



JUMO variTRON – Automation System

System overview

Brief description

The central processing unit JUMO variTRON 500 along with the proven input and output modules (incl. controller module) form a complete system. In case of the central processing unit JUMO variTRON 300 a router module is additionally required (primary: router module 1-port).

The central processing unit manages all configuration and parameter data of the complete system and provides a PLC acc. to IEC 61131-3 (CODESYS V3.5; as extra code). The PLC can be activated in different versions:

- CODESYS runtime system
- CODESYS runtime system incl. Remote TargetVisu
- CODESYS runtime system incl. WebVisu
- CODESYS runtime system incl. Remote TargetVisu and WebVisu

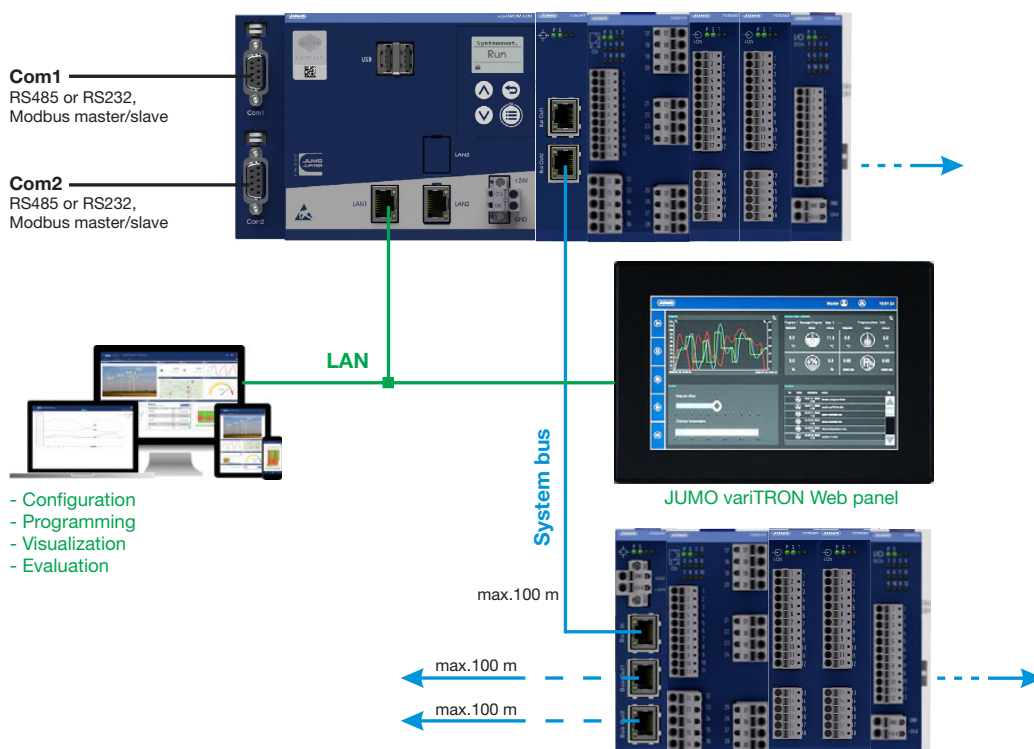
For visualization, commercially available panels are used which support CODESYS Remote TargetVisu or WebVisu functionality. The visualization is also possible via web browser. Visualizations have to be implemented with CODESYS resources.

A convenient 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.

Features

- Quick wiring of operating voltage and system bus provided by simple module connection principle
- Flexible connection technology due to removable terminal strips with Push-In technology
- Modular device and function concept
- Web panels (705070) with capacitive or resistive touch screen in different sizes
- Universal analog inputs
- Reliable, independent PID controllers with autotuning function
- Integrated PLC acc. to IEC 61 131-3 (option)

