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# JUMO variTRON 500

## Central processing unit

### Brief description

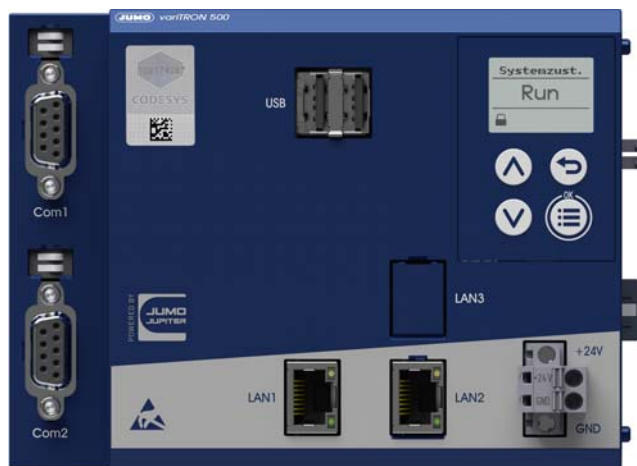
The central processing unit JUMO variTRON 500 along with the proven input and output modules (incl. controller module) of the measuring, control, and automation system JUMO mTRON T form a complete system.

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

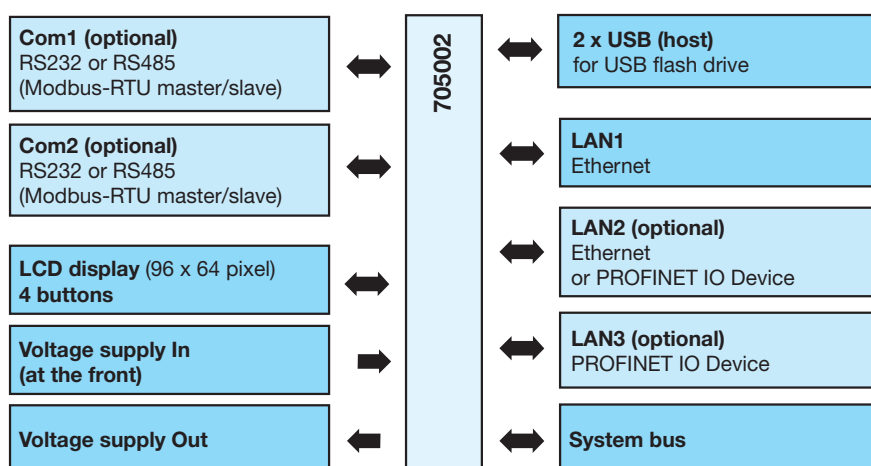
For visualization, commercially available panels are used which support CODESYS Remote TargetVisu or WebVisu functionality. Visualizations have to be implemented with CODESYS resources.

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



Type 705002

### Block diagram



### Features

- Process mapping for all connected input/output modules (incl. controller module)
- 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 xx)
- 2 field bus interfaces
- PROFINET IO controller (in conjunction with PLC) and/or device (device as of system version xx)
- Plug and Play for input/output module replacement
- Battery-buffered RAM
- Real-time clock

### Approvals and approval marks (see "Technical data")

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## Description

### JUMO variTRON 500

The central processing unit JUMO variTRON 500 is based on a new hardware platform with an 800 MHz processor. In the first expansion stage, this processor is used as quad core variant.

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 such as OPC UA, MQTT)
- Integration of various fieldbus systems such as PROFINET IO, EtherCAT, and Modbus-TCP/-RTU (based on CODESYS V3.5)
- Easy integration of new software functions via PLC (CODESYS V3.5)
- Availability of function and visualization libraries (as of system version xx)
- Easy adaptation of hardware inputs and outputs
- Support of a multi-plant principle
- Customized operation and visualization with up to 5 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 diagnostics

### Input/output modules

The proven input and output modules (incl. controller module) of the JUMO mTRON T measuring, control, and automation system are available as module variants.

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 record and digitize a highly diverse range of process variables.

JUMO variTRON 500 enables simultaneous operation of up to 120 control loops so that it can also be used for sophisticated processes. In a future expansion stage, an even higher number of control loops will be available. 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 directly via EtherCAT. In addition, JUMO digiLine sensors for liquid analysis can be connected directly to the central processing unit.

