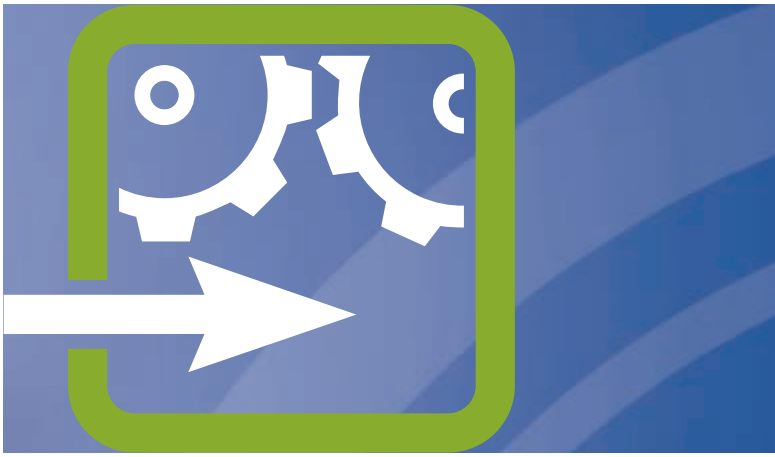
More than sensors + automation

Automation

Innovative solutions for the highest requirements



Contact
Phone: +49 661 6003-0
Email: automation@jumo.net

Dear Reader,

The automation of machines and plants is the basis for planning and optimizing production processes. The aim is to lastingly increase product quality, productivity, and energy efficiency.

For decades now JUMO has been offering established solutions for a secure, reliable, and profitable plant operation and production process with its products from the field of automation.

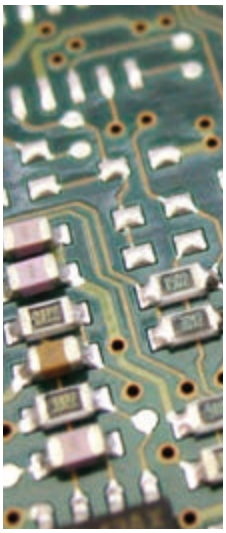
How do we do it? Through long-term experience and expertise: because for more than 60 years JUMO has been one of the leading manufacturers in the field of measurement and control technology. Consequently JUMO is also an expert partner for the automation industry.

We place great value on regular new developments, constant improvement of existing products, and on increasingly economic production methods – because only this path allows us to achieve the highest degree of innovation for you.

This brochure provides an overview of JUMO's products and systems from the field of automation.

Further information about our products can be found using the given type/product group number at www.jumo.net.

Contents



Automation 4

Transmitters 6

Digital indicators 12

Solid state relays and thyristor power controllers 16

Automation system 20

Software 26

Automation

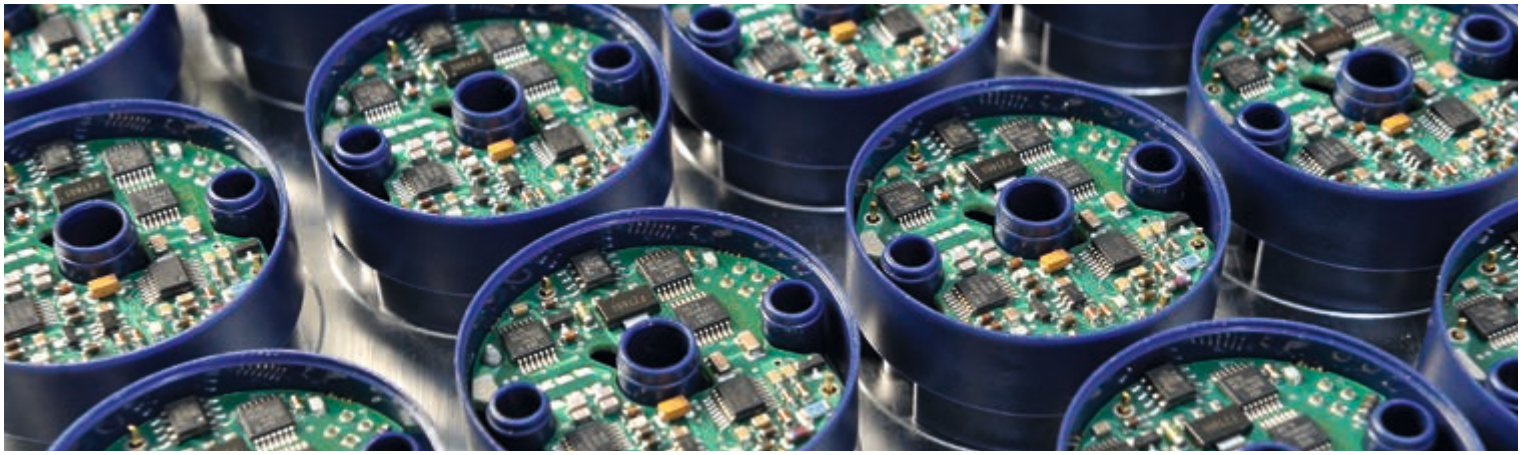
For automation JUMO offers a cleverly combined product spectrum of temperature transmitters, digital indicators, thyristor power controllers, and solid state relays via a complete measurement, control, and automation system through to plant visualization software.

Thanks to a flexible configuration by a PC setup program, the individual device functions can be rapidly and conveniently adjusted for a wide range of applications. This enables a cost-neutral configuration for many applications in the industry.

The most important industries

For every task the right solution: our wide range of different devices offers the right solution for classic plant construction and mechanical engineering as well as for the process industry or for the OEM-sector.

In addition to the standard devices, JUMO offers individual customized versions for special applications.



Transmitters

A secure, economical, and precise signal adjustment of temperature sensors, as well as other sensor elements, is achieved by electronic transmitters of the JUMO dTRANS T series. These can, depending on the transmitter type, support a wide range of sensor types through the universal measurement input. In terms of output they provide a correspondingly linearized current/voltage and/or HART® signal for further processing to subsequent devices.

JUMO offers a well rounded range of transmitters that are available as head transmitters or as space-saving mounting rail transmitters. For cable-free and mobile use a wireless-head transmitter is available that enables a recording of temperature process values on movable or hard-to-access plants.

Head transmitters

The head transmitters of the JUMO dTRANS series are designed for installing in the terminal head form B or for terminal head form J. The great advantage of the head installation is that it allows higher measuring accuracy due to the conversion of the sensitive sensor signal to a stable output signal (e.g. 4 to 20 mA or HART® signal) in the direct vicinity of the sensor. The fully-sealed head electronics also offers increased protection against adverse environmental conditions. Combined with such devices as the JUMO PROCESStemp RTD temperature probe for process technology, the head transmitters provide the exact measurement of your process temperature.




