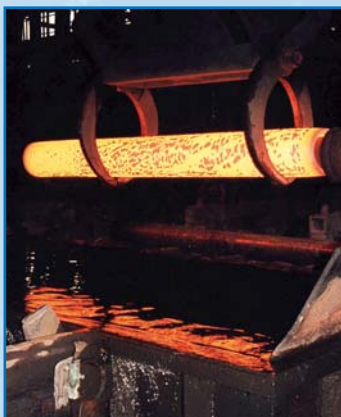




New Generation of Modular Control Systems



Tecomat TC700



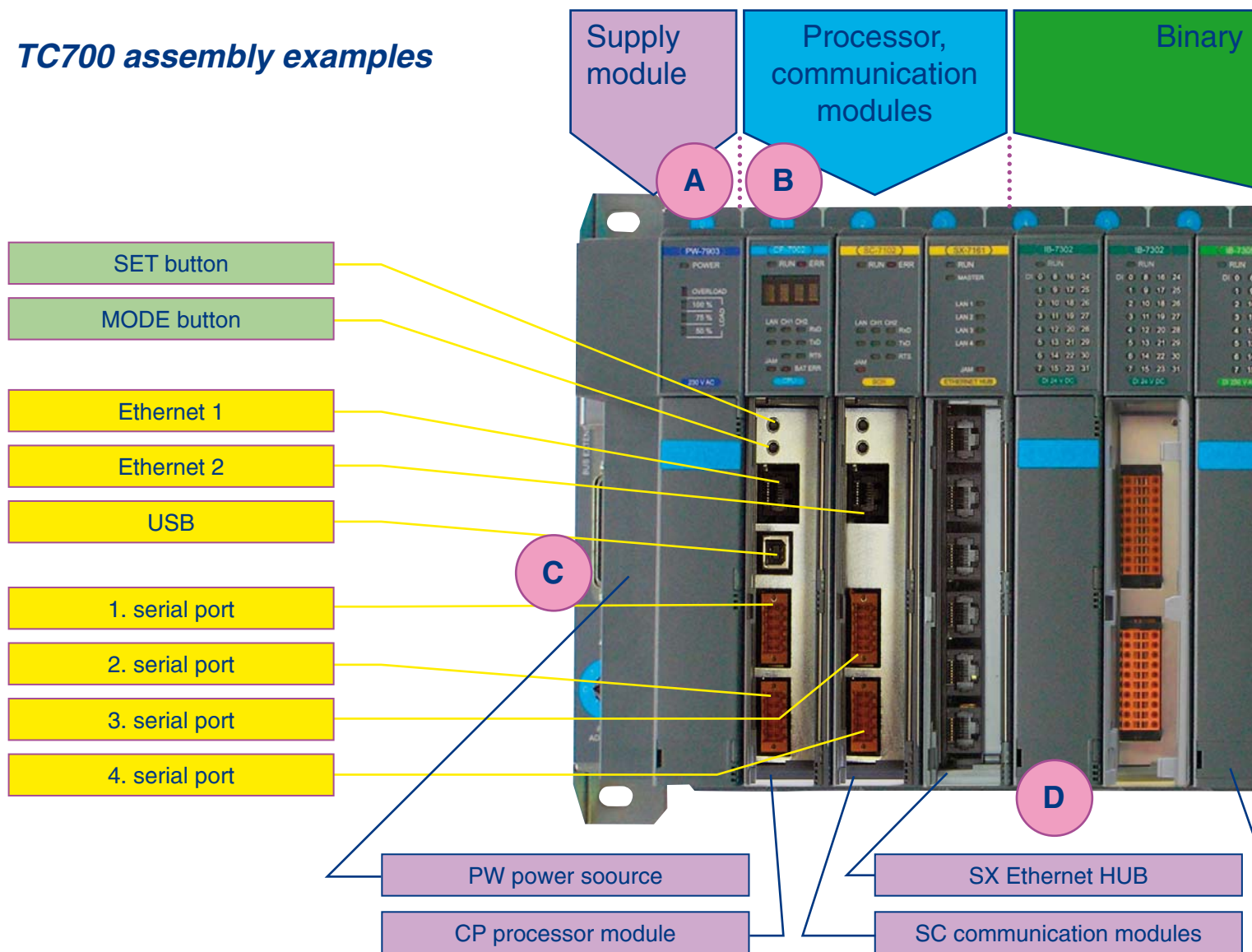
User-friendliness

Reliability

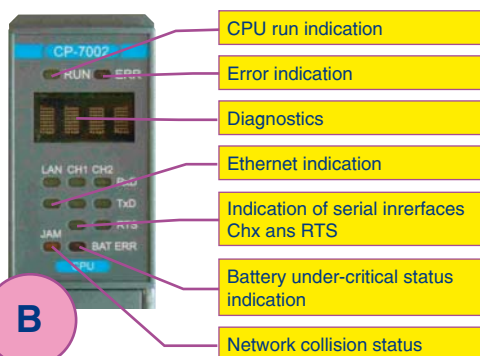
Cost savings



TC700 assembly examples

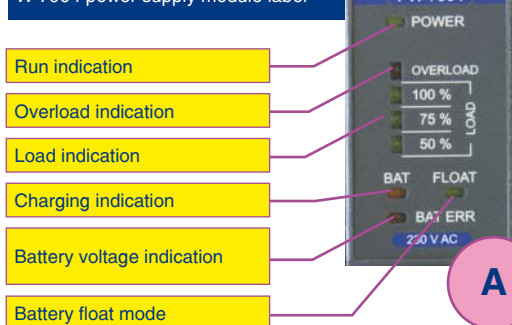


CP-7002 processor module label

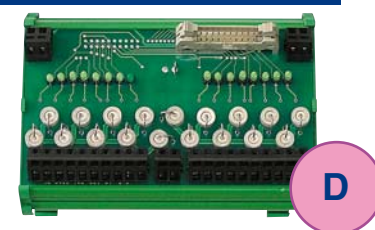


The Tecomat TC700 opens a new chapter of control and regulation from company Teco a.s. When designing the new system, we were concentrating on your three main requirements – **USER-FRIENDLI-NESS, RELIABILITY** and **COST SAVING**. Through consistent integration of the IEC/EN 61131 international standard and of all well-proved properties of the Tecomat PLCs produced until now as well as new pieces of knowledge, a new product has been made, which can be used in a great number of middle-sized and extensive applications in many branches of industrial automation or building installations.

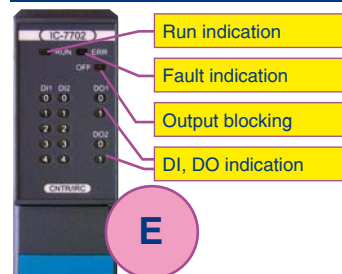
W-7904 power supply module label

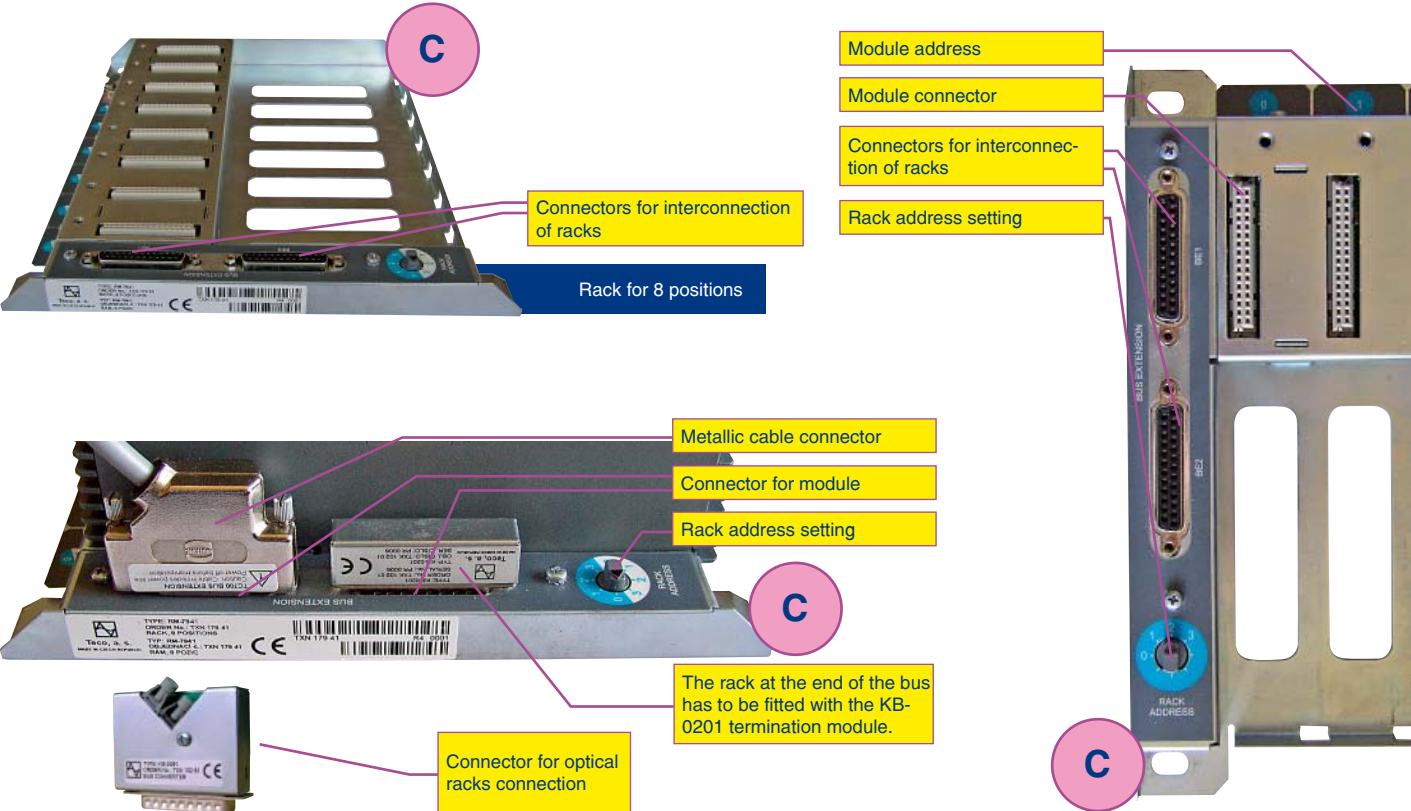
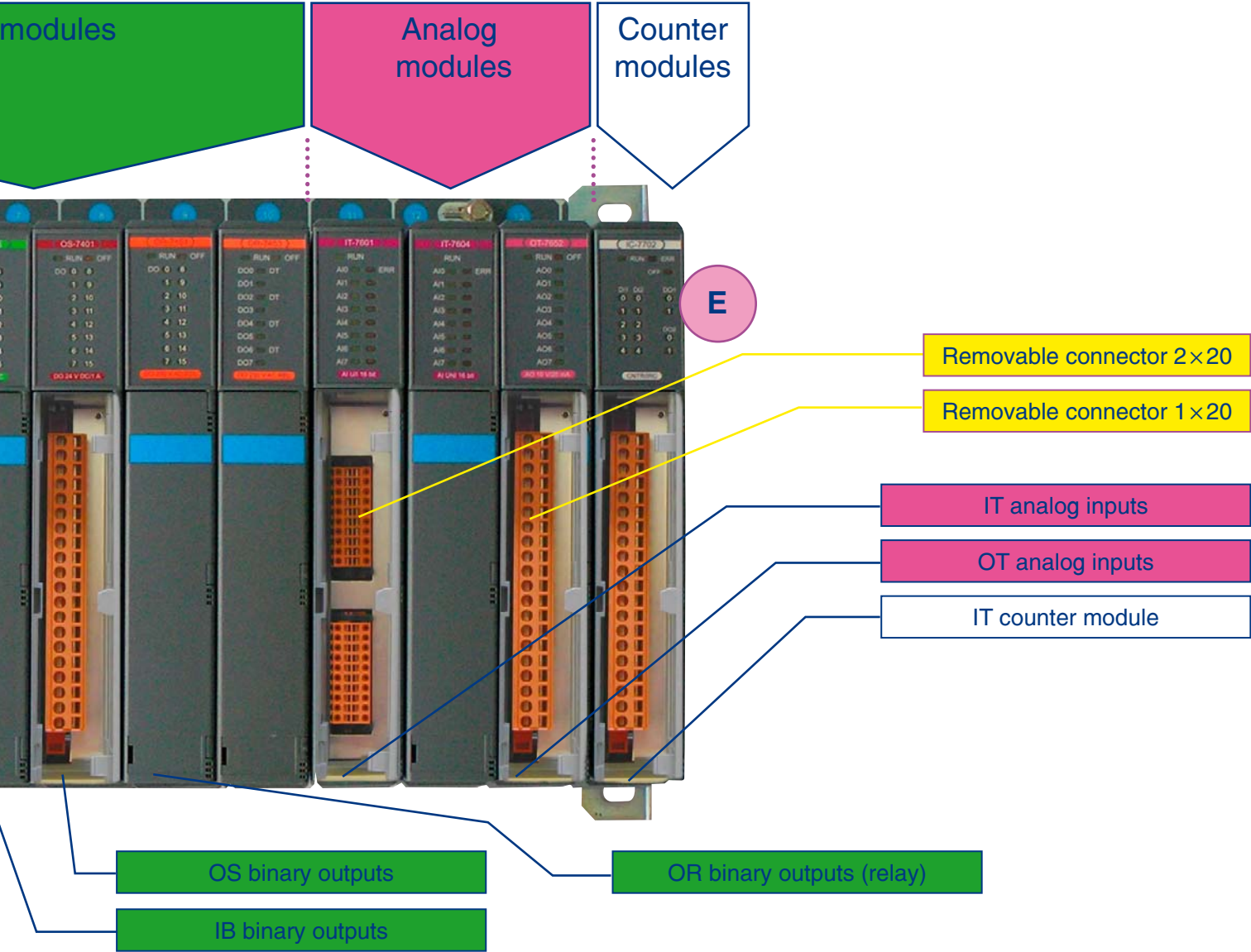


