TECOMAT TC 700

TECO
Advanced Automation

TECOMAT TC700 - Central processing units

Type	CP-7000	CP7004/CP7007
Ethernet 10/ 100 Mbps	No	Yes
Serial port slots	2	2
USB port	Yes	Yes
Memory Card slot	No	Yes
Web server integrated	No	Yes

Basic features

- Powerful CPU of TC700 programmable controller (PLC) according to IEC EN 61131.
- Outstanding integration of controller together with the IT technologies in one module.
- Onboard Fast Ethernet (10/100Mbit/s, RJ445) port, available for LAN/internet access including programming.
- Fixed IP address, that can be set by the user, TCP and UDP transfer protocol available for user communication needs.
- 2nd Ethernet port available on an expansion communication module SC-7104.
- 2 serial ports. Both have slots for optional interfaces. **See the MR-01xx submodules.**
- Expandable number of serial ports up to total 10 using SC-7103 or SC-7104.
- User friendly setting of all parameters of serial ports.
- USB 2.0 port for the simple connection of a notebook for programming.
- Any Ethernet or serial ports are available for programming of PLC or remote access from SCADA.
- Internal Real Time Clock circuit.
- Slot for SD/SDHC/MMC flash card integrated. Up to 16 GB flash disk organized in files compatible with FAT32, FAT 16, FAT 12 can be used as a permanent mass storage for data logging with timestamps.
- CP-7000 is powerful CPU to operate up to 64 modules, ie. 4 racks with 15 modules. CP-7004 can control twice more i.e. 128 modules in the distributed racks of smaller size or 8 racks with 15 positions.
- CPU supports hot swapping of I/O modules (on-line changing of modules) with the on-line check of I/O system integrity.
- Integrated Web server on CP-7004. Flash disk on the card (up to 16 GB) can be used to create your own graphical web site accessible trough LAN or Internet..

CPU programming features

- Free programmable according to IEC EN 61131-3.
- On-line programming. With the full check of program and variables integrity including changing data types.
- Programming and data communication (in LAN, WiFi, WAN, Internet) is available on Ethernet port (100 Mbit/ s) with fixed IP address.
- Built-in PROFIBUS DP Master on serial port.
- Built-in BACnet protocol on Ethernet.
- Built-in Web server, free creation of user internal WEB site stored on memory card (XML technology). Fully supported by MOSAIC tool Web Maker.
- You can create the website integrated in TECOMAT to control any machine or process through the standard web browser.
- An object to show pictures from IP cameras on webpage is available.

Connecting

- CPU can be fixed in any position in the rack. Communication among other modules and power supply are provided by rear bus connector
- Connections of external communications are provided through connectors on the front panel under the front door.
- For Ethernet port standard UTP CAT5 cables with RJ45 connector can be used.
- USB 2.0 can be connected by standard A-B cable to the standard device connector.
- More PLC TECOMAT can be networked by Ethernet (LAN/ WAN) or by RS485 bus.

Use

- Can be used as powerful PLC in machinery, process, building or transport automation tasks.
- Can be used as programmable data or protocol convertor among industrial buses and Ethernet based networks.
- Can be used as independent programmable data logger of any measured or internal data point with time stamping.

Basic features of CPU	CP-7000	CP7004/CP7007
CPU:	High speed 32 bit RISC processor	High speed 32 bit RISC processor
PLC Instruction cycle:	0.2 ms/ 1k instructions	0.2 ms/ 1k instructions
Real Time Clock (RTC):	Yes	Yes
Backup period of RAM and RTC:	< 100 h by supercap > 100 h up to 5 years by CR2032 lithium battery	< 100 h by supercap > 100 h up to 5 years by CR2032 lithium battery
User Program Memory:	192 kB	192kB
User Tables Memory	64 kB	64 kB
Backup memory for user program and tables	256 kB Flash	256 kB Flash
Internal data memory (DataBox):	0.5 MB onboard	0.5 MB onboard, expandable up to 3.5 MB (SX-7153)
Internal memory for archiving the project resources:	2 MB	2 MB
Memory card slot:	No	Yes, MMC/ SD, SDHC
Memory for variables:	64 kB/ 32 kB permanent	64 kB/ 32 kB permanent
No. of IEC timers/ counters:	4096/ 8192	4096/ 8192

Communication	CP-7000	CP7004/CP7007
Ethernet port:	No	1× 10/ 100 Base TX
Expanding the number of Ethernet ports:	See SC-7104	See SC-7104
Supported protocols on Ethernet port:		TCP/ IP, UDP/ IP, HTTP, SMTP, MODBUS TCP
USB port:	USB 2.0	USB 2.0
Serial ports:	2× free slot for optional interface (see submodules MR-0xxx)	2× free slot for optional interface (see submodules MR-0xxx)
Number of expanding serial ports (by SC-7103 or SC-7104):	2	8
System communication bus available within one rack:	1× TCL1 (RS485, 5 Mbit/s)	1× TCL1 (RS485, 5 Mbit/s)
System I/O bus expandable among the racks:	1× TCL2 (RS485, 345 kbit/s)	1× TCL2 (RS485, 345 kbit/s)
Max. number of racks with I/O module	4 racks 19" (15 positions) or equivalent	8 racks 19" (15 positions) or equivalent


CP-7000


CP7004/CP7007


SX-7153

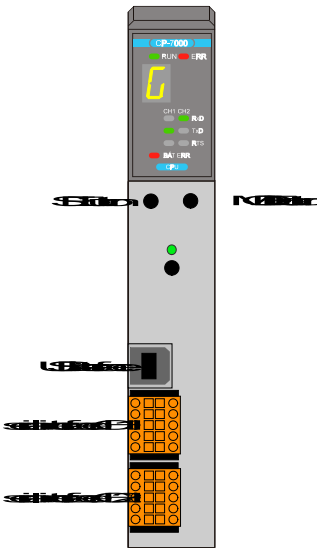
Related products

Submodules with communication interface MR-01xx

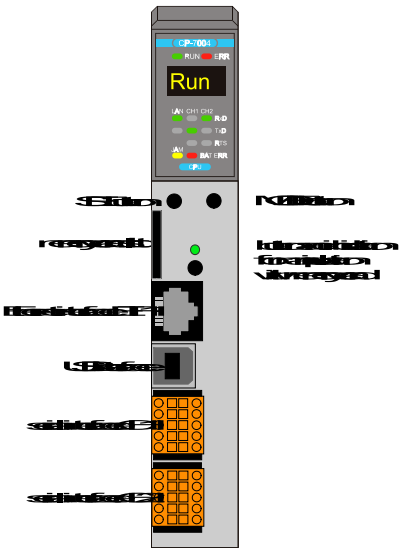
Dimensions and Weight	CP-7000	CP7004/CP7007
Dimensions	137 × 30 ×198 mm	137 × 30 ×198 mm
Weight	300 g	300 g

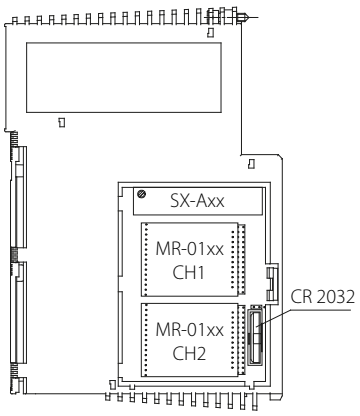
Front panels

CP-7000



CP7004/CP7007





Position of slots for DataBox sub module, interface submodules, and backup battery

Programming – MOSAIC

Programming	According IEC EN 61131-3; see MOSAIC
Graphical programming	Functional block diagram (FBD), Ladder diagram (LD)
Textual languages	Structured text (ST) Instruction list (IL)
On-line programming	Yes, any changes of program or data types
On-line debugging	Yes

SW tools, plug-ins available in MOSAIC

PLC simulator	Built-in
Alfanumeric display simulator	PanelSim
Editor of alfanumeric display	PanelMaker
Editor of graphic display	Graphic Panel Maker
Editor of internal web pages (XML)	WebMaker (WYSIWYG editor)
Editor and simulator of feedback loop controller	PIDMaker
Monitoring and analysis of variables on time base	GraphMaker
Built-in visualization	Yes
User functional block and libraries creation	Yes
Libraries available	Motion control library, communication library, internet library, file system operation library, library for sending and receiving SMS, control and regualtion library, building automation library etc.