Technical data

	dTRANS T01 Ex dTRANS T01/HART® Ex* dTRANS T01 Junior	dTRANS T03 J dTRANS T03 B dTRANS T03 BU	dTRANS T05 B	dTRANS T07B dTRANS T07 B SIL dTRANS T07 B Ex dTRANS T07 B Ex SIL
Designation				
Data sheet	707010	707030	707050	707080
Input RTD temperature probe	Pt100, Pt500, Pt1000 (junior only Pt100/Pt1000), two-wire/three-wire/four-wire circuit	Pt100, two-wire/three-wire circuit	Pt100, Pt500, Pt1000, resistance transmitter, two-wire/three-wire/four-wire circuit	Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Cu50, Cu100, two-wire/three-wire/four-wire circuit
Input thermocouple	L, J, U, T, K, E, N, S, R, B, D, C (junior only J, K, N, S, R)	–	R, S, B, J, T, E, K, N , L, U, A1, C, D, -100 to +1100 mV	A,B,C,D,E,J,K,L,N,R,S,T,U
Output	4 to 20 mA (invertible)	4 to 20 mA, 0 to 10 V	4 to 20 mA (invertible)	4 to 20 mA (invertible)
Calibration accuracy	± 0.05 %	± 0.2 %	± 0.05 %	± 0.05 %
Galvanic isolation	3.75 kV, 2 kV, 1 kV	–	3.75 kV	2 kV
Special features	Customer-specific linearization	Analog signal path, can be digitally adjusted/configured	USB interface, customer-specific linearization, control LED (red/green), storing min/max sensor temperature via drag indicator function	Two universal measurement inputs (RTD, TC, Ω, mV), high degree of accuracy (0.1 K with Pt100 sensor), output 4 to 20 mA (one-channel loop powered), HART® 7 protocol, SIL 2/SIL 3 hardware/software according to IEC 61508, reliable measuring mode due to sensor monitoring and device hardware error detection, optional plug-on display BD7 for B-head device version
NAMUR-compliant	NE21			NE 43 and NE 89
Approval	ATEX/IECEx	–	–	ATEX/IECEx, SIL, cULus
Configuration	Via PC interface, HART® version via HART® modem	Via PC interface	Via standard USB cable without auxiliary voltage	Via HART® modem with JUMO DTM or HART® communicator with JUMO DD
Voltage supply	DC 11.5 to 30 V	DC 7.5 to 30 V, DC 15 to 30 V (BU)	DC to 35 V	DC 11 to 42 V (without SIL and Ex approval)
Ambient temperature	-40 to +85 °C			-40 to +85 °C (without SIL and Ex approval)
Installation	In terminal head, form B	In terminal head, form B or form J	In terminal head, form B	In terminal head, form B

* no IECEx

Mounting rail transmitter

	Designation	dTRANS T01 HART® T	dTRANS T02 J, PCP, LCD, Ex	dTRANS T03 T, TU dTRANS T03 TU	dTRANS T04
	Data sheet	707010	707020	707030	707040
Technical data	Input RTD temperature probe	Pt100, Pt500, Pt1000, two-wire/three-wire/ four-wire circuit	Pt100, Pt500, Pt1000, resistance transmitter, two-wire/three-wire/four-wire circuit	Pt100, two-wire/three-wire circuit	Pt100, Pt1000, potentiometer
	Thermocouple input	J, K (more upon request)	L, J, U, T, K, E, N, S, R, B, D, C, -10 to +10 V, -20 to +20 V	–	–
	Output	4 to 20 mA	0 (4) to 0 mA, 0 (2) to 10 V	4 to 20 mA, 0 to 10 V	0 (4) to 20 mA, 0 to 10 V
	Calibration accuracy	± 0.05 %	± 0.075 %	± 0.2 %	± 0.3 %
	Galvanic isolation	2 kV	50 V (triple isolation)	–	Up to 3.7 kV (against voltage supply)
	Special features	Customer-specific linearization	Universal transmitter, customer-specific linearization, open-collector output, alarm output	Analog signal path, can be digitally adjusted	Measuring ranges and current or voltage output can also be configured via the DIP switch, sensor-related hardware version
	NAMUR compliant	NE21			
	Approval	–	ATEX/IECEx	–	–
	Configuration	Via HART® modem	Via PC interface or keys (LCD version)	Via PC interface	Via PC interface or DIP switch
	Voltage supply	DC 11.5 to 30 V (two-wire transmitter)	DC 24 V, AC 110 to 230 V (four-wire transmitter)	DC 15 to 35 V (two-wire/three-wire transmitter)	AC 110 to 240 V, AC/DC 20 to 53 V (four-wire transmitter)
	Ambient temperature	-25 to +70 °C	-10 to +60 °C	-25 to +70 °C	-25 to +55 °C
	Installation	On mounting rail/DIN rail 35 × 7.5 mm			

Technical data

Designation	dTRANS T05 T	dTRANS T06	dTRANS T07 T dTRANS T07 T SIL dTRANS T07 T Ex dTRANS T07 T Ex SIL
Data sheet	707050	707070	707080
Input RTD temperature probe	Pt100, Pt500, Pt1000, two-wire/three-wire/four-wire circuit	Pt50, Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, Cu50, Cu100, two-wire/three-wire/four-wire circuit	Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Cu50, Cu100, two-wire/three-wire/four-wire circuit
Input Thermocouple	R, S, B, J, T, E, K, N, L, U, A1, C, D, -100 to +1100 mV	L, J, U, T, K, E, N, S, R, B, C, A1, D, L, Chromel® Alumel®, PLII, 0 to 1 V	A, B, C, D, E, J, K, L, N, R, S, T, U
Output	4 to 20 mA, 0 to 10 V	0(2) to 10 V or 0(4) to 20 mA (invertible)	4 to 20 mA, 20 to 4 mA (invertible)
Calibration accuracy	± 0.05 %		
Galvanic isolation	1.875 kV	1.8 kV	2 kV
Special features	USB interface, customer-specific linearization, control LED (red/green), storing min/max sensor temperature via drag indicator function	Universal input for a number of sensors and standard signals, intuitive operation and configuration on the device or via USB interface with setup program, RS485 interface Modbus RTU and relay output limit value (option), intelligent additional functions such as min/max drag indicator, operating hours counter and output simulation SIL 2/SIL 3 according to DIN EN 61508 and PL c/d according to ISO 13849 (option), sensor matching for RTD temperature probe, customer-specific linearization, high degree of galvanic signal separation, connection diagram available in the display	Two universal measurement inputs (RTD, TC, Ω, mV), high degree of accuracy (0.1 K with Pt100 sensor), output 4 to 20 mA (one-channel loop powered), HART® 7 protocol, HART® communication sockets on the front, SIL 2/SIL 3 hardware/software according to IEC 61508, reliable measuring mode due to sensor monitoring and device hardware error detection
NAMUR-compliant	NE43	NE 43	NE 43 and NE 89
Approval	–	SIL and PL, cUL, DNVGL	ATEX/IECEx, SIL, cULus
Configuration	Via standard USB cable without auxiliary voltage	On the device via USB interface with PC setup program	Via HART® modem with JUMO DTM or HART® communicator with JUMO DD
Voltage supply	DC 1 to 35 V (two-wire/three-wire transmitter)	AC 110 to 240 V, DC 24 V (four-wire transmitter)	DC 12 to 42 V (without SIL and Ex approval, two-wire transmitter)
Ambient temperature	-10 to +70 °C	-10 to +70 °C	-40 to +85 °C (without SIL and Ex approval)
Installation	On mounting rail/DIN rail 35 × 7.5 mm		

Wireless head transmitter

	Designation	Wtrans B	Wtrans receiver T01
Technical data	Data sheet	707060	902931
	Input	Pt100, Pt500, Pt1000, resistance transmitter, resistance/potentiometer (two-wire, three-wire, four-wire circuit), R, S, B, J, T, E, K, N, L, U, A1, C, D, 0 to 50 mV, 0(4) to 20 mA (via external shunt)	16 receiving channels (receiving frequency 868.4 MHz)
	Output	Wireless-based with open air range of up to 300 m (transmission frequency 868.4 MHz)	2 × 4 to 20 mA/0 to 10 V, 2 × relay or 4 × 4 to 20 mA/0 to 10 V
	Calibration accuracy	± 0.1 %	
	Galvanic isolation	> 10 kV	50 V
	Special features	Transmission interval 1 to 3600 s, customer-specific linearization	LCD display, RS485 interface (Modbus)
	NAMUR-compliant	NE21	
	Approval	–	
	Configuration	Via PC interface	Via PC interface or keys on the front
	Voltage supply	3.6 V Li battery (battery size AA)	AC 110 to 240 V, AC/DC 20 to 30 V
	Ambient temperature	-30 to +85 °C	-20 to +50 °C
	Installation	In terminal head, form B	On mounting rail/DIN rail 35 × 7.5 mm

