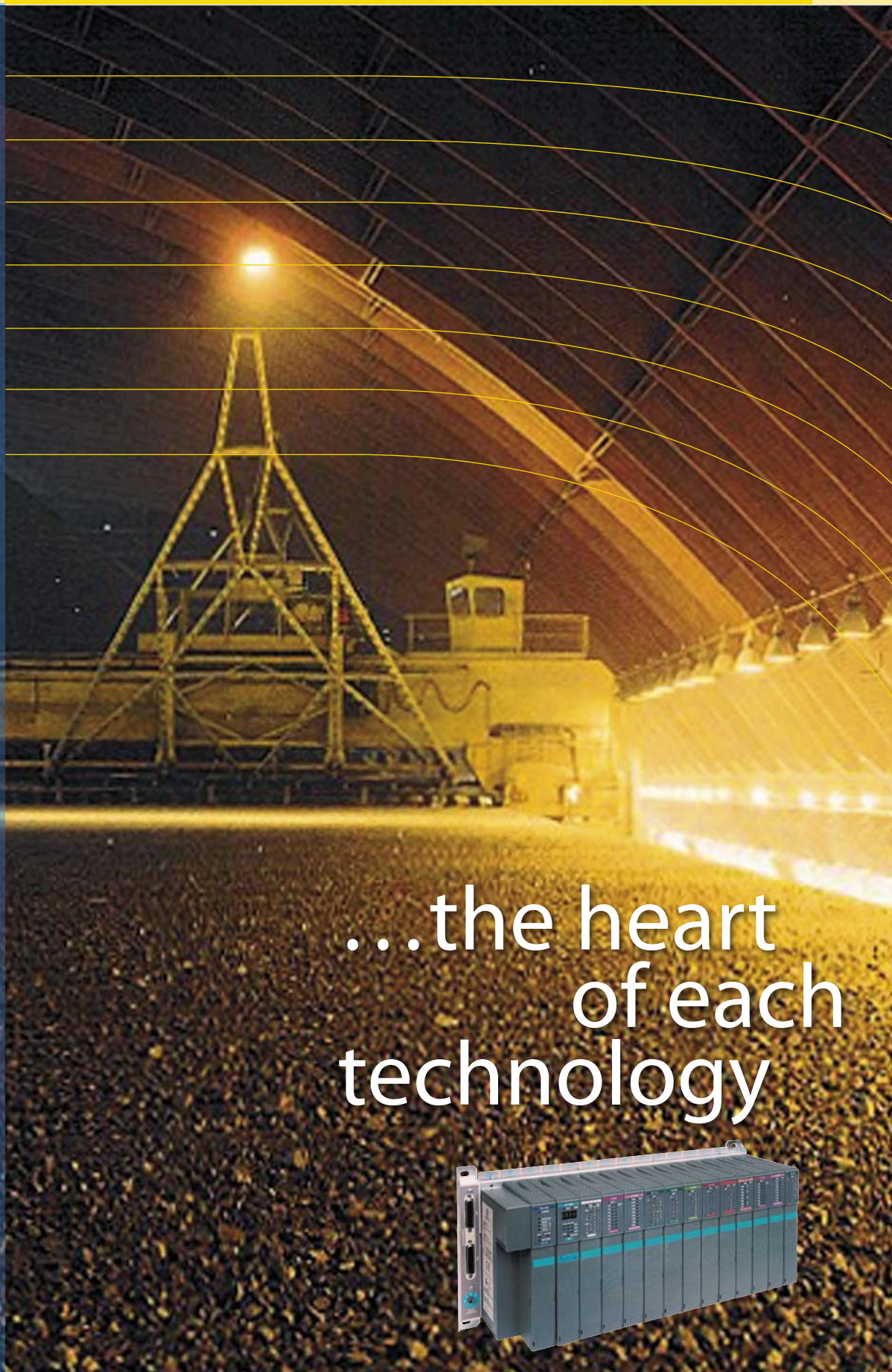
TECOMAT TC700

April 2008

PRODUCT INFORMATION

Control systems for machines, processes, buildings and traffic

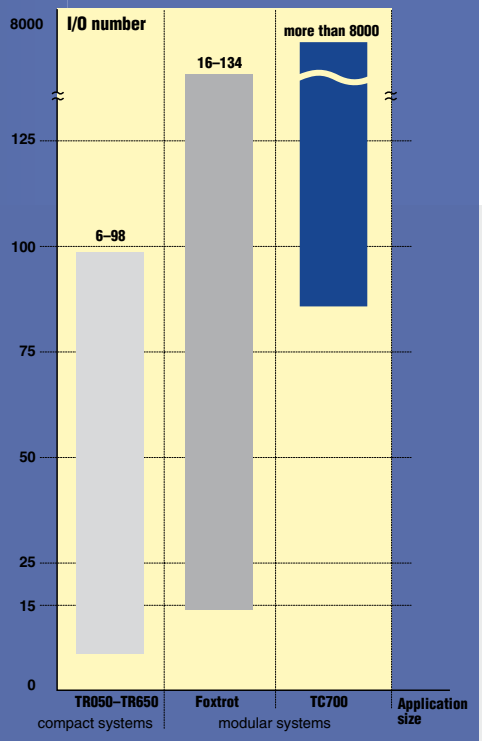


...the heart of each technology

www.tecomat.com

What is Tecomat TC700?

Tecomat TC700 – it is a modular control system from Teco Inc.
Through a consistent integration of the international standard IEC EN 61131 and all well-proved features of present Tecomat PLC's altogether with new added features, a new product has been created which can be used for a great number of middle-sized and extensive applications in many branches of industrial automation, traffic or building installations.
Tecomat TC700 belongs to systems with increased functional reliability.



Selected certificates and test reports

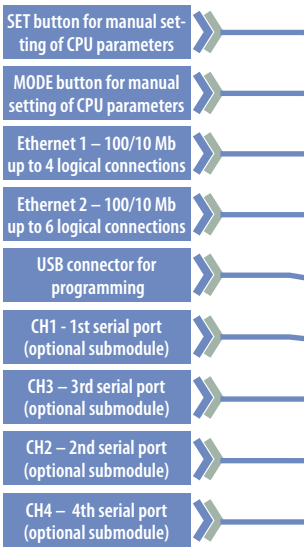
ISO 9001

Declaration of conformity

TC700 surge withstand capability

TC700 resistance against sinusoidal vibrations

An example of TC700 assembly



Comparison of Tecomat TC700 and other Tecomat control systems according to the number of I/O

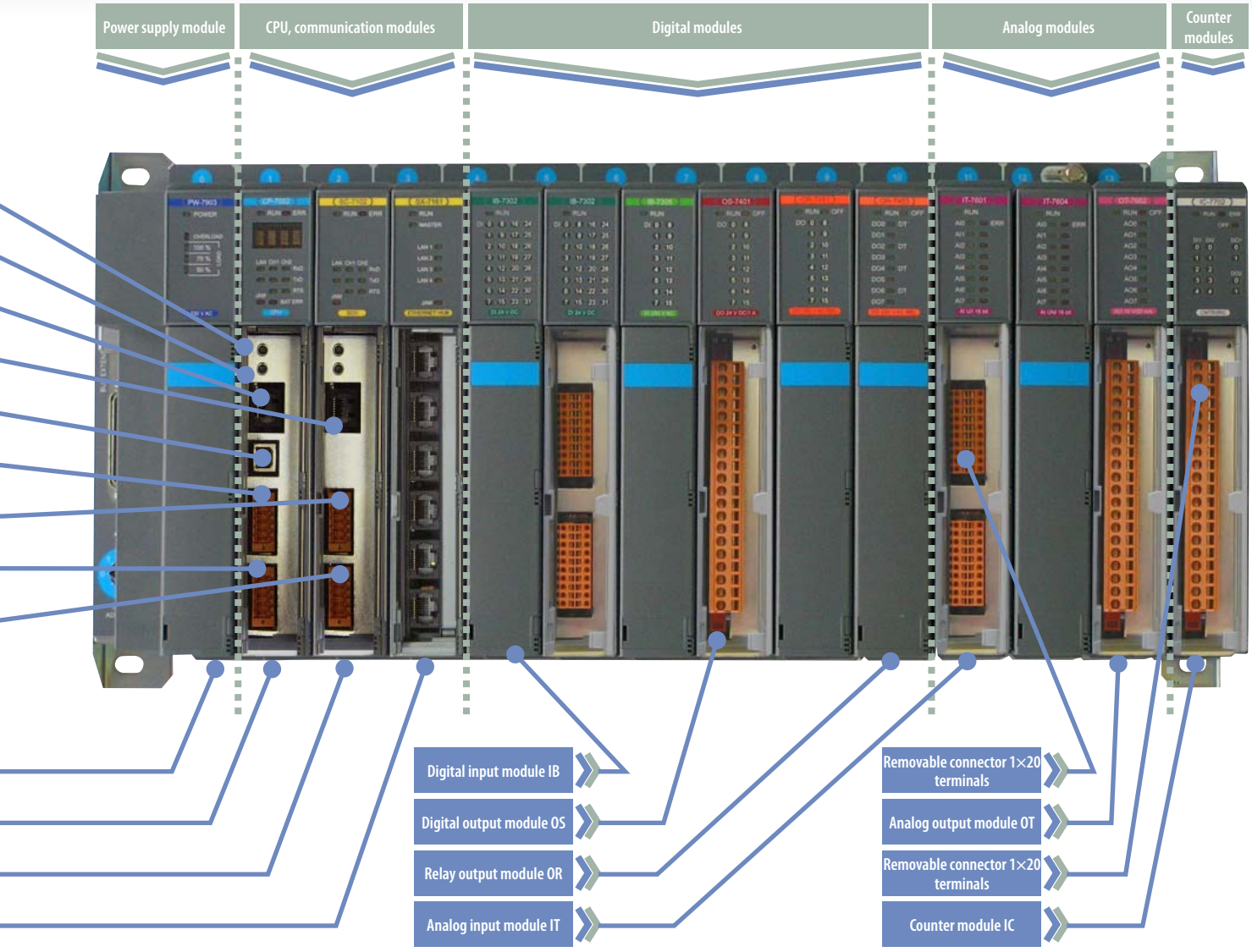
Main innovative features of Tecomat TC700 system:

- New serial bus for the communication among CPU and I/O modules. The bus can be expanded without using any other converters. Each I/O module communicates with CPU independently.
- Optical or metalic wires for the connection of peripheral racks with I/O modules.
- A new 32bit RISC processor based CPU module with scan speed up to 0.2 ms/1k instructions
- Fast Ethernet 100/10 Mbit for real-time communication with up to 10 threads. It can be used also for connection of peripheral racks to I/O modules.
- New design of power supplies with possible redundancy or UPS function.
- Redundant CPU function allowing an increased operational reliability.
- I/O modules hot-swap function
- On-line programming
- Built-in web server
- MMC/SD card (up to 2 GB) with file system

Tecomat TC700 offers:

For building installations and building management:

- Control of middle and larger technologies for heating, ventilation and air conditioning machine rooms
- Measuring and control of all energy types consumption (Energy Management)
- Integration of the building safety elements (Alarm/Fire-fighting systems)
- Integration of access control systems – doors, gates, etc.
- Excellent building processes coordination
- Control optimization ensuring cost savings owing to lower consumption



For machine engineering applications:

- Control of up to 6 independent axes in various modes of motion coupling (Motion Control)
- High-speed inputs for a connection of up to 4 incremental position sensors
- Period, pulse length and phase shift measuring for generator synchronizing
- Support for industrial buses via various protocols (Profibus DP, CAN, Modbus)

For process control:

- Comfortable debugging and maintenace of applications using a hot swap function of I/O modules or on-line programming
- Power supply UPS function with the possibility of connecting back up accumulators
- Memory back up
- Memory card of up to 2GB capacity for data archiving and recipes storage
- Increased protection of external I/O modules
- Analog measuring using HART protocol
- Standard inputs measuring ranges including thermocouples
- Higher operational reliability thanks to redundancy functions of CPU, power supplies or communication
- Decentralization of I/Os via racks of various dimensions and the possibility of their optical interconnection

For traffic control:

- Mechanical design allowing the operation in the environment with pulses and vibrations
- Enhanced thermal endurance at extreme conditions
- Higher operational reliability thanks to redundancy functions of CPU, power supplies or communication
- Special FSK modems for safe long-distance information transfer (telematics)
- Measuring and control of all energy types consumption (Energy Management, substations)
- Integration of safety elements of trafficconstructions
- Tunnel control:
  - Variable traffic signs
  - Operational information device
  - Traffic detectors – speed measurement, vehicles weighing
  - Accommodative, stand-by lighting
  - Ventilation
  - Physical quantities measuring – opacity
  - Sound systems
  - Fire-fighting system
  - SOS announcing point
  - Video supervision signalization

Tecomat TC700 system components

Tecomat TC700 consists of:

Racks of various size with internal serial bus and connectors

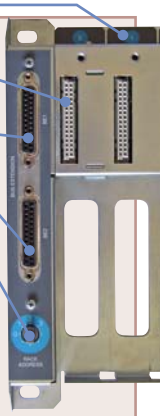
Power supply modules with UPS function

Efficient CPU with Ethernet communication

Communication modules with Ethernet

Wide range of peripheral modules for wide field of application

Tecomat TC700 allows a realization of one-rack assemblies (power supply and CPU included) as well as assemblies consisting of several racks and distributed peripheries.



Module address

System modules are embedded into connectors on the bus rack which act as their power supply.

Rack interconnection connectors

Rack address setting

Rack interconnection connectors

Rack with 8 slots

Rack types vary from 2 to 15 slots

Connector for fibre optical cables

Connector for metallic cable

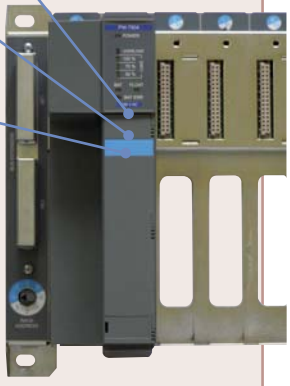
Loose connectors of end racks must be mounted by KB-0201 terminators.

Impulse-regulated power supplies feed other TC700 assembly modules through a bus.

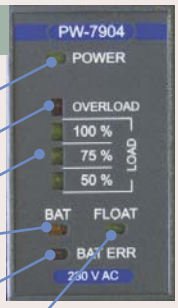
Power supplies are equipped with processor allowing autoidentification and diagnostics.

It is necessary to plant power supplies on to the rack so that their total output sum cover the total consumption.

Power supplies can be placed at any position of any rack.



PW-7904 power supply module label



Run indication

Overload indication

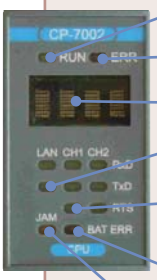
Load pressure indication

Charging indication

Battery voltage indication

Battery maintenance mode

CP-7002 CPU module label



CPU run indication

Error indication

Diagnostics

Ethernet indication

Indication of serial interfaces CH1 and CH2

Battery subcritical status indication

Network collision status

CPU modules are equipped with high-speed 32bit RISC processor. They reach the cycle lenght of up to 0.2 ms per 1000 instructions. CPU can contain up to 192 kB memory for user program, 64 kB for tables and up to 3 MB Databox memory for archiving data and also up to 2GB MMC/SD when the external memory card is (and can be) used. Some CPU can contain a backup memory Flash EEPROM.

Connector for 2nd channel submodule CH2

1st channel submodule CH1

Back-up battery

CP-7002 processor module area for submodules planting

CPU supports on-line programming

TC700 is programmed according to IEC EN 61131-3

TC700 PLC system can be backed up

CPU module can be planted at any position on any rack of the assembly.

SC-7102 communication module label

Communication modules are used for expansion of CPU by other serial channels and Ethernet interface.

CPU run indication

Error indication

Ethernet indication

Indication of serial interfaces CHx

Network collision status

CPU - CH1, CH2, ETH1

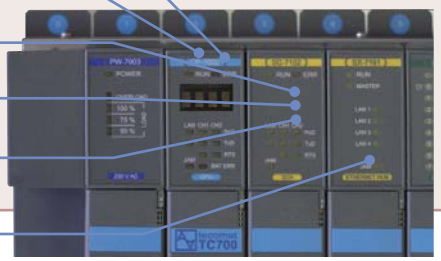
CPU module is able to keep independent connection with up to 4 devices at a time through Ethernet

SC - CH3, CH4, ETH2

Up to 4 SC-710x modules with the total number of 8 serial channels (CH3-CH10)

SC-7102 module is able to keep independent connection with up to 6 devices at a time through Ethernet

4-port Ethernet hub



OR-7453 output relay module label

Run indication

Output blocking indication

Switched on output indication

Counter modules provide the connection of position sensors, counters and other functions with max. input impulse frequency of 100kHz.