Order numbers

TXN 170 00	CP-7000, CPU, 192 kB + 64 kB RAM, 0.5 MB DataBox, 2× SCH, 1× USB
TXN 170 07	CP-7007, CPU, Ethernet 10/ 100 Mbit RJ-45, 320 kB + 64 kB for program, 192 kB memory for data. 0,5 MB DataBox, expandable + 3 MB, 2× SCH, USB, MMC/ SD slot
TXN 170 04	CP-7004, CPU, Ethernet 10/ 100 Mbit RJ-45, 192 kB + 64 kB, 0.5 MB DataBox, expandable + 3 MB, 2× SCH, USB, MMC/ SD slot
TXN 171 53	SX-7153 Databox 3 MB, additional data memory

TECOMAT TC700 – CPU for redundancy

Type	CP-7005
Ethernet 10/ 100 Mbps	No, can be provided by additional SC-7104 module
Serial port slots	No , can be provided by additional SC-7104 or SC-7103 module
USB port	Yes

Basic features of CP-7005

- Powerful CPU of TC700 programmable controller (PLC) according to IEC EN 61131.
- CP-7005 is equipped with the firmware to enable redundant parallel work of 2 CPUs in the Hot- Standby mode.
- CP-7005 enables the configuration of the TC700 PLC with redundant CPU, redundant power supply, redundant communication with host system as well as redundant communication with I/O modules.
- To work TC700 fully redundant, two independent racks – usually RM-7942 - must be equipped by two CP-7005, two power supplies, two SE-7131 system expanders for communication with I/O system, two or more communication modules SC--710x for communication with the host system – SCADA or similar.
- Under each rack/each CP-7005 there can be up to 4 racks of I/O modules connected. It enables to work with redundant I/O modules. Proper electrical wiring of inputs and outputs has to be ensured in the electrical design of the project.
- Racks with I/O modules are connected using system expanders SE-7131/32. They enable the proper redundant work of two CP-7005 over the single I/O system.
- Both CP-7005 are interconnected by 2 synchronization lines and connected to the ID-20 service module.
- ID-20 service module indicates the status of each CPU in the redundant configuration and enables proper handling the system during service work to avoid any drop out and ensure continual work of PLC.
- Ethernet and 2 serial channels on CPU are fully dedicated to synchronize both CP-7005 and they cannot be used in application program.
- To expand number of communication channels - Ethernet and serial – additional modules SC-710x has to be added together with each CP-7005 in their racks. They can be used fully in the user program.
- The redundant CP-7005s synchronize automatically all working memory including program memory. This feature enables to program only one (hot) CP-7005 through the USB port. Program in next CP-7005 (standby) is immediately copied in next synchronization cycle.
- On-line programming. With the full check of program and variables integrity including changing data types.

CPU programming features

- Free programmable according IEC EN 61131-3.
- All type instructions can be used as in other CP-700x, including arithmetic functions, floating point instructions, PID loop control etc.

Basic features of system expanders SE-7131 (master) and SE-7132 (slave)

- System expanders SE-7131/32 enables to connect I/O system via quick Ethernet line. Only dedicated Ethernet line can be used, since the band of this line is used fully for I/O operations.
- Twin system expanders work together as Master-Slave and also support redundancy.
- They enable to connect single I/O system placed in up to 4 racks full of I/O modules which are controlled by two CP-7005 working in Hot-Standby mode.
- Each CP-7005 has one SE-7131 Master in its rack. Their SE-7132 Slaves are placed in the same I/O rack. The SE-7132 slaves ensure proper handling the system bus in I/O racks during changing the control work from one CP-7005 (Hot) to the other one (Standby) and vice versa.

Connecting

- To create redundant configuration, at least 2 independent racks have to be used and one ID-20 service module.
- Each rack has at least one power supply module PW-790x and one CP-7005.
- Both CP-7005 are interconnected by 2 synchronizing lines. Each CP-7005 has to be connected to ID-20 by RCP1 interface placed in CH2 slot.
- Each power supply module has to be connected to the main power through ID-20 to be properly maintained during service work.
- To provide redundant communication with the host system, SC-7104 has to be placed in each rack. Their Ethernet ports are configured properly. The OPC server or SCADA system Reliance automatically select the active channel for uninterrupted communication.

Use

- Can be used as powerful redundant PLC with the high grade of availability in machinery, process, building or transport automation tasks.

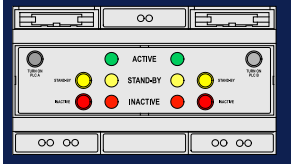
Basic features of CPU	CP-7005
CPU:	High speed 32 bit RISC processor
PLC Instruction cycle:	0.9 ms/ 1k instructions
Real Time Clock (RTC):	Yes
Backup period of RAM and RTC:	< 100h by supercap > 100h up to 5 years by CR2032 lithium battery
User Program Memory:	128 kB
User Tables Memory	64 kB
Backup memory for user program and tables	192 kB Flash
Internal data memory (DataBox):	2.5 MB onboard
Internal memory for archiving the project resources:	2 MB
Memory card slot:	No
Memory for variables:	64 kB/ 32 kB permanent
No. of IEC timers/ counters:	4096/ 8192

Communication	CP-7005
Ethernet port:	No
Expanding the number of Ethernet ports:	See SC-7104
USB port:	USB 2.0
Serial ports:	The onboard slots used for redundancy support. Next ports can be added by SC-7103 or 7104.
Max. number of expanding serial ports (by SC-7103 or SC-7104):	8
System communication bus available within one rack:	1× TCL1 (RS485, 5 Mbit/s)
System I/O bus expandable among the racks:	1× TCL2 (RS485, 345 kbit/s)
Max. number of racks with I/O modules	4 racks with 15 positions or equivalent number of smaller racks/ 64 modules

CP-7005

SE-7131

SE-7132



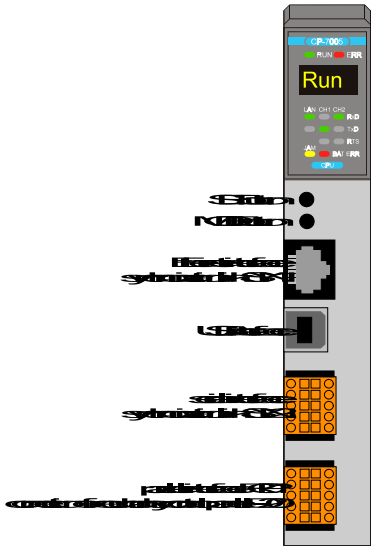
ID-20

System expanders	SE-7131 Master	SE-7132 Slave
Ethernet port:	Yes, only for communication with SE-7132	Yes, only for communication with SE-7131
Serial ports:	No	No
Number of expanding serial ports (by SC-7103 or SC-7104):		8 within the same rack, where SE-7132 is placed
System I/O bus expandable among the racks:	SE-7131 pass system buses TCL1 and TCL2 through the Ethernet line to the SE-71321	SE-7132 converts Ethernet packets received form SE-7131 back to the TCL1 and TCL2 system buses for racks with I/ O

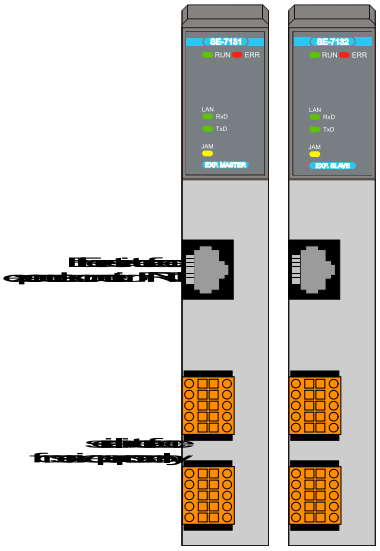
Dimensions and Weight	CP-7005	SE-7131	SE-7132
Dimensions	137 × 30 ×198 mm	137 × 30 ×198 mm	137 × 30 ×198 mm
Weight	300 g	300 g	300 g