System with JUMO variTRON 500



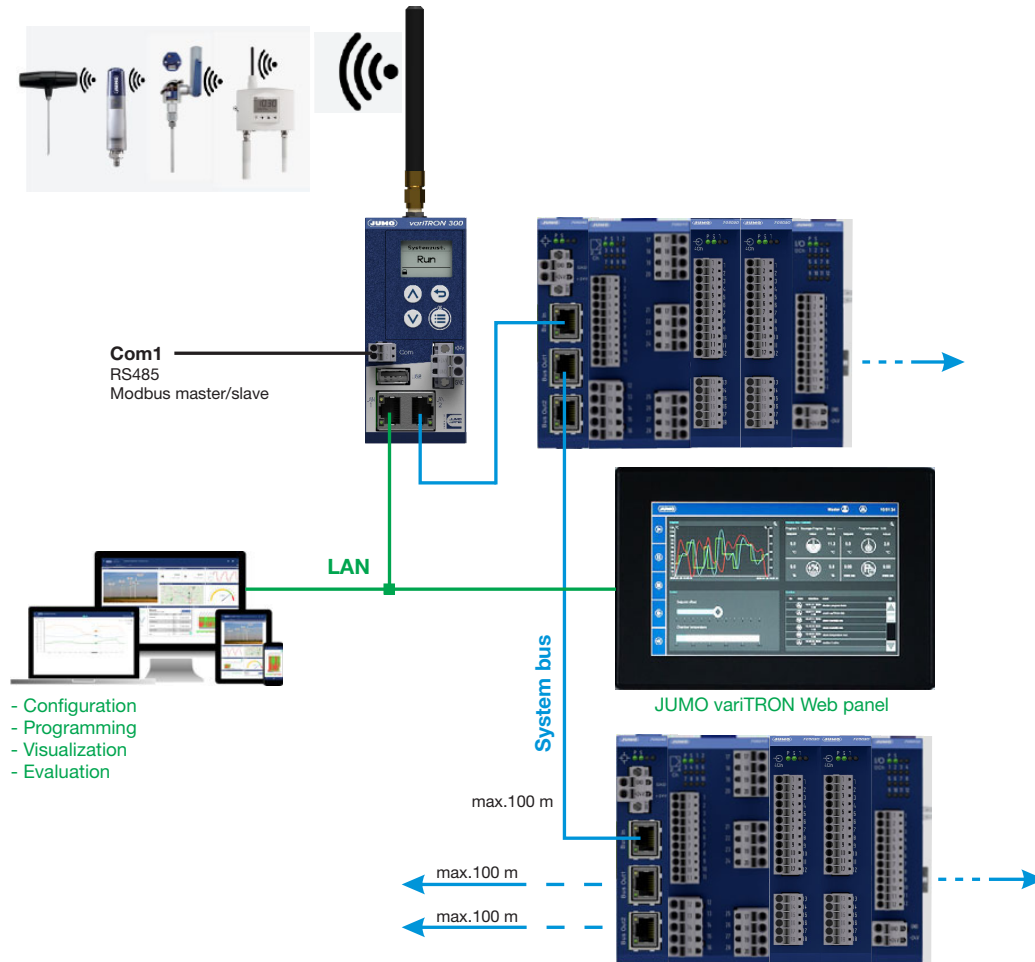
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System with JUMO variTRON 300

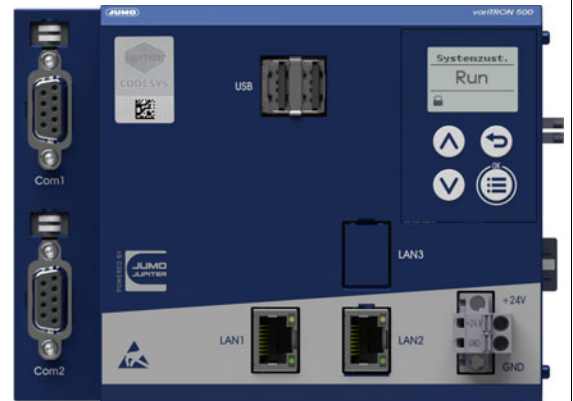


Central processing unit

JUMO variTRON 500 – 705002

CPU

- Quad Core CPU 800 MHz
- RAM 1024 MB, battery-backed SRAM (for retain data)
- eMMC 8 GB (flexible allocation between system data and application data)
- Battery-backed real-time clock
- Process mapping for all connected input/output modules (including controller modules)
- Display and keys to display the system status
- 2 USB host interfaces
- OPC UA server (in conjunction with PLC)
- 9 program generators (in conjunction with PLC, as of system version 4)
- 2 field bus interfaces (RS232 or RS485; as of system version 3)
- PROFINET IO controller (in conjunction with PLC)
- Data evaluation with JUMO smartWARE Evaluation (as of system version 6)
- Plug and Play when replacing input/output modules
- The central processing unit operates at a voltage supply of DC 24 V and supplies the connected input/output modules and, if necessary, the router module 705041
- Dimensions (W × H × D): 135 mm × 101 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705002

JUMO variTRON 300 – 705003

CPU

- Single Core CPU 792 MHz
- RAM 512 MB
- eMMC 2 GB (flexible allocation between system data and application data)
- Battery-backed real-time clock
- Process mapping for all connected input/output modules (including controller modules)
- Display and keys to display the system status
- USB host interface
- OPC UA server (in conjunction with PLC)
- 9 program generators (in conjunction with PLC)
- Field bus interface (RS485)
- Wireless interface (receiver for JUMO Wtrans transmitters; as of system version 5)
- PROFINET IO controller (in conjunction with PLC)
- Data evaluation with JUMO smartWARE Evaluation (as of system version 6)
- Plug and Play when replacing input/output modules
- The central processing unit operates at a voltage supply of DC 24 V
- A router module is required to connect input/output modules (primary: router module 1-port, 705043)
- Dimensions (W × H × D): 45 mm × 101 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705003