Isolation amplifier

	Designation	Ex-i power supply/input isolating amplifier
Technical data	Data sheet	707530
	Input	0(4) to 20 mA, supply isolating amplifier operation or input isolating amplifier operation
	Output	0(4) to 20 mA, 0(1) to 5 V
	Calibration accuracy	± 0.1 %
	Galvanic isolation	375 V_{peak}
	Special features	HART®-compatible, active/passive current output, LED for power status, universal power supply
	Approval	ATEX: Ex ia, SIL 2, UL
	Configuration	Via DIP switch
	Supply	AC/DC 24 to 230 V
	Ambient temperature	-20 to +60 °C
	Installation	On mounting rail/DIN rail 35 × 7.5 mm

Application

Temperature measurement in rotating equipment through the use of wireless head transmitters

Use of the JUMO Wtrans B wireless head transmitter offers many advantages especially at difficult installation locations One application area, for example, is a rotating industrial furnace.

The challenge

A rotating furnace has fixed housing and a rotating component. Here, temperature has to be measured continuously and reliably so that such factors as a smooth hardening/ melting process can be ensured. At the same time, temperature measurement within the oven chamber is made more difficult due to the rotation.

The solution

A wireless solution is ideal to acquire and archive the product temperature within the furnace. Mineral-insulated thermocouples in combination with the JUMO Wtrans B are used for temperature acquisition. Outside of the furnace each thermocouple is connected with a wireless head transmitter through plug connectors. The cases of the JUMO Wtrans B are mounted outside of the outer furnace housing. A sheet metal protects against excessive temperature by reducing the ambient temperature to a maximum of 80 °C. The antenna is attached (through the wall holder) in close proximity to the furnace / to the transmitters. The wireless measuring chains acquire the product temperature at different locations within the furnace and transfer those in variable transfer rates. Subsequently the measured values are recorded in a primary control and archived according to product. The batteries are exchanged once a year during maintenance. The signal transmission is undisturbed as a result of the minimal distance between the transmitter and receiver antenna.

Digital indicators

Digital indicators enable a precise on-site display of process values and monitor the values that are important for a smooth production process. Limit value monitoring functions ensure an automatic monitoring of important process variables.

JUMO offers a complete indicator range from the one-channel compact format to the two-channel version with text display and moving script.

Digital indicators

	Designation	diraVIEW 132 diraVIEW 116	diraVIEW 108, horizontal/vertical diraVIEW104
Technical data	Data sheet	701510	
	Display	18 segment LCD display, display elements for switch position of the outputs and timer, pixel matrix LCD display (only type diraVIEW 108 and diraVIEW 104)	
	Input	One user configurable analog input for RTD temperature probes, thermocouples, current 0(4) to 20 mA, voltage 0(2) to 10 V, resistance transmitters, resistance/potentiometers	
	Output	701510: one relay 3 A/230 V AC (N/O contact), one logic output 0/14 V (alternative to digital input 1) 701511: two relays 3 A/230 V AC (N/O contact), one logic output 0/14 V (alternative to digital input 1), optional: analog output, relay	Two relays 3 A/230 V AC (N/O contact), one logic output 0/14 V (alternative to digital input 1), optional: analog output, relay, PhotoMOS® relay
	Calibration accuracy	0.1 %/0.25 %	
	Galvanic isolation	3000 V (measurement input for supply)	
	Special features	Math and logic functions, ST code programming, min/max value memory and display, hold function, service and operating hours counter, tare function for weighing applications	
	Configuration	On the device via USB interface with PC setup program	
	Approval	cULus	
	Protection type	IP65	
	Voltage supply	AC/DC 20 to 30 V, AC 110 to 240 V	
	Ambient temperature	-10 to +55 °C	
	Connections	Spring-cage terminals, Push-In® terminal technology	
	Alarms	4x limit value monitoring	
	Digital inputs	Two digital inputs for potential-free contacts (digital input 1 alternative to logic output)	
	Interfaces	Setup interface (USB powered), RS485 interface (optional)	

Digital indicators

Technical data

Designation	di eco	di 308
Data sheet	701540	701550
Display	Three-figure segment display (red, figure height 13 mm)	Five-figure LCD display (two-line, figure height 18/7 mm), text display as moving script with color change
Input	Pt100/Pt1000/KTY2X-6, thermocouples J, L, K, 0(4) to 20 mA, 0 to 10 V	Up to two channels with multifunction input: RTD temperature probe, thermocouple, standard signal, 0 to 20 mA/0 to 10 V
Output	Relay (10 A)	Two relays (can be expanded by optional board)
Calibration accuracy	0.1 %/0.4 %	0.1 %/0.25 %
Galvanic isolation	None	500 V (measurement input for supply)
Special features	Switch-on delay and alarm suppression are configurable, sensor-related hardware version	Can be optionally expanded with analog output, RS485, PROFIBUS, math, up to four limit values
Configuration	Via PC interface or keys on the front	Via PC interface or keys on the front
Approval	cULus	cULus
Protection type	IP65 (front side), IP20 (rear side)	IP65 (front side), IP20 (rear side)
Voltage supply	DC 24 V, AC 110 V/230 V	AC/DC 20 to 30 V, AC 110 to 240 V
Ambient temperature	0 to 55 °C	0 to 55 °C
Installation	In the panel cut-out 76 × 36 mm	In the panel cut-out 96 × 48 mm

Handheld thermometer

Designation	TDA-300 / TDA-3000
Data sheet	702540
Display	LCD display with date/time
Sensor input	Pt100, thermocouple K, J
Calibration accuracy	0.1 %
Special features	Data logger, 99/9999 measured values, TDA-3000 with USB interface for reading, min/max value recording
Approval	–
Configuration	Menu navigation with keys
Protection type	IP67 (TDA-300), IP54 (TDA-3000)
Voltage supply	1.5 V alkaline battery (battery size AA)
Ambient temperature	-20 to +50 °C

Application

Zone monitoring in climatic chambers

The challenge

A prevailing uniform climate is important for storing medication or other fragile goods in climatic chambers for reasons such as adhering to the quality of the pharmaceutical agents. These chambers can consists of two or more zones. The values temperature and humidity are decisive when storing medications. Firstly, the two measured values have to be controlled and, secondly, they are to be made available for tracking purposes within the documentation. It is important here that that the average value of the two parameters is available as analog signal 4 to 20 mA.

The solution

The JUMO di308 indicating device easily meets all the requirements that the customer placed upon the above named application. The two analog inputs, two relay outputs, one analog output, and the math function allow the device to acquire, control, and document the temperature as well as humidity. The limit value setting sets off an alarm as soon as the temperature and humidity value of the set actual value is exceeded or is not reached. The two analog inputs monitor themselves via the preset limit values. The documentation of the values is performed by the math function which develops the average value of the two inputs and then makes it available via the analog output.

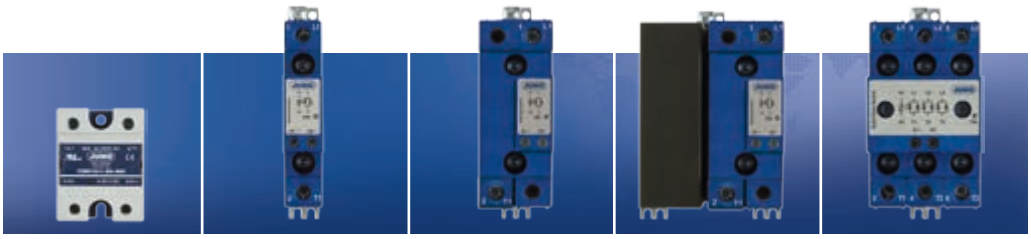
The implementation with the JUMO di 308 indicating device allows the application to be put into operation without additional programming effort. The user, therefore, has access to simple operation without comprehensive technical understanding.