External module IB-0402



IC-7702 counter module label





User-friendliness – performance and simplicity

Tecomat TC700 consists of the following items:

- Rack with internal serial bus and connectors allowing easy assembly of the system
- Power supply source
- Central control module (CPU)
- Communication modules
- System of peripheral modules
- All units are equipped with optical indication of status.

Power supply sources:

- are designed according to a new concept
- have a processor allowing SW setting, autodiagnosics
- can be parallel-arranged to increase power source capacity (the sum of capacities) or to ensure redundant supply of the system (hot standby)
- supply the other modules through a bus
- can be fitted at any position of any rack of the assembly
- can use the function of UPS and standby accumulators
- have the possibility of power supply selection between 24 V DC or 230 V AC

Central control modules (CPU):

- 32bit RISC Motorola processor
- Cycle duration 0,9 ms
- Program memory up to 128 kB
- Table memory up to 64 kB
- Secondary memory (Databox) up to 3 MB
- Backup memory Flash EEPROM

Programming

- On-line programming under operation
- According to IEC/EN 61131-3 standard

I/O peripheral modules:

- perform independent communication with CPU
- SW-addressing
- are identified automatically
- have removable terminal board for conductor connection
- through the serial bus the racks are connected with the other I/O modules without additional interface
- are hot-swappable (HOT-SWAP)*
- are connectable also by means of a special submodule or Ethernet (remote I/O)
- by means of the Profibus DP network the TP1000 peripheral system can be used.

Communication:

- TC700 uses a number of interface types and communication modes.
- Communication interfaces are fitted both on CPU and communication modules.

- Newly, Ethernet is employed (one physical interface contains 4 logic data channels and USB).
- Besides the EPSNET protocol, it is possible to communicate by means of MODBUS Slave, PROFIBUS DP Master/Slave or CANopen protocols.
- For SCADA systems (visualisation), direct drivers or OPC server for Tecomat are available.

High reliability is supported by

Diagnostics:

- Process control (WATCHDOG)
- Power supply control (POWERFAIL)
- Data protection during power failure
- Serial communications
- Data transmission via the I/O bus
- Control of user program validity
- Guarding cycle period of user program
- Continuous control of user program correctness
- Autodiagnosics of power supply sources
- Autodiagnosics of I/O modules

Redundancy of:

- power supply sources (parallel connection)
- central control modules (by means of CPU with redundancy function)
- communication

Galvanic isolation of:

- I/O modules

Increased protection of external modules:

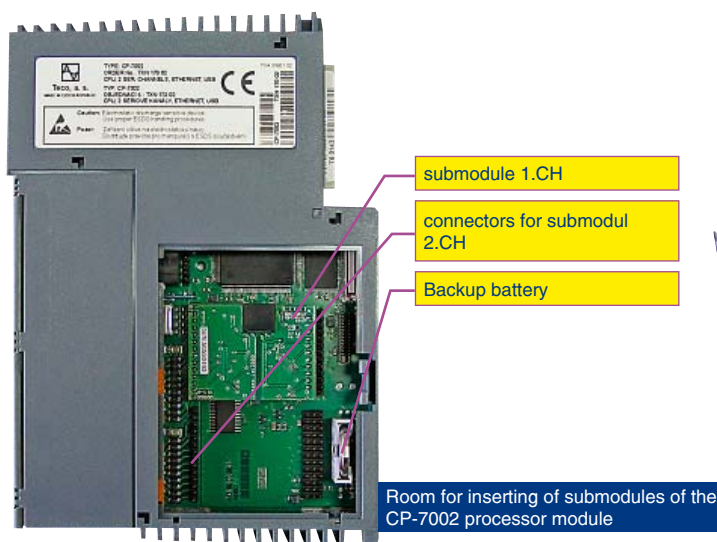
- Overvoltage protection
- RC elements
- Varistors
- Arresters

Mechanical design:

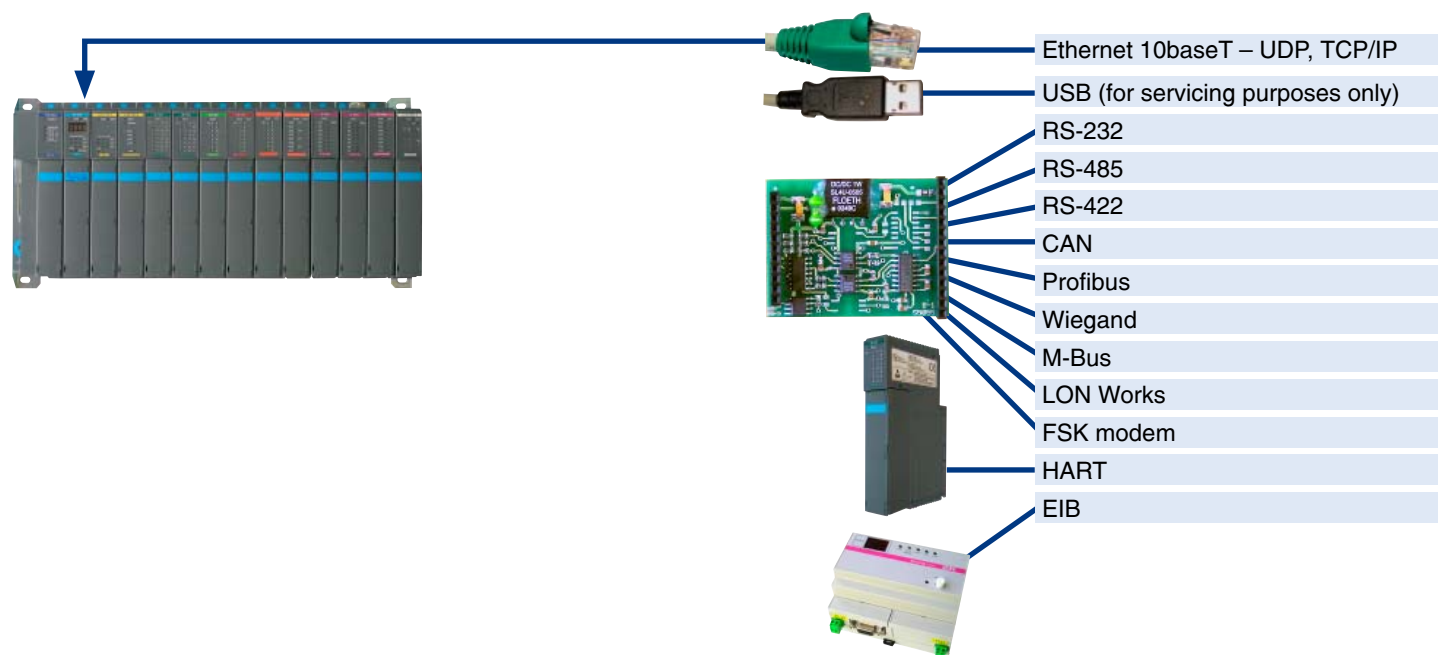
- Surge and vibration tests

Cost saving is ensured by:

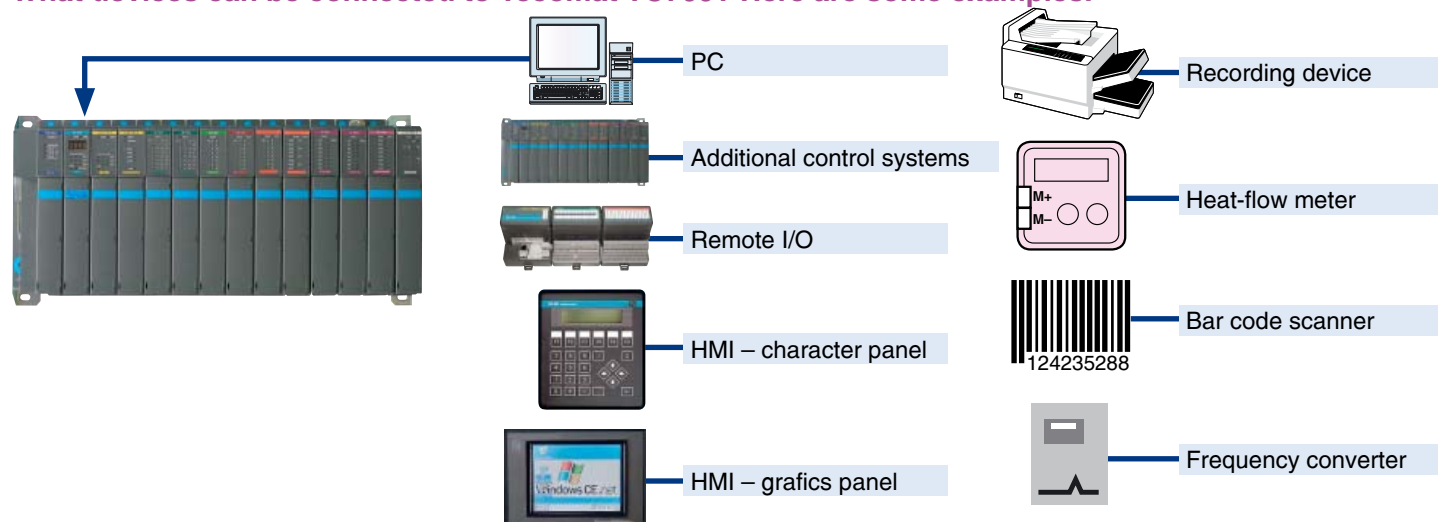
- the UPS function of the power supply sources - it is not necessary to fit separately;
- the effective backup system through connection of an external accumulator;
- connecting of the I/O modules in the other racks without additional interface (previously STM units);
- mounting also into switchgears with small depth;
- using standardized switch cupboards with a standard width of 19";
- locating up to 15 peripheral units in the rack with a width of 19";
- reverse as well as communication compatibility with the other products of Tecomat and Tecoreg series.