Input/output modules

Multichannel controller module – 705010



- 2-channel PID controller with relay output or logic output to control solid-state relays
- Up to 4 PID controller channels can be activated (cascadable)
- 2 universal analog inputs, 2 digital inputs (DC 0/24 V) and 2 digital outputs (relay or logic DC 0/15 V)
- Supported measuring elements: Thermocouples, RTD temperature probes, resistance transmitters, resistance/potentiometers, or standard signals (current or voltage)
- The analog inputs are galvanically isolated from each other.
- 3 expansion slots for expansion to up to 4 universal analog inputs, 8 digital inputs, 3 analog outputs, or 8 digital outputs
- Supported controller types: Two-state controller, three-state controller, modulating controller, continuous controller, or continuous controller with integrated actuator controller
- Customer-specific linearization possible by using a formula
- Limit value monitoring function
- 4 formulae for math and logic functions (option)
- 1 counter input up to 10 kHz
- The module operates independently (configurable) which means the control task is carried out even if the central processing unit or the higherranking system malfunctions
- Temperature regulator (TR) acc. to DIN EN 14597 (option)
- If the controller is replaced during service work the new controller (identical type) is automatically configured
- Dimensions (W × H × D): 45 mm × 103.6 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705010

Relay module 4-channel – 705015



- 4 relay outputs controlled via the system bus by digital signals
- Each relay is equipped with a changeover contact AC 230 V / 3 A
- Separate terminal strip per relay output
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705015

Analog input module 4-channel – 705020



- 4 universal analog inputs
- Supported measuring elements: Thermocouples, RTD temperature probes, resistance transmitters, resistance/potentiometers, or standard signals (current or voltage)
- The analog inputs are galvanically isolated from each other
- Customer-specific linearization possible by using a formula or up to 45 pairs of values
- Limit value monitoring function
- A digital input (DC 0/24 V) is additionally provided
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705020

Analog input module 8-channel – 705021



- 8 analog inputs for RTD temperature probes Pt100, Pt500, or Pt1000 in 2-wire circuit
- The analog inputs are not galvanically isolated from each other
- Limit value monitoring function
- A digital input (DC 0/24 V) is additionally provided
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705021

Analog output module 4-channel – 705025



- 4 separately configurable analog outputs 0(2) to 10 V or 0(4) to 20 mA
- Analog outputs galvanically isolated from each other
- Configurable behavior in case of an error, e.g. acc. to NAMUR recommendation NE 43
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)



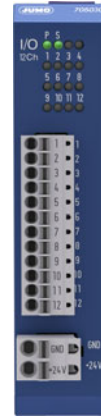
For further information: Refer to data sheet 705025



Digital input/output module 12-channel – 705030

I/O
12

- 12 channels, that can each be configured as digital input (DC 0/24 V) or digital output (DC 0/24 V, 500 mA)
- Supply of external voltage through terminal at the front
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)

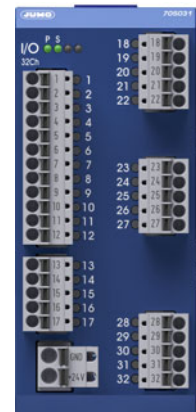


For further information: Refer to data sheet 705030

Digital input/output module 32-channel – 705031

I/O
32

- Compatible with JUMO variTRON as of system version 3
- 17 digital outputs (DC 0/24 V, 500 mA)
- Up to 15 additional digital inputs (DC 0/24 V) or digital outputs (DC 0/24 V, 500 mA) as options
- Supply of external voltage through terminal at the front
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705031

Thyristor power controller TYA 20x – 70906x



- Various device versions for single-phase operation, for operation in a three-phase economy circuit, and for a complete three-phase operation
- Integration into the automation system via EtherCAT or PROF-INET
- Access to various process values of the power controller



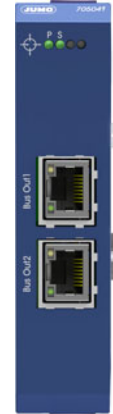
For further information: Refer to data sheet 709061, 709062, 709063

Special modules

Router module 2-port – 705041



- Compatible with JUMO variTRON as of system version 3
- Decentralized module assignment supported
- Arrangement on DIN rail (lateral system bus input and output)
- 2 RJ45 system bus connections at the front (2 × Bus Out), galvanically isolated
- Up to 100 m distance between 2 router modules
- Up to 30 router modules are possible
- No configuration of the router module required
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705041

