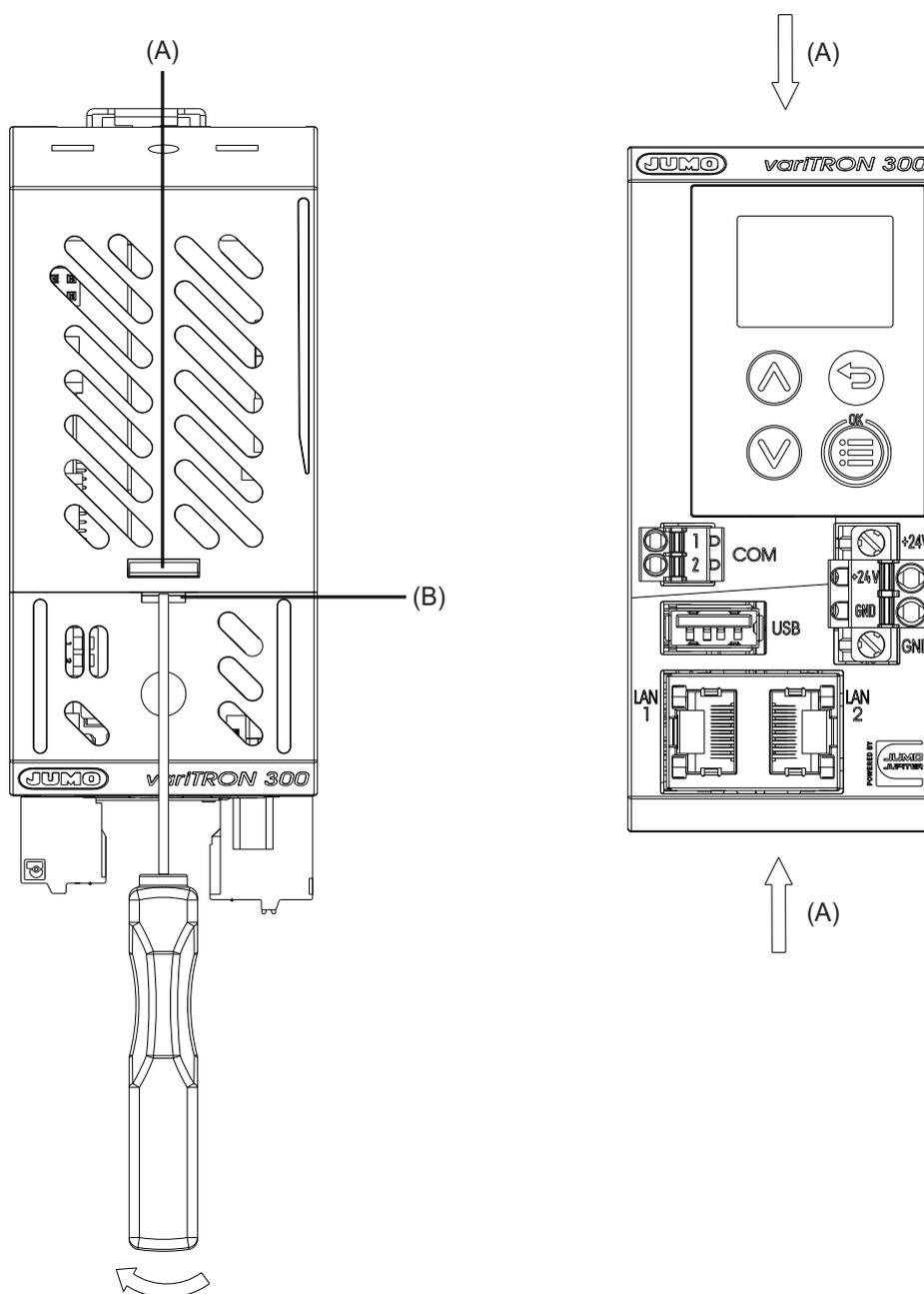
Risk of fire or explosion!

- ▶ Do not recharge, disassemble or dispose of the battery in a fire.
-

Shutting down the system

1. Shut down the system and disconnect it from the voltage supply. To do this, loosen the 2 screws of the wired terminal strip +24V/GND and pull the terminal strip forward.
2. If necessary, pull off the wired terminal strip COM toward the front.
3. If necessary, remove other connecting cables (USB, LAN).