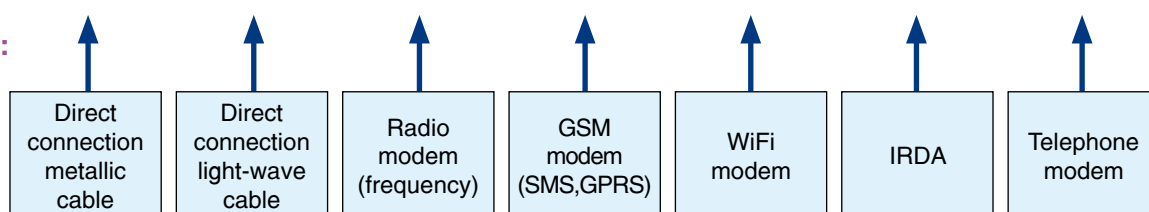
Through which interfaces does Tecomat TC700 communicate?



What devices can be connected to Tecomat TC700? Here are some examples.



Transmission means:

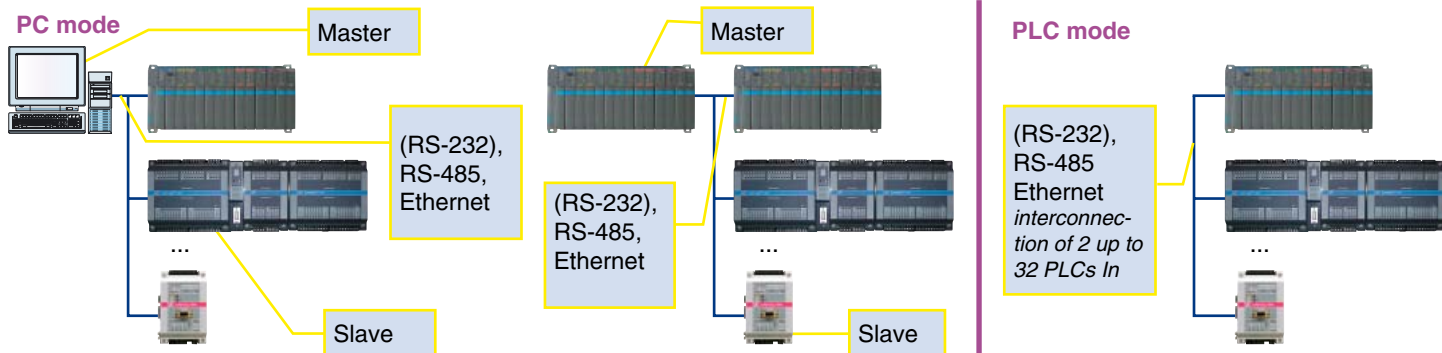


Which modes can be used by particular Tecomat TC700 modules?

Protocol	Mode	Central modules				Communication modules			
		CP-7001, 7002, 7003, 7005				SC-7101	SC-7102		
		USB	Ethernet1	CH1	CH2	CH3-CH4	Ethernet2	CH3-CH4	CH5-CH10
EPSNET	PC	●	○	●	●	●	●	●	○
	PLC		○	●	●	●	●	●	○
	UNI			●	●	●		●	○
	MPC			●	●	●		●	○
	EIO				○			●	○
MODBUS	MDB			●	●	●		●	○
PROFIBUS	DPS			●	●				
	PFB			○	○				
CAN	CAN			●	●				
	CAS			●	●				
	CAB			●	●				
xxx	UPD			●	●				

● central modules CP-7001, 7002, 7003, 7005
 ○ central modules CP-7002, 7003, 7005

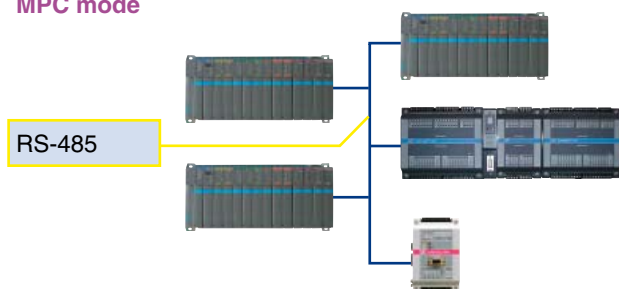
How can the communication modes of Tecomat TC700 be used?



Connection of PLC (Slave) in PC mode to a superior system (PLC, PC, Tempo, ...) through the EPSNET protocol without any intervention into the user program, complete package of EPSNET services available (services are available always on one channel).

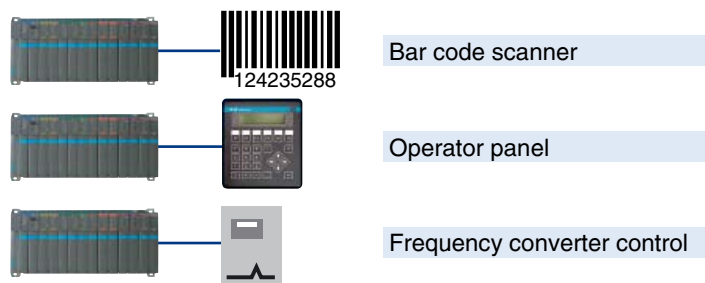
PLC interconnection of 2 to 32 PLCs in the PLC mode among each other for fast data transmission via the EPSNET-F protocol by means of designation of passing zones on the same registers of all PLCs, high network throughput, up to 238 bytes from each participant.

MPC mode



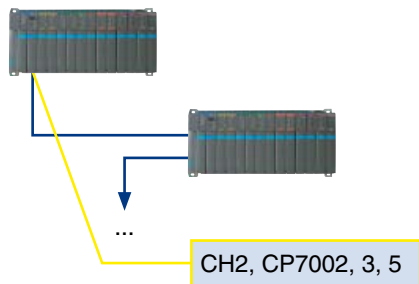
Connection of up to 64 PLCs in the PC mode to several superior systems via the EPSNETmultimaster protocol, up to 238 bytes read and 238 bytes written.

UNI mode



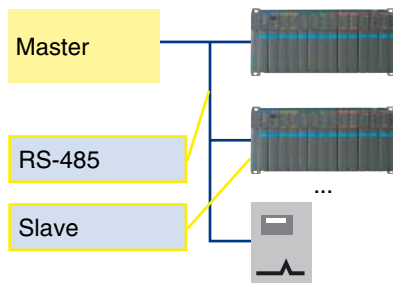
Examples of use of the UNI mode using the support of character-oriented protocols with asynchronous transmission.

EIO mode



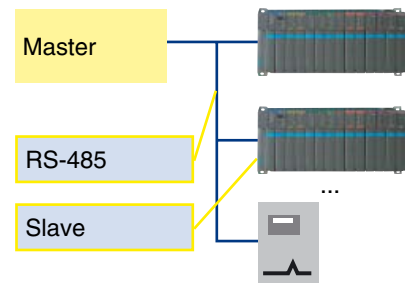
Connection of up to 4 racks of remote I/O through a special submodule, increasing of the number of racks to 8.

MDB mode



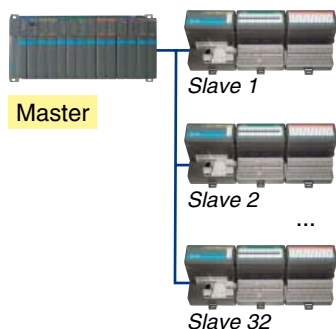
Connection of more participants (Slave) in the MODBUS network to the superior system.

DPS mode



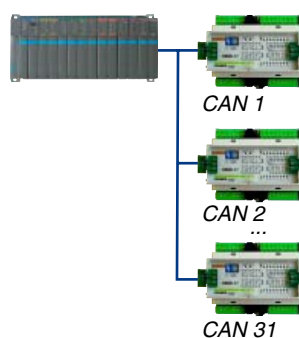
Connection of TC700 as the slave system through the PROFIBUS DP protocol.

PFB mode



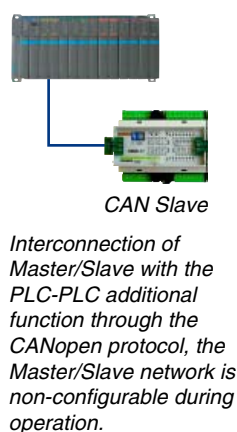
Connection of up to 32 devices to TC700 through the PROFIBUS DP protocol.

CAN mode

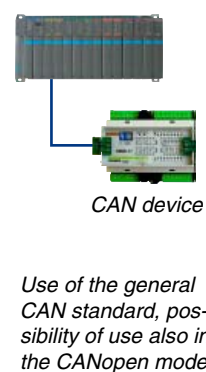


Connection of up to 31 peripheral modules through the CANopen protocol.

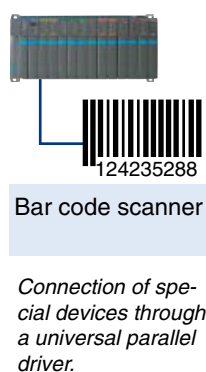
CAS mode



CAB mode



UPD mode



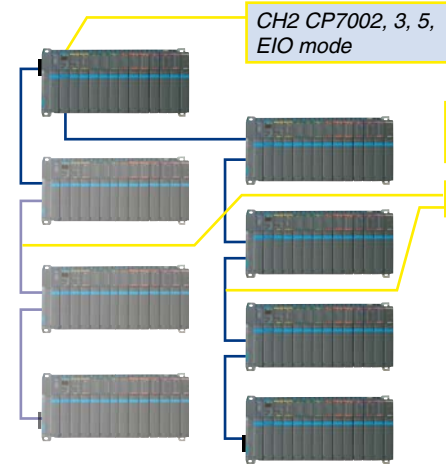
How can the peripheral modules be connected?