IC-7702 counter module label

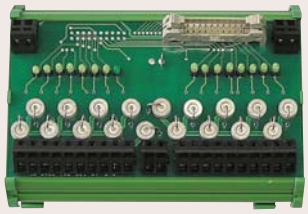
Run indication

Error indication

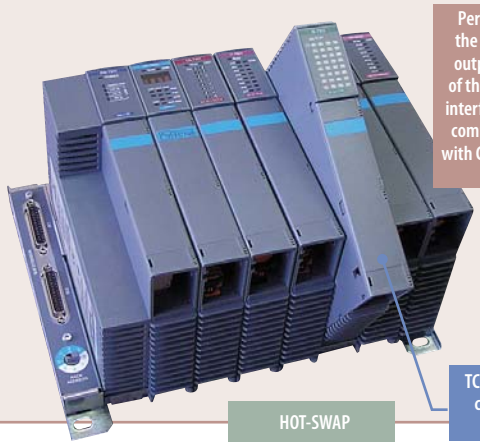
Output blocking

DI/DO status indication

External module IB-0402



There are external modules available for the connection of higher number of signals and are equipped with increased protection against accidental impacts.

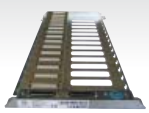


Peripheral modules enable the connection of input and output signals and ensuring of their galvanic isolation and interference filtering. Modules communicate independently with CPU and contain autoidentification.

HOT-SWAP

TC700 peripheral modules can be swapped during operation.

Tecomat TC700 Components

					
Group name	**Racks**	**Power supplies**	**CPU modules**	**Communication modules**	**Submodules**
Basic features	TC700 PLC is designed for the installation into racks and racks according to DIN 41496 standard. The modules are fitted into the connectors on the rack bus that ensures both modules power supply and their communication with CPU. Racks from one assembly are connected by bus cables plugged in to the connectors at the left rack margin. The source modules have to be fitted onto the racks in such a way that the overall power consumption is covered. Any of the interconnection connectors must not stay unmounted.	Impulse-regulated power supplies feed other modules of the TC700 assembly through a bus. They have a network voltage failure circuit monitoring and a circuit for power supply load indication. Those types that are equipped with a UPS circuit allow automatic back up of the system via external accumulators. The power supply sources can be arranged in parallel way to increase the power source output or to reach redundant feeding of the system. All power supply sources fulfil the requirements laid on safe voltage power sources (SELV).	CPU modules are equipped with high-speed 32bit RISC processor. The cycle lenght is up to 0.2 ms per 1000 instructions. They contain instruction file with a 32 bit stack and all standard functions including, floating point instructions, PID controller, multi-loop control and interrupt processes. They support on-line programming according to the IEC EN 61131-3. They are competent of portability of the source code from other Tecomat systems. CPU modules contain memory for a program, datas, back up, Flash memory for data archiving and optionally a slot for MMC/SD cards.	Communication modules serve for the CPU expansion of up to 8 additional serial channels (SC-710x), 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).	The serial interface submodules create an interconnection between the communication channel or communication module of CPU and corresponding industrial bus. Databox memory submodules serve for the expansion of a basic memory by other RAM memory used for technological data archiving.

Basic parameters, operational conditions

Power supply	----	24V DC / 115 V DC / 230V AC	supply onto the bus	supply onto the bus	----
Dimensions (h × w × d) (mm)	230.4×(89.9 – 485.2)	198×60×137	198×30×137	198×30×137	----
Type of module	built-in	built-in	built-in	built-in	built-in
Coverage according to CSN EN 60529)	IP20 (after installation into rack)	IP20 (after installation into rack)	IP20 (after installation into rack)	IP20 (after installation into rack)	IP20 (after installation into rack)
Operating temperatures range (°C)	0°C to +55°C	0°C to +55°C	0°C to +55°C	0°C to +55°C	0°C to +55°C
Diagnostics	----	optical indication	optical indication	optical indication	----

Types

RM-7944, TXN 179 44
4 positions for modules 30 mm wide
RM-7946, TXN 179 46
4 positions for modules 30 mm wide
RM-7941, TXN 179 41
8 positions for modules 30 mm wide
RM-7942, TXN 179 42
15 positions for modules 30 mm wide

PW-7901, TXN 179 01
24 V DC, 50 W, without UPS
PW-7902, TXN 179 02
24 V DC, 50 W, UPS
PW-7903, TXN 179 03
230 V AC, 50 W, without UPS
PW-7904, TXN 179 04
230 V AC, 50 W, UPS
PW-7906, TXN 179 06
24 V DC, 24 W, without UPS
PW-7907, TXN 179 07
230 V AC, 24 W, without UPS
PW-7908, TXN 179 08
115 V DC, 50 W, without UPS

CP-7001, TXN 170 01
0.9 ms/1k instructions, RTC, SRAM, 64 kB+64 kB, EEPROM 64 kB+64 kB, Databox 128 kB, 2×CH, USB, 3.6 W
CP-7002, TXN 170 02
0.9 ms/1k instructions, RTC, SRAM 64 kB+64 kB, EEPROM 64 kB+64 kB, Databox 128 kB–3 MB, 2×CH, Ethernet 10 Mb, USB, 3.6 W
CP-7003, TXN 170 03
0.9 ms/1k instructions, RTC, SRAM, 128 kB+64 kB, EEPROM 128 kB+64 kB, Databox 0–3 MB, 2×CH, Ethernet 10 Mb, USB, 3.6 W

NEW!

CP-7004, TXN 170 04
0.2 ms/1k instructions, RTC, SRAM, 192 kB+64 kB, EEPROM 192 kB+64 kB, Databox 128 kB, 2×CH, Ethernet 100 Mb, USB, MMC/SD slot, Web Server, 3.6 W

CP-7005, TXN 170 05
0.9 ms/1k instructions, RTC, SRAM, 128 kB+64 kB, EEPROM 128 kB+64 kB, Databox 2,5 MB, 2×CH, Ethernet 10 Mb, USB, redundant function, 3.8 W

Important features:

Diagnostics:
- Watchdog
- Powerfail
- Data protection during power failure
- Serial communications protection
- Data transmission via the I/O bus protection
- Control of user program validity
- User program cycle period guarding
- Continuous control of user program correctness
- Autodiagnostics of power supply sources
- Autodiagnostics of I/O modules

SC-7101, TXN 171 01
expansion by 2×CH, 3.6 W
SC-7102, TXN 171 02
expansion by 2×CH, 1×Ethernet, 3.6 W
SX-7161, TXN 171 61
4-port Ethernet hub, cascading, 3.6 W
SE-7131, TXN 171 31
system expander, master, for remote I/O communication using Ethernet, 3.6 W
SE-7132, TXN 171 32
system expander, slave, for remote I/O communication using Ethernet, 3.6 W
UC-7201, TXN 172 01
connection of analog sensors using HART protocol, 3.0 W
CD-7251, TXN 172 51
long-distance transmission module, master modem, 3.0 W
CD-7252, TXN 172 52
long-distance transmission module, slave modem, 3.0 W

MR-0104, TXN 101 04
RS-232, galvanic isolation, autoidentification
MR-0114, TXN 101 14
RS-485, galvanic isolation, autoidentification
MR-0124, TXN 101 24
RS-422, galvanic isolation, autoidentification
MR-0151, TXN 101 51
CAN interface, controller I82527
MR-0152, TXN 101 52
Profibus DP Slave
MR-0154, TXN 101 54
Remote I/O TC700 (EIO mode at CH2)
MR-0155, TXN 101 55
FSK Modem
MR-0156, TXN 101 56
FSK modem with continuous amplifier
MR-0158, TXN 101 58
M-bus master for 6 to 20 stations
MR-0159, TXN 101 59
LON submodule
MR-0160, TXN 101 60
2×CAN interface, SJA1000 controller
MR-0161, TXN 101 61
CAN interface, SJA1000 controller
SX-7153, TXN 171 53
Databox 3 MB, additional memory

Binary modules

Input, output and combined binary modules TC700 are used for connection of input and output logical signals and to ensure their galvanic isolation and filtering of failures. Logical levels of input signals are signalled by green LED positioned on the frontal module label. Modules include removable terminal boards for conductors connection. Peripheral modules can be changed in running mode. Modules independently communicate with CPU and contain autoidentification.

supply onto the bus

198×30×137

built-in

IP20 (after installation into the rack)