Front panels

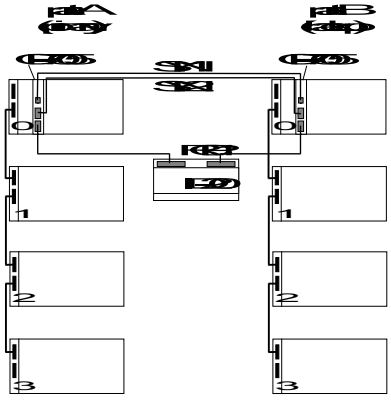
CP-7005



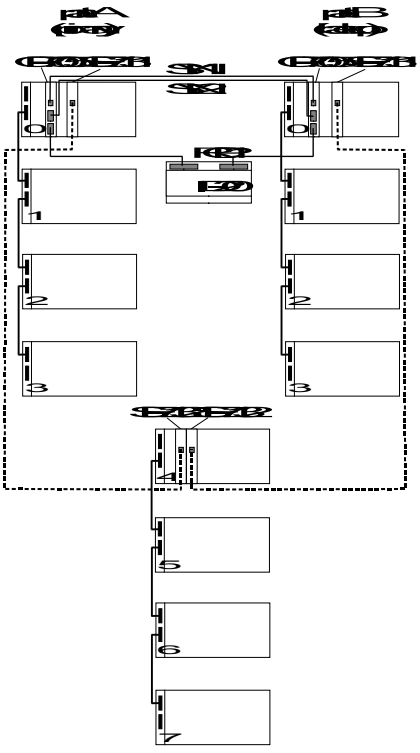
SE-7131, SE-7132



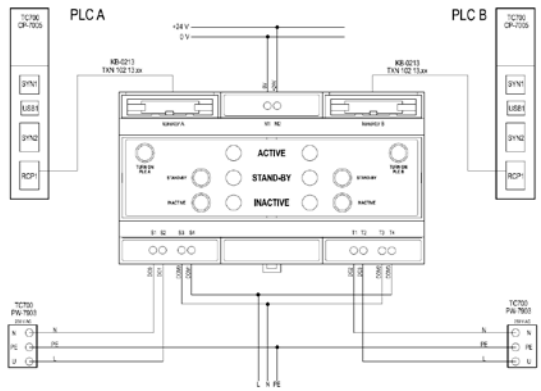
Interconnecting of two redundant CP-7005 and PW-7903 with ID-20



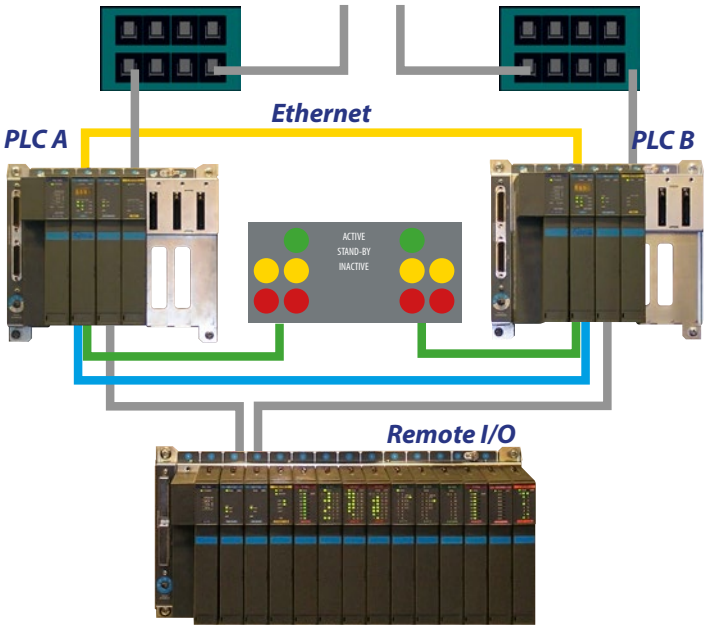
Enhanced redundant scheme of redundant I/O using system expanders



Basic scheme of redundant I/ O system



Redundant scheme of single I/O system and redundant communication with the host system



Programming – MOSAIC

Programming	According to IEC EN 61131-3; see MOSAIC
Graphical programming	Functional block diagram (FBD), Ladder diagram (LD)
Textual languages	Structured text (ST) Instruction list (IL)
On-line programming	Yes, any changes of program or data types
On-line debugging	Yes

SW tools, plug-ins available in MOSAIC

PLC simulator	Built-in
Alphanumeric display simulator	Panel Sim
Editor of alphanumeric display	PanelMaker
Editor of graphic display	Graphic PanelMaker (GPMaker)
Editor and simulator of feedback loop controller	PIDMaker
Monitoring and analysis of variables on time base	GraphMaker
Built-in visualization	Yes
User functional block and libraries creation	Yes
Libraries available	Motion control library, communication library, internet library, file system operation library, library for sending and receiving SMS, control and regualtion library, building automation library etc.

Order numbers

TXN 170 05	CP-7005, CPU, with redundandt function, Ethernet 10 Mbit RJ-45, 128 kB + 64 kB RAM, 2.5 MB DataBox (expandable up to 3MB), 2× SCH, 1× USB,
TXN 054 31	ID-20 operation panel for redundant CP-7005
TXN 171 31	SE-7131 System expander Master with ETH for redundant communication
TXN 171 32	SE-7132 System expander Slave with ETH for redundant communication

MR – submodules with communication interface

Type	DI	DO	AI	AO	Comm
MR-0104					RS 232
MR-0114					RS-485
MR-0124					RS-422
MR-0152					Profibus DP Slave
MR-0158					M-Bus
MR-0159					LON
MR-0160					CAN
MR-0161					2× CAN

Basic features

- Submodules (Piggybacks) MR-01xx are designed to be inserted in slots CH1 and CH2 of CPU CP-7000, CP-7004 and of communication modules SC-7103 and SC-7104.
- Selection of interface submodule is a selection of physical layer of communication. The higher layers as protocol and communication modes can be set in configuration tool of MOSAIC.

Connecting

- Submodules are to be inserted in slots under the door on the right hand side of the module housing.
- The signal layout on the connector is a part of documentation of each submodule.

Use

- In all cases where TC700 has to be addapted to communicate with other device or with other TECOMAT.

Specification	MR-0104	MR-0114	MR-0124
Interface	RS-232	RS-485	RS-422
Galvanic isolation	Yes	Yes	Yes
Isolation voltage	1000 V DC	1000 V DC	1000 V DC
Max. comm. rate	200 kBd	2 MBd	2 MBd
Receiver input impedance	Min. 7 kΩ	Sensitivity ±200 mV	Sensitivity ±200 mV
Transceiver output level	±8 V	Typ. 3.7 V	Typ. 3.7 V
Max. distance of wiring	15 m	1200 m	1200 m

Specification	MR-0152	MR-0158	MR-0159	MR160/161
Interface	Profibus DP Slave	M-Bus for up to 6 heat meters	LON node with 25 network variables	CAN, 2×CAN
Galvanic isolation	Yes	Yes	Yes	Yes
Isolation voltage	1000 V DC	1000 V DC	According to LON specifications	1000 V DC
Max. comm. rate	12 Mbps	9.6 kbps	Dtto	0.5 Mbps
Receiver input impedance	Sensitivity ±200 mV		Dtto	Sensitivity +–200 mV
Transceiver output level	Typ. 3.7 V	Typ. 24 V power supply	Dtto	Typ. 5 V
Max. distance of wiring	1200 m (<187 kbps)	200 m	Dtto	100 m

Power supply

Internal	On slot pin

Dimensions and weight

Dimensions	36 × 11 × 52 mm
Weight	30 g

Order number

TXN 101 04	MR-0104, RS-232 galvanic isolation
TXN 101 14	MR-0114, RS-485 galvanic isolation
TXN 101 24	MR-0124, RS-422 galvanic isolation
TXN 101 52	MR-0152, PROFIBUS DP Slave galvanic isolation
TXN 101 58	MR-0158, M-Bus Master for 6 Slaves galvanic isolation
TXN 101 59	MR-0159, LON interface
TXN 101 60	MR-0160, 2× CAN (SJA1000, Philips) galvanic isolation
TXN 101 61	MR-0161, 1× CAN (SJA1000, Philips) galvanic isolation

MR-0104, RS-232
MR-0114, RS-485
MR-0124, RS-422

MR-0158, M-Bus
MR-0159, LON
MR-0161, 2× CAN

MR-0152, Profibus DP

TECOMAT TC700 – racks

Type	RM-7942	RM-7941	RM-7946	RM-7944
No. of slots	15	8	4	2

Basic features

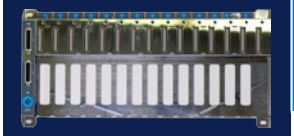
- The RM-794x racks are designed for mechanical installation of modules, their electrical interconnection, power supply distribution. It is possible to interconnect more racks into bigger distributed assemblies.
- The RM-794x racks contains 2, 4, 8 or 15 positions (slots) for the modules with the basic width (30 mm).
- The design of the racks together with the bus inside allows the hot swapping of the I/O modules.