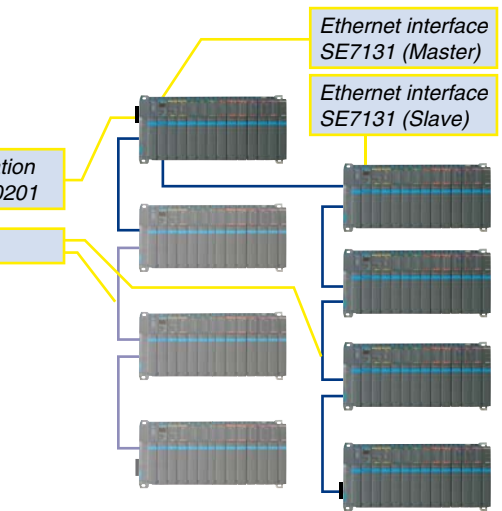
a) Connection of peripheral modules in the rack with 15 positions



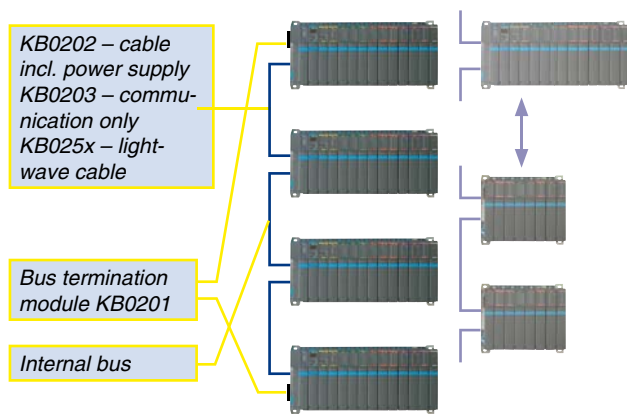
b) Connection of peripheral modules in the rack with 8 positions



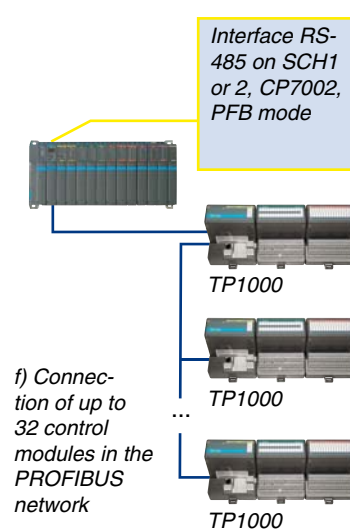
d) Connection of peripheral modules to max. 8 racks with 15 positions through internal bus and serial interface with EIO mode



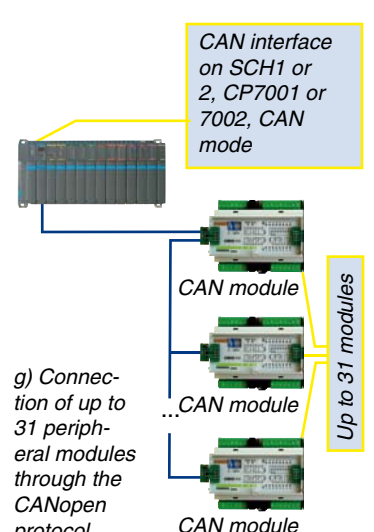
e) Connection of peripheral modules to max. 8 racks with 15 positions through internal bus and Ethernet with SE-7131/2 units (Master/Slave)



c) Connection of peripheral modules to max. 4 racks with 15 positions through internal bus. Instead of one rack with 15 positions, it is possible to connect up to 2 racks with 8 positions.

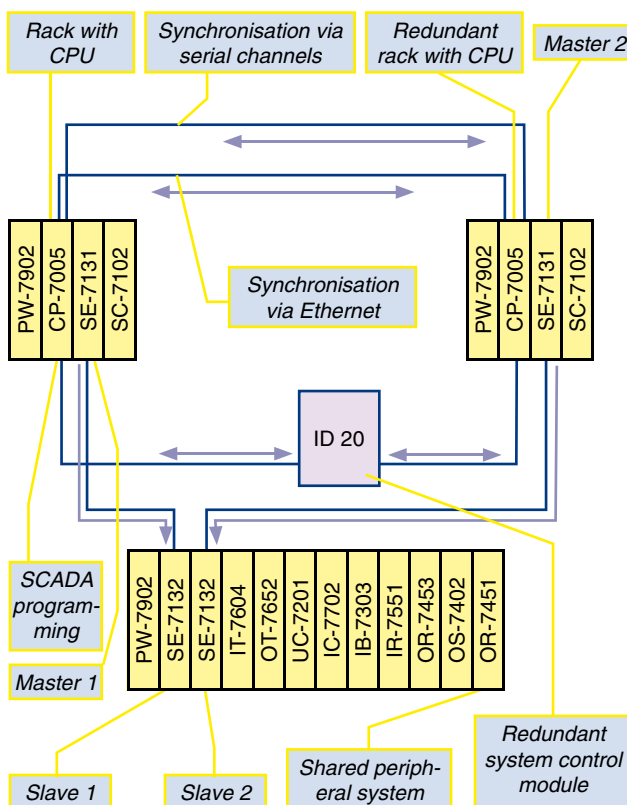


f) Connection of up to 32 control modules in the PROFIBUS network

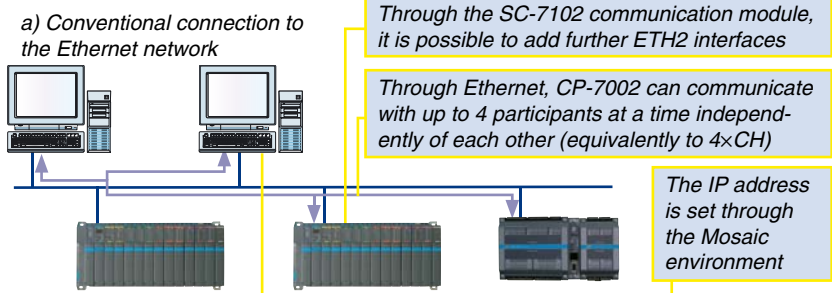


g) Connection of up to 31 peripheral modules through the CANopen protocol

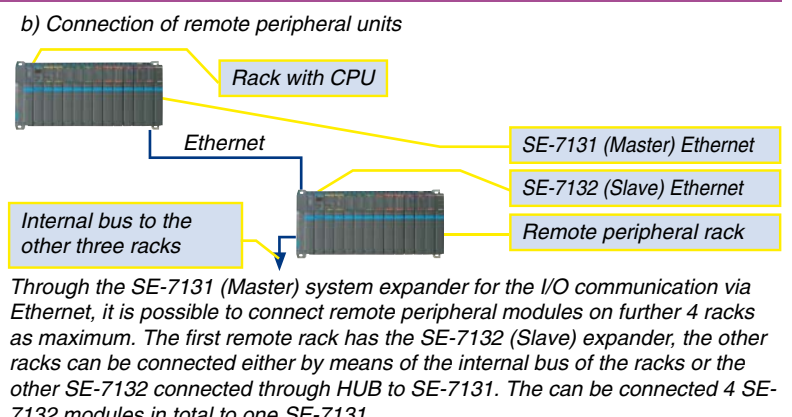
How can redundant connection of TC700 central units be realized?



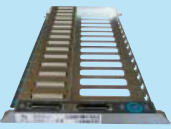
How can the Ethernet interface be used in Tecomat TC700 communication?



Standardly, CP-7002 is equipped with Ethernet 10baseT according to IEEE 802.3. This enables TC700 to communicate through the standard LAN network via the UDP or TCP/IP protocol by a speed of 10 Mb/s.



TECOMAT TC700 COMPONENTS

Group	Type	Binary input BI	Transistor binary output – BO	Relay binary output – RO	Analog Input AI	Analog output AO	Serial interface	Ethernet 10Mbit RJ-45	USB	Power supply	Order number
TC700 modular control system components											
	Racks										
	RM-7944 – rack, 2 positions for modules 30 mm wide										TXN 179 44
	RM-7946 – rack, 4 positions for modules 30 mm wide										TXN 179 46
	RM-7941 – rack, 8 positions for modules 30 mm wide										TXN 179 41
	RM-7942 – rack, 15 positions for modules 30 mm wide										TXN 179 42
Tecomat TC700 allows realizing of assemblies with one rack (including power supply and central module) as well as assemblies with several racks and distributed peripheral units. The maximum number of the racks is limited to 64 modules (peripheral as well as source modules) including one central module (possibility of expansion by means of the EIO mode). The central module can be mounted at any position of the assembly. The source modules have to be fitted in the racks in such a way to cover the overall power consumption. TC700 is designed for mounting into distributing frames. The positions of the assembly holes for fitting the racks in the distributing frames have to be in accordance with the DIN 41496 standard.											
	Power supply sources										
	PW-7901 – supply source 24 V DC, 50 W, without UPS									24 V=	TXN 179 01
	PW-7902 – supply source 24 V DC, 50 W, with UPS									24 V=	TXN 179 02
	PW-7903 – supply source 230 V AC, 50 W, without UPS									230 V~	TXN 179 03
	PW-7904 – supply source 230 V AC, 50 W, with UPS									230 V~	TXN 179 04
	PW-7906 – supply source 24 V DC, 18 W, without UPS									24 V=	TXN 179 06
Pulse-controlled power supply sources supply the other modules of the TC700 assembly through a bus. They have a circuit for network voltage failure monitoring and a circuit for power supply source load indication. Some types are equipped with a UPS circuit, which allows automatic feeding of the system in case of a power supply source failure after connection of external accumulators (24 V/0.8 to 8 Ah). The power supply sources can be arranged parallelly (in this case, they are fitted in the same rack, or in different racks mutually interconnected with power supply) to increase the power source output (the sum of outputs of individual sources) or to reach redundant feeding of the system. The supply sources can be fitted at any position of any rack of the assembly. All power supply sources fulfil the requirements laid on safe voltage power sources (SELV). The power supply sources are equipped with autodiagnosics.											
	Central modules										
	CP-7001 – CPU, SRAM 64 kB+64 kB, EEPROM 64 kB+64 kB, DataBox 128 kB						2	–	1	internal	TXN 170 01
	CP-7002 – CPU, SRAM 64 kB+64 kB, EEPROM 64 kB+64 kB, DataBox 128 kB to 3 MB						2	1	1	internal	TXN 170 02
	CP-7003 – CPU, SRAM 128 kB+64 kB, EEPROM 128 kB+64 kB, position for DataBox 3 MB						2	1	1	internal	TXN 170 03
	CP-7005 – CPU, SRAM 128 kB+64 kB, EEPROM 128 kB+64 kB, DataBox 3 MB, redundant function						2	1	1	internal	TXN 170 05
Central modules have an instruction set with a stack of the width of 32 bits, all common functions including sign arithmetic, floating point instructions, PID controller, multi-loop control and interrupt processes. The modules allow on-line programming during operation. They are equipped with the transferability of the source code from the other Tecomat systems. The SRAM memory is used for the program and tables, the DataBox secondary memory is for data archiving. The Flash EEPROM memory fully backs up the program and the data. The central modules have a real time circuit with automatic switching from daylight saving time to regular time, standardly two serial channels, the USB interface for servicing purposes and optionally the interface Ethernet 10baseT according to IEEE 802.3 for network connection.											
	Communication modules										
	SC-7101 – expansion of CPU by 2 optional interfaces						2	–		internal	TXN 171 01
	SC-7102 – expansion of CPU by 2 optional interfaces, Ethernet 10Mbit RJ-45						2	1		internal	TXN 171 02
	SX-7161 – 4-port hub Ethernet 10Mbit RJ-45, cascading							4		internal	TXN 171 61
	SE-7131 – system expander Master for remote I/O communication via Ethernet						2	1		internal	TXN 171 31
	SE-7132 – system expander Slave for remote I/O communication via Ethernet						2	1		internal	TXN 171 32
	UC-7201 – interface with HART protocol									internal	TXN 172 01
	CD-7251 – module of remote transmissions Master – modem						1			internal	TXN 172 51
	CD-7252 – module of remote transmissions Slave – modem						1			internal	TXN 172 52
Communication modules serve for the expansion of the central module by up to 8 additional serial channels (SC-710x), optionally by the Ethernet interface (SC-7102), connection of remote I/O modules via Ethernet (SE-713x), connection of analog sensors with the HART interface (UC-7201). In addition, the communication modes are used for remote transmission through the FSK modems (CD-725x).											
	Serial interface submodules										
	MR-0102 – RS-232 galvanic isolation with own power source and identification						1			internal	TXN 101 02
	MR-0112 – RS-485 galvanic isolation with own power source and identification						1			internal	TXN 101 12
	MR-0122 – RS-422 galvanic isolation with own power source and identification						1			internal	TXN 101 22
	MR-0151 – CAN						1			internal	TXN 101 51
	MR-0152 – PROFIBUS DP Slave						1			internal	TXN 101 52
	MR-0155 – submodule with FSK modem and hub						1			internal	TXN 101 55
	MR-0156 – submodule with FSK modem, hub and continuous amplifier						1			internal	TXN 101 56
	MR-0158 – submodule M-BUS Master						1			internal	TXN 101 58
	MR-0159 – submodule LON Works						1			internal	TXN 101 59
	MR-01xx – submodule Wiegand						1			internal	TXN 101 xx
The serial interface submodules create interconnection between the serial channel and corresponding industrial bus.											
DataBox secondary memory submodules											
SX-7153 – Databox 3 MB, data secondary memory											
										internal	TXN 171 53