0°C up to +55°C

optical signalization

IB-7302, TXN 173 02
32×DI, GI, 24 V DC, 3 mA, 5 ms, connector 2×20, 1 mm², 1.8 W

IB-7303, TXN 173 03
16×DI, GI, 24 V AC/DC, 7 mA, 0.5 ms, interruption, SWfilter, connector 1×20, 2.5 mm², 1.0 W

IB-7305, TXN 173 05
16×DI, GI, 230 V AC, 5 mA, 10 ms, connector 1×20, 2.5 mm², 0.8 W

IB-7310, TXN 173 10
64×DI, GI, 24 V DC, for external terminal modules,, 1.5 W

IB-7311, TXN 173 11
32×DI, GI, 24 V DC, for external terminal modules, 1.5 W

OS-7401, TXN 174 01
16×DO, GI, 24 V DC, 2A, 0.4 ms, connector 1×20, 2.5 mm², 0.8 W

OS-7402, TXN 174 02
32×DO, GI, 24 V DC, 0.5 A, 0.4 ms, connector 2×20, 1.0 mm², 1.8 W

OS-7405, TXN 174 05
16×DO, GI, 230 V AC, 0.25 A, 0.4 ms, triac, connector 1×20, 2.5 mm², 1.8 W

OS-7410, TXN 174 10
64×DO, GI, 24 V DC, 50 mA, for external terminal modules, 1.5 W

OS-7411, TXN 174 11
32×DO, GI, 24 V DC, 50 mA, for external terminal modules,, 1.5 W

OR-7451, TXN 174 51
16×RO, GI, 230 V AC, 3 A, switch relay, connector 1×20, 2.5 mm², 3.8 W

OR-7453, TXN 174 53
8×RO, GI, 230 V AC, 3A, 4×switch relay, 4×relé přepínací, connector 1×20, 2.5 mm², 2.4 W

IR-7551, TXN 175 51
8×DI, 8×RO, GI, 24 V DC, 10 mA, switch-over relay, connector 1×20, 2.5 mm², 2.0 W

IS-7510, TXN 175 10
32×DI, 32×DO, GI, 24 V DC, 50 mA,for external terminal modules, 1.5 W

Analog modules

Input and output analog modules TC700 are used for connection of input and output analog signals that are galvanically isolated. They transmit the analog voltage/current levels to numerical values and vice versa. Input analog modules are able to adjust each input separately and also adjust the sensor' s error indication. Modules include removable terminal boards for conductors connection. Peripheral modules can be changed in running mode. Modules independently communicate with CPU and contain autoidentification.

supply onto the bus

198×30×137

built-in

IP20 (after installation into the rack)

0°C up to +55°C

optical signalization

IT-7601, TXN 176 01
8×AI, GI, differential inputs 16 bit, U, I, standard ranges, connector 2×20, 1 mm², 3.0 W

IT-7602, TXN 176 02
16×AI, GI, differential fast inputs 16 bit, 12 ms, U, I, standard ranges, connector 2×20, 1 mm², 4.0 W

IT-7604, TXN 176 04
8×AI, GI, universal inputs 16 bit, U, I, Pt100, Pt1000, Ni1000, termocouples, connector 2×20, 1 mm², 3.0 W

IT-7606, TXN 176 06
32×AI, GI, universal inputs 16 bit, U, I, Pt1000, Ni1000, connector 2×20, 1 mm², 3.5 W

OT-7652, TXN 176 52
8×AO, GI, universal inputs 16 bit, U, I, connector 1×20, 2.5 mm², 3.5 W

External terminal modules

External terminal modules are designed for signal disposal from I/O Tecomat TC700 modules. Owing to this it is possible to connect signals directly from the technology without any other terminal boards. The modules contain protecting elements and enable prompt installation and easy servicing in case of the failure - especially with modules where components are located in sockets. The terminal boards can be placed on the switchboard independently of the position of PLC itself. It is worth to draw the attention to modules with switching elements for high load.

24V DC

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built-in

IP20 (after installation into the rack)

0°C up to +55°C

optical signalization

IB-0401, TXN 104 01
16×DI, direct sensor access, 24 V DC

IB-0402, TXN 104 02
16×DI, GI, cluster sensor access, surge guards, 24 V DC

IB-0403, TXN 104 03
16×DI, GI, cluster sensor access, surge guards, 230 V AC

IB-0404, TXN 104 04
16×DI, cluster sensor access, surge guards, 24 V DC

OR-0422, TXN 104 22
8×RO, GI, 24 V DC, relay 4 A v paticích samostatně vyvedené

OR-0424, TXN 104 24
16×RO, GI, 230 V AC, relay 3 A, protection RC, cluster load access

OR-0425, TXN 104 25
16×DO, GI, 230 V DC, SSR relay DC 0.5 A,varistor protection, RC, direct load access

OR-0426, TXN 104 26
16×DO, GI, 230 V AC, SSR relay AC 2 A, protection, direct load access

OR-0427, TXN 104 27
8×RO, GI, 230 V AC, relay 16 A, protection, separate contacts

OR-0428, TXN 104 28
16×DO, 24 V DC, SSR relay DC 0.5 A, protection, cluster load access

IT-0451, TXN 104 51
4×AI, 20 mA, 10 V, protection – lightning arrester, transil, direct sensor access

IT-0453, TXN 104 53
8×AI, 20 mA, 10 V, direct sensor access, loops' supply

OT-0461, TXN 104 61
8×AO, 20 mA, 10 V, output circuit supply incl. protection

IC counter module

The counter module is used for connection of incremental sensors of position, realization of 32bit feedforward and reversible counters and other functions with maximum frequency of 100 kHz input impulses.The module includes removable terminal boards for conductors connection. Modules independently communicate with CPU and contain autoidentification.
The module performs these functions:

- the counter/reversible c.
- the incremental encoder
- the period measurement
- the timer
- positioning
- the reference zoom-in

supply onto the bus

198×30×137

built-in

IP20 (after installation into the rack)

0°C up to +55°C

optical signalization

IC-7702, TXN 177 02
4×counter 32 bit with 3×IN or 2×counter 32 bit with 5×IN; 4×DO, 24 V DC, 2 A, connector 1×20, 2,5 mm², 1.0 W

GT motion control modules

Positioning modules are used for machinery motion control via servo-drive (Motion Control). They are appointed for synchronous control of 1 to 6 axes in different modes of mutual movement structures. The modules ensure the conversion of input levels to levels of internal logical PLC signals and filter failures out and conversely the conversion of logical PLC signals to output signals. The modul is uniquely identified in PLC through the modul position in the rack and the address of the rack.

NEW!

supply onto the bus

198×30×137

built-in

IP20 (after installation into the rack)

0°C up to +55°C

optical signalization

GT-7751, TXN 177 51
1 attitude control axe, 1 position in the rack

GT-7752, TXN 177 52
2 attitude control axes, 1 position in the rack

GT-7753, TXN 177 53
4 attitude control axes, 2 positions in the rack

GT-7754, TXN 177 54
6 attitude control axes, 3 positions in the rack

Each axe include a control loop with PID regulator where input information on actual position is gained via an inceremental encoder or via an position sensor with a serial communication port (SSI). The output from the regulator is an analog signal +/-10V DC for servodrive. Individual axes of positioning modules are able to work completely independently or with various types of interdependency within axes´ movements. For the purpose of an axe control integrity, the each axe has its own 24V binary inputs for the connection of referential sensor, 2 HW limit sensors, the sensor of the measuring contact sensing head and a relay output for the servodrive brake control. There can be up to 3 arbitrary axes in use in a joint linear interpolation at the maximum configuration and remaining 3 axes can again be mutually in the linear interpolation or in any other joint coupling. For a circular interpolation there can be 2 arbitrary axes with the circular interpolation used in one out of three levels. Furthermore, there is possible to set the dependence on a curve coupling, "minute movements" or movements dependent on the fourth axe, coiling and trail included. Different types of axe dependance can be combined within one module. The communication with the positioning module is supported via functional block libraries according to both IEC 61 131-3 standards and also to "Motion Control" specification defined by the „PLCopen" union.

Remote I/O system TP1000

TP1000 is an remote I/O system used for the distribution of a wide spectrum of I/O signals with many ranges within larger applications. It enables the direct connection of sensors and actuators to terminal boards of modules whereby reduces the number of terminal boards, cables, attachements bars and fuse boards. TP1000 uses high-speed data transmission in between modules. They are automaticaly addressable. The system communicates with the superior system via the Profibus DP protocol. TP1000 is appointed to be installed on the DIN attachement bar.

