JUMO variTRON 500 – Automation System

Central Processing Unit 705002

Brief description

The central processing unit JUMO variTRON 500 along with the proven input and output modules (incl. controller module) 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:

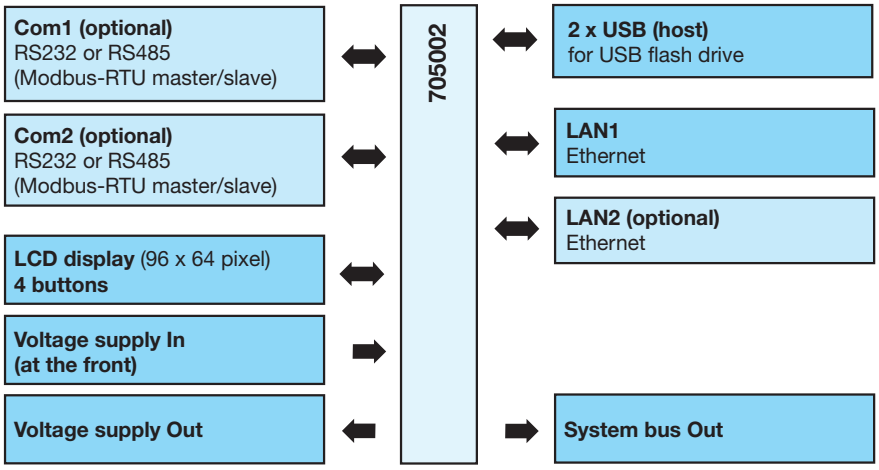
- CODESYS runtime system
- CODESYS runtime system incl. Remote TargetVisu
- CODESYS runtime system incl. WebVisu
- CODESYS runtime system incl. Remote TargetVisu and WebVisu

For visualization, commercially available panels are used which support CODESYS Remote TargetVisu or WebVisu functionality. 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 x) and can be individually integrated into the customer application.

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 x)
- 2 field bus interfaces (as of system version 3)
- PROFINET IO controller (in conjunction with PLC)
- 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, which is used as a 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 (e.g. OPC UA, MQTT)
- Integration of different fieldbus protocols such as PROFINET IO, EtherCAT, and Modbus-TCP/-RTU
- Easy integration of new software functions via PLC (CODESYS V3.5)
- Availability of function and visualization libraries (as of system version x)
- Easy adaptation of hardware inputs and outputs
- Customized operation and visualization with several operator stations via CODESYS remote target visualization or via web visualization (mixed operation is possible)
- Panels in various formats (portrait or landscape, 4:3 or 16:9)
- JUMO Web Services

Input/output modules

The proven input and output modules (incl. controller module) 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 more than 120 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.

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Technical data

Interfaces

USB host	
Description	USB
Type	A (socket)
Number	2
Device category	Mass storage class
Application	For connecting a USB flash drive (interfaces cannot be used simultaneously)
Data rate	Low Speed, Full Speed, Hi-Speed
Max. current	500 mA per interface
Ethernet	
Description	LAN1, LAN2 (optional)
Type	RJ45
Number	1 (optional: 2)
Application	Communication with: - PC (setup program, web browser) - Email server - Modbus-TCP master/slave - PROFINET IO device - EtherCAT slave - OPC UA client
Protocol	TCP, IPv4, HTTP(S) Via CODESYS as an option: Modbus-TCP, PROFINET IO controller, EtherCAT master, OPC UA server
Transfer rate	10 Mbit/s, 100 Mbit/s
Connection cable	Network cable, at least CAT5 (S/FTP)
Cable length	Up to 100 m
RS232 or RS485 (serial interface)	Depending on the device version
Description	Com1, Com2
Type	D-Sub 9-pole
Number	2
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
Transfer rate	9600 Bd, 19200 Bd, 38400 Bd
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)

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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^2, max. 2.5 mm^2
Stranded wire with ferrule	Min. 1.5 mm^2, max. 2.5 mm^2
2 × stranded wire with twin core-end ferrule with plastic collar	1.5 mm^2
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) Observe fault 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 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
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