Router module 3-port – 705042



- Compatible with JUMO variTRON as of system version 3
- Decentralized module assignment supported
- First module on an additional DIN rail for connecting further modules
- 3 RJ45 system bus connections at the front (1 × Bus In, 2 × Bus Out), galvanically isolated
- Up to 100 m distance between 2 router modules
- Up to 30 router modules are possible
- The router module operates at a voltage supply of DC 24 V and supplies the connected input/output modules
- No configuration of the router module required
- For applications such as Hot Connect, for example, the address of the router module can be set by rotary coding switches
- Dimensions (W × H × D): 22.5 mm × 103.6 mm × 101.5 mm (without connection elements)



For further information: Refer to data sheet 705042

Router module 1-port – 705043



- Compatible with JUMO variTRON as of system version 4
- Connects the central processing unit variTRON 300 with the modules
- Decentralized module assignment also supported as an alternative
- First module on an additional DIN rail for connecting further modules
- Galvanic isolation of the system bus connection
- Up to 100 m distance between 2 router modules
- Up to 30 router modules are possible
- The router module operates at a voltage supply of DC 24 V and supplies the connected input/output modules
- No configuration of the router module required
- Dimensions (W × H × D): 22.5 mm × 101 mm × 23.9 mm (without connection elements)



For further information: Refer to data sheet 705043

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Panels

JUMO variTRON web panels – 705070

HMI

Various versions:

- TFT color screen
- Up to 16 million colours
- Touch operation, resistive or capacitive
- Multi-touch operation (capacitive), also with gloves
- Screen sizes (diagonal) from 10.9 cm (4.3") to 54.6 cm (21.5")
- Screen resolutions from 480 × 272 to 1920 × 1080
- Panel mounting or variable fastening
- Connection to the central processing unit via Ethernet interface
- Voltage supply DC 24 V or PoE
- Versions for food industry



For further information: Refer to data sheet 705070

Power supply units

Power supply units 24 V – 705090



- Voltage supply AC 100 to 240 V
- 150 % peak load capability (for typical 4 s)
- Minimum current inrush
- Floating DC-OK relay contact
- Efficiency up to 93.5 %
- Active power factor correction (PFC; for 705090/05-33 and 705090/10-33)
- Active filter against mains transients
- Quick connection due to spring terminals
- Dimensions (W × H × D):
 705090/03-33: 32 mm × 130.5 mm × 106,5 mm
 705090/05-33: 40 mm × 130.5 mm × 121.5 mm
 705090/10-33: 60 mm × 130.5 mm × 121.5 mm



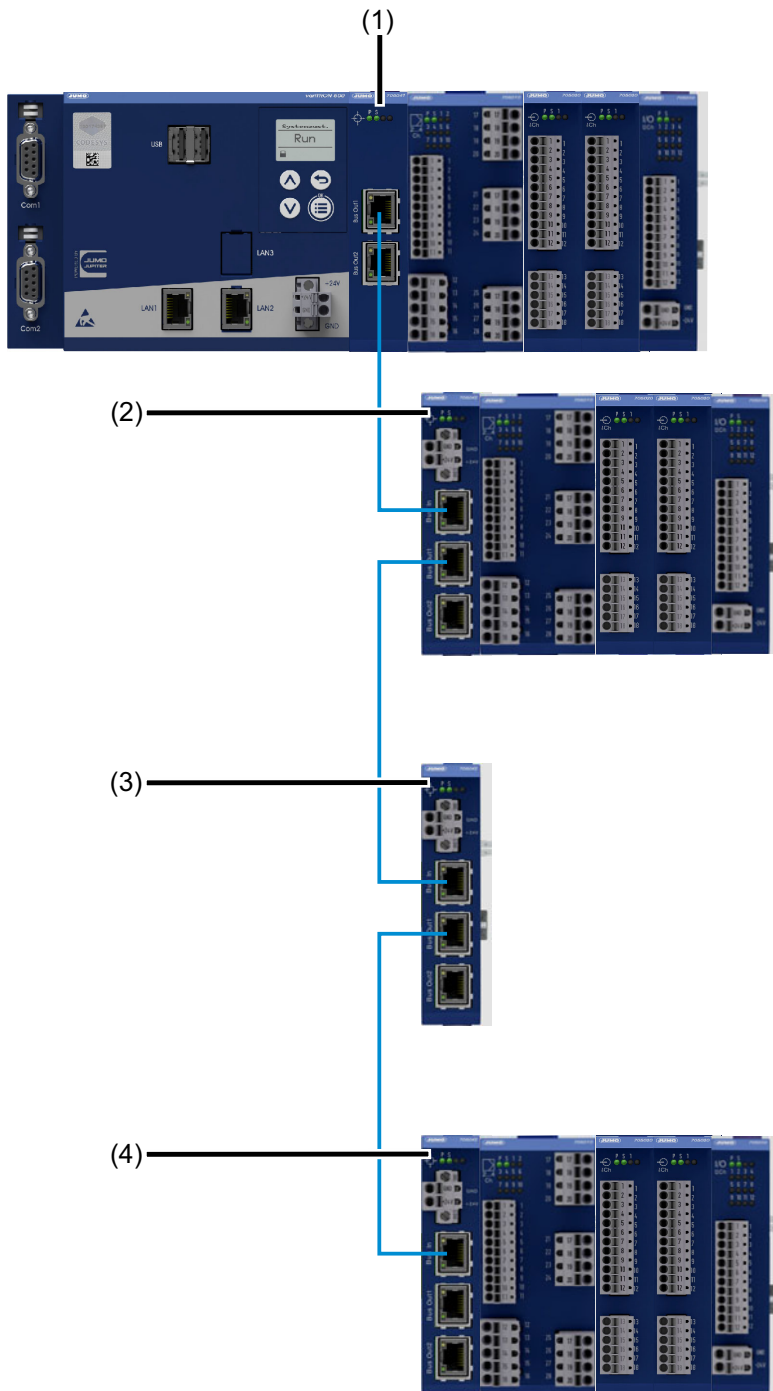
For further information: Refer to data sheet 705090