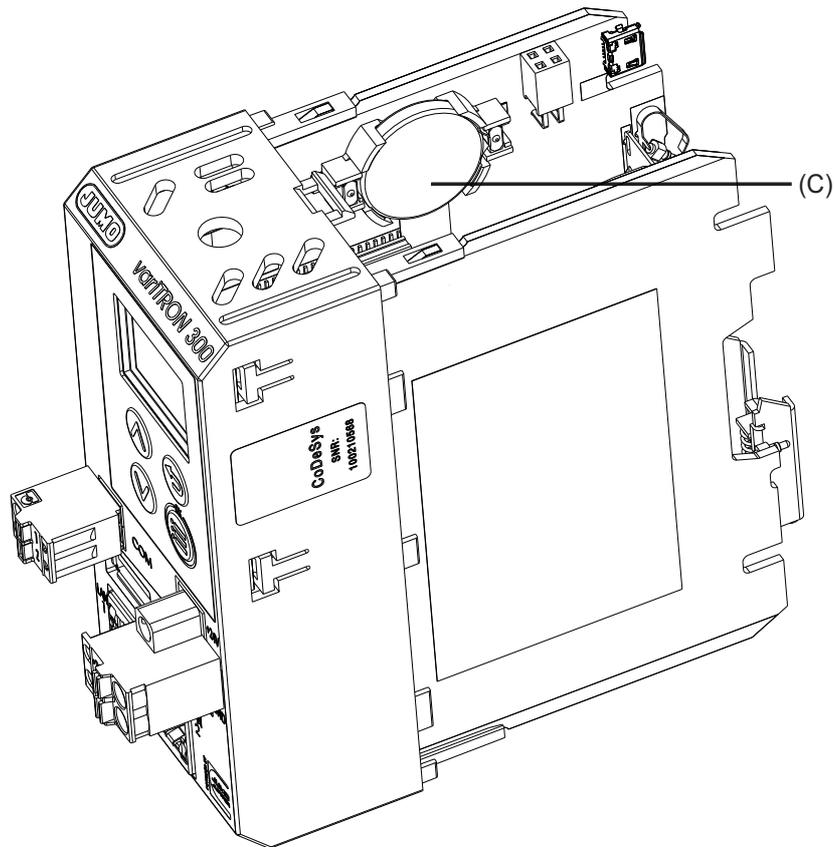
Opening the housing



1. If necessary for space reasons, remove the central processing unit from the DIN rail. To do this, please follow the instructions on dismantling previously provided in this document.
2. Loosen both locking hooks (A) one after the other using a screwdriver. To do this, insert the screwdriver into the small slot (B) below the locking hook and turn carefully (maximum 90°). When doing so, pull the housing parts slightly apart so that the locking connections can be released.
3. Pull the front housing section out of the rear housing section.

8 Annex

Replacing the battery



1. Remove the old battery (C) from the holder and replace it with a new one of the same type.

Closing the housing

1. Insert the front housing section into the rear housing section and ensure that both locking hooks engage.
2. If applicable, place the central processing unit back on the top-hat rail. To do this, please follow the instructions on installation previously provided in this document.

Starting up the system again

1. If applicable, connect the connecting cables (USB, LAN).
2. If applicable, attach the wired terminal strip COM.
3. Attach the wired terminal strip +24V/GND and fasten. Start up the system.

8.5 Open-source software

The software of device and/or components of the device was developed using open-source software.

Insofar as the respective applicable license conditions justify a claim to the provision of the source code or other information, JUMO GmbH & Co. KG will provide the source code and the license texts on a conventional data carrier at the costs incurred for the provision of the data carrier.

This offer is valid for three years after the software is made available. If provided for in the license terms, this offer is valid beyond that.

For questions regarding open source software, please contact:

Address JUMO GmbH & Co. KG
License Compliance
Moritz-Juchheim-Straße 1
36039 Fulda, Germany

Email licensecompliance@jumo.net

8 Annex

8.6 China RoHS

|  产品组别 Product group: 705003 部件名称 Component Name | 产品中有害物质的名称及含量 China EEP Hazardous Substances Information | | | | | | |
|--|---|-----------|-----------|-----------------|---------------|-----------------|---|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) | |
| | 外壳 Housing (Gehäuse) | ○ | ○ | ○ | ○ | ○ | ○ |
| 过程连接 Process connection (Prozessanschluss) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 螺母 Nuts (Mutter) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 螺栓 Screw (Schraube) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

本表格依据SJ/T 11364的规定编制。
 This table is prepared in accordance with the provisions SJ/T 11364.
 ○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
 Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.
 x：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
 Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.



JUMO GmbH & Co. KG

Street address:
Moritz-Juchheim-Straße 1
36039 Fulda, Germany

Delivery address:
Mackenrodtstraße 14
36039 Fulda, Germany

Postal address:
36035 Fulda, Germany

Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO UK LTD

JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK

Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.

6724 Joy Road
East Syracuse, NY 13057, USA

Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

