

JUMO variTRON 300 – Automation System

Central Processing Unit 705003

Brief description

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 router module 1-port, 705043) form a complete system.

The central processing unit manages all configuration and parameter data of the complete system and makes a PLC acc. to IEC 61131-3 (CODESYS V3.5) available (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 (see order details).

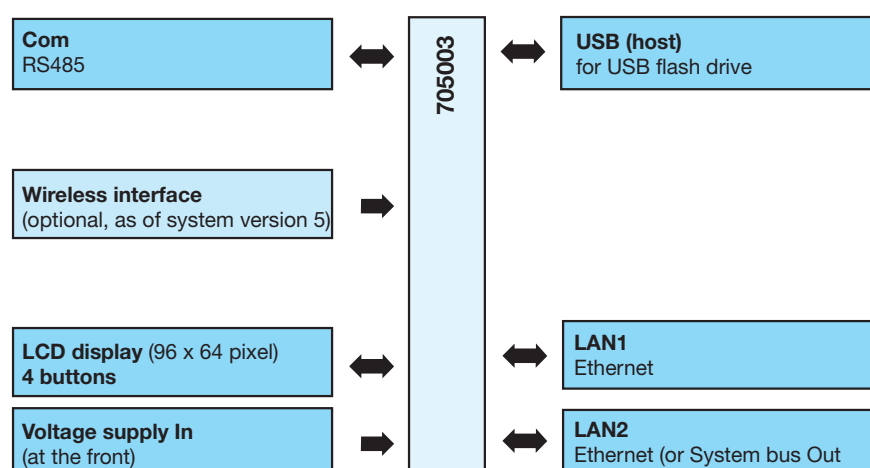
A convenient setup program is used for configuration. JUMO standard functions for CODESYS are provided in libraries (as of system version 6) and can be individually integrated into the customer application.

As of system version 5, the central processing unit JUMO variTRON 300 is also optionally usable as a receiver for the JUMO Wtrans transmitters, thereby enabling wireless transmission of measured values.



Type 705003

Block diagram



Features

- 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; Modbus RTU in conjunction with PLC)
- PROFINET IO controller (in conjunction with PLC)
- Plug and Play when replacing input/output modules
- Battery-buffered RAM
- Real-time clock
- Process data and batch recording (as of system version 6)

Approvals and approval marks (see technical data)

Description

JUMO variTRON 300

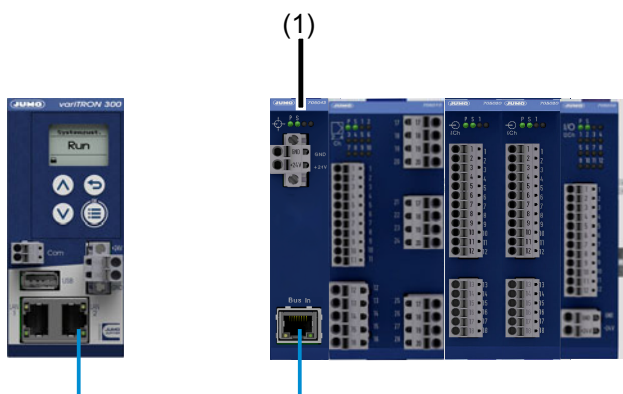
The central processing unit JUMO variTRON 300 is based on a new hardware platform with a 792 MHz processor (single core).

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)
- JUMO 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)

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 digiLine 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.

Process data recording

As of system version 6, the JUMO variTRON 300 central processing unit provides a function for recording process data. This allows up to 60 analog or digital channels (signals) to be recorded. The channels are arranged in groups for this purpose.

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

The JUMO smartWARE Evaluation software is available for visualization and evaluation of the recorded data. Here, a fee-based license is required (number of channels).

Batch recording

As of system version 6, batch recording is also part of the scope of the JUMO variTRON 300 central processing unit, allowing up to 10 batches to be recorded simultaneously.