Use of the router modules

Router modules 2-port and 3-port

Connection example



- (1) Router module 2-port (705041), attached to JUMO variTRON 500 central processing unit (705002)
- (2) Router module 3-port (705042) with downstream modules
- (3) Router module 3-port (705042) to increase the range
- (4) Router module 3-port (705042) with downstream modules

The router module 2-port (705041) is primarily used on the same DIN rail as the variTRON 500 central processing unit (705002) and enables system bus networking with standard network cables (CAT5, S/FTP). The position of the router module 2-port on the DIN rail is freely selectable.

The router module 3-port (705042) or the router module 1-port (705043) is always used as the first module on a separate DIN rail and is designed for system expansion with additional modules. Both router modules can also be used to increase the system bus range.

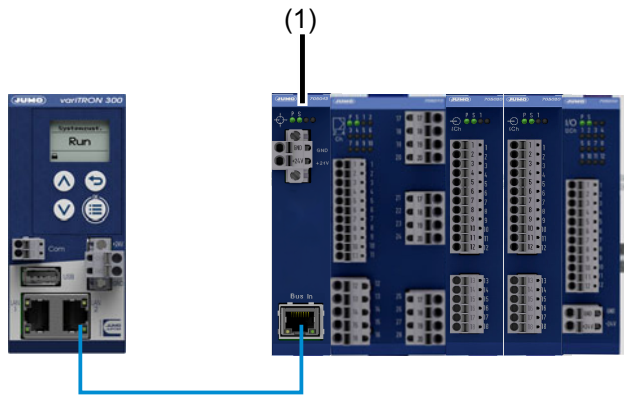
The router module 2-port can also be used together with the router module 1-port or the router module 3-port for system expansion.

System bus interconnection is only possible with the router modules of the JUMO variTRON system (closed system); conventional Ethernet switch technology cannot be used.

In the illustrated connection example, the voltage supply of the central processing unit and the modules is not shown (terminals +24 V and GND).