Solid state relays, thyristor power controllers

Wherever electrical energy is converted to heat and/or used for industrial heat generation, thyristor power controllers are used. To develop practical products for this sector that have established themselves on the market, a close cooperation with the user is very important.

JUMO offers you products that provide you with an energy-efficient, sustainable, and cost-oriented production.

Solid state relays



	Designation	❶ TYA 432-45/25, 230 ❷ TYA 432-45/50, 600	❸ TYA 432-100/25, 230 ❹ TYA 432-100/50, 600	TYA 432-100/40, 600	TYA 432-100/60, 600	TYA 432-100/3, 20, 600
	Data sheet	709010	709020			
Technical data	Load type	One-phase				Three-phase
	Dimensions	45 × 58.2 × 29 mm	17.8 × 110 × 98.5 mm	35.6 × 110 × 140.5 mm	70 × 110 × 140.5 mm	54 × 110 × 102.5 mm
	Load voltage	❶ 24 to 265 V AC ❷ 42 to 660 V AC	❸ 24 to 240 V, ❹ 42 to 600 V	42 to 660 V AC		
	Load current (max)	❶ 25 A_{eff} ❷ 50 A_{eff}	25 A_{eff} (at 40 °C)	40 A_{eff} (at 40 °C)	60 A_{eff} (at 40 °C)	20 A_{eff} (at 40 °C)
	Load current (min)	❶ 150 mA AC ❷ 250 mA AC	250 mA AC	400 mA AC		250 mA AC
	Control voltage	❶ 3 to 32 V DC ❷ 4 to 32 V DC	❸ 3 to 32 V DC ❹ 4 to 32 V DC	4 to 32 V DC		5 to 32 V
	Peak reverse voltage	❶ >= 650 Vp ❷ >= 1400 Vp	❸ > = 800 Vp ❹ > = 1200 Vp	1600 Vp		1200 Vp
	Operating mode	Zero-voltage switching				
	Galvanic isolation	Between the control and power section through optocouplers; insulation voltage 4 kV				
	Ambient temperature	-20 to +70 °C	-40 to +80 °C			
	Electrical connection	Screw terminals				
	Protection type	IP20				
	Weight	60 g	260 g	515 g	972 g	850 g
	Approvals	cULus/CSA				
	Special features	Overvoltage protection by integrated varistor, LED display for control input				

Thyristor power controllers

	Designation	**TYA 201** **Single-phase thyristor power controller**	**TYA 202** **Three-phase thyristor power controller in economy circuit**	**TYA 203** **Three-phase thyristor power controller**
	Data sheet	709061	709062	709063
Technical data	**Load currents**	20, 32, 50, 100, 150, 200, 250 A		
	Load voltage	24, 42, 115, 230, 400, 460, 500 V		
	Control voltage	Control voltage = load voltage		
	Configuration	Setup/USB-powered Plain text display on the device		
	Operating modes	Phase-angle control, burst firing mode, half-wave control, SSR logic operation, fast logic operation, alpha start, soft start	Burst firing mode, SSR logic operation, fast logic operation, alpha start, soft start	Phase-angle control, burst firing mode, half-wave control, SSR logic operation, fast logic operation, alpha start, soft start
	Load types	Resistive load, resistive inductive load, cold/warm ratio 1:16, transformer load, infrared emitter (short, medium, long-wave)	Resistive load, resistive inductive load, transformer load, infrared emitter (short, medium, long-wave)	Resistive load, resistive inductive load, cold/warm ratio 1:16, transformer load, infrared emitter (short, medium, long-wave), carbon emitter
	Approval	cULus		
	System interfaces	Modbus, PROFIBUS DP, JUMO mTRON T system bus		Modbus, PROFIBUS DP, JUMO mTRON T system bus
	Ambient temperature	-20 to +70 °C		
	Subordinate control loop	U, U^2 control (standard); I, I^2, P control (optional)		
	Special features	Current limiting	Economy circuit	Current limiting
		Mains load optimization, dual energy management, "Teach-In" function (partial load failure detection), "R-control" (resistance limitation), intelligent diagnosis system, integrated semiconductor fuse, device configuration without auxiliary voltage, vibrant display, "True RMS" (Root Mean Square)		

Application

Infrared automobile tunnel

Foto: Heraeus

Thyristor power controllers are important function blocks of heat treatment plants. Special advantages of JUMO thyristor power controllers emerge as a result of the integrated subordinate control loop. The devices are used to eliminate or compensate for external disturbances such as mains voltage fluctuations and changes in resistance that would negatively impact the control path. Varying mains voltages result in power changes in the process that can be noticed by changes in temperature. If the power controller has a subordinate control loop, the fluctuation in the energy supply is directly balanced out in the power controller, which results in the provision of a constant amount of power. This achieves high quality and continuity in the process. A distinction is made between U^2, I^2, and P control loops that also positively affect the control quality. Application areas include control of heating elements with non-linear temperature profiles. These include all types of MoSi and SIC heating elements. High starting currents that occur very frequently with short-waved IR emitters can be limited by soft start function or current limiting. Transformers can be controlled without steps through the phase-angle control.

The thyristor power controller of the JUMO TYA-20X series provide significant advantages due to a reliable and flexible technology and many user-friendly functions such as dual energy management, partial load failure detection, and resistance limitation.

Automation system JUMO mTRON T

JUMO mTRON T combines a universal measured value recording system with a precise control system offering intuitive operation. It can also be expanded into a complete automation solution. The scalability of the JUMO mTRON T allows it to be individually adapted to a particular task. The tamper-proof data recording is just one of its outstanding features. The control and data recording therefore meet the requirements of the AMS 2750 and CQI-9 specifications.

JUMO automation system

The modular JUMO mTRON T uses an Ethernet-based system bus and an integrated PLC – even for decentralized automation tasks. The automation system can be used universally and combines JUMO's extensive process expertise with a simple, application-oriented, and user-friendly configuration concept.

Multifunction panel 840, type 705060

The panel with 8.4" TFT touchscreen (640 × 480 pixels, 256 colors) displays data and process statuses. Among other features, the panel's predefined screen masks for service, controller, program generator, and recording functions make the overall system easy to use.

Features:

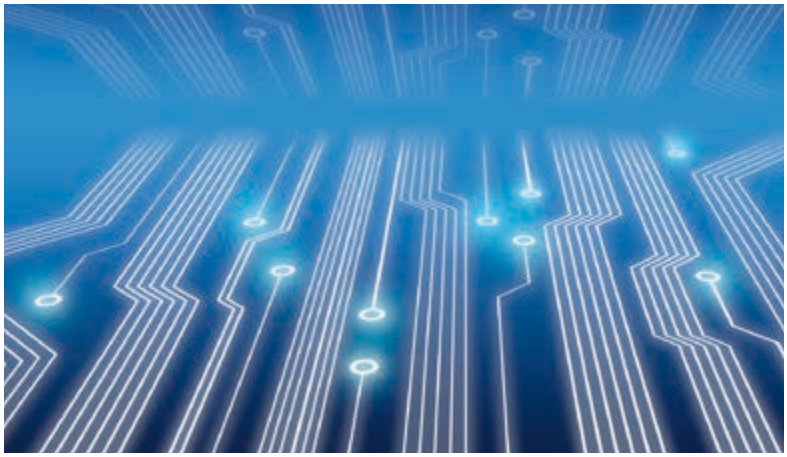
- Comprehensive user management: up to 16 user groups with individual rights allocation/up to 50 different users
- Individually-generated process screens in which measured value displays and input fields can be integrated
- Integrated paperless recorder for tamper-proof data recording of up to 54 analog and 54 digital process values including batch reporting
- Integrated web server
- Alarm and event lists
- Comprehensive interface connections: Ethernet/LAN, RS232, RS422/485, Modbus RTU and Modbus TCP (master/slave), USB host, USB device
- Robust metal case (die-cast aluminum), stainless steel option, protection type (front): IP67

Central processing unit, type 705001

The central processing unit contains the process screen for your application with up to 30 input/output modules (including controller modules and power controllers but not including any router modules) and at the same time manages the configuration and parameter data of your system. A setup program is used for quick and convenient hardware/software configuration as well as project planning of the measured value recording tasks and control tasks.