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

The batch recording is also evaluated using the JUMO smartWARE Evaluation software. Here, a fee-based license is also required (number of batch recordings).

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 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, in a data center, or on a cloud server with a Docker environment. A manipulation detection system ensures data security.

Further information on the JUMO smartWARE Evaluation software:

qr-en-evaluation.jumo.info

Technical data

Interfaces

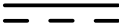
USB host	
Designation	USB
Type	A (socket)
Number	1
Device category	Mass storage class
Application	For connecting a USB flash drive
Data rate	Low Speed, Full Speed, Hi-Speed
Max. current	500 mA
Ethernet	
Designation	LAN1, LAN2
Type	RJ45
Number	2
Protocol	TCP, IPv4, HTTP(S)
Application	Via CODESYS as an option: Modbus TCP, PROFINET IO controller, EtherCAT master, OPC UA server, BACnet/IP Communication with: - PC (setup program, web browser) - email 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)
Transfer rate	10 Mbit/s, 100 Mbit/s
Connecting cable	Network cable, at least CAT5 (S/FTP)
Cable length	Up to 100 m
RS485 (serial interface)	
Designation	Com
Type	Removable terminal strip, 2-pole with PUSH IN technology
Number	1
Application	Fieldbus applications, communication via modem with a PC or with an email server
Protocol	Via CODESYS: Modbus RTU master/slave
Data format	8/1/n, 8/1/e, 8/1/o

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

Display

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

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	DC 24 V +25/-20 % SELV
Residual ripple	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	Min. 0.2 mm ² , max. 2.5 mm ²
Stranded wire with ferrule	Min. 0.25 mm ² , max. 2.5 mm ²
2 × stranded wire with twin ferrule with plastic collar	Min. 0.5 mm ² , max. 1.5 mm ² (both stranded wires with identical cross section)
Stripping length	10 mm
Conductor cross section on terminals 1 and 2 (COM)	
Wire or stranded wire without ferrule	Min. 0.14 mm ² , max. 1.5 mm ²
Stranded wire with ferrule	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
Stripping length	9 mm
Electrical safety	According to DIN EN 61010-1 Overvoltage category III, pollution degree 2
Protection rating	III
Electromagnetic compatibility (EMC)	
Interference emission	Acc. to DIN EN 61326-1 Class A – only for industrial use –
Interference immunity	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
Data backup	Buffered RAM
Buffer battery service life	Typically 6 years (lithium battery) Observe error messages on battery status in the event list (battery almost empty, battery empty)!

Housing and environmental conditions

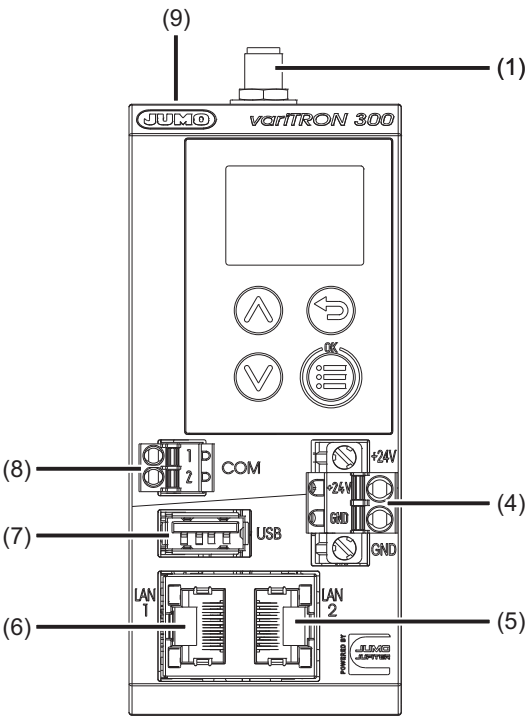
Case type	Plastic case for DIN rail mounting in the control cabinet (indoor use); DIN rail acc. to DIN EN 60715, 35 mm × 7.5 mm × 1 mm
Dimensions (W × H × D)	45 mm × 101 mm × 101.5 mm (without connection elements)
Weight (fully fitted, incl. antenna)	Approx. 215 g
Protection type	IP20, according to DIN 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

Approvals and approval marks

Approval mark	Test facility	Certificate/certification number	Inspection basis	Valid for
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	All types

Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.