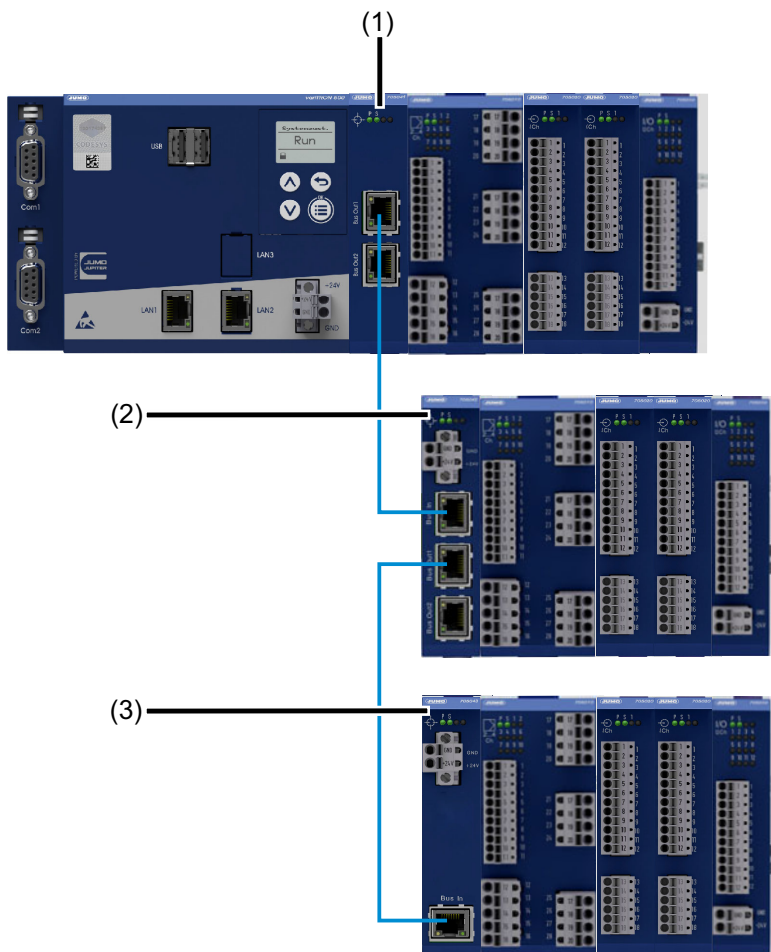
Router module 1-port

Connection example 1



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

Connection example 2



- (1) Router module 2-port (705041), attached to JUMO variTRON 500 central processing unit (705002)
 (2) Router module 3-port (705042) with downstream modules
 (3) Router module 1-port (705043) with downstream modules

The router module 1-port (705043) is mounted on a DIN rail and provides the lateral connections of the system bus and power supply. It is primarily used to connect the input and output modules of the JUMO variTRON automation system to a JUMO variTRON 300 central processing unit (705003), which itself has no side connections (see connection example 1).

The central processing unit is connected to the router module using a standard network cable (CAT5, S/FTP). 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).

In addition, the router module 1-port can also be used for decentralized arrangement of further modules on an additional DIN rail. For this purpose, it is connected to a router module 2-port (705041) or a router module 3-port (705042) of the same system (see connection example 2).

System bus interconnection is only possible with the router modules of the JUMO variTRON system (closed system); conventional Ethernet switch technology cannot be used.

In the illustrated connection example, the voltage supply of the central processing unit and the modules is not shown (terminals +24V and GND).

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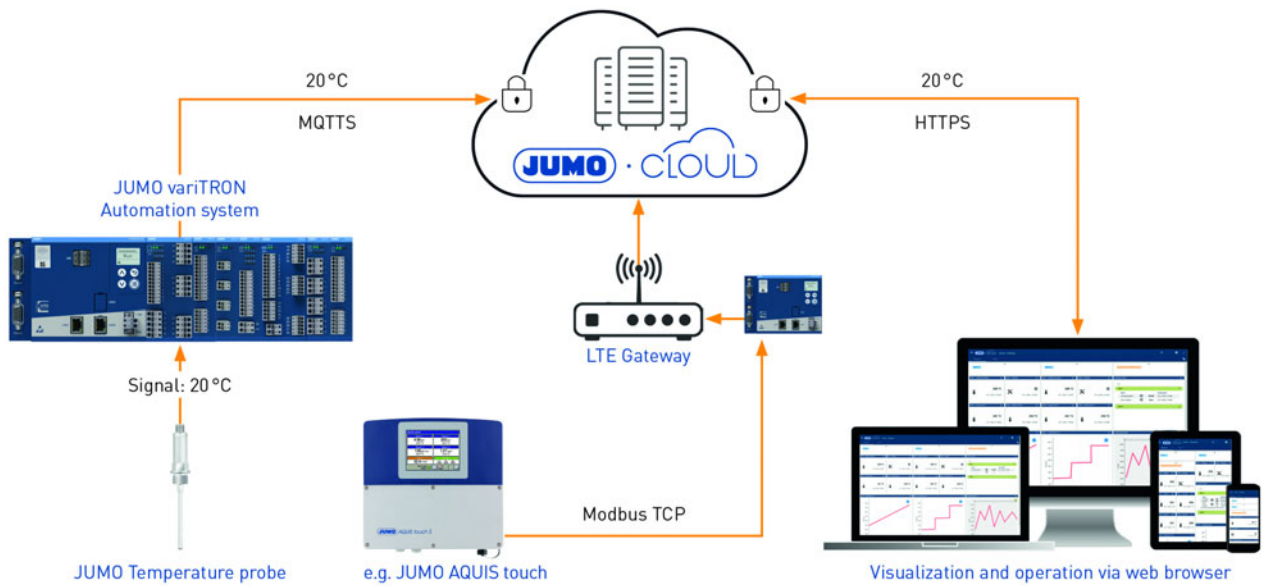
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User software