Features:

- CODESYS V3 PLC
- Nine program generators including process step function
- 64 limit values are monitored
- Math and logic modules
- Comprehensive interface connections: Ethernet/LAN, RS232, RS422/485, Modbus RTU as well as Modbus TCP (master/slave), PROFIBUS DP (slave), USB device
- Integrated web server
- Email functions (e.g. alarm for limit value violation)
- JUMO digiLine sensors for liquid analysis can be connected via PLC application



Additional operating panels

Type 705065

The multifunction panel 840 is the standard human machine interface for the JUMO mTRON T. When required, the automation system can be made even more flexible with additional operating panels.

Features:

- Display sizes of 3.5" to 15"
- Direct access to PLC variables
- Up to four operating panels can be connected to each JUMO mTRON T central processing unit

Input/output modules

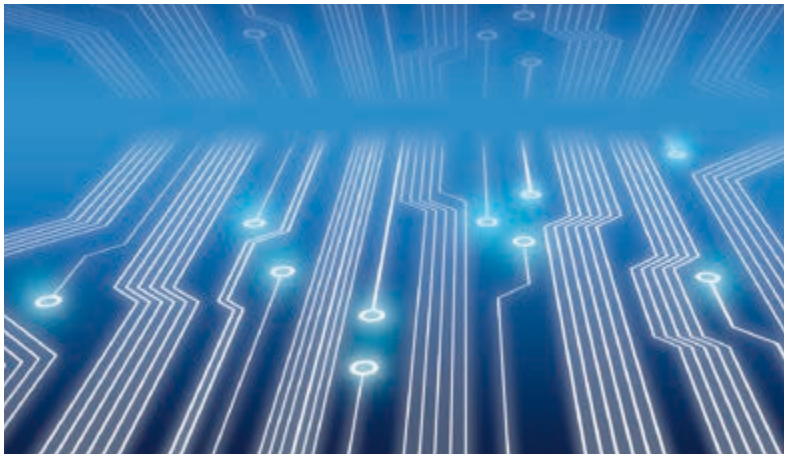
Various modular components are available as input/output modules. These can include an analog input module with universal inputs for thermocouples, RTD temperature probes, and voltage or current standard signals. As a result the same hardware can be used to precisely record and digitize a highly diverse range of process variables.

JUMO mTRON T enables simultaneous operation of up to 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 make demands on the central processing unit resources. Power controllers can also be connected via the system bus.

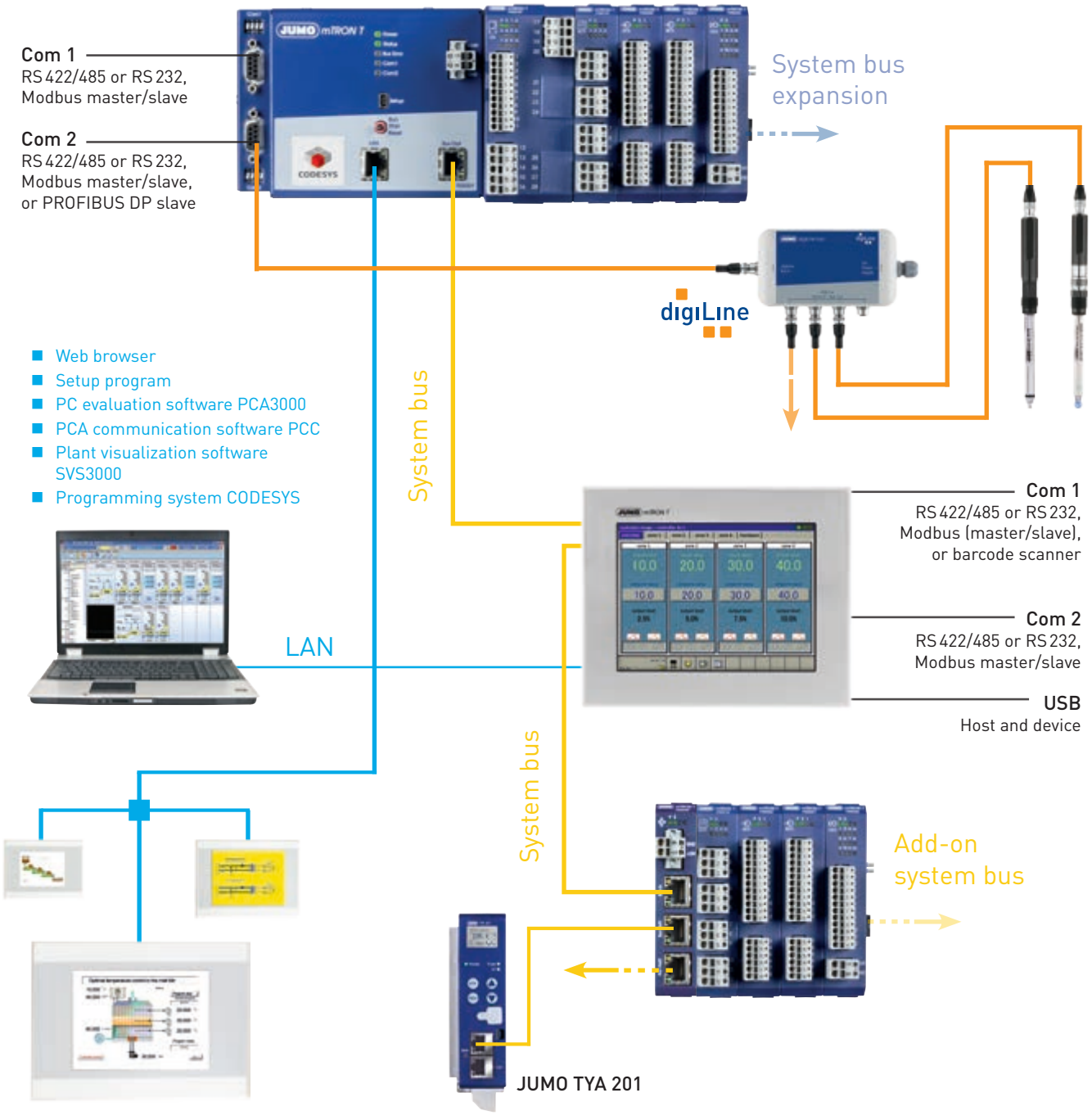
In addition, JUMO digiLine sensors for liquid analysis can be connected directly to the central processing unit.