24V DC

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built-in

IP20

0°C up to +55°C

optical signalization

PO 5063, TXP 150 63
control module Profibus DP (supply for maximum of 12 modules)

PO 6500, TXP 165 00
Profibus control module base

PO 8085, TXP 180 85
additional power supply unit 5V DC supply for maximum of 12 modules)

PO 6800, TXP 168 00
power supply unit base

PO 7078, TXP 170 78
bus expansion modul, max. 4 segments

PO 8500, TXP 185 00
expansion cable

PO 1000, TXP 110 00
16×DI, 24V DC

PO 1002, TXP 110 02
16×DI, 230 V AC

PO 1010, TXP 110 10
32×DI, 24 V DC

PO 2020, TXP 120 20
16×DO, 24 V DC, 2 A

PO 2022, TXP 120 22
16×RO, 230 V AC, 2 A, switching contact

PO 6000, TXP 160 00
screwless terminal boards for digital I/O

PO 6100, TXP 161 00
screwless terminal boards for digital I/O with safety fuse

PO 1112, TXP 111 12
8×AI, universal, individually programmable

PO 2132, TXP 121 32
4×AO, universal, individually programmable

PO 6001, TXP 160 01
screwless terminal boards for analog I/O

PO 6101, TXP 161 01
screwless terminal boards for analog I/O with safety fuse

HMI

Connectors, cables

Under the name KB-02xx are supplied connectors and cables for metalic or optical interconnection between the Tecomat TC700 system bus and particular racks. Further there are at disposal connectors and cables for Ethernet interconnection, USB cables and cables annexing external I/O modules to peripheral modules.

KB-0201, TXN 102 01
bus termination module(BUS EXT.) TC700, 2 ks

KB-0202, TXN 102 02.xx
bus interconnection cable TC700, supply incl.

KB-0203, TXN 102 03.xx
bus interconnection cable TC700, communication only

KB-0204, TXN 102 04
modul for a bus connection TC700 via customer´s cable, 2pcs

KB-0205, TXN 102 05.xx
TP Ethernet 10Mbit cable, standard

KB-0206, TXN 102 06.xx
TP Ethernet 10Mbit cable, crossed

KB-0207, TXN 102 07
Interconnection cable for HUB-HUB

KB-0208, TXN 102 08
USB cable A – B standard, lenght 3 m

KB-0209, TXN 102 09
programming cable RS232 for TC700, lenght 3 m

KB-0211, TXN 102 11
cable for external binary I/O modules, 20pin/20pin, shielding Faston 2.8

KB-0212, TXN 102 12
able for external binary I/O modules, 20pin/20pin, unshielded

KB-0213, TXN 102 13
cable for external analog I/O modules, 20pin/lead tail, shielding Faston 2.8

KB-0250, TXN 102 50
optical bus interconnection module TC700 (POF plastic, up to 2,2dB)/40m

KB-0251, TXN 102 51
optical bus interconnection module TC700 (HCS plastic, up to 13dB)/300m

KB-0252, TXN 102 52
optical bus interconnection module TC700 (Glass MM, up to 3,5dB)/1700m

KB-0260, TXN 102 60.xx
optický kabel duplex POF 220 dB/km

KB-0261, TXN 102 61.xx
optical cable duplex HCS 8 dB/km

TXN 102 30
20-pole screwless connector, 5,08 mm pitch

TXN 102 31
direct 20-pole screw connector, 5,08mm pitch

TXN 102 32
vertical 20-pole screw connector, 5,08mm pitch

TXN 102 40
set of connectors, screwless 2x20-poles, 3,5mm pitch

Supplementary instruments

Supplementary instruments are in particular external interface converters, hubs or a converter from an analog output to three-point control outputs.

TR340, TXN 092 90
M-Bus/RS-232 interface converter, 24V AC/DC

TS311, TXN 070 34
converter of analog output 0-10 V for three-point control, 24V AC/DC

SLC-66, EI 5066.42
interface converter for DIN bar RS-485/RS-232, 230V AC

SLC-67, EI 5067.40
desktop interface converter RS-485/RS-232, 230V AC

XL-0471, TXN 104 71
RS-485 double joint branch, branch wire surge protection

TXK 646 15.12
communication cable PC/EI5067.xx (9/9pin/RS-232C), 3m

TXK 646 16.12
communication cable PC/EI5067.xx (25/9pin/RS-232C), 3m

External PS supply units

Universal one-level pulse sources with high efficiency (80%), low radiation and good level of input overvoltage resistance. They supply the system with a constant stabilized voltage and are designed for DIN bar installation. PS xx/24 sources can be used to supply the Tecomat system, the system network and technologies. PS xx/27 are intended to supply backup batteries. IP20 shielding. Standard range of operational temperatures is from 0°C up to +55°C.

PS 25/24, TXN 070 22
230 V AC/ 24 V DC, 1A

PS 50/24, TXN 070 10
230 V AC/ 24 V DC, 2A

PS 50S/24, TXN 070 27
230 V AC/ 24 V DC, 2 A, power loss report - relay

PS 50/27, TXN 070 21
230 V AC/ 27.2 V DC, 2 A

PS 50S/27, TXN 070 29
230 V AC/ 27.2 V DC, 2 A, power loss report - relay

PS 100/24, TXN 070 15
230 V AC/ 24 V DC, 4 A

PS 100/27, TXN 070 16
230 V AC/ 27.2 V DC, 4 A

TOUCH graphical panels

It is a programmable, commonly applicable terminal for viewing and setting of parameters of control and information systems, for archivation and viewing of technological and operational parameters of production lines or their sections. It is possible to connect it to any control or information system or it can be used also as a control computer at the same time.

Important features:

- TFT diplay
- resolution from 800×600 to 1280×1024 pixels
- from 10,4" to 19"
- Ethernet, USB
- RS-232, RS-485
- Microsoft Windows XP/2000
- 230V AC power supply

Panel computers TEMPO 02

It is a panel computer with touch screen graphical display for a wide spectrum of usage within industrial applications, transport, buildings etc. TEMPO 02 fulfill the function of HMI, i. e. intermediate a visual communication with the operator. It also can serve as a control computer at the same time. The undeniable advantage of the TEMPO 02 is its mechanical and thermal resistance that predestinates the product for applications in a demanding environment.

Important features:

- mechanical and thermal resistance
- STN or TFT display
- resolution 320×240 pixels
- 5,7"
- CF card slot for additional memory
- Ethernet
- USB
- Audio I/O
- 4 slots for serial submodules (RS-232/485/422, CAN, Profibus DP)
- Microsoft Windows CE.NET or LINUX
- 24V DC/230V AC power supply

Character panels

Operator panels for creation of user interface or for realization of control systems remote operator panel. Panels meet requirements on usage in an industrial environment. It is possible to connect them via optional serial interface RS-232/485/422. They are intended for projection of datas, alarms, text messages and for entry and changes of task parameters and maintenance.

Important features:

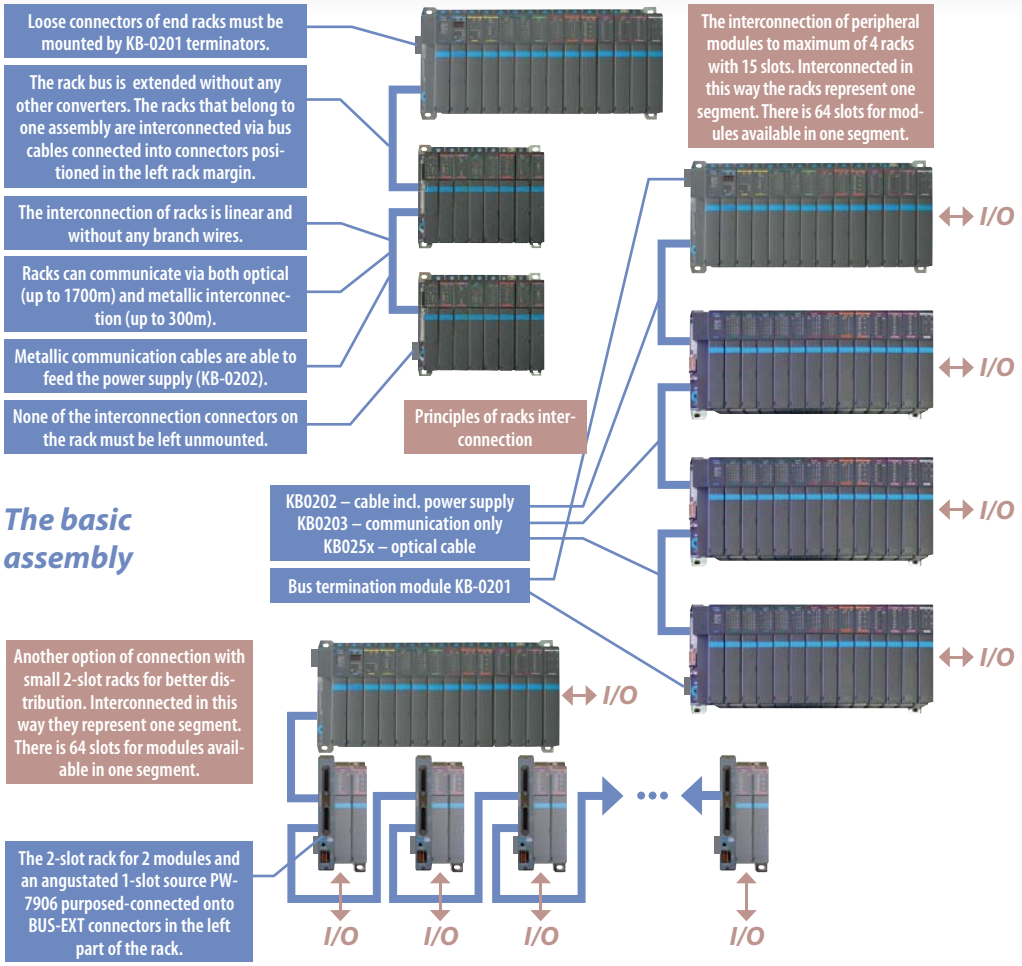
- number of characters: 2×16, 4×20
- number of keys: 8, 26
- communication: serial interface
- communication mode: Master or Slave
- power supply 24V AC/DC


Tecomat
TC700
components

The structure of Tecomat TC700 system

The Tecomat TC700 system variability helps the user to master both medium-complicated tasks on modules located on one small rack and also extensive assemblies containing a lot of inputs and outputs. If it is required by the application, there is the possibility of creation either an assembly containing few large racks or an extensive decentralized topology of up to 128 modules where single controle nodes are constituted of less I/Os. Besides, there is basically unexhaustible number of up to 16-communication channels available operating in different modes and in 2 independent Ethernet lines providing up to 10 independent logical connections via various communication modes. The system is also able to operate in various types of redundant interconnection.

TC700 configuration options



Which modes can be used by Tecomat TC700?

communication modes TC700		Central modules CP-7001, CP-7002, CP-7003, CP-7004, CP-7005				Communication modules SC-7101, SC-7102		
Protocol	Modes	USB	ETH1 [1]	CH1	CH2	ETH2 [2]	CH3-CH4	CH5-CH10
EPSNET	PC	CP-7001,2,3,4,5	CP-7002,3,4	CP-7001,2,3,4	CP-7001,2,3,4	CP-7001,2,3,4,5	CP-7001,2,3,4,5	CP-7002,3,4,5
	PLC		CP-7002,3,4	CP-7001,2,3,4	CP-7001,2,3,4	CP-7001,2,3,4,5	CP-7001,2,3,4,5	CP-7002,3,4,5
	UNI [3]		CP-7002,3,4	CP-7001,2,3,4	CP-7001,2,3,4	CP-7001,2,3,4,5	CP-7001,2,3,4,5	CP-7002,3,4,5
	MPC			CP-7001,2,3,4	CP-7001,2,3,4		CP-7001,2,3,4,5	CP-7002,3,4,5
	EIO				CP-7002,3,4			
	SYN			CP-7005				
	RED		CP-7005					
	UPD			CP-7001,2,3,4	CP-7001,2,3,4,5			
MODBUS	MDB			CP-7001,2,3,4	CP-7001,2,3,4		CP-7001,2,3,4,5	CP-7002,3,4,5
PROFIBUS DP	DPS			CP-7001,2,3,4	CP-7001,2,3,4			
	PFB			CP-7002,3,4	CP-7002,3,4		CP-7002,3,4,5	CP-7002,3,4,5
CAN	CAN			CP-7001,2,3,4	CP-7001,2,3,4			
	CAS			CP-7001,2,3,4	CP-7001,2,3,4			
	CAB			CP-7001,2,3,4	CP-7001,2,3,4			
	CSJ			CP-7001,2,3,4	CP-7001,2,3,4			

Remark:
[1] ETH1 interface (Ethernet) can maintain up to 4 independent logical connections (4x logical CH) in different communication modes
[2] ETH2 interface can maintain up to 6 independent logical connections (6x logical CH) in different communication modes
[3] UNI mode is a common user channel for universal usage – connection of frequency converters, operator´s conseles, bar-code readers, heat meters, modems etc.

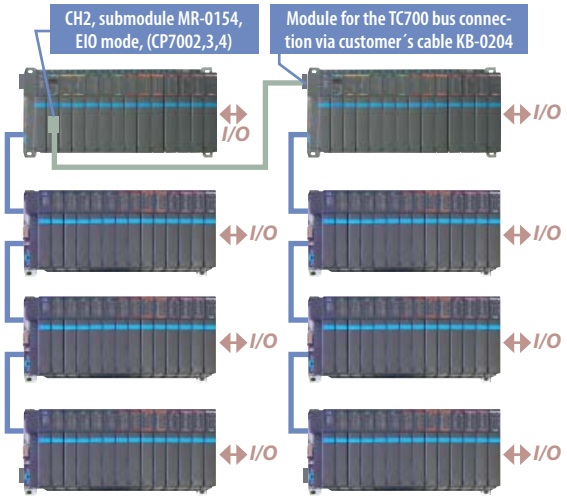
Transmision means:

- direct connection via metalic cable
- direct connection via optical cable
- transmision via phone modem
- analog transmision via radio modem
- digital transmision via GSM (SMS, GPRS)
- WiFi network
- infrared transmision IRDA

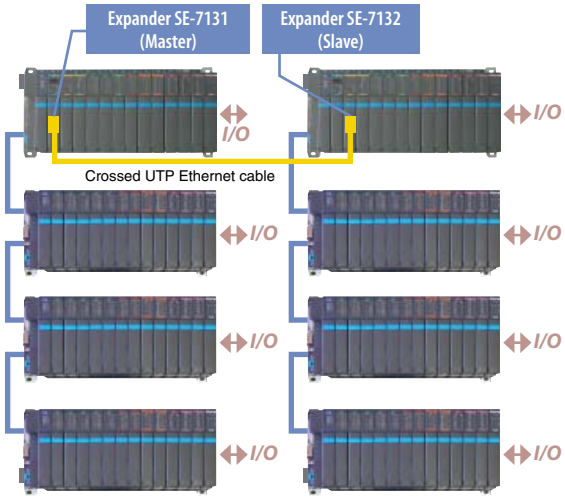
Which devices can be for example connected to Tecomat TC700?

Expanded assembly

The expanded assembly TC700 by submodule MR-0154. The number of slots of TC700 can be expanded up to 128 via EIO mode.



The expanded assembly TC700 with system expanders SE-7131 and SE-7132. The number of slots can be expanded up to 128.

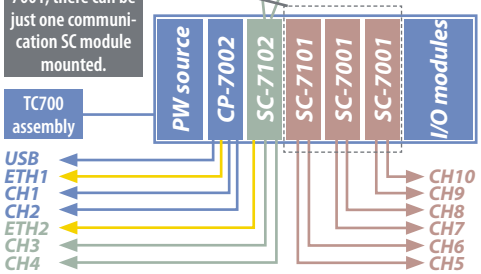


The communication interface TC700

There can be max. of 4 communication SC modules in the TC700 assembly.

In case of CPU CP-7001, there can be just one communication SC module mounted.

Module SC-7102 can be used the only time between communication on modules



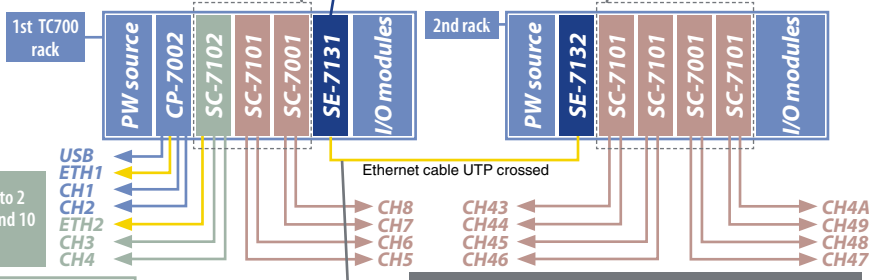
The system can maintain up to 10 independent Ethernet connections (4 to ETH1, 6 to ETH2) in various communication modes (PC, PLC, UNI).