Group	Type	Binary input BI	Transistor binary output – BO	Relay binary output – RO	Analog Input AI	Analog output AO	Type of removable connector	Power supply	Order number
	Input binary units								
	IB-7302 – galvanic isolation, 24 V DC, 3 mA, 5 ms	32					2×20, 1 mm ²	internal	TXN 173 02
	IB-7303 – galvanic isolation, 24 V DC/AC, 7 mA, 0,5 ms, interrupt, SW filter	16					1×20, 2,5 mm ²	internal	TXN 173 03
	IB-7305 – galvanic isolation, 230 V AC, 5 mA, 10 ms	16					1×20, 2,5 mm ²	internal	TXN 173 05
	IB-7310 – galvanic isolation, 24 V DC (for external modules)	64					external	internal	TXN 173 10
	IB-7311 – galvanic isolation, 24 V DC (for external modules)	32					external	internal	TXN 173 11
	External input I/O modules (for binary units IB-7310, IB-7311, IS-7510)								
	IB-0401 – 24 V DC, direct connection of sensors	16						24 V=	TXN 104 01
	IB-0402 – 24 V DC, galvanic isolation, conn. of sensors in groups, overvoltage protection	16						24 V=	TXN 104 02
	IB-0403 – 230 V AC, galvanic isolation, conn. of sensors in groups, overvoltage protection	16						24 V=	TXN 104 03
	IB-0404 – 24 V DC, connection of sensors in groups	16						24 V=	TXN 104 04
	Output binary units								
	OS-7401 – galvanic isolation, 24 V DC, 2 A, 0,4 ms	16					1×20, 2,5 mm ²	internal	TXN 174 01
	OS-7402 – galvanic isolation, 24 V DC, 0,5 A, 0,4 ms	32					2×20, 1 mm ²	internal	TXN 174 02
	OS-7405 – galvanic isolation, 230 V AC, 0,25 A, semiconductor output (triac)	16					1×20, 2,5 mm ²	internal	TXN 174 05
	OS-7410 – galvanic isolation, 24 V DC, 50 mA, (for external modules)	64					external	internal	TXN 174 10
	OS-7411 – galvanic isolation, 24 V DC, 50 mA, (for external modules)	32					external	internal	TXN 174 11
	OR-7451 – galvanic isolation, switching relay 230 V, 3 A			16			1×20, 2,5 mm ²	internal	TXN 174 51
	OR-7453 – galvanic isolation, 4 switching relays, 4 switchover relays 230 V, 3 A			8			1×20, 2,5 mm ²	internal	TXN 174 53
	External output I/O modules (for binary units OS-7410, OS-7411, IS-7510)								
	OR-0422 – relay 4 A, galvanic isolation, 24 V DC, relays in sockets, separately led-out			8				24 V=	TXN 104 22
	OR-0424 – relays 3 A, galvanic isolation, 230 V AC, protection–RC, grouped conn. of loads			16				24 V=	TXN 104 24
	OS-0425 – SSR DC 3 A, galv. isolation, 230 V DC, protection–varistor, RC, direct conn. of loads			16				24 V=	TXN 104 25
	OS-0426 – SSR AC 2 A, galv. isolation, 230 V DC, protection, direct conn. of loads			16				24 V=	TXN 104 26
	OR-0427 – relé 16 A, galvanic isolation, 230 V AC, protection, separate contacts				8			24 V=	TXN 104 27
	OS-0428 – SSR DC 0,5 A, 24 V DC, protection, grouped connection of loads			16				24 V=	TXN 104 28
	Combined binary units								
IR-7551 – galvanic isolation, 24 V DC, 10 mA, 5 ms, switching relay	8		8			1×20, 2,5 mm ²	internal	TXN 175 51	
IS-7510 – galvanic isolation, 24 V DC, 50 mA (for external modules)	32	32				external	internal	TXN 175 10	
The input, output and combined TC700 binary modules serve for the connection the input and output logic signals, for providing of galvanic isolation and interference filtering. The logic levels of the input signals indicate the green LED diodes on the front panel of the module. The units have removable boards for the connection of conductors. The peripheral modules are hot-swappable. External modules are available for the connection of a higher number of signals and are equipped with increased protection against undesirable effects.									
	Analog units								
	IT-7601 – galvanic isolation, differential inputs 16bit, U, I, standard ranges				8		2×20, 1 mm ²	internal	TXN 176 01
	IT-7602 – galvanic isolation, fast differential inputs 16bit, 20 ms, U, I, standard ranges				16		2×20, 1 mm ²	internal	TXN 176 02
	IT-7604 – galv. isolation, univ. inputs 16bit, U, I, Pt100, Pt100, Ni1000, thermocouples				8		2×20, 1 mm ²	internal	TXN 176 04
	IT-7606 – galvanic isolation, universal inputs 16bit, U, I, Pt100, Pt100, Ni1000				32		2×20, 1 mm ²	internal	TXN 176 06
	OT-7652 – galvanic isolation, 16bit, 0 ÷ 10 V , 10 ÷ +10 V , –5 ÷ +5 V, 0(4) ÷ 20 mA					8	1×20, 2,5 mm ²	internal	TXN 176 52
	External I/O modules (for analog units IT-7601, IT-7604)								
	IT-0451 – 20 mA, 10 V, protection – arrester, transil, direct connection of sensors				4			24 V=	TXN 104 51
	IT-0453 – 20 mA, 10 V, direct connection of sensors, current loop power supply				8			24 V=	TXN 104 53
	OT-0461 – 20 mA, 10 V, power supply of output circuits including protection					8		24 V=	TXN 104 61
	The TC700 input and output analog modules serve for the connection of the input and output analog signals with galvanic isolation. They convert analog voltage or current levels to numerical values and vice versa. The input analog units have the possibility of setting of each input separately and are equipped with sensor damage indication. The units have removable terminal boards for the connection of conductors. The peripheral modules are hot-swappable. External modules are available for the connection of a higher number of signals and are equipped with increased protection against undesirable effects.								
TC700 modular control system components									
	Counters								
	IC-7702 – 4 counters 32bit with 3× IN or 2 counters 32bit with 5× IN, 4× DO 24 V DC, 2 A (counter, bi-directional counter, incremental position sensor, period measurement, timer, positioning, moving to reference...)						1×20, 2,5 mm ²	internal	TXN 177 02
The counter module serves for the connection of incremental position sensors and for the realization of 32 bit forward and reverse counters as well as further functions with a maximum frequency of the input pulses of 80 kHz. The units have removable boards for the connection of conductors.									

TECOMAT TC700 COMPONENTS

Group	Type	Binary input BI	Special functions of binary input	Transistor binary output – BO	Relay binary output – RO	Analog Input AI	Analog output AO	Serial interface	Ethernet 10Mbit RJ-45	Display / Keyboard	Power supply	Order number
TC700 modular control system components												
	Connectors											
	Screwless connector, 20 pins, pitch 5.08 mm											TXN 102 30
	Screw-type connector, direct, 20 pins, pitch 5.08 mm											TXN 102 31
	Screw-type connector, perpendicular, 20 pins, pitch 5.08 mm											TXN 102 32
	Set of connectors, screwless, 2× 20 pins, pitch 5.08 mm											TXN 102 40
  	Cables, termination components											
	KB-0201 – bus termination module (BUS EXT.) TC700, 2 pcs											TXN 102 01
	KB-0202 – cable of TC700 bus interconnection, incl. power supply (the length is given by last part of the order number behind the dot)											TXN 102 02.xx
	KB-0203 – cable of TC700 bus interconnection, only communication (the length is given by last part of the order number behind the dot)											TXN 102 03.xx
	KB-0204 – cable of TC700 bus interconnection by the customer's cable, 2 pcs											TXN 102 04
	KB-0205 – cable TP Ethernet 10 Mbit, standard, (the length is given by last part of the order number behind the dot)											TXN 102 05.xx
	KB-0206 – cable TP Ethernet 10 Mbit, crossed, (the length is given by last part of the order number behind the dot)											TXN 102 06.xx
	KB-0207 – interconnection cable for HUB-HUB											TXN 102 07
	KB-0208 – cable USB A–B standard, 3 m											TXN 102 08
	KB-0209 – programming cable RS232 for TC700, 3 m											TXN 102 09
	KB-0211 – cable for external I/O modules to binary units, 20 pin / 20 pin, shielding faston 2,8											TXN 102 11
	KB-0212 – cable for external I/O modules to binary units, 20 pin / 20 pin, no shielding											TXN 102 12
	KB-0213 – cable for external I/O modules to analog units, 20 pin / free end, shielding faston 2,8											TXN 102 13
	KB-0250 – module of optical interconnection of TC700 bus (to 2,2 dB)											TXN 102 50
	KB-0251 – module of optical interconnection of TC700 bus (to 13 dB)											TXN 102 51
	KB-0260 – light-wave cable duplex POF 220 dB/km (the length is given by last part of the order number behind the dot)											TXN 102 60.xx
	KB-0261 – light-wave cable duplex HCS 8 dB/km (the length is given by last part of the order number behind the dot)											TXN 102 61.xx
Additional devices												
	Converter											
	TR340 – interface converter M-BUS/RS-232					2	–	–	24V~			TXN 092 90
	TR341 – communicate programmable system, 3× SCH					3	–	externí	24V~			TXN 092 91
	TR342 – interface converter RS232/ EIB					2	–	–	24V~			TXN 092 92
	TS311 – analog output converter 0-10V to 3 state controlling	2	1	–	–	–	–	–	24V~			TXN 070 34
	SLC-66 – interface converter in profile to DIN bar RS485 / RS232					2	–	–	230V~			EI 5066.42
	SLC-67 – table interface converter RS485 / RS232					2	–	–	230V~			EI 5067.40
	XL-0471 RS-485 hub, over-voltage protection of extension					1	–	–	–			TXN 104 71
	communicate cabel PC/EI5067.xx (9/9 pin/RS232C) 3m											TXK 646 15.12
	communicate cabel PC/EI5067.xx (25/9 pin/RS232C) 3m											TXK 646 16.12
	External power supply sources											
	PS-25/24 – power supply source 230V AC/24 V DC, 1 A									230V~		TXN 070 22
	PS-50/24 – power supply source 230 V AC/24 V DC, 2 A									230V~		TXN 070 10
	PS-50S/24 – power supply source 230 V AC/24 V DC, 2 A									230V~		TXN 070 27
	PS-100/24 – power supply source 230 V AC/24 V DC, 4 A									230V~		TXN 070 15
	TS-411 – safety transformer 25 VA to bar IP20									230V~		TXP 104 11
	TS-421 – safety transformer 50 VA to bar IP20									230V~		TXP 104 21
	TS-431 – safety transformer 100 VA to bar IP20									230V~		TXP 104 31