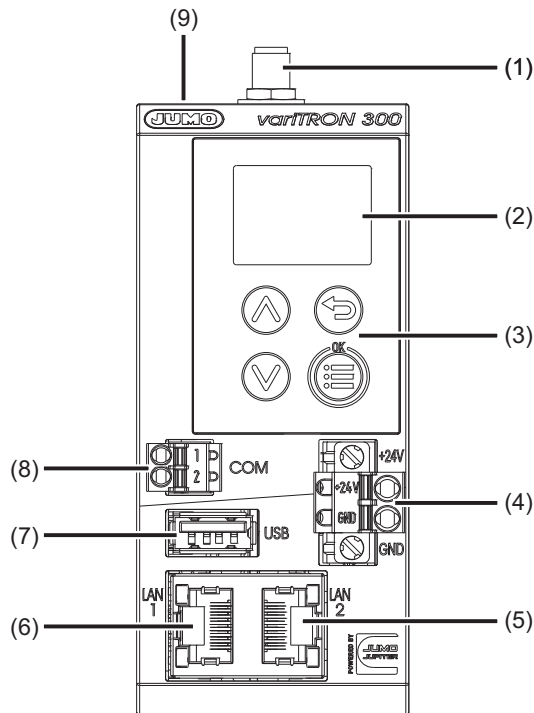
Interfaces

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 -

Voltage supply

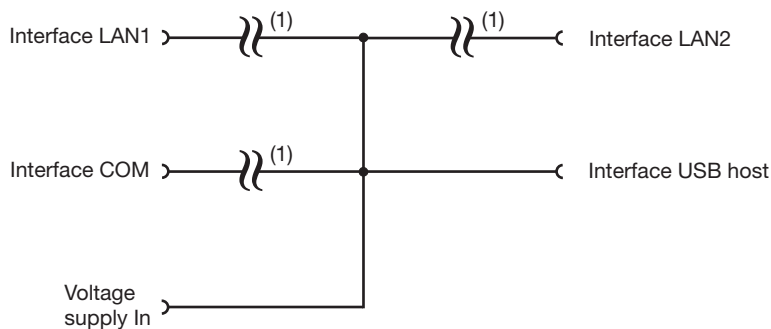
Connection	Designation	Number	Symbol and terminal designation
Voltage supply In	+24 V and GND	(4)	

Display, operating, and connection elements



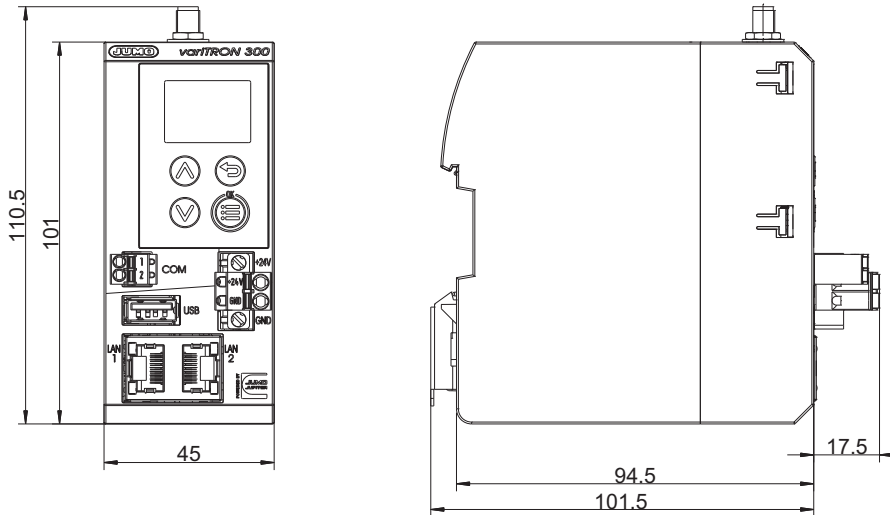
- (1) Antenna connector
- (2) Display
- (3) Control elements
- (4) Voltage supply DC 24 V
- (5) Interface LAN2
- (6) Interface LAN1
- (7) USB host interface
- (8) RS485 interface
- (9) Switches for terminating resistors (RS485), inside the housing