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

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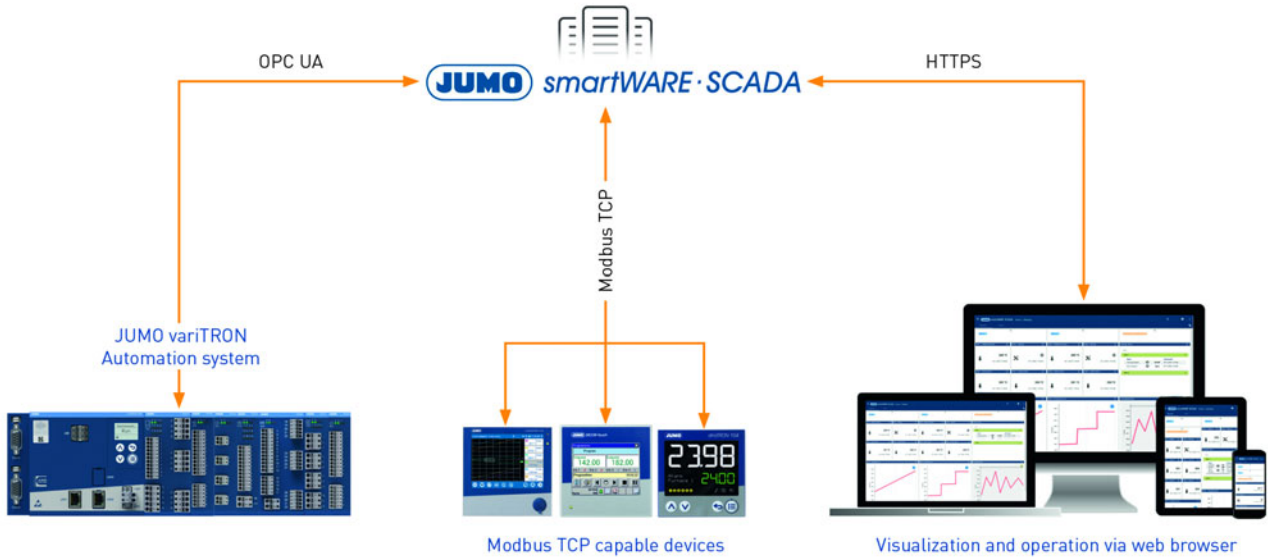
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JUMO smartWARE SCADA

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:

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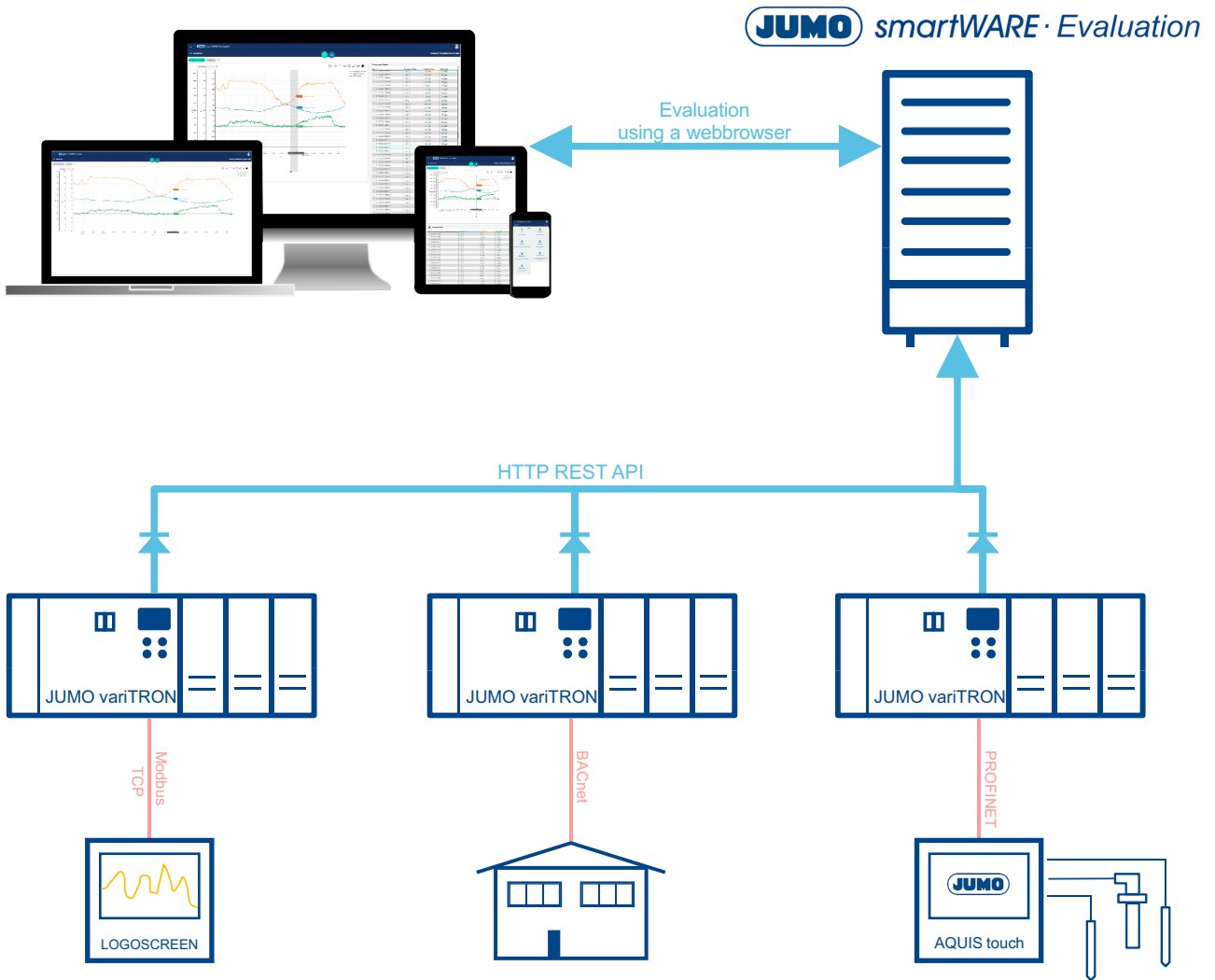
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JUMO smartWARE Evaluation