Connecting

- The installation of the rack in the control panel is done by the fixation on the base plate of the control panel with screws of max. M6.
- For proper functionality of the internal bus in the self standing rack, the terminators KB-0201 have to be used on expansion connectors left on the rack.
- To enlarge the capacity of slots for more modules, the racks can be combined and interconnect by metallic cables or by optic fiber cables.
- The terminators KB-0201 have to be placed on the first rack and on the last one, while cables are used among the racks.
- To ensure proper addressing of the modules, the unique address has to be set by the rotary encoder on the left hand side of each rack.

Use

- The racks are used to interconnect any combination of I/O, CPU, communication and power supply modules of TC700 system.
- The racks and their connectivity enables to create centralized or distributed installation without the need of any other communication module.
- The max. number of interconnected racks are 32 with 2 positions (RM-7944) or 4 with 15 positions (RM-7942).



RM-7942

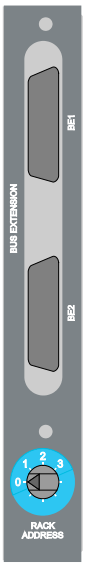
RM-7941

RM-7946

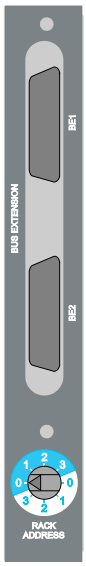
RM-7944

Panels with bus connectors and adressing switches

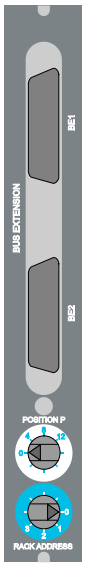
RM-7942



RM-7941

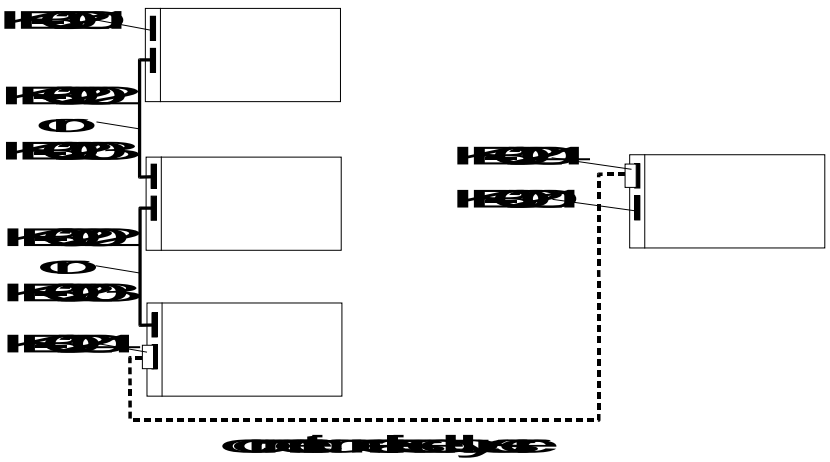


RM-7946



RM-7944

Interconnection of more racks



Communication

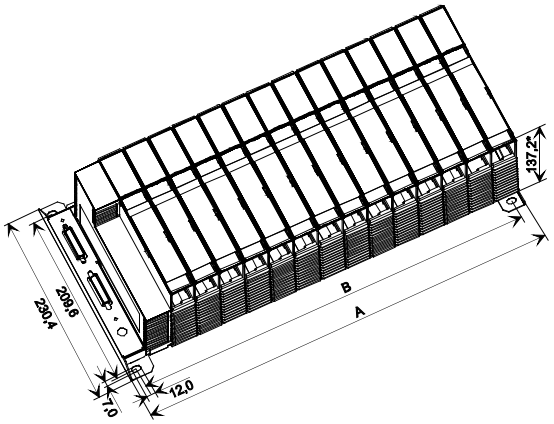
System I/ O bus	1× TCL2 (RS485, 345kbit/s, expandable over the racks) 1× TCL1 (5Mbit/s, not expandable, only within one rack)

Power supply

- The racks are passive. However they distribute the 24 V DC power supply for all modules placed in the rack through the bus.
- The power supply wires are also available on the expansion bus connectors, so the I/O modules in expansion racks can be supplied from the power supply in the other rack. The total power of all modules and voltage drop over the long interconnecting cables has to be taken into account.

Basic dimensions

- Power supply modules PW-79xx are used as a source of 24 V DC for the rack. At least one power supply module has to be used.
- More power supply modules can be placed in the rack to increase the power or to perform redundancy of power supply.



Dimensions and weight	RM-7942	RM-7941	RM-7946	RM-7944
Dimension with modules	485,2 × 230,4 × 137,2 mm	272,3 × 230,4 × 137,2 mm	150,7 × 230,4 × 137,2 mm	89,9 × 230,4 × 137,2 mm
Weight	900 g	600 g	500g	300g

Order number

TXN 179 44	RM-7944 rack, 2 positions
TXN 179 46	RM-7946 rack, 4 positions
TXN 179 41	RM-7941 rack, 8 positions
TXN 179 42	RM-7942 rack, 15 positions

TECOMAT TC700 – system cables and terminators

Type	KB-0201	KB-0202	KB-0203	KB-0204	KB-0220	KB-0250	KB-0251	KB-0252
Function	Tterminator	Bus Expansion cable with power supply	Bus Expansion cable without power supply	Bus Expansion connector for user wiring	Module for metallic interconnection with galvanic isolation	Module for fibre optic interconnection (POF)	Module for fibre optic interconnection (HSC)	Module for fibre optic interconnection (MM)

Basic features

- The RM-794x racks can be chained to enlarge the number of I/O modules in centralized installation or enables distributed installation of I/O modules. No additional communication module is necessary.
- The bus either in single rack or in chain of racks has to be terminated by terminators KB-0201 at the beginning and at the end of the bus.
- There are two possibilities for interconnection
  - Metallic cables has 4 options
  - KB-0202 with the TCL2 bus and with power supply. It is suitable up to 10 m of distance between racks.
  - KB-0203 with the TCL2 bus without power supply. It can be used up to 300 m.
  - KB-0204 set of 2 connectors for wiring by user.
  - KB-0220 module with galvanic isolation. It has 4 screw-type terminals for easy installation.
- Fibre optic interconnection can be performed by 3 types of convertors:
  - KB-250 set of 2 convertors for POF (Plastic Optic Fibres) with standard Duplex Versatile Link connectors.
  - KB-251 set of 2 convertors for HCS® (Hard Clad Silica) fibres with standard Duplex Versatile Link connectors.
  - KB-252 set of 2 convertors for MM (Multimode) fibres with Duplex ST connector

Connecting

- The terminals KB-0201 and cables KB-0202, KB-0203 have to be plugged in D-sub the connectors on the left side of the rack. Connectors have to be fixed by screws.
- Convertors KB-0220, KB-0250, KB-0251 and KB-0252 have to be plugged in D-sub connectors on the left side of the rack. The optic connectors on the other side are ready to accept standard optic fibres.