Modules	Multichannel controller module	Relay module four-channel	Analog input module four-channel	Analog input module eight-channel
Data sheet	705010	705015	705020	705021
Features	- Up to four independently configurable PID control loops with a fast cycle time and proven control algorithms - Independent operation - Math and logic functions - Counter input up to 10 kHz	- Four relay outputs controlled via the system bus by digital signals - Changeover contact in each case (230 V/3 A) - The switching statuses are displayed with LEDs	- Four high-quality, 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 - Additional digital input	- Eight high-quality analog inputs for RTD temperature probes Pt100, Pt500, Pt1000 in two-wire circuit - Limit value monitoring - Additional digital input

Modules	Analog output module	Digital input/output module	Router module	Power controller JUMO TYA 200 series
Data sheet	705025	705030	705040	709061, 709062, 709063
Features	- Four configurable analog outputs 0(4) to 20 mA or 0(2) to 10 V - Adjustable output behavior in case of malfunction	- 12 digital inputs or outputs - Each channel can be configured as an input DC 0/24 V or output DC 24 V - Capacity per output: 500 mA - Switching statuses are displayed with LEDs	Input/output modules can be divided between several supporting rails or control cabinets using a router module. Decentralized automation solutions are therefore simple to implement	- 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



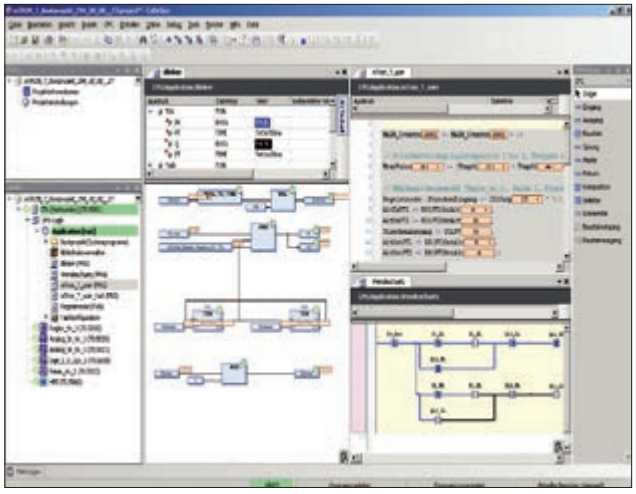
System structure



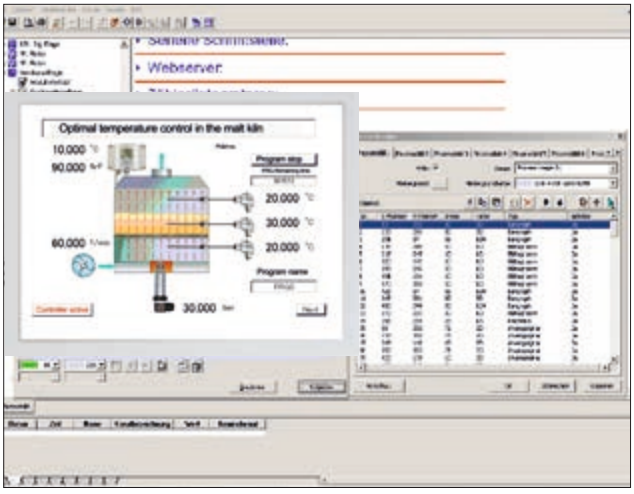
Configuration

The option of individually presenting the plants, including their processes and individual sections, is very important to an automation system. For this purpose up to 18 process screens can be individually generated in the multifunction panel. In turn up to 150 objects can be presented per process screen on up to 16 different levels.

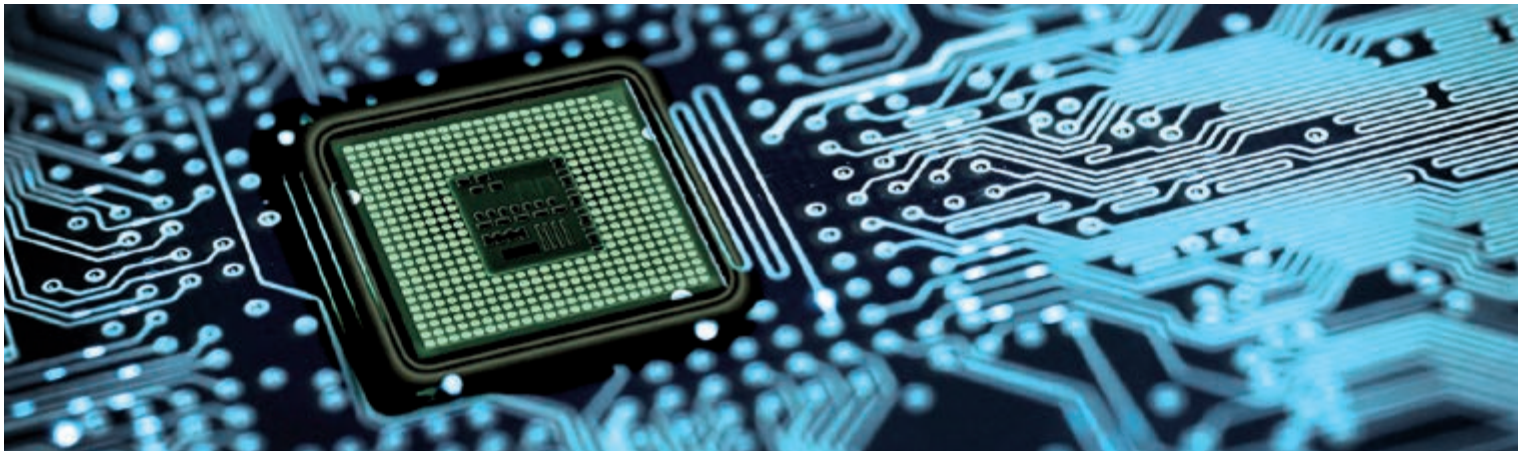
Other than the necessary system functionality, project planning software that is as simple and intuitive to operate as possible was at the heart of JUMO's product development. For this reason, hardware/software configuration and project planning of the measured value recording tasks as well as control tasks using the setup program are carried out for the JUMO mTRON T with the same look and feel as other JUMO devices. To ensure an automation solution according to IEC 61131-3, access to the CODESYS V3 programming system has been integrated in the JUMO setup program. This means that the hardware assignment and the description of the physical inputs/outputs are adopted automatically. Project variables can then, for example, be defined and linked to a particular input or output address of the hardware assignment that appears in the device tree. All editors for programming the control application that are defined in the IEC 61131-3 standard are available in CODESYS. After programming of the automation solution with CODESYS the project data is transferred from the setup program again. As a result the complete application can be recorded in a project file, which greatly simplifies project management and version maintenance.