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## Technical data

### Interfaces

<b>USB host</b> Description Type Number Device category Application Data rate Max. current	USB A (socket) 2 Mass storage class For connecting a USB flash drive (interfaces cannot be used simultaneously) Low Speed, Full Speed, Hi-Speed 500 mA per interface
<b>Ethernet</b> Description Type Number Application Protocol Transfer rate Cable length	LAN1 RJ45 1 Communication with PC (setup program, web server), email server, Modbus-TCP master/slave, PROFINET IO device, EtherCAT slave, OPC UA client TCP, IPv4, HTTP(S) Via CODESYS as an option: Modbus-TCP, PROFINET IO controller, EtherCAT master, OPC UA server 10 Mbit/s, 100 Mbit/s Up to 100 m
<b>Ethernet</b> Description Type Number Application Protocol Transfer rate Cable length	Depending on the device version LAN2 RJ45 1 Communication with PC (setup program, web server), email server, Modbus-TCP master/slave, PROFINET IO device, EtherCAT slave, OPC UA client TCP, IPv4, HTTP(S) Via CODESYS as an option: Modbus-TCP, PROFINET IO controller, EtherCAT master, OPC UA server 10 Mbit/s, 100 Mbit/s Up to 100 m
<b>PROFINET IO device</b> Description Type Number Application Protocol Transfer rate Cable length	Depending on the device version (as of system version xx) LAN2 + LAN3 2 × RJ45 1 Communication with PROFINET IO controller PROFINET IO device 10 Mbit/s, 100 Mbit/s Up to 100 m
<b>RS232 or RS485 (serial interface)</b> Description Type Number Application Protocol Data format Transfer rate	Depending on the device version Com1, Com2 D-Sub 9-pole 2 Fieldbus applications, communication via modem with a PC or with an email server Via CODESYS: Modbus-RTU master/slave 8/1/n, 8/1/e, 8/1/o 9600 Bd, 19200 Bd, 38400 Bd

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System bus	
Description	None (side connector)
Type	System specific
Number	1
Application	Connection of a router module 705041 or an input/output module

## Display

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

## Electrical data

Voltage supply	
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. 1.16 A (at DC 19.2 V) Current consumption of lined-up modules also has to be considered (see "Hardware configuration" in the setup program)!
Power consumption	Max. 25 W
Conductor cross section (voltage supply)	
Wire or stranded wire without ferrule	Min. 1.5 mm <sup>2</sup> , max. 2.5 mm <sup>2</sup>
Stranded wire with ferrule	Min. 1.5 mm <sup>2</sup> , max. 2.5 mm <sup>2</sup>
2 × stranded wire with twin core-end ferrule with plastic collar	1.5 mm <sup>2</sup>
Stripping length	10 mm
Electrical safety	According to DIN EN 61010-1 Overvoltage category III, pollution degree 2
Protection rating	III
Electromagnetic compatibility	Acc. to DIN EN 61326-1
Interference emission	Class A - only for industrial use -
Interference immunity	Industrial requirement
Data backup	Buffered RAM
Buffer battery service life	Approx. 6 years (lithium battery)

## 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 x 7.5 mm x 1 mm
Dimensions (W × H × D)	135 mm × 101 mm × 101.5 mm (without connection elements)
Weight (fully fitted)	Approx. 590 g
Protection type	IP 20, 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
Mechanical environmental influences <sup>a</sup>	Classification acc. to DIN EN 60721-3-3, table 6, class 3M2

<sup>a</sup> Test conditions are listed in the System Description 7050000T98... (B 705000.8).

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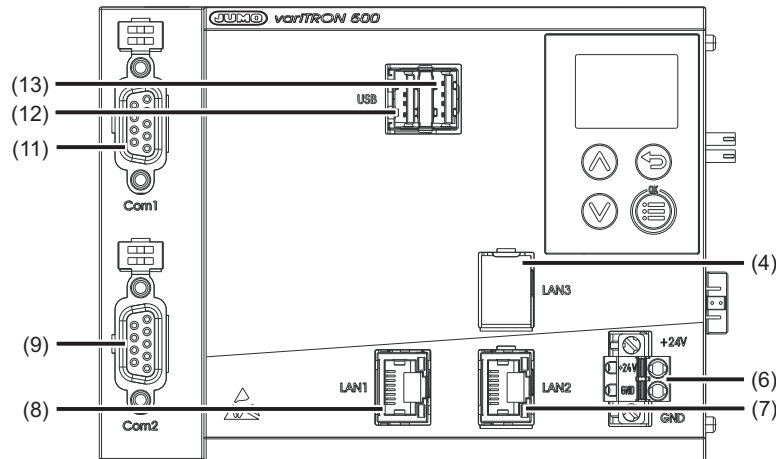
## Approvals/approval marks