Use

- The KB-02xx terminals and cables enable to provide proper physical interconnection of the TC700 racks in different indoor and outdoor automation tasks.
- They ensure reliability of any interconnection

Order number

TXN 102 01	KB-0201 TC700 bus termination module (set of 2 pcs)
TXN 102 02.01	KB-0202 TC700 bus interconnection cable, including power supply 25 cm
TXN 102 02.xx 1)	KB-0202 TC700 bus interconnection cable, including power supply 50 cm
TXN 102 03.01	KB-0203 TC700 bus interconnection cable, without power line 25 cm
TXN 102 03.xx 1)	KB-0203 TC700 bus interconnection cable, without power line 50 cm
TXN 102 04	KB-0204 TC700 bus termination module (set of 2 pcs) for custom wiring
TXN 102 20	KB-0220, Module for GI metalic interconnection TC700, 4× screw type terminal
TXN 102 50	KB-0250 Set of 2 modules for optic interconnection of TC700 bus (POF to 2.2dB)
TXN 102 51	KB-0251 Set of 2 modules for optic interconnection of TC700 bus (HSC up to 13dB)
TXN 102 52	KB-0252 Set of 2 modules for optic interconnection of TC700 bus (MM glass 3.5dB/1.7km)
TXN 102 60.04	KB-0260 Optic fibre duplex POF 220 dB/ km, 1 m
TXN 102 60.20	KB-0260 Optic fibre duplex POF 220 dB/km, 5 m
TXN 102 60.30	KB-0260 Optic fibre duplex POF 220 dB/km, 10 m
TXN 102 60.34	KB-0260 Optic fibre duplex POF 220 dB/ km, 20 m
TXN 102 61.34	KB-0261 Optic fibre duplex HCS 8 dB/ km, 20 m
TXN 102 61.38	KB-0261 Optic fibre duplex HCS 8 dB/ km, 30 m
TXN 102 61.46	KB-0261 Optic fibre duplex HCS 8 dB/ km, 50 m
TXN 102 61.56	KB-0261 Optic fibre duplex HCS 8 dB/ km, 100 m

xx means the cable length according the following table. Other length can be ordered individually.

Number for xx	Length of cable	Type of cable KB-0202	KB-0203
.01	25 cm	yes	yes
.02	50 cm	yes	yes
.03	75 cm	yes	yes
.04	100 cm	yes	yes
.08	200 cm	-[2])	yes
.12	300 cm	-[2])	yes
.20	500 cm	-[2])	-[2])

2)- not available

KB-0201


KB-0202


KB-0203

KB-0204


KB-0251


KB-0252

TECOMAT TC700 – Power Supply Modules

Type	PW-7901	PW-7902	PW-7903	PW-7904	PW-7906	PW-7907	PW-7908
Input voltage	24 V DC	24 V DC	230 V AC	230 V AC	24 V DC	230 V AC	115 V DC
UPS functionality	No	Yes	No	Yes	No	No	No
Output power	50 W	50 W	50 W	50 W	18 W	18 W	50 W

Basic features

- All TC700 modules including CPU, communication and I/O modules are supplied from the bus power line in the rack.
- All power supplies modules are designed to be fixed in the TC700 rack and to convert industrial standard 24 V DC or 230 V AC power line into the internal power line on the bus.
- They are switching power supplies with high efficiency, controlled by microprocessor. They are equipped with the load level indication.
- All power supplies meet requirements for safe voltage supply SELV (Safe Extra Low Voltage acc. IEC 364-3)
- Due to redundancy requirements or increasing the power, parallel arrangement of up to 5 power modules in one rack is allowed. In such case the compensation of output currents of each power module is performed.
- 2 types of power supply modules contain the circuits which perform the UPS (Uninterruptible Power Supply) functionality using only external standard lead 24 V DC maintenance free accumulator. It compensates a power line failure. The internal circuits enable the charging of accumulator during normal work. The continuous supply of the bus power during a main power line failure is ensured without any drop. The circuits protect the accumulators against deep discharge as well.

Connecting

- Power supply modules PW-7901÷7904 and PW-7908 can be placed in any slot in the rack. They occupy 2 slots.
- PW-7906 and PW-7907 are designed to supply small racks with 2 and 4 slots. In order to save those slots for I/O modules they are mounted on expansion connectors at the left side of the racks. They have also less power (18 W) comparing with the standard double slot power supplies (50 W)
- The input power line has to be connected to the front connector covered by door on the module.
- The accumulator has to be wired to other front connector under the same door.

Use

- Power supplies PW-79xx are designed for use only in TC700 to perform any requirements for reliable, uninterruptable supplying of distributed TC700 PLC.


PW-7901


PW-7902


PW-7903


PW-7904


PW-7906


PW-7907


PW-7908

Basic features	PW-7901	PW-7902	PW-7903	PW-7904	PW-7906	PW-7907	PW-7908
Input voltage/tolerance	24 V DC/ 19÷36 V DC	24 V DC/ 19÷36 V DC	230 V AC/ 180÷264 V AC	230 V AC/ 180÷264 V AC	24 V DC/ 19÷36 V DC	230 V AC/ 180÷264 V AC	115 V DC/ 95÷131 V DC
Frekvence vstupního napětí			48-63 Hz	48-63 Hz		48-63 Hz	
Max. continuous input current (A) or input power (VA)	4 A	4 A	72 VA	72 VA	2 A	43 VA	0.7 A
Input protection	fuse (T4A)	fuse (T4A)	fuse (T1A)	fuse (T1A)	fuse (T2A)	fuse (T1A)	fuse (T2A)
Output power	50 W	50 W	50 W	50 W	18 W	18 W	50 W
Efficiency	85%	85%	80%	80%	85%	85%	
Output Voltage	24.3 V ± 0.1 V DC	24.3 V ± 0.1 V DC	24.3 V ± 0.1 V DC	24.3 V ± 0.1 V DC	24.3 V ± 0.1 V DC	24.3 V ± 0.1 V DC	24.3 V ± 0.1 V DC
Output short protection	Electronic	Electronic	Electronic	Electronic	Electronic	Electronic	Electronic
Galvanic isolation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Max. period of power line drop out	50 ms	50 ms (when UPS off)	50 ms	50 ms (when UPS off)	10 ms	10 ms	50 ms
UPS functionality	No	Yes	No	Yes	No	No	No
External accumulator		24 V / 1.3 ÷ 12 Ah		24 V / 1.3 ÷ 12 Ah			
Electric insulation input/output	1500 V DC	1500 V DC	3750 V DC	3750 V DC	1500 V DC	3750 V DC	2500 V DC

Dimensions and Weight	PW-7901	PW-7902	PW-7903	PW-7904	PW-7906	PW-7907	PW-7908
Dimensions	137 × 60 × 198 mm	137 × 60 × 198 mm	137 × 60 × 198 mm	137 × 60 × 198 mm	90 × 27 × 192 mm	90 × 27 × 192 mm	137 × 60 × 198 mm
Weight	1 600 g	1 600 g	1 600 g	1 600 g	810 g	810 g	1 600 g

Order number

TXN 179 01	PW-7901 power supply 24 V AC / DC without UPS
TXN 179 02	PW-7902 power supply 24 V AC / DC with UPS
TXN 179 03	PW-7903 power supply 230 V AC, without UPS
TXN 179 04	PW-7904 power supply 230 V AC, with UPS
TXN 179 06	PW-7906 power supply 24 V DC, 18 W (only for RM-7941 since 2007, RM-7944 and RM-7946)
TXN 179 07	PW-7907 power supply 230 V AC, 18 W (only for RM-7941 since 2007, RM-7944 and RM-7946)
TXN 179 08	PW-7908 power supply 115 V DC without UPS

TECO Advanced Automation

TECOMAT TC700 – Communication modules

Type	SC-7103	SC-7104
Ethernet 10/ 100 Mbps	No	Yes
Serial slots	2	2

Basic features

- Communication modules are designed to expand the capacity of system communication channels of the central units CP-700x.
- SC-7104 can add the second Ethernet port with the own IP address and 2 serial ports.
- SC-7103 can add only two serial ports.
- Both serial ports on the module must be equipped by optional submodule MR-01xx to give full functionality. See MR-01xx datasheet.
- SC-710x must be placed in the same rack as the CP-700x module.
- For CP-7000 (and older) only one SC-710x can be added.
- For CP-7004 up to 4 communication modules can be added and only one SC-7104 with Ethernet port can be among them.
- By inserting communication modules the second Ethernet port and serial ports become the system communication channel.