Group	Type	Binary input BI	Special function of binary input	Transistor binary output – BO	Relay binary output – RO	Analog input AI	Analog output AO	Order number
Peripheral system TP1000								
Communication modules, power supply, base terminal boards, cables								
	PO5063 – control module Profibus DP (with power supply source for max. 12 modules)							TXP 150 63
	PO6500 – base for Profibus control module							TXP 165 00
	PO8085 – additional power supply source 5 V DC (for max. 10 modules)							TXP 180 85
	PO6800 – base for power supply source							TXP 168 00
	PO7078 – bus expansion module (for max. 4 segments)							TXP 170 78
	PO8500 – expansion cable 0.4							TXP 185 00
	PO8501 – expansion cable 1.4							TXP 185 01
	PO8524 – bus termination – spare part							TXP 185 24
Digital units								
	PO1000 – 24V DC	16	–					TXP 110 00
	PO1002 – 230V AC	16	–					TXP 110 02
	PO1010 – 24V DC	32	–					TXP 110 10
	PO2020 – 24V DC /2A			16				TXP 120 20
	PO2022 – 230V AC /2A, switching contact				16			TXP 120 22
	PO6000 – screwless terminal boards for digital I/O							TXP 160 00
	PO6100 – screwless terminal boards for digital I/O with fuses							TXP 161 00
Analog modules								
	PO1112 – universal, individually programmable					8		TXP 111 12
	PO2132 – universal, individually programmable						4	TXP 121 32
	PO6001 – screwless terminal board for analog I/O							TXP 160 01
	PO6101 – screwless terminal board for analog I/O with fuses							TXP 161 01



- TP1000 is a peripheral system for distribution of I/O signals for larger applications
- TP1000 supports a wide range of I/O signals and operating ranges
- Through its flexible architecture, TP1000 reduces the number of installation components and the time of system activation
- TP1000 allows direct connecting of sensors and actuators to module terminals
- TP1000 uses high-speed data transmission among modules
- TP1000 reduces the number of terminal boards, cabling, bars and possible fuse boxes

Configuration of TP1000 through the control module Profibus DP PO5063:

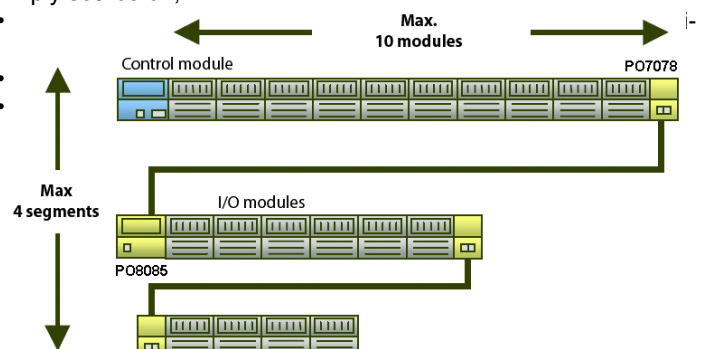
- The PO5063 module performs control functions and runs in cycles - read/write of I/O and communication with superior systems.
- The PO5063 module contains a power supply source (for max. 12 modules).
- A typical system (network) consists of the control module and

optional I/O modules.

- Maximum number of modules in total: 20.
- Maximum number of modules for one segment: 10
- Maximum number of segments: 4 (interconnection through expansion modules PO7078)
- Maximum 200 Byte for inputs and 200 byte for outputs
- Maximum number of modules supplied from one supply source is 12, divided into max. 2 segments
- The connection to a Teco PLC is possible through the PFB mode on the serial channel of the central unit
- SW configuration is supported by the Mosaic development environment.

The I/O modules are:

- inserted to the bases working as connectors for various types of signals and for communication with the control element;
- interconnected with cabling the terminal board located on the base, which is fitted to the TS35 bar;
- removable at any time without the necessity of removing cabling;
- removable and hot-swappable at any time with the power supply source on;



Group	Type	Order number
SW environment for creation of application program		
Application environment Mosaic		
	MOSAIC – Lite, Free (includes Lite PID maker for 1 PID controller)	TXF 686 00
	MOSAIC – Profi (includes Lite PID maker for 1 PID controller)	TXF 686 02
	MOSAIC – Profi / additional installation	TXF 686 04
	MOSAIC – Profi Upgrade / xPro	TXF 686 05
	MOSAIC – Profi Upgrade / EPOS	TXF 686 06
	MOSAIC – Profi Upgrade from Compact	TXF 686 09
	MOSAIC – ST plugin	TXF 686 21
	MOSAIC – PID Maker plugin for setting of up to 8 PID controllers – full version	TXF 686 30

MOSAIC

Professionalism

The **Mosaic** development environment is a complex development tool for programming of standard as well as demanding applications of the Tecomat and Tecoreg systems.

Scope of application

MOSAIC allows comfortable creation and debugging of programs also for extensive projects including a great number of control systems or remote I/O modules.

Compatibility

MOSAIC is a product based on the Windows platform employing a number of up-to-date technologies. The architecture of the programming environment as well as its particular tools are in compliance with the **IEC61131-3** standard.

The Mosaic development environment preserves the portability of projects created in the original X-PRO environment.

Tools

The **Mosaic** development environment contains a number of main as well as support tools and components facilitating program creation and its consequent debugging. Here we talk about so-called PLUG-IN modules.

Programming

According to the IEC61131-3 standard, the **Mosaic** development environment offers several ways of accessing the application programs:

- IL – Instruction List – basic programming language
- LD – Ladder Diagram – language for logic problems displaying the program in a form of a relay diagram
- ST – Structured Text – higher programming language (it is necessary to order it separately)

Main environment components

Project Manager – complex project management, creation of system configuration, configuration file generation

Text Editor, debugger – creation of the application program and its debugging, availability of standard debugging functions, variable monitoring, etc.

Compiler – compilation of the application program into an executable code. It allows also reverse compatibility as well as code decompilation.

PLC and ID simulator

– debugging and testing of the application program before its activation in a real system.

Hypertext help – a detailed guide to the Mosaic development environment with a number of examples.

Environment support components

PanelMaker – support the design of the screens of operator panels (text entry, display of variables, display structure creation, etc.).

GraphMaker – on-line/off-line monitoring of selected variables, allows displaying of up to 16 time courses at a time in a form of a time diagram, it combines the function of a digital oscilloscope and logic analyser.

PIDMaker – facilitates implementation and debugging of control algorithms, based on specified parameters it generates the PID controller program for PLCs, it provides interactive preview of the response of the system under control in a form of graphs, by this it facilitates optimum setting of the controller (the full version has to be ordered separately).

Version of the Mosaic development environment

MOSAIC Lite – free version of the development environment with a possibility to program a PLC with two units (1 unit as inputs, outputs or communication). The latest version is always available on www.tecomat.cz.

MOSAIC Compact – for programming of compact PLCs of series TC400, TC500, TC600, TC650 and Tecoreg controllers. It requires a dongle.

MOSAIC Profi – for all systems of company TECO a.s. without limitations. It requires a dongle.

For debugging of logic problems, it is possible to display the program in a form of a relay diagram.

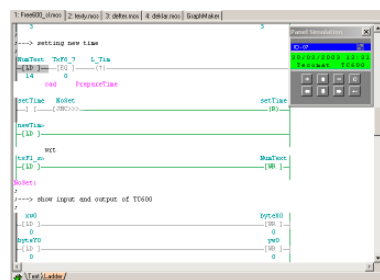
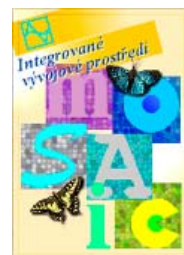
The GraphMaker tool serves for debugging and servicing of applications for monitoring of selected variables.

PanelMaker – a tool for the creation of the screens of operator panels ID-07, ID-08.

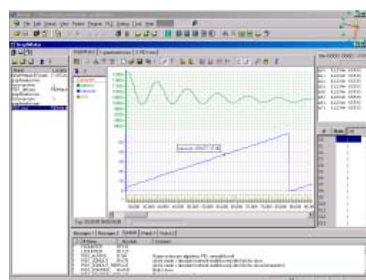
Debugging of PID controllers is facilitated by the PIDMaker tool.

Configuration of network I – serial channel setting

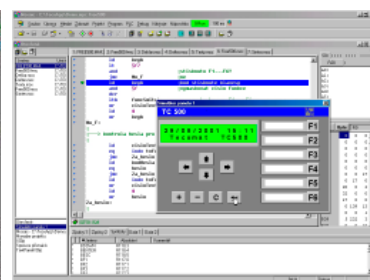
Configuration of network II – serial channel setting



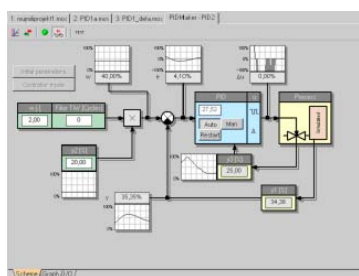
For debugging of logic problems, it is possible to display the program in a form of a relay diagram.



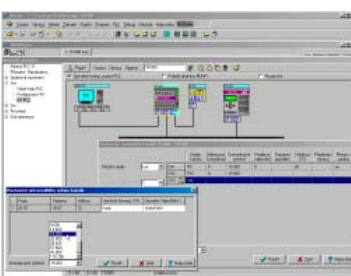
The GraphMaker tool serves for debugging and servicing of applications for monitoring of selected variables.



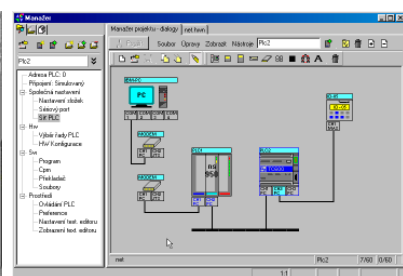
PanelMaker - a tool for the creation of the screens of operator panels ID-07, ID-08.