Electrical isolation



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

Dimensions



Module overview

Central processing unit

- JUMO variTRON 300
Data sheet 705003

Input/output modules

- Multichannel controller module
Data sheet 705010
- Relay module 4-channel
Data sheet 705015
- Analog input module 4-channel
Data sheet 705020
- Analog input module 8-channel
Data sheet 705021
- Analog output module 4-channel
Data sheet 705025
- Digital input/output module 12-channel
Data sheet 705030
- Digital input/output module 32-channel
Data sheet 705031
- Thyristor power controller type 70906x
Data sheet 709061, 709062, 709063

Special modules

- Router module 2-port
Data sheet 705041
- Router module 3-port
Data sheet 705042
- Router module 1-port
Data sheet 705043

Panels

- JUMO variTRON web panels
Data sheet 705070

Power supply units

- 705090/03-33
Data sheet 705090
- 705090/05-33
Data sheet 705090
- 705090/10-33
Data sheet 705090

Order details

(1)	Basic type
705003	Central processing unit, type 705003 (2 × Ethernet (RJ45), 1 × USB host interface, 1 × RS485 interface), Node-RED)
(2)	Basic type extension 1
0	Single core CPU
(3)	Basic type extension 2
1	RAM 512 MB
(4)	Basic type extension 3
0	eMMC 2 GB ^a
(5)	Basic type extension 4
0	Without software control loops
(6)	Version
8	Standard with default settings
(7)	Wireless interface
00	Without interface
10	Wtrans 868.4 MHz (Europe)
20	Wtrans 915 MHz (America, Australia, Canada and New Zealand)
(8)	Voltage supply
36	DC 24 V +25/-20 %, SELV
(9)	DNV GL approved
000	Without approval
(10)	Extra codes ^b
224	PLC according to IEC 61131-3 (CODESYS V3.5; necessary to operate the device as a PLC)
225	Program generator 1 – 9 ^c
280	Remote TargetVisu ^c
281	WebVisu ^c
282	PROFINET IO controller ^c
283	OPC UA server ^{c, d}
284	Modbus TCP master ^c
285	Modbus TCP slave ^c
286	EtherCAT master ^c
289	BACnet/IP ^c

^a Flexible allocation between system data and application data.

^b 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) simultaneously, depending on the application. As a more powerful device, the JUMO variTRON 500 central processing unit (type 705002) is available. Your contact person in Technical Sales will be happy to advise you on selecting the appropriate central processing unit for your application.

^c Only in conjunction with extra code 224.

^d Not available with system version 6.

Order code (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)
705003 / 0 1 0 0 - 8 - 00 - 36 / 000 , 224 , ...^a

Order exam- 705003 / 0 1 0 0 - 8 - 00 - 36 / 000 , 224
ple

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

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

Stock versions

Order code	Part no.
705003/0110-8-00-36/224,281	00746454
705003/0110-8-10-36/224,281	00746455
705003/0110-8-20-36/224,281	00746456

Accessories

Designation	Part no.
RJ45 patch cable SF/UTP, length 0.3 m	00747472
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 line permanently connected, length 10 m, T _{max.} 125 °C	00757047
Additional lambda/4-antenna, impedance 50 ohm, T _{max.} 125 °C	00757039