There are allowed to get up to 2 independent Ethernet lines and 10 independent channels.

There can be max. of 3 communication SC modules in the TC700 assembly

The system expander SE-7131 occupy channels CH9, CH10.

There can be assigned up to 4xSC-7101 to the system expander SE-7132.



The line between the two expanders must not be interconnected to a different network because its capacity is fully employed.

TC700 mode description

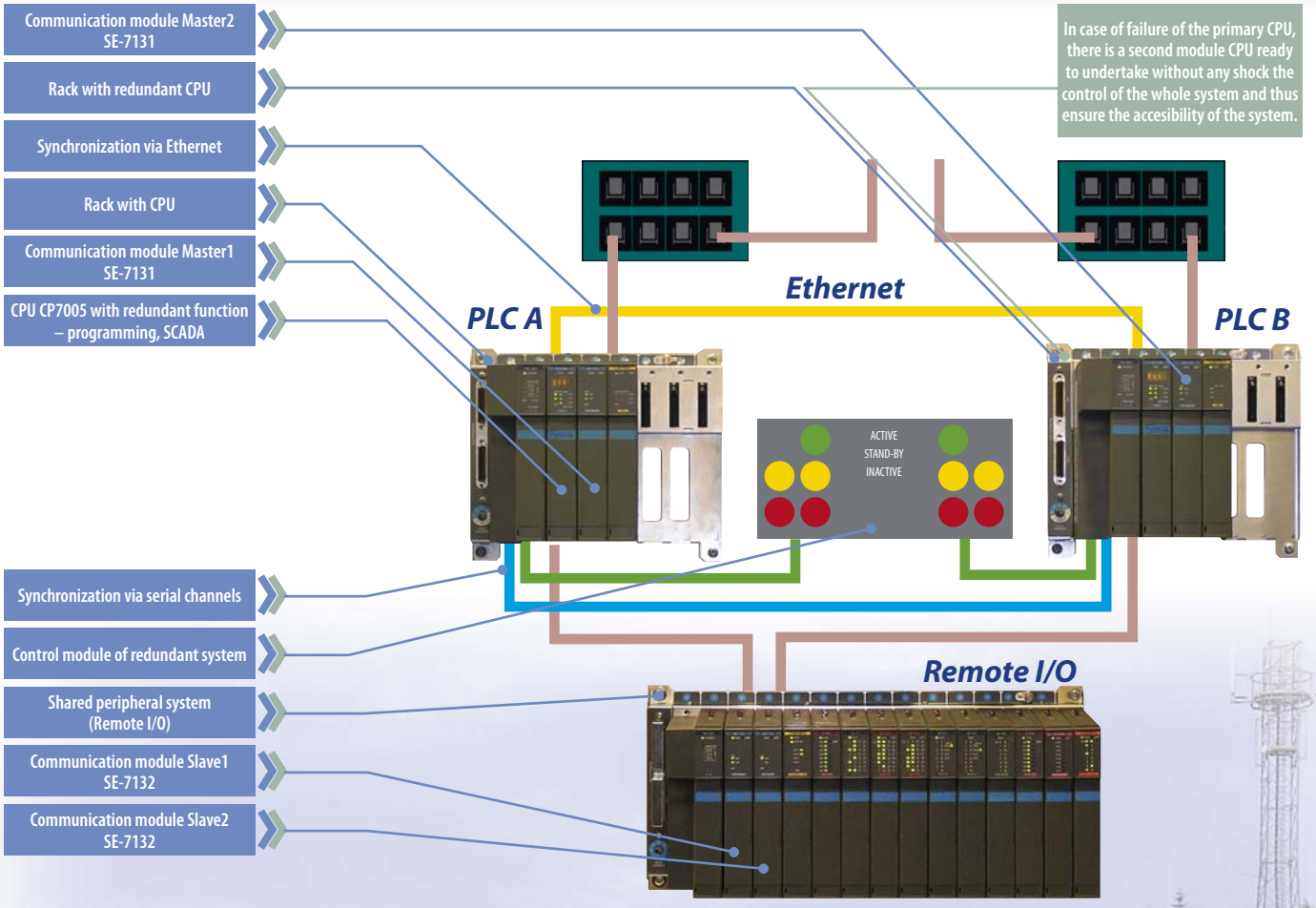
- **PC** – PLC(Slave) connection in the PC mode to the master system (PC, PLC....) via EPSNET protocol without any other interference in the user´s programme, the complex set of EPSNET functions available, always on the one channel only. The protocol EPSNET UDP in TCP/IP networks in the Ethernet interface.
- **PLC** – interconnection of up to 32 PLC systems among each other for high-speed data transmission via EPSNET-F protocol through allocation of transfer zones in the similar registers of all PLC, high network throughput
- up to 238bits from one user. TCP/IP network in the Ethernet interface.
- **UNI** – in uses the support of figure oriented serial protocols with asynchronous transmission for PLC communication with terminal equipment (operator panel, printer...).The interchange of general data via UDP and TCP protocols in the Ethernet interface.
- **MPC** – connection of up to 64 PLC in the PC mode to several master systems via EPSNET protocol multimaster, up to 238bits from one user.
- **EIO** – connection of up to 64 peripheral modules of remote I/Os
- **UPD** – connection of specialized devi ces via universal paraller driver.
- **SYN** – sync channel for redundancy (for CH1 CP-7005).
- **RED** – sync channel for redundancy (for Ethernet interface CP-7005)
- **MDB** – connection of more users (Slave) in the Modbus network to the master system.
- **DPS** – connection of TC700 as a slave system via Profibus DP protocol.
- **PFB** – connection of up to 32 Slave devices to TC700 via Profibus DP protocol.
- **CAN** – connection of up to 31 peripheral modules via CANopen protocol.
- **CAS** – Master/Slave interconnection with the additional function PLC-PLC via CANopen protocol, the network Master/Slave is not configurable in running.
- **CAB** – the usage of the general CAN standard, can be used also in CANopen mode.
- **CSJ** – CAN network with the transmission rate up to 1MBd

Types of communication interfaces and submodules TC700

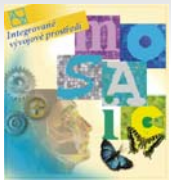
Interface	Submodule	Max. transmission rate	Supported modes
RS-232	MR-0104	200 kBd	PC, PLC, MPC, UNI, MDB, PFB
RS-485	MR-0114	2 MBd	
RS-422	MR-0124	2 MBd	
CAN with the controller 182527	MR-0151	500 kBd	CAN, CAS, CAB
Profibus DP Slave	MR-0152	12 MBd	DPS
RS-485 (remote I/O TC700)	MR-0154	2 MBd	EIO
Modem FSK	MR-0155	1.2 kBd	UNI
Modem FSK with running amplifier	MR-0156	1.2 kBd	UNI
M-Bus Master for 6–20 stations	MR-0158	9.6 kBd	UNI
LON	MR-0159	72 kBd	UNI
2xCAN with the controller pair SJA1000	MR-0160	1 MBd	CSJ
CAN with the controller SJA1000	MR-0161	1 MBd	CSJ
Ethernet 100/10, connector RJ-45	---	100Mb / 10Mb	PC, PLC, UNI, RED
USB 2.0, connector B	---	12 MBd	PC

Instruments for high-tech control

Redundant connection of PLC Tecomat TC700



SW instruments



MOSAIC

It is a complex development environment for programming of common as well as sophisticated aplications of Tecomat systems. MOSAIC allows easy creation and debugging of programs, extensive projects involving a large number of control systems or remote I/O modules. MOSAIC uses a range of modern technologies. The environment architecture and its single instruments respect the IEC61131-3 standard.

Important features:

- Programming according to the IEC61131-3 standard:
  IL – Instruction List
  ST – Structured Text
  LD – Ladder Diagram
  FBD – Function Block Diagram
- function block libraries
- project management
- PanelMaker
- GraphMaker
- PIDMaker
- the system, network configuration
- standard debugging, decompilation
- PLC, ID simulation
- on-line programming
- wide range of supportive tools

Member of
PLCopen
Standardization in Industrial Control programming

SCADA Reliance

The modern open SCADA/HMI system for real-time monitoring and operating of industrial technologies. By means of Reliance, it is possible to create graphical user interface between operated technology and the operator. Reliance is high- spectrum, secure and robust system, optimalized even for very extensive aplications.