Connecting

- SC-710x communication modules can be inserted in any position but in the same rack as the CP-700x central module. The best position is next to CP-700x.
- Ethernet port has standard RJ-45 socket.
- Serial ports are connected by screw less 10 pin connectors by the wires up to 1mm² cross section.

Use

- Communication modules are designed to expand the capacity of communication channels of the CPU CP-700x.
- The type of the physical interface like RS-232, RS-485, RS-422, CAN etc. can be chosen by optional submodules MR-01xx.
- The protocol running on each port must be chosen by SW configuration in the MOSAIC development environment.

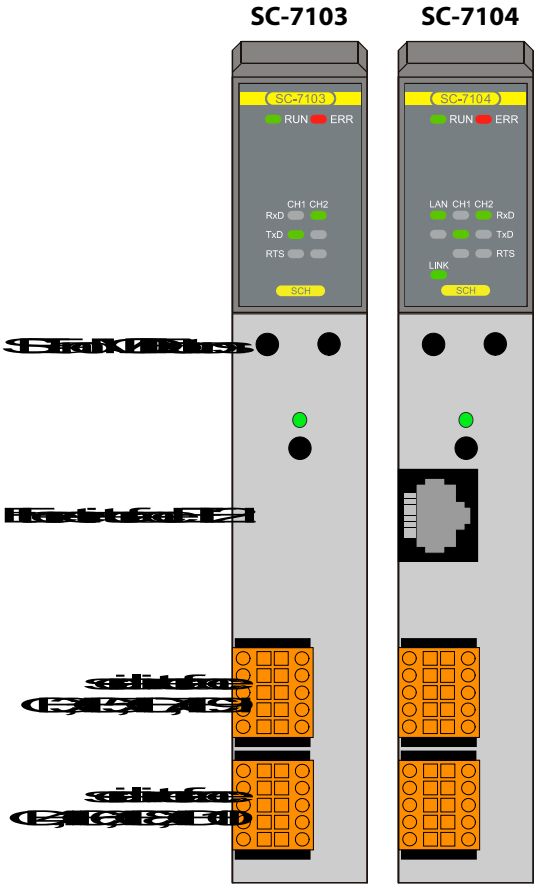
SC-7103

SC-7104

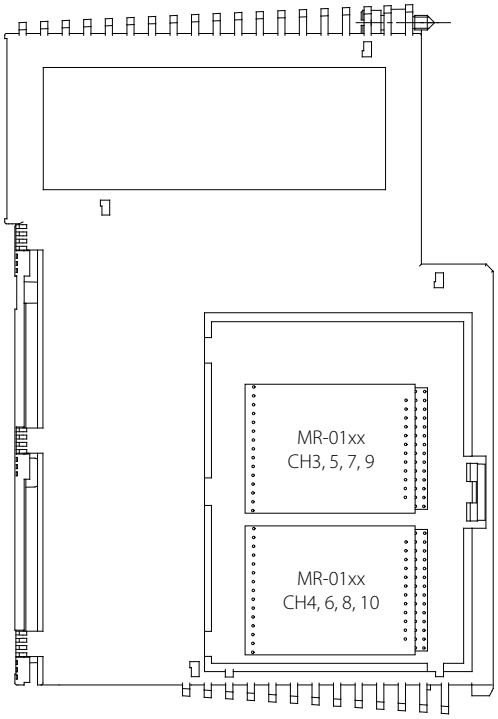
Communication	SC-7103	SC-7104
Ethernet port	No	1× 10/ 100 Base TX
Supported protocols on Ethernet port		TCP/IP, UDP/IP, HTTP, SMTP, MODBUS TCP
Serial ports	2× free slot for optional interface (see submodules MR-0xxx)	2× free slot for optional interface (see submodules MR-0xxx)

Dimensions and weight	SC-7103	SC-7104
Dimensions	137 × 30 ×198 mm	137 × 30 ×198 mm
Weight	300 g	300 g

Front panels



Installation of submodules



Order number	
TXN 171 03	SC-7103, 2 serial channels
TXN 171 04	SC-7104, 2 serial channels, 1 × ETHERNET 10/ 100 Mbps RJ-45

TECOMAT TC700 – Binary input modules

Type	IB-7302	IB-7303	IB-7305	IB-7310	IB-7311
Binary inputs	32	16	16	64	32
Input voltage	24 V DC	24 V DC/AC	230 V AC	24 V DC	24 V DC
Connection	2 × 20 pin Screwless connector	20 pin Screw type connector Screwless conector	20 pin Screw type connector Screwless connector	4 × 20 pin DIN 41651 Flat Cable Connector	2 × 20 pin DIN 41651 Flat Cable Connector

Basic features

- Expansion modules with 16 up to 64 binary inputs for enlarging number of I/O of the TC700 configuration.
- Inputs are organized in groups with common wire.
- Galvanic isolation of inputs from internal circuits of controller is provided.
- Status of the module and of each output is indicated by LED on the front panel.
- Modules can be placed in any position of the rack.
- Modules support a hot-swap. This feature is programmable and must be enabled by the programmer.
- IB-7303 module allows to invoke an interrupt from input (HW interrupt)
- Other details are given in tables.

Connecting

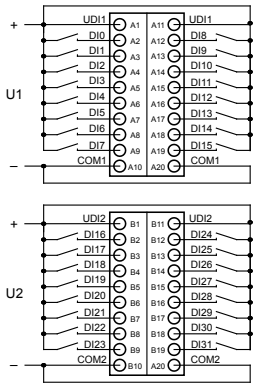
- Front end connectors are ordered separately since user can choose the screw/screwless one.
- The high density modules IB-7310 and IB-7311 has to be connected through the cable to external input modules with additional protection elements.
- Modules are to be fixed in the rack by one screw at the top of the module.
- Modules are addressed by their position in the rack.
- Modules are power supplied from the rack. The onput circuits must be supplied by external power supply.

Use

- Modules are used to connect binary, logic, input signals and provide galvanic isolation and filtering of breakowns.