Approval mark	Test facility	Certificate/certification number	Inspection basis	Valid for
c UL us	Underwriters Laboratories	Submitted	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
USB host (2 ×)	USB	(12), (13)		
Ethernet (LAN2 optional)	LAN1, LAN2	(8), (7)		1 TX+      Transmission data + 2 TX-      Transmission data - 3 RX+      Received data + 6 RX-      Received data -
PROFINET IO device (optional)	LAN2 + LAN3	(7) + (4)		1 TX+      Transmission data + 2 TX-      Transmission data - 3 RX+      Received data + 6 RX-      Received data -
Serial interface RS232 (optional)	Com1, Com2	(11), (9)		2 RxD      Received data 3 TxD      Transmission data 5 GND      Ground
Serial interface RS485 (optional)	Com1, Com2	(11), (9)		3 TxD+/RxD+      Transmission/received data + 5 GND      Ground 8 TxD-/RxD-      Transmission/received data -

## Voltage supply

Connection	Designation	Number	Symbol and terminal designation
Voltage supply In	+24 V and GND	(6)	 + ———— ○ +24 V $U_x$ - ———— ○ GND

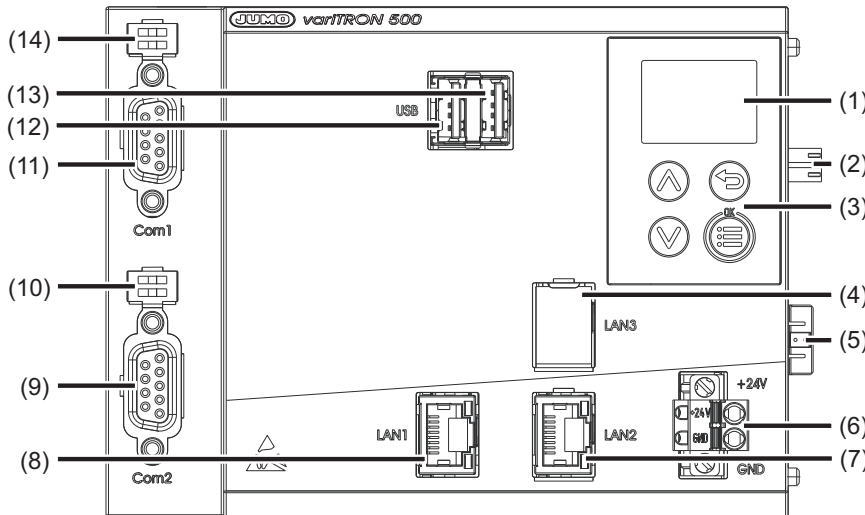
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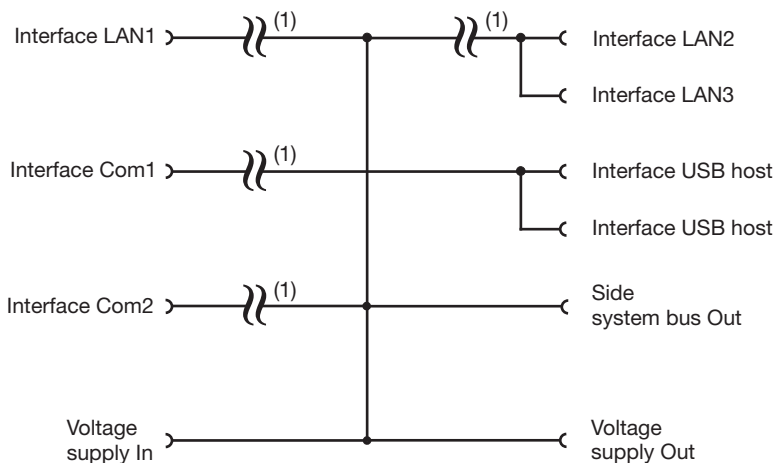


## Display, operating, and connection elements



- (1) Display
- (2) Voltage supply Out, DC 24 V
- (3) Control elements
- (4) Interface LAN3 (not equipped here)
- (5) Side system bus Out
- (6) External voltage supply DC 24 V
- (7) Interface LAN2
- (8) Interface LAN1
- (9) Interface Com2
- (10) Com2 terminating resistors
- (11) Com1 interface
- (12) USB host interface 1
- (13) USB host interface 2
- (14) Com1 terminating resistors