JUMO smartWARE Evaluation stores process data from distributed plants that is acquired by JUMO variTRON devices. The collected data can be viewed and evaluated with a web browser. Thanks to Docker technology, JUMO smartWARE Evaluation can be installed on a desktop computer, on a server in your own network, or on a cloud server. A manipulation detection system ensures data security.



Further information on the JUMO smartWARE Evaluation software:

qr-en-evaluation.jumo.info

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System versions

A system version consists of individual components from the areas of device software, drivers and templates, and smartWARE products

By enhancing these components, the automation solutions of JUMO are continuously expanded. The enhancements are realized within the scope of new system versions (expansion stages).

Version compatibility

The following overview tables show which versions of the individual components are compatible within a system version.

JUMO variTRON 500 – 705002

Device software

System version	Firmware	CODESYS Runtime		
5	as of 388.5.0.0.32	V3.5 SP16 Patch 3		
6	as of 388.6.0.0.36	V3.5 SP16 Patch 3		
7	as of 388.7.0.0.26	V3.5 SP17 Patch 3		

Drivers and templates

System version	Visu template	digiLine driver		
5	---	2.0.0.5		
6	462.6.0.0.1	2.0.0.5		
7	462.7.x.x.x	2.0.0.5		

smartWARE

System version	smartWARE Setup ^a	smartWARE Evaluation ^a	smartWARE Program ^b	
5	as of 432.4.0.0.35	452.1.0.0.21	---	
6	as of 432.6.0.0.6	452.2.0.0.12	---	
7	as of 432.7.0.0.28	452.3.0.0.12	473.x.x.x.x	

^a downward compatible

^b including Process Technology visu template

JUMO variTRON 300 – 705003

Device software

System version	Firmware	CODESYS Runtime		
6	as of 431.6.0.0.36	V3.5 SP16 Patch 3		
7	as of 431.7.0.0.26	V3.5 SP17 Patch 3		

Drivers and templates

System version	Visu template	digiLine driver		
6	467.6.0.0.1	2.0.0.5		
7	467.7.x.x.x	2.0.0.5		

smartWARE

System version	smartWARE Setup ^a	smartWARE Evaluation ^a	smartWARE Program ^b	
6	as of 432.6.0.0.6	452.2.0.0.12	---	
7	as of 432.7.0.0.28	452.3.0.0.12	---	

^a downward compatible

^b including Process Technology visu template

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Release notes

The release notes show the main differences of a system version compared to the previous system version. A distinction is made according to the central processing units. Differences that apply to all central processing units are listed under 70500x.

System version 5

705002

- Shared file system access from the CODESYS and Node-RED application (/jupiter/share folder)

System version 6

705002

- Acquisition (logging) of process data (max. 240 channels) and batches (max. 20)

705003

- First official availability of 705003
- Acquisition (logging) of process data (max. 60 channels) and batches (max. 10)

70500x

- CODESYS library for process values
- SSH password can be generated
- Adjustable error count for system boot from backup partition

System version 7

705003

- OPC UA server
- CODESYS library for Wtrans transmitter configuration
- Firmware update for radio module (V1.01)

70500x

- Update to CODESYS V3.5 SP17 Patch 3
- CODESYS Development System as 64-bit version (factory default); 32-bit version as "fallback" possible
- Integration of network drives during the configuration
- File system access to USB storage media via CODESYS
- JUMO Web Cockpit: File explorer for files in the shared folder
- Configuration of the groups: Additional operating modes (event operation, event operation with post-trigger, time operation)
- Configuration of the groups: Linear or logarithmic scaling of the analog channels
- Update for cloud gateway (version 4.4.20211214)

End of support (end of life)

- System version 5: April 30, 2022