Connection examples

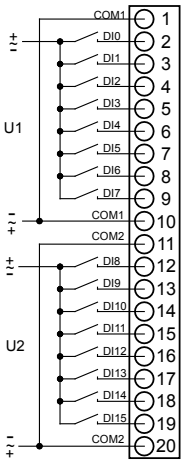
IB-7302



Connector: 2× 20pin Screwless connector TXN 102 40

Conductors cross-section: max. 1 mm²

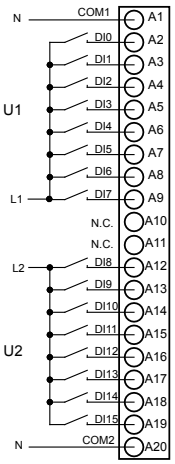
IB-7303



20pin Screw-type connector/ Screwless connector TXN 102 3×

max. 2.5 mm²

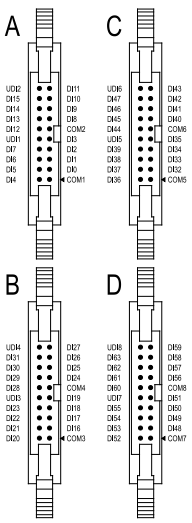
IB-7305



20pin Screw type connector/ Screwless connector TXN 102 3×

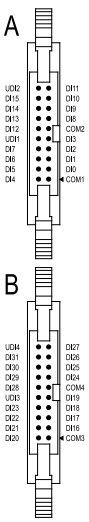
max. 2.5 mm²

IB-7310



Connector: 4×20pin DIN 41651 Flat Cable Connector

IB-7311



2×20pin DIN 41651 Flat Cable Connector

IB-7302

IB-7303

IB-7305

IB-7310

Binary inputs	IB-7302	IB-7303	IB-7305	IB-7310	IB-7311
No. of inputs / groups	32/ 4	16 / 2	16/ 2	64/ 8	32/ 4
Type of input according to IEC EN 61131-2	Type 1	Type 1	Type 1	Type 3	Type 3
Common wire	Minus	Minus, plus	-	Minus	Minus
Input voltage	24 V DC	24 V AC/ DC	230 V AC, 50/ 60 Hz	24 V DC	24 V DC
Input current at log. 1	max. 3 mA	max. 5 mA	max. 10 mA	max. 3 mA	max. 3 mA
Time of open/close the input	5 ms/ 5 ms	0.5 ms/ 0.5 ms	10 ms/ 10 ms	5 ms/ 5 ms	5 ms/ 5 ms
Galvanic isolation	Yes	Yes	Yes	Yes	Yes
External supply voltage of module input circuits	24 V DC	24 V DC	-	24 V DC	24 V DC
Max. power consumption from external source (1 group)	60 mA	50 mA	-	30 mA	30 mA
Insulation voltage among inputs and internal circuits	500 V DC	500 V AC/ DC	3750 V AC	500 V DC	500 V DC
Insulation voltage among groups of inputs	500 V DC	500 V AC/ DC	2500 V AC	500 V DC	500 V DC

IB-7311

Power supply	IB-7302	IB-7303	IB-7305	IB-7310	IB-7311
Power supply voltage (SELV)	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack
Module power loss	4 W	4 W	6 W	8 W	5 W
Power consumption	1.8 W	1 W	0.8 W	1.5 W	1.5 W

Dimensions and weight	IB-7302	IB-7303	IB-7305	IB-7310	IB-7311
Dimensions	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm
Weight	300 g	300 g	300 g	300 g	300 g

TXN 102 40

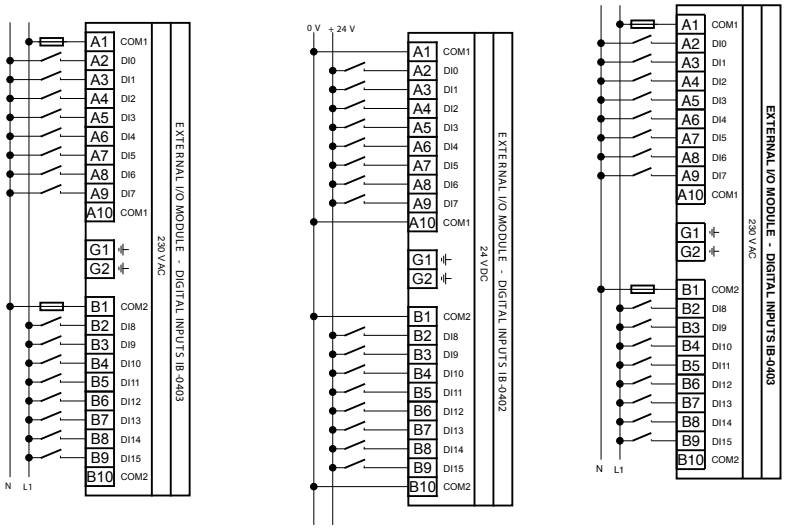
Order number

TXN 173 02	IB-7302 32 inputs 24 V DC/ 5 ms, common minus pole for group of 16 inputs
TXN 173 03	IB-7303 16 inputs 24 V DC/ AC, 0.5 ms, interrupt, common pole for group of 8 inputs
TXN 173 05	IB-7305 16 inputs 230 V AC, 10 ms
TXN 173 10	IB-7310 64 DI GI, 24 V, 5 ms, basic module for external modules IB-04xx
TXN 173 11	IB-7311 32 DI GI, 24 V, 5 ms, basic module for external modules IB-04xx
TXN 102 30	Connector, screwless type, 20 pins, pitch 5.08 mm
TXN 102 31	Connector, screw type, parallel,20 pins, pitch 5.08 mm
TXN 102 32	Connector, screw type, right angle, 20 pins, pitch 5.08 mm
TXN 102 40	2 connectors, screwless type, 20 pins, pitch 3.5 mm
TXN 102 45	4 IDC connectors according to DIN41651 for flat cables, 20 pins

TXN 102 30

TXN 102 32

Connection



Conductors cross-section	Max. 2.5mm²	Max. 2.5mm²	Max. 2.5mm²

KB-0211
KB-0212
KB-0213

TECOMAT TC700 – External input modules

Type	IB-0401	IB-0402	IB-0403
Number of inputs	16	16	16
Input voltage	24 V DC	24 V DC	230 V AC
Connecting	Screwless terminal	Screwless terminal	Screwless terminal

Basic features

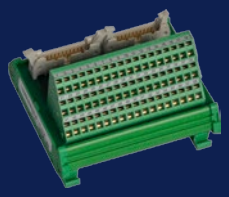
- External input modules are designed as end terminals of high density I/O modules IB-7310, IB-7311 and IS-7510.
- External modules give wider choice of different contact configuration and include input protection elements like varistors or surge arresters.
- IB-0401 – can be doubled and interconnected in order to enable redundant (parallel) connecting to 2 input modules in the rack.
- The status of each input is indicated by the LED on the module.
- Other details are given in the tables below.

Connecting

- External output modules are interconnected with the TC700 modules in the rack by parallel cables KB-0211, KB-0212 or KB-0213 with plug-in connectors or other flat cables compatible with DIN 41651.
- IB-0401 has 3 dedicated terminals for signal, +24 V and GND wires of sensor for each input.
- External modules are mounted on DIN rail.
- Terminals of external modules are designed to be the front end terminal in control panel and can be directly wired to sensors coming from the field.

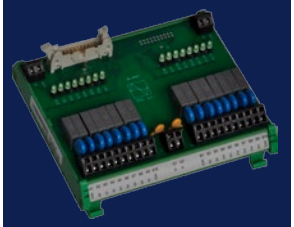
Use

- External input modules IB-04xx are useful where high density of I/O modules in the rack has to be connected quickly and with minimum wiring inside the control panel.
- External input modules are used where surge protection of input signals coming from outdoor installation is required.



IB-0401

IB-0402



IB-0403

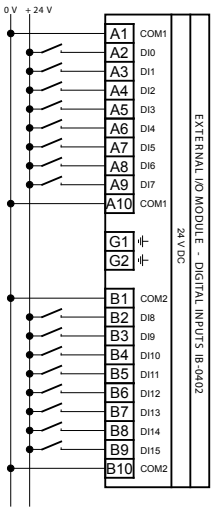
KB-0211
KB-0212
KB-0213

Binary inputs	IB-0401	IB-0402	IB-0403
No. of inputs/ groups	16/ 1	16/ 2	16/ 2
Common wire	AC/ DC Minus	AC/ DC Minus	AC
Input voltage	24 V AC/ DC	24 V AC/ DC	230 V AC, 50/ 60 Hz
Input current at log. 1	max. 7 mA DC, 10 mA AC	max. 7 mA DC, 10 mA AC	max. 10 mA AC
Galvanic isolation of R connector	No, GI is a part of IB-7310, IB-7311 and IS-7510 modules	No, GI is a part of IB-7310, IB-7311 and IS-7510 modules	Yes
External supply voltage of module input circuits	24 V DC/ AC	24 V DC/ AC	24 V DC
Insulation voltage among the inputs and internal circuits	–	–	3750 V AC

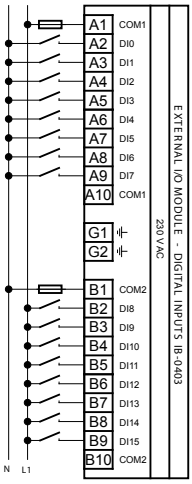
Power supply	IB-0401	IB-0402	IB-0403
Power supply voltage	No power supply is needed	No power supply is needed	24 V DC/ 2 W
Module power loss	4 W	4 W	6 W