## Electrical isolation



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

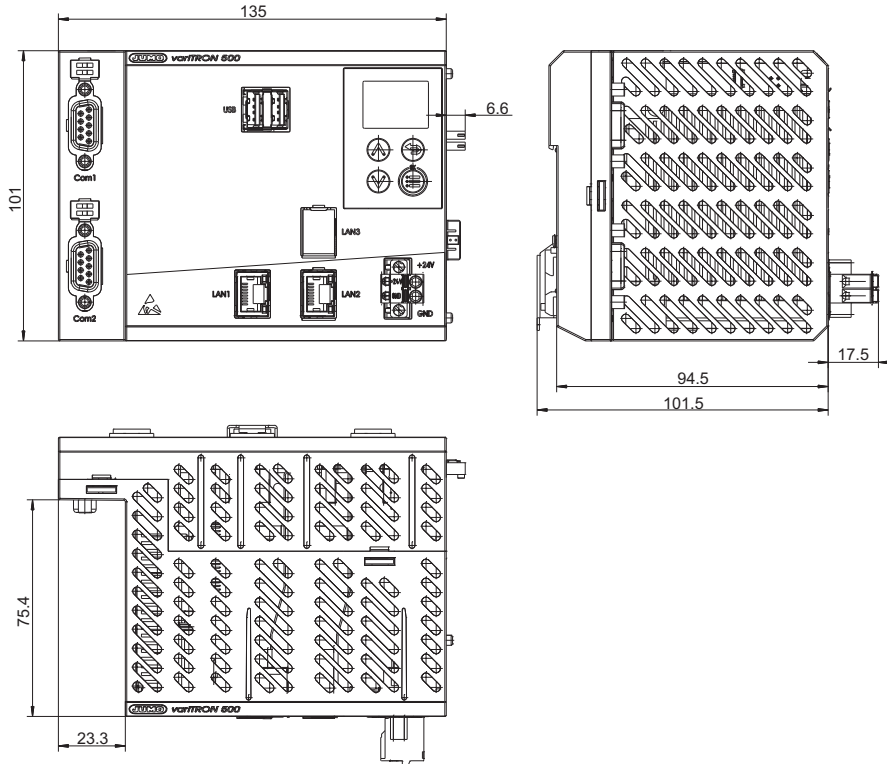
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## Dimensions



## Module overview

### Base units

- JUMO variTRON 500  
Data sheet 705002

### 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  
Data sheet 705040

### Power supply units

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



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## Order details

<b>(1)</b>	<b>Basic type</b>
705002	Central processing unit, type 705002 (1 × Ethernet (RJ45), 1 × system bus (side), 2 × USB host interface)
<b>(2)</b>	<b>Basic type extension 1</b>
0	Single core CPU (as of system version xx)
2	Quad core CPU
<b>(3)</b>	<b>Basic type extension 2</b>
2	RAM 1024 MB
<b>(4)</b>	<b>Basic type extension 3</b>
0	eMMC 2 GB <sup>a</sup> (as of system version xx)
1	eMMC 8 GB <sup>a</sup>
<b>(5)</b>	<b>Basic type extension 4</b>
0	Without software control loops
1	32 software control loops (as of system version xx)
2	64 software control loops (as of system version xx)
3	128 software control loops (as of system version xx)
4	256 software control loops (as of system version xx)
<b>(6)</b>	<b>Version</b>
8	Standard with default settings
<b>(7)</b>	<b>Com1 interface</b>
00	Not used
51	RS232 Modbus-RTU <sup>b</sup>
55	RS485 Modbus-RTU <sup>b</sup>
<b>(8)</b>	<b>Interface Com2</b>
00	Not used
51	RS232 Modbus-RTU <sup>b</sup>
55	RS485 Modbus-RTU <sup>b</sup>
<b>(9)</b>	<b>Interfaces LAN2, LAN3</b>
00	Not used
08	Ethernet (RJ45)
63	PROFINET IO device (2 × RJ45) (as of system version xx)
<b>(10)</b>	<b>Voltage supply</b>
36	DC 24 V +25/-20 %, SELV
<b>(11)</b>	<b>DNV GL approval</b>
000	Without approval
062	With DNV GL approval <sup>c</sup> (as of system version xx)
<b>(12)</b>	<b>Extra codes</b>
213	Recording function (as of system version xx)
214	Math and logic module (activation for all connected controller modules)
224	PLC according to IEC 61131-3 (CODESYS V3.5)
225	Program generator 1 – 9 (as of system version xx) <sup>d, e</sup>
228	Program generator 1 – 9 with process steps (as of system version xx) <sup>d, e</sup>
280	Remote TargetVisu <sup>d</sup>
281	WebVisu <sup>d</sup>
282	PROFINET IO controller <sup>d</sup>
283	OPC UA server <sup>d</sup>
284	Modbus-TCP master <sup>d</sup>
285	Modbus-TCP slave <sup>d</sup>
286	EtherCAT master <sup>d</sup>
887	Manipulation detection with digital certificate <sup>f, g</sup>