Important features:

- technology failure minimisation via early service warning
- data flow redundance
- subsequent analysis of failure or malfunction
- continual data access (GSM, Internet)
- easy and transparent development environment
- range of direct communication drivers
- OPC-client

Basic environment modules:

Design
View
Control
Control Server
Server
Web Client
Mobile Client

OPC server for Tecomat

The possibility on data interchange between systems of Teco brand and other systems – so called OPC clients. OPC (Object Linking and Embedding for Process Control) form the routine standard of data interchange in the industrial automation. OPC is a set of specifications that allow to create an universal interface for data interchange among individual programs within the computer or the network.

Important features:

- Client – Server
- periodical data reading/writing
- reading of station system time
- simulation of variables
- generating of random value
- change of the variable format

SoftPLC

The function realization of the central unit of the programmable controller on the PC. SoftPLC serves for operating machines and technologies, creation and function check of PLC application programs or libraries, training and testing of specific programming techniques essential for operating machines and technologies or creating third party applications.

Important features:

- Tecomat TC700 emulation on the PC platform with MS Windows XP or 2000
- the complex usage of MOSAIC environment
- initialization of more PLC instalations on the PC
- cooperation with SW and I/O´s of other producers

What does the redundancy mean?

- Duplication of such items where even a small error probability can cause the critical situation.
- The method on how to increase the reliability of solution within the control system.
- Tecomat TC700 enables, thanks to its architecture, to solve the redundancy in several levels.

The redundancy and power supply backup

- the integration of UPS in to supply modules PW-7902/7904 with the possibility to connect 24V accumulator
- the accumulator is controled and recharged by a control circuit integrated in the supply module.
- the instalation of more supply modules on to one rack.

CPU redundancy and communication with I/O

- the usage of two identical CPU modules (CP-7005) in the hot-standby mode
- CPU modules are placed on separate racks with own power supply and own connection to the master dispatching system.
- CPU modules are programmed and debugged in such a way as if only one of them is programmed.
- the application program is processed by both modules
- in case of the primary CPU failure the second CPU is ready without a shock to undertake the control of the whole system and thus ensure the access of the whole system.
- high-speed synchronization of aplication datas and statuses via Ethernet interface
- high-speed diagnostics and anti-shock transitions, while the CPU is manually serviced, are ensured by operating module ID-20
- racks with I/O are connected via industrial Ethernet through two pairs of system expanders SE-7131/SE-7132 ensuring correct message routing from/to CPU
- due to Ethernet it is possible to use this duplicated communication in both the redundant tree and the redundant circle structure.

I/O redundancy

- considering the cost-effective solution it is advised to choose and minimise the number of critical I/O´s in terms of a project.
- duplicated inputs are necessary to be taken care of via input logic of the aplication program.
- duplicated outputs are necessary to be taken care of in the project via HW logical sum total which output is operated by a relevant actuator

Teco a. s.
Havlíčkova 260
280 58 Kolín 4
Czech Republic
Phone: +420 321 737 611
Fax: +420 321 737 636
E-mail: teco@tecomat.cz
www.tecomat.com

Teco a. s. – office Morava
1. máje 1000
756 61 Rožnov pod Radhoštěm
Czech Republic
Phone: +420 724 353 014
E-mail: jahn@tecomat.cz
www.tecomat.com

Teco a. s. – office Praha
Czech Republic
Phone: +420 724 211 281
E-mail: kolcaba@tecomat.cz
Phone: +420 606 711 314
E-mail: smejkal@tecomat.cz
www.tecomat.com

Teco a. s. – office Pardubice
Czech Republic
Phone: +420 606 601 262
E-mail: cermak@tecomat.cz
www.tecomat.com

Tecont s. r. o.
Member of Teco group
Jana Palacha 1552
532 35 Pardubice
Czech Republic
Phone: +420 466 310 650
Fax: +420 466 310 651
E-mail: tecont@tecont.cz
www.tecont.cz

Proteco s. r. o.
Member of Teco group
Teplého 1628
530 02 Pardubice
Czech Republic
Phone: +420 466 330 016
Fax.: +420 466 330 024
E-mail: proteco@proteco.cz
www.proteco.cz

Geovap s. r. o.
Member of Teco group
Čechovo nábřeží 1790
530 03 Pardubice
Czech Republic
Phone/fax: +420 466 024 111
E-mail: reliance@geovap.cz
www.geovap.cz

Slovteco s. r. o.
Teco Authorized partner in Slovakia
M. R. Štefánika 31/37, 977 01 Brezno
Slovakia
Phone/fax: +421 486 113 147
E-mail: slovteco@stonline.sk
web.stonline.sk/slovteco

Teco a. s. – office Łódź
Poland
Phone: +48 661 550 128
E-mail: tecomat@gmail.com
www.tecomat.com

P. H. U. Logicon
Teco Authorized partner in Poland
ul. Kolbego 7, 59-220 Legnica
Poland
Phone/faks: +48 767 213 490-1
E-mail: logicon@logicon.com.pl
www.logicon.com.pl

PITEKS
Teco Authorized partner in Poland
Os. M. Mielżyńskiego 115/22,
62-020 Swarzędz
Poland
Phone/Fax: +48 61 651 91 31,
E-mail: piteks.automatyka@wp.pl
www.piteks.pl

CAOM SA
Distributor of Teco in Romania
Vatra Street No. 56
705200 Pascani – Iasi county
Romania
Phone: +40 232-761.947, 765.869,
765.860, Fax: +40 232-761.722
E-mail: marketing@caom.ro
www.caom.ro

Helectron SA
Authorized distributor
of company Teco in Greece
3 N. Uranou str., 46 27 Thessaloniki
Greece
Phone +30 2310 500 540
Fax: +30 2310 512 122
E-mail: info@helectron.gr
www.helectron.gr

МАЭП 2000
представитель
Варшавское шоссе, 125, стр. 1
113 105 Москва
Россия
Тел./факс: +7 495 781 26 51
E-mail: tecovent@mail.ru

ООО „Группа компаний АСК"
сотрудник, консультант
ул. 8 Марта 5
620 014 Екатеринбург
Россия
Тел.: +7 343 371 44 44
Факс: +7 343 371 55 55
E-mail: drugoff@ask.ru; ask@ask.ru

СБ Титан
сотрудник, консультант
пр. Победы 160, оф. 442
454 000 Челябинск
Россия
Тел.: +7 351 230 36 22
Факс: +7 351 247 31 77
E-mail: avtoritet_putin@mail.ru
E-mail: sb-titan@mail.ru

СП „Контур Автоматизация"
Партнер, консультант Teco a. o. в России
Проспект Мира, 188
129128, г. Москва
Россия
Тел.: +7 495 181 3709
Факс: +7 495 187 1976
e-mail: Director@spcontur.ru

ЧП ПРОФИКОМ
Партнер, консультант и дистрибютор
Teco a. o. в Украине
ул. Кульпарковская 93 оф. 115
79021, г. Львов
Украина
Тел./Факс:+380 32 2248558
моб.+380 80679589603
e-mail: teco@i.ua

ЧП „Степанов С.А."
Партнер, консультант Teco a. o. в Украине
ул. Авангардная 6, 312
54003, г, Николаев
Украина
Тел./факс: +380 512 554 530
Моб. тел.: +380 677 201 320
e-mail: stepsik@gala.net, info@stepsik.com

АО ПРП Целинэнергоремонт
сотрудник, консультант
Главпочтамт а/я 27
473 000 Астана
Республика Казахстан
Тел.: +7 3172 31 10 12
Факс: +7 3172 31 11 53
E-mail: lamonovai@mail.ru
E-mail: prp@kepter.kz

CEASYTO Ltd.
Distributor of Teco in China
Room 5, Floor 21, Building A,
Zhongrun International Mansion,
No. 18, Sanhao Street, Heping District
110004 Shenyang
China
Phone: +86 24 23949788, 23942388
Fax: +86 24 24943188
E-mail: ceasyto@ceasyto.com
www.ceasyto.com

Pretech Automation Pvt. Ltd.
Distributor Teco in India
305, Poonam Plaza, Gultekdi,
Market Yard Road.,
Pune - 411037
India
Phone/Fax: +91-20-24267956/57
E-mail: pretech@vsnl.com
www.pretechautomation.com