Debugging of PID controllers is facilitated by the PIDMaker tool.



Configuration of network I - serial channel setting.



Configuration of network II - serial channel setting.

Group	Type	Order number
Operator panels, graphics stations – HMI		
Character control panels ID		
	ID-12 - LCD panel 4 seven-segment characters, 3 buttons, RS485, 2 x BI, 1 x internal temperature sensor, 1 x COM Master, 24 V AC / DC	TXN 054 30
	The ID-12 control panel is used for user corrections of required values (e.g. temperature) in rooms. It belongs among so-called room spatial modules. With its parameters, it is suitable for direct connection to all systems equipped with the RS-485 communication interface. The module is an active component (Master mode) - it controls itself data exchange with the system. It is fitted with a sensor for temperature measurement in the room and with two binary inputs for detection of complementary conditions (open window, presence of a person, etc.). The values of the sensor, inputs and the information on button depression are transferred through a serial line to a superior system.	
	ID-07 – LCD panel 2 × 16 characters, 8 push buttons, 1 × position for optional interface, 1 × COM Master/Slave, 24 V AC/DC	TXN 054 25.11
	ID-08 – LCD panel 2 × 16 characters, 26 push buttons, 1 × position for optional interface, 1 × COM Master/Slave, 24 V AC/DC	TXN 054 26.11
	ID-07 – LCD panel 4 × 20 characters, 26 push buttons, 1 × position for optional interface, 1 × COM Master/Slave, 24 V AC/DC	TXN 054 26.12
	The ID-08 was newly emulated on the PDA platform, which allows creating of so-called mobile terminal for fieldwork.	
	MR-02 – submodule of serial interface RS232 for ID-0x (without galvanic isolation)	5XK 068 91
	MR-04 – submodule of serial interface RS485 for ID-0x (without galvanic isolation)	5XK 068 93
	MR-09 – submodule of serial interface RS485 for ID-0x (galvanic isolation, internal supply)	TXK 085 03
	MR-17 – submodule of serial interface RS422 for ID-0x (without galvanic isolation)	TXK 085 11
	The ID-07, ID-08 operator panels are suitable for creation of user interface or realization of a remote operator panel for control and regulating systems. The panels fulfil the requirements for use in industrial environments. They are connected to a superior system through a serial line with an optional interface RS-232 / RS-485 / RS-422. The operator panels display data, alarms and text messages. They are used for entry and modifications of the task parameters and servicing interventions. They work in both Master and Slave modes.	
	Graphics control panels TEMPO	
	TEMPO 02 C230A – panel computer IPXA255/400 MHz, touch/LCD DSTN 320 × 240 – 5,7", audio I/O, 4 × expansion slot, Ethernet 10/100, USB, memory 64 MB SDRAM, 32 MB StrataFlash, external CF II, 0 °C to +50 °C, 230 V AC	TXN 190 02
	TEMPO 02 C024A – panel computer IPXA255/400 MHz, touch/LCD DSTN 320 × 240 – 5,7", audio I/O, 4 × expansion slot, Ethernet 10/100, USB, memory 64 MB SDRAM, 32 MB StrataFlash, external CF II, 0 °C to +50 °C, 24 V DC	TXN 190 12
	TEMPO 02 C024A – panel computer IPXA255/400 MHz, touch/LCD TFT 320 × 240 – 5,7", audio I/O, 4 × expansion slot, Ethernet 10/100, USB, memory 64 MB SDRAM, 32 MB StrataFlash, external CF II, –25 °C to +50 °C, 24 V DC	TXN 190 16
	MR-0102 – submodule RS-232, galvanic isolation with own power source and identification	TXN 101 02
	MR-0113 – submodule RS-485 and auto RTS with own power source and identification	TXN 101 13
	MR-0122 – submodule RS-422, galvanic isolation with own power source and identification	TXN 101 22
	MR-0160 – submodule CAN 2 interfaces on module	TXN 101 60
	MR-0151 – submodule CAN	TXN 101 51
	MR-0152 – submodule PROFIBUS DP Slave	TXN 101 52
	Connector with cover – screwless-type, 2 × 7 pins, pitch 3,5 mm	TXN 102 41
	Installation Windows CE.net version 4.0	TXE 050 60
	Installation Embedded Linux version 2.4 for Tempo	TXE 050 61
	Control Web 2000 – CE driver TECOMAT	TXF 686 91
	Control Web 2000 – Runtime for Windows CE (TEMPO, MP)	TXF 687 01
	Control Web 2000 – Runtime builder, OEM for TEMPO	TXF 687 02
	Control Web 2000 – development version + Runtime builder, OEM for TEMPO	TXF 687 03
	Support CD – Win CE	TXF 687 10
	Support CD – Teco Linux	TXF 687 11
	TEMPO 02 is a panel computer with a touch graphics panel for a wide spectrum of industrial applications, transport, building, etc. It has the HMI function (Human Machine Interface), i.e. it realizes visual communication with the operator. At the same time, it can have the function of the master computer. The panel display is in versions both STN and TFT with the resolution of 320 × 240 and the size of 5,7". Standardly, it is equipped with CompactFlash, Ethernet interface 10/100, USB and audio I/O interface. Four positions for submodules can be optionally fitted with the interface RS-232 / RS-485 / RS-422 / CAN-Open / Profibus or specialized I/O modules. The TEMPO 02 system is standardly supplied with operation systems Microsoft Windows® CE.NET or Embedded LINUX, which provide an open standard platform for the creation of applications.	
Graphics control panels TOUCH		
	TOUCH51 – panel computer with a touch screen (800 × 600, 10,4"), CPU 300 MHz, low power input, RAM 128 Mbyte, Flash 128 Mbyte	TXN 192 01
	TOUCH55 – panel computer with a touch screen (1023 × 768, 15", TFT), optionally CPU – PCU01, PCU02	TXN 192 10
	PCU01 – processor unit – ATX mainboard, CPU INTEL Celeron 1,7 GHz, RAM 128 MByte, HDD 40 GByte	TXN 192 11
	PCU02 – processor unit – low power input, small dimensions, CPU 667 MHz, RAM 128 MByte, HDD 20 GByte	TXN 192 13
	TOUCH 51, 52 are programmable, generally applicable terminals that can serve as operator panels for displaying and setting of the parameters of control and information systems, for archiving and viewing of technological and operational parameters of production lines and their sections. The terminal can be connected to the Teco systems as well as to the systems of another brands. The panels are equipped with display units with a touch display in TFT design. TOUCH 51 has the resolution of 800 × 600 and the size of 10.4". TOUCH 55 has the resolution of 1024 × 768 and the size of 15". The connection to the other systems is ensured by standard means such as Ethernet 10/100, USB, COM, etc. The terminals, which can also be used as control computers, are standardly supplied with Microsoft Windows® XP or 2000 operation system that provide a standard platform for the creation of applications.	

Group	Type	Operation system	Order number
Visualisation tools - SCADA visualisation environment			
The most important visualisation programs with native drivers for Tecomat / Tecoreg PLCs			
	Reliance (Geovap, spol. s r.o. Pardubice, The Czech Republic)	MS Windows	
	Control Web (Alcor, a.s. – Moravské přístroje, Zlín, The Czech Republic)	MS Windows	
	Promotic (Microsys, s.r.o., Ostrava, The Czech Republic)	MS Windows	
	Genesis (Iconics Europe, Plzeň, The Czech Republic)	MS Windows	
	TIRS (Coral, s.r.o., Hradec Králové, The Czech Republic)	MS Windows, Linux	
	Aster 32 (Aster, s.r.o., Jičín, The Czech Republic)	MS Windows	
OPC server			
	OPC server for Tecomat, version 1.0	MS Windows	TXF 686 90
Visualisation SW - SCADA/HMI Reliance including communication drivers			
    	Reliance 3 Design Desktop – (the number of points is given by the last part of the order number behind the point)	MS Windows	TXF 686 50.0x
	Reliance 3 Enterprise – (the number of points is given by the last part of the order number behind the point)	MS Windows	TXF 686 51.0x
	Reliance 3 Runtime View – (the number of points is given by the last part of the order number behind the point)	MS Windows	TXF 686 60.0x
	Reliance 3 Runtime Control – (the number of points is given by the last part of the order number behind the point)	MS Windows	TXF 686 61.0x
	Reliance 3 Server – (the number of points is given by the last part of the order number behind the point)	MS Windows	TXF 686 65.0x
	Reliance 3 Runtime Server – (the number of points is given by the last part of the order number behind the point)	MS Windows	TXF 686 66.0x
	Reliance J 3.0 – Java applet	MS Windows	TXF 686 81
	Communication driver Teco	MS Windows	TXF 686 80.01
	Communication driver Allen Bradley	MS Windows	TXF 686 80.02
	Communication driver Rittmeyer wsr3000	MS Windows	TXF 686 80.07
	Communication driver AMIT	MS Windows	TXF 686 80.08
	Communication driver SMS (Siemens M20, TC35, MC35, MC39, Wavecom WMOD2B)	MS Windows	TXF 686 80.09
	Communication driver Modbus	MS Windows	TXF 686 80.10
	Communication driver Sauter EY2400	MS Windows	TXF 686 80.11
	Communication driver Johnson Controls DX9100	MS Windows	

Reliance

Universality

Reliance represents a modern open visualization SCADA/HMI system for monitoring, control and automation of technological processes in real time. **Reliance** provides a graphic interface between the technology being controlled and the operator. **Reliance** is a universally applicable, safe and sturdy system optimised also for very extensive applications.

Productivity and reliability

Reliance increases the quality and productivity of production processes.

Reliance minimizes technology failures by timely warning of the operator.

Reliance contains built-in redundancy of data flows.

Reliance can subsequently analyse the failure causes or technology failures (Postmort).

Reliance allows faster creation of applications by means of a system integrator = lower purchase price.

Reliance enables safe access to technological data 24 hours a day (Internet, GSM-SMS).

Speed and reliability

Reliance has a modern user-friendly RAD development environment.

Reliance does not require writing of the program code for basic functions.

Reliance allows central administration and configuration of extensive applications.

Reliance supports easy export to a web format.

Also non-trained personnel can orientate easily in the **Reliance** applications.

Reliance saves costs of application development as well as technical support.

Reliance components

Reliance Reliance is a RAD application (Rapid Application Development) for creation of a visualisation project. The user can use a number of components available and can create his own components, too. A script editor (VB Skript) is part of Reliance.

Versions: **DESKTOP** – for simple applications 1 computer – n stations (local PC control room), **ENTERPRISE** – with communication control in the network and on the web.

Reliance Reliance Runtime ensures a separate run of a visualization task on the PC of the end user. Among others, it also allows graphical representation of technological data and error messages, user development of tables and graphs as well as user administration. The applications are protected by access rights and passwords.

Versions:

VIEW – a view version without a possibility of technology commanding

CONTROL – allows entering commands according to the user access rights.

Reliance server is the module of the communication centre for the data from technological stations and runtime modules. The data is archived and provided to other runtime modules, web clients of RELIANCE J or other servers through the TCP/IP protocol. It passes and executes the commands only from authorized clients.