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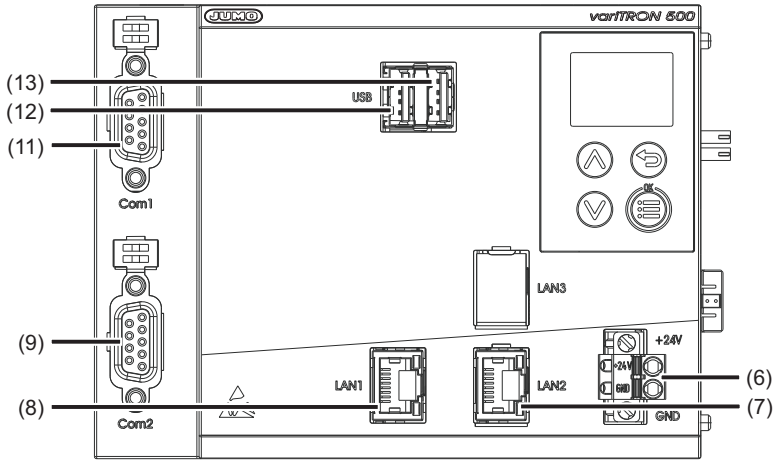
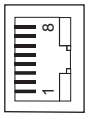
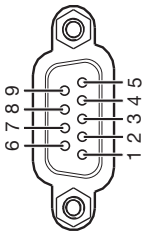
Connection diagram

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+ 2 TX- 3 RX+ 6 RX-	Transmission data + Transmission data - Received data + Received data -
Serial interface RS232 (optional)	Com1, Com2	(11), (9)		2 RxD 3 TxD 5 GND	Received data Transmission data Ground
Serial interface RS485 (optional)	Com1, Com2	(11), (9)		3 TxD+/RxD+ 5 GND 8 TxD-/RxD-	Transmission/received data + Ground 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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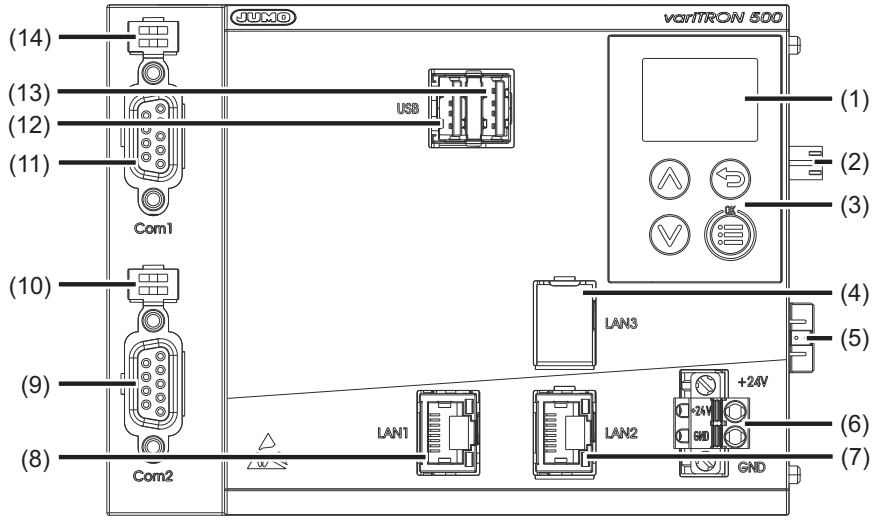
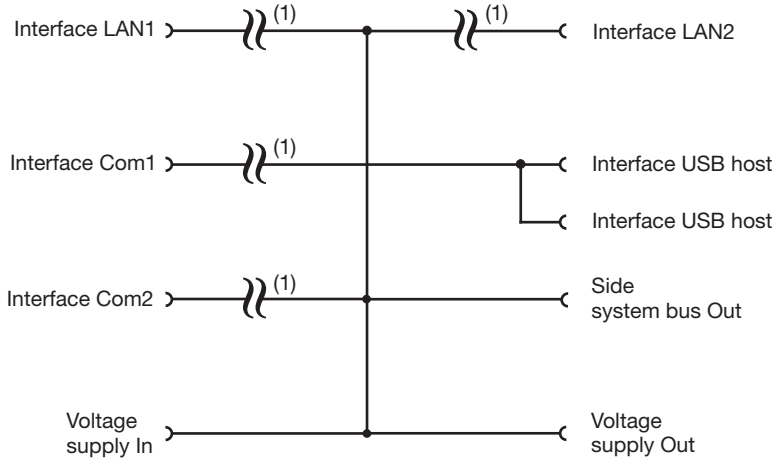
Display, operating, and connection elements