PLC programming system CODESYS V3



Setup program with process screen editor including process screen preview

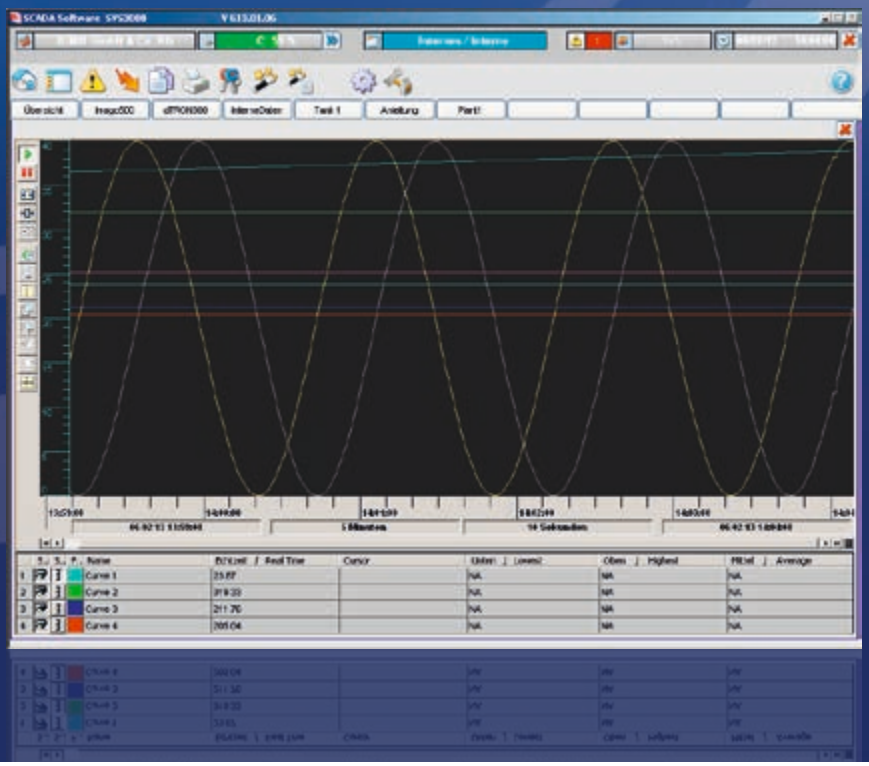


Software

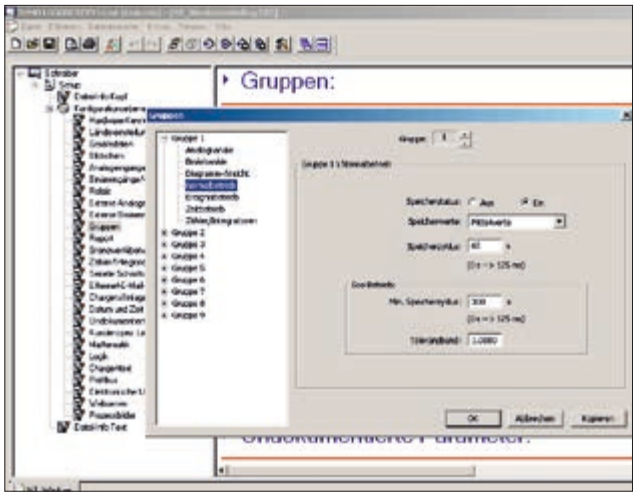
To work hand in hand with the products from automation, JUMO offers intuitive PC-based setup software which supports the user during device configuration and parameterization. It also simplifies the optimization of the control of plants or processes so that you can implement good control in terms of energy efficiency. The startup tool contained in the setup software is particularly helpful during startup.

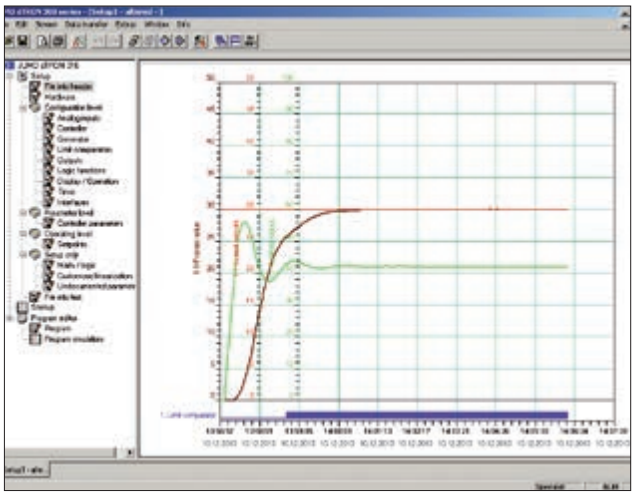
The professional PC evaluation software PCA3000 can be used for administration, archiving, visualization, and evaluation of the historical process data recorded by a paperless recorder integrated into a digital controller or by the JUMO mTRON T automation system. The plant visualization software SVS3000, which is also PC-based, enables online-visualization and reporting of important process values; this can also be performed in a batch-related manner if required. Pre-programmed graphic elements make it easier to create a customized process screen.

In addition, the JUMO mTRON T automation system is equipped with the PLC programming system CODESYS, which is easy to program via the development environment embedded in the setup program.



PC software components





Setup program

You can use the setup program to conveniently carry out project design and configuration of the respective digital compact controller on your PC. Integrated auxiliary functions assist you in adjusting the controller to your process or your application.

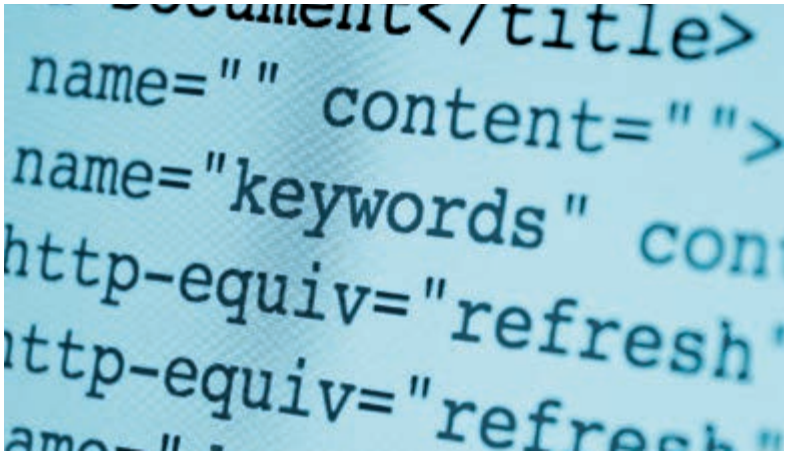
- User-friendly configuration, parameterization, and startup
- Diagnosis function (display of the process data)*)
- Input of math and/or logic formulas*)
- Program editor*)
- Process screen editor*)
- Simple printout of the configuration for documentation purposes**)

Startup software**)

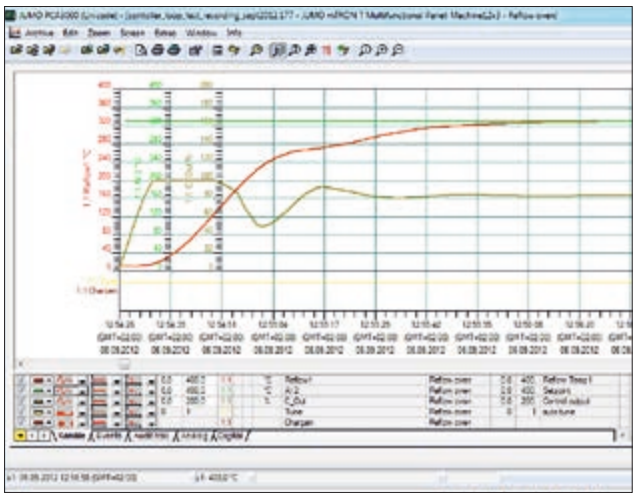
This software tool* included in the setup program enables real-time visualization and storage of analog and binary signals during a startup or optimization phase after a tool change for example. A visual display of the key process data in real-time is particularly useful when carrying out demanding processes.