Version: Reliance Runtime Server has an additional possibility of the graphical representation of technological data.



Reliance J serves for technology on-line monitoring and control on intranet or Internet through an Internet browser supporting the Java language. Reliance J is able to display the application developed at the development environment as the Java applet and thus, it is not necessary to develop a special web version. The selected technology

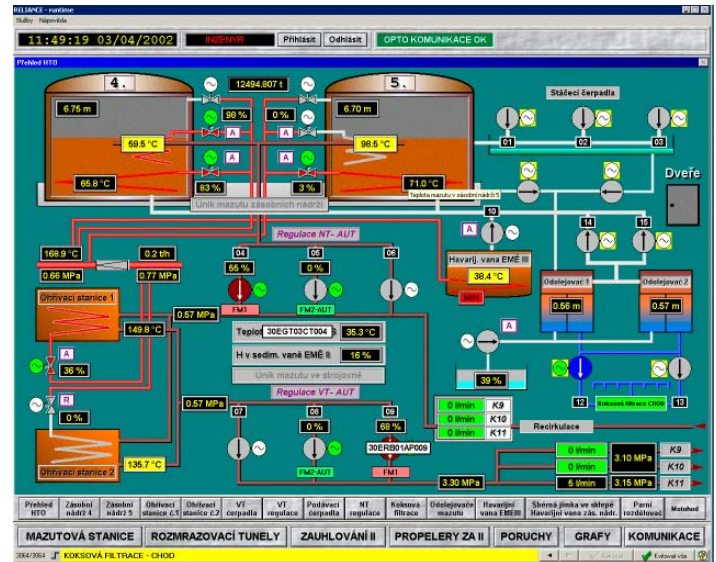
(Java) minimizes the volume of the data transmitted through the network.

Communication

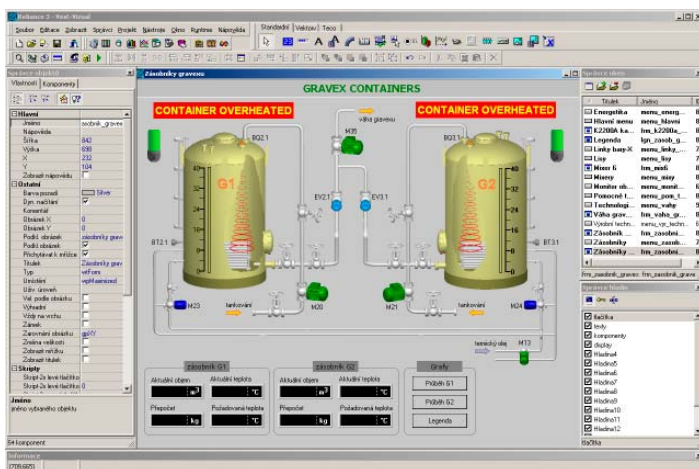
Communication drivers allow data transmission from technological stations to visualisation and commanding in the opposite direction as it is required by the concrete communication protocol of connected stations. **Reliance** contains native drivers for some devices. In some other cases, so-called OPC interface can be used.

Openness – the OPC client

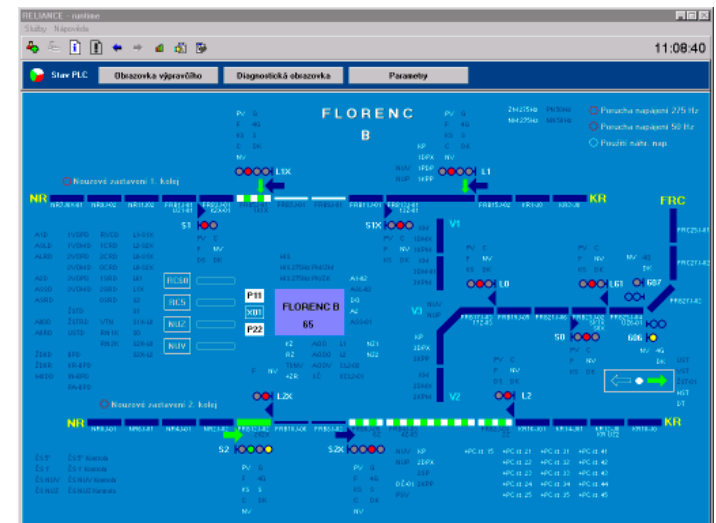
RELANCE is an OPC client, this means it is able to communicate with any device being connected by means of the OPC server.



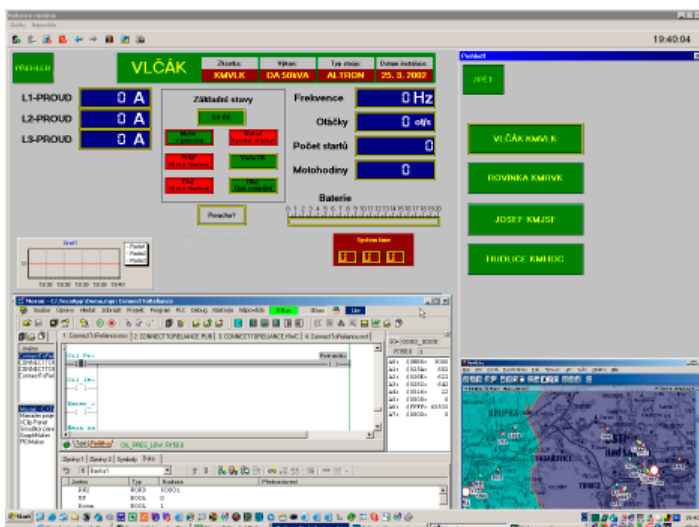
Example – Power plant Mělník



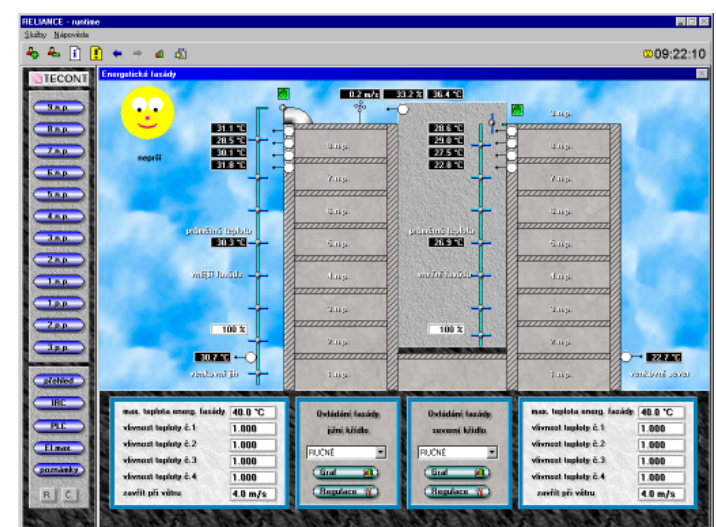
Example of visualisation – Vestizol



Postmort application – the Prague underground



Example of connection Reliance – Mosaic



Example of visualisation – Moravian regional library



Product graph

I/O number
6500

OPC server for TECOMAT

OPC (Object Linking and Embedding for Process Control) is a common standard for data exchange in industrial automation. OPC is a file of specifications allowing developing a universal interface for data passing among individual programs in a computer or network.

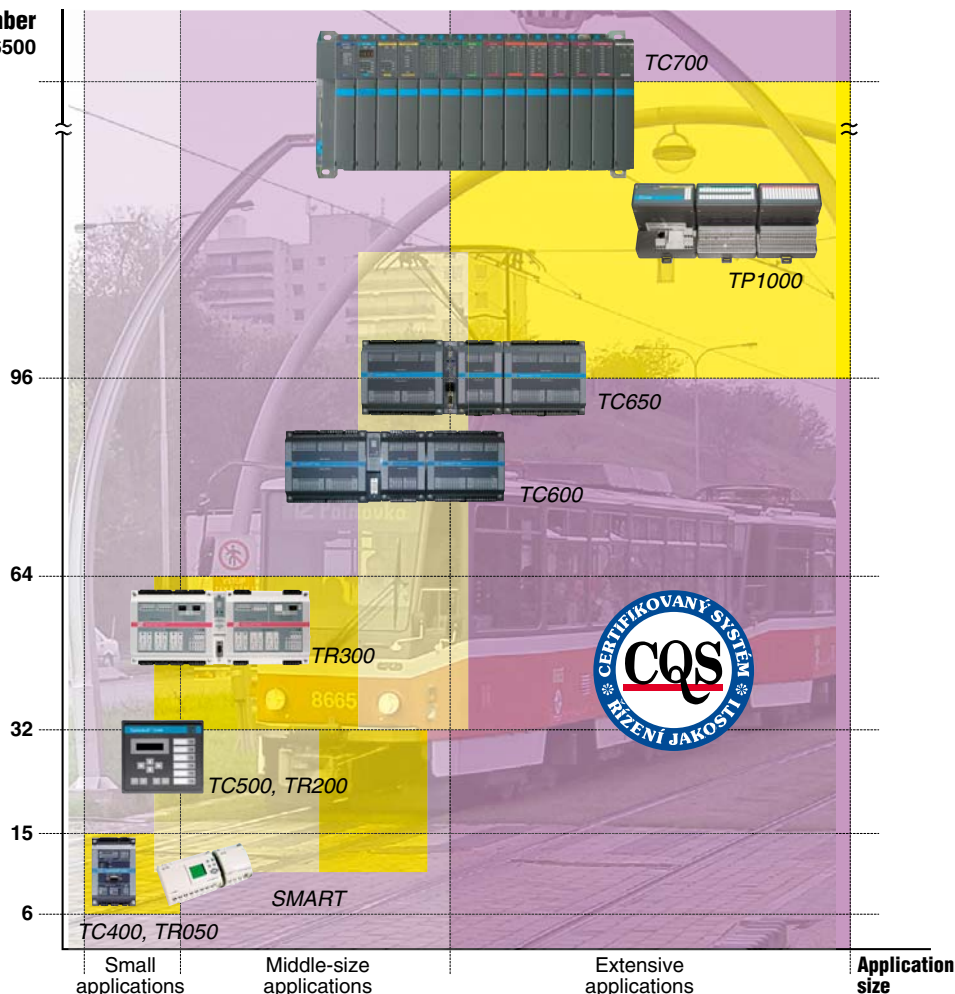
The OPC server for Teco systems provides a possibility of data exchange between Teco systems and another systems (so-called OPC clients) that do not know our communication protocol but support the OPC standard.

Communication is event-based and performed according to the client - server scheme. The Teco OPC server communicates as needed with slave systems (Tecomat / Tecoreg) and the data acquired is passed further as required by the clients being connected (e.g. SCADA environment). The OPC server evaluates the read data and if the change of the value being monitored is greater than its dead band, the clients are sent information on the change of the value. In this way, the network and the clients are not supplied with redundant information.

At the same time, the OPC server ensures data passing from the clients to individual slave PLCs. Simultaneously, the OPC client can be the OPC server for the other OPC clients. In this way, systems of various SW and HW producers can be interconnected.

The Teco OPC server performs:

- periodical data read / write from / to data zone registers;
- station system time read / write;
- controlled read / write to Databox;
- variable value simulation by direct entering of the value by the user;
- random value generation;
- variable format recalculation and change.



Selected certificates and test reports



For more information please contact:

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OPC server for Tecomat