(1) Display
(2) Voltage supply Out, DC 24 V
(3) Control elements
(4) Interface LAN3 (for future use)
(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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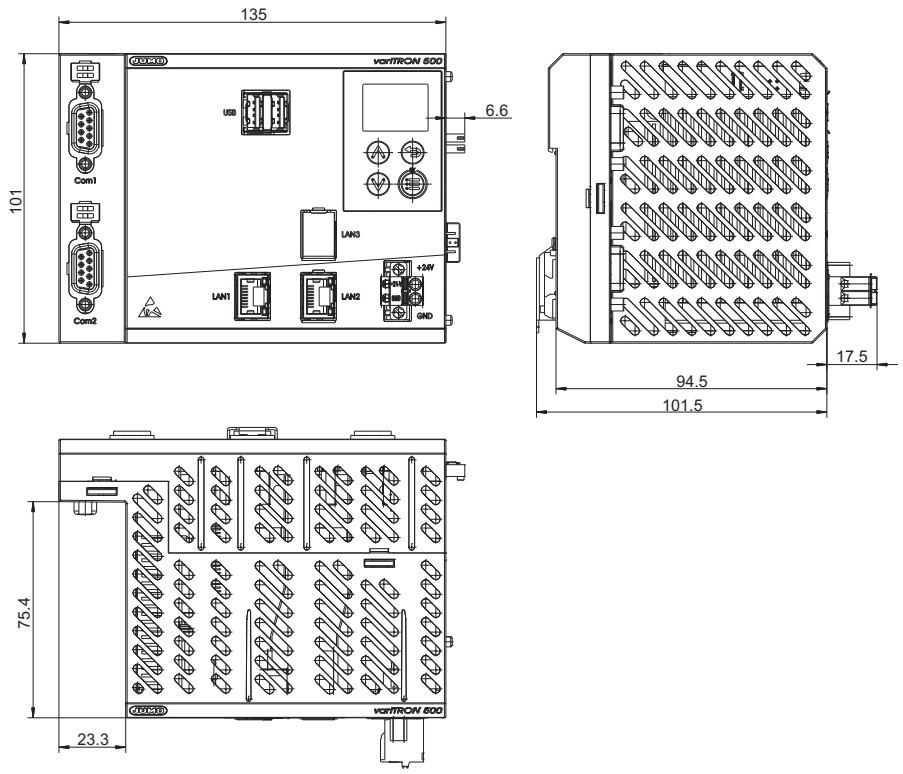
Dimensions



Module overview

Central processing unit

- 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
  (as of system version 3)
- Thyristor power controller type 70906x
  Data sheet 709061, 709062, 709063
  (as of system version 3)

Special modules

- Router module 2-port
  Data sheet 705041
  (as of system version 3)
- Router module 3-port
  Data sheet 705042
  (as of system version 3)

Panels

- JUMO variTRON Web panels
  Data sheet 705070

Power supply units

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

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Order details

	(1)	**Basic type**
705002		Central processing unit, type 705002 (1 × Ethernet (RJ45), 1 × system bus (side), 2 × USB host interface)
	(2)	**Basic type extension 1**
2		Quad core CPU
	(3)	**Basic type extension 2**
2		RAM 1024 MB
	(4)	**Basic type extension 3**
1		eMMC 8 GB[a]
	(5)	**Basic type extension 4**
0		Without software control loops
	(6)	**Version**
8		Standard with default settings
	(7)	**Com1 interface**
00		Not used
51		RS232 Modbus-RTU[b] (as of system version 3)
55		RS485 Modbus-RTU[b] (as of system version 3)
	(8)	**Interface Com2**
00		Not used
51		RS232 Modbus-RTU[b] (as of system version 3)
55		RS485 Modbus-RTU[b] (as of system version 3)
	(9)	**Interface LAN2**
00		Not used
08		Ethernet (RJ45)
	(10)	**Voltage supply**
36		DC 24 V +25/-20 %, SELV
	(11)	**DNV GL approval**
000		Without approval
	(12)	**Extra codes**
224		PLC according to IEC 61131-3 (CODESYS V3.5; necessary to operate the device as a PLC)
225		Program generator 1 – 9 (as of system version x)[c]
280		Remote TargetVisu[c]
281		WebVisu[c]
282		PROFINET IO controller[c]
283		OPC UA server[c]
284		Modbus-TCP master[c]
285		Modbus-TCP slave[c]
286		EtherCAT master[c]

[a] Flexible allocation between system data and application data.

[b] The PLC (extra code 224) enables additional interface protocols to be implemented (extra cost).

[c] Only in conjunction with extra code 224.

	(1)		(2)	(3)	(4)	(5)	(6)		(7)		(8)		(9)		(10)		(11)		(12)	
Order code	705002	/	2	2	1	0	8	-		-		-		-	36	/	000	,	224	, ...[a]
Order example	705002	/	2	2	1	0	8	-	00	-	00	-	00	-	36	/	000	,	224	

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

Scope of delivery

1 central processing unit, type 705002, in the ordered version
1 cover for system bus
2 screw-on end clamps for DIN rail
1 installation instructions

Accessories

Description	Part no.
Interface modules (expansion boards):	
RS232 Modbus-RTU (as of system version 3)	00679682
RS485 Modbus-RTU (as of system version 3)	00679678
Ethernet (RJ45)	00688709