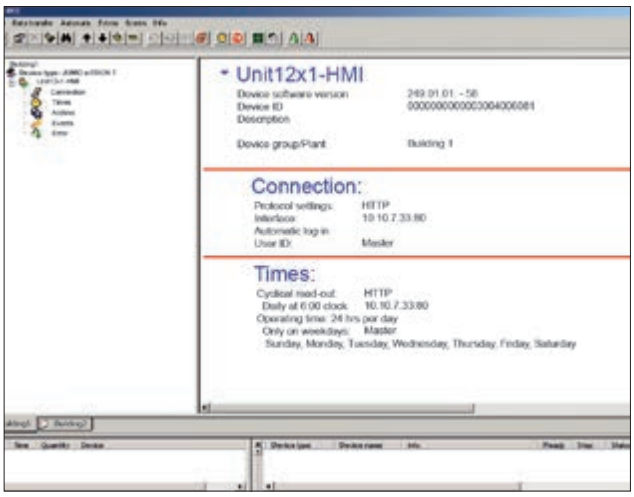
- Visualization, monitoring, and recording of relevant analog and binary signals
- Triggering of a setpoint value change for determining control-related characteristic values on the basis of the plant behavior
- Straightforward comparison of control results for various controller parameters
- Random monitoring of control quality
- No additional devices required to assist with startup

*) Included with the JUMO mTRON T automation system and with certain JUMO compact controllers
**) Included with certain JUMO compact controllers; in preparation for the JUMO mTRON T automation system



PC software components





Evaluation software PCA 3000

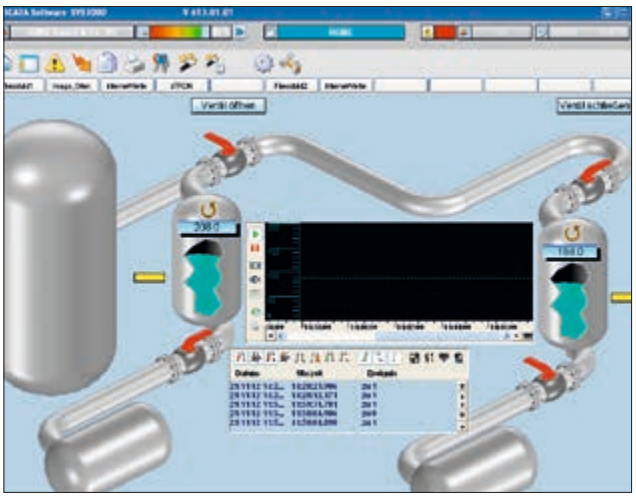
The PC-based, professional evaluation software PCA3000 can be used to manage, archive, visualize, and evaluate historical process data (measurement data, batch data, notifications, etc.). The data can be imported using a USB memory stick or a memory card. It can also be made available for central data processing via the PCC communication software.

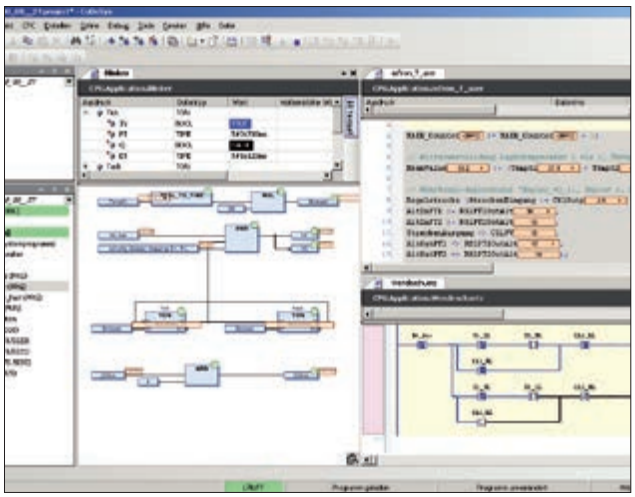
- Easy, straightforward backup and archiving of all process data in a data file
- Archived data can be read and visualized directly from a CD-ROM or DVD
- Graphic measured value processing: evaluation of measured data using a min/max search and zoom function (magnifying glass)
- Data export with PCA3000 form issued in a range of formats (CSV, HTML, PDF)

PCA communication software (PCC)

PCC communication software is ideally geared towards PCA3000 and allows for easy data extraction via Ethernet, a serial interface (USB, RS485), or modem.

- Time-controlled, automatic data extraction via interface or modem
- Easy, straightforward backup and archiving of all process data in a data file on a hard disk drive or a network server
- Diagnosis function (display of current process data, e.g. via modem or Ethernet)
- Can be launched as a Windows® service
- Email notification in the event of communication failure





Plant visualization software SVS3000

The visualization software SVS3000 enables you to visualize process data in real-time or as a historical trend on your PC. The diverse reporting functions with batch-related protocol creation facilitate the evaluation of archived production data. Thanks to pre-programmed graphic objects, it is easy to visualize plant-specific components and processes in the form of module screens and process screens. You have the option of processing 75, 250, 1,000, or 5,000 process variables.

- Comprehensive library with graphic elements for customized process screens
- Preprogrammed graphic objects for JUMO products
- Quick and simple creation of customized group screens and trend screens
- Plant operation via group screens and/or process screens
- Extensive documentation function with continuous and batch-related evaluation
- Search function for date/time, plant/user-definable batch criteria
- Automatic printing and data export

PLC programming system CODESYS V3

The CODESYS development environment implemented in the JUMO mTRON T is a comprehensive software tool for industrial automation. This widely used PLC programming system according to IEC 61 131-3 enables the implementation of almost all automation tasks.

All editors defined in the standard are available for the purpose of programming your control applications:

- Editor for structured text (ST)
- Sequential function chart editor (SFC)
- Continuous function chart editor (CFC)
- Function block diagram editor (FBD)
- Ladder diagram (LD)
- Instruction list editor (IL)

Services & Support

It is the quality of our products that is responsible for such a high level of customer satisfaction. But our reliable after-sales service and comprehensive support are also valued. Let us introduce you to the key services we provide for our innovative JUMO products. You can count on them – anytime, anywhere.

JUMO Services & Support – so that it all comes together!

Manufacturing Service

Are you looking for a competitive and efficient system or component supplier? Regardless of whether you seek electronic modules or perfectly fitting sensors – either for small batches or mass production – we are happy to be your partner. From development to production we can provide all the stages from a single source. In close cooperation with your business our experienced experts search for the optimum solution for your application and incorporate all engineering tasks. Then JUMO manufactures the product for you.
As a result you profit from state-of-the-art manufacturing technologies and our uncompromising quality management systems.

Customer-specific sensor technology

- Development of temperature probes, pressure transmitters, conductivity sensors, or pH and redox electrodes according to your requirements
- A large number of testing facilities
- Incorporation of the qualifications into application
- Material management
- Mechanical testing
- Thermal test

Electronic modules

- Development
- Design
- Test concept
- Material management
- Production
- Logistics and distribution
- After-sales service

Metal technology

- Toolmaking
- Punching and forming technology
- Flexible sheet metal machining
- Production of floats
- Welding, jointing, and assembly technology
- Surface treatment technology
- Quality management for materials

Information & Training

Would you like to increase the process quality in your company or optimize a plant? Then use the offers available on the JUMO website and benefit from the know-how of a globally respected manufacturer. For example, under the menu item "Services and Support" you will find a broad range of seminars. Videos are available under the keyword "E-Learning" about topics specific to measurement and control technology. Under "Literature" you can learn valuable tips for beginners and professionals. And, of course, you can also download the current version of any JUMO software or technical documentation for both newer and older products.

Product Service

We have an efficient distribution network on all continents available to all of our customers so that we can offer professional support for everything concerning our product portfolio. Our team of professional JUMO employees is near you ready to help with consultations, product selection, engineering, or optimum use of our products. Even after our devices are commissioned you can count on us. Our telephone support line is available to give you answers quickly. If a malfunction needs to be repaired on site our Express Repair Service and our 24-hour replacement part service are available to you. That provides peace of mind.

Maintenance & Calibration

Our maintenance service helps you to maintain optimum availability of your devices and plants. This prevents malfunctions and downtime. Together with the responsible parties at your company we develop a future-oriented maintenance concept and are happy to create all required reports, documentation, and protocols. Because we know how important precise measurement and control results are for your processes we naturally also professionally calibrate your JUMO devices – on site at your company or in our accredited DAkkS calibration laboratory for temperature. We record the results for you in a calibration certificate according to EN 10 204.

www.jumo.net

Picture credits: Heraeus Noblelight Hanau

PR 70090 EN/00583375/2018-04-04/V6