Dimensions and weight	IB-0401	IB-0402	IB-0403
Dimensions	108 × 92 × 54 mm	129 × 92 × 54 mm	139 × 125 × 54 mm
Weight	300 g	300 g	300 g

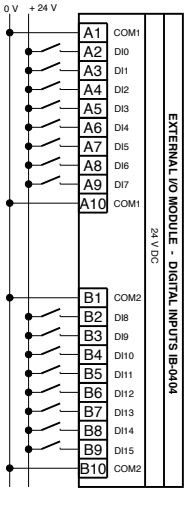
IB-0402



IB-0403



IB-0404



Conductors cross-section	max. 2,5 mm^2	max. 2,5 mm^2	max. 2,5 mm^2

Order number	
TXN 104 01	IB-0401 16 × DI 24 V DC, external module for IB-7310, IB-7311, IS-7510
TXN 104 02	IB-0402 16 × DI 24 V DC, surge protection, external module for IB-7310, IB-7311, IS-7510
TXN 104 03	IB-0403 16 × DI 230 V AC, surge protection, external module for IB-7310, IB-7311, IS-7510
TXN 102 11.04	KB-0211 cable for external I/O modules, 20 pin/20 pin, shielded – (faston 2.8), 1m
TXN 102 12.04	KB-0212 cable for external I/O modules, 20 pin/20 pin, unshielded 1m
TXN 102 13.04	KB-0213 cable for external I/O modules, 20 pin/ free end, shielded-(faston 2.8), 1m

TECO Advanced Automation

TECOMAT TC700 – Binary output modules

Type	OS-7401	OS-7402	OS-7410	OS-7411
Number of outputs	16	32	64	32
Switching voltage	24 V DC	24 V DC	24 V DC	24 V DC
Switching current	2 A	0.5 A	0.05 A	0.05 A
Connection	20pin Screw type connector Screwless connector	2× 20pin Screwless conector	4× 20pin DIN 41651 Flat Cable Connector	2× 20pin DIN 41651 Flat Cable Connector

Basic features

- Expansion modules with 16, 32 and 64 binary semiconductor outputs for enlarging number of I/O of the TC700 configuration.
- Outputs are organized in groups with one common wire.
- Galvanic isolation of outputs from internal circuits of controller is provided.
- Status of the module and of each output is indicated by LED on the front panel.
- Modules can be placed in any position of the rack.
- Modules support a hot-swap. This feature is programmable and must be enabled by the programmer.
- Other details are given in tables.

Connecting

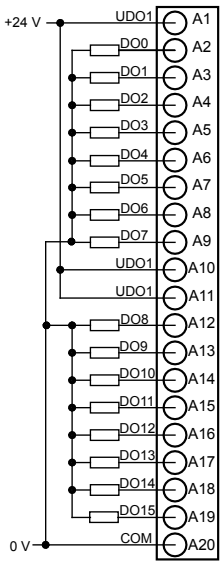
- Front end connectors are ordered separately since user can choose the screw/screwless one.
- The high density modules OS-7410 and OS-7411 has to be connected through the cable to external output modules with different switching and protection elements.
- Modules are to be fixed in the rack by one screw at the top of the module.
- Modules are addressed by their position in the rack.
- Modules are power supplied from the rack. The loads must be supplied by external power supply.

Use

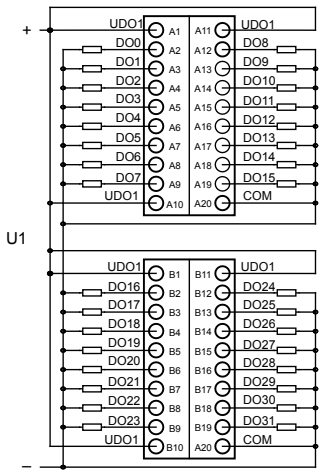
- To switch on/off the loads of controlled process or machine at the 24V DC or 230V AC levels.

Connection examples

OS-7401



OS-7402

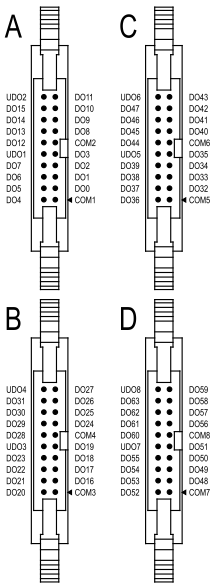


Conductors cross-section

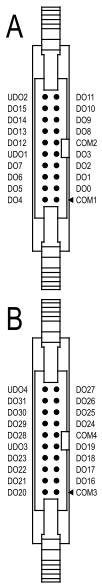
max. 2,5 mm²

max. 1,0 mm²

OS-7410



OS-7411



Conductors cross-section

Plug-in connector on cable according to DIN 41651 - KB-0211, KB-0212, KB-0213

Plug-in connector on cable according to DIN 41651

OS-7401

OS-7402

OS-7410

OS-7411

Binary outputs	OS-7401	OS-7402	OS-7410	OS-7411
No. of outputs / groups	16/ 1	32/ 1	64/ 8	32/ 4
Galvanic isolation	Yes	Yes	Yes	Yes
Type of output	Semiconductor switch	Semiconductor switch	Semiconductor switch	Semiconductor switch
Common pole	Plus	Plus	Minus, for each group	Minus
Switching voltage	24 V DC	24 V DC	24 V DC	24 V DC
Switching current	max. 2 A	max. 0.5 A	max. 0.05 A	max. 0.05 A
Common pole current	max. 10 A	max. 16 A	max. 2 A	max. 2 A
Leakage current	<300 µA	<300 µA	<300 µA	<300 µA
Switch on/switch off period	400 µs/ 400 µs	400 µs/ 400 µs	400 µs/ 400 µs	400 µs/ 400 µs
Short-circuit protection	Internal, <6.5 A	Internal, <1.1 A	–	–
Overload protection	Yes, <6,5 A	Yes, thermal protection	–	–
Reverse polarity protection	Yes	Yes	–	–
Spike suppressor of inductive load	External RC, varistor or diode snubber	External RC, varistor or diode snubber	External RC, varistor or diode snubber	External RC, varistor or diode snubber

Power supply	OS-7401	OS-7402	OS-7410	OS-7411
Power supply voltage from the rack	24 V DC,	24 V DC,	24 V DC,	24 V DC,
Power consumption	Max. 0.8 W	Max. 1.0 W	Max. 1.5 W	Max. 1.5 W
External power supply for output circuits	24 V DC/ 350 mA	24 V DC/350 mA	24 V DC/ 100 mA	24 V DC/ 50 mA
Module power dissipation	Max. 10 W	Max. 10 W	Max. 18 W	Max.10 W

Dimensions and weight	OS-7401	OS-7402	OS-7410	OS-7411
Dimensions	137 × 30 ×198 mm	137 × 30 ×198 mm	137 × 30 ×198 mm	137 × 30 ×198 mm
Weight	300 g	300 g	300 g	300 g

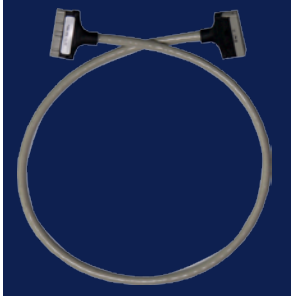
Order number

TXN 174 01	OS-7401 16 outputs 24 V DC, 2 A
TXN 174 02	OS-7402 32 outputs 24 V DC, 0.5A
TXN 174 10	OS-7410 64 × DO GO, 24 V, 0.5 A, basic module for external modules OS-04xx
TXN 174 11	OS-7411 32 × DO GO, 24 V, 0.5 A, basic module for external modules OS-04xx
TXN 102 30	Connector, screwless type, 20 pins, pitch 5,08
TXN 102 31	Connector, screw type, parallel direction, 20 pins, pitch 5,08
TXN 102 32	Connector, screw type, right angle, 20 pins, pitch 5,08
TXN 102 40	Set of 2 connectors, screwless type, 2 × 20 pins, pitch 3,5
TXN 102 11.04	KB-0211 cable for external I/ O modules, 20 pin/ 20 pin, shielded – (faston 2.8), 1m
TXN 102 12.04	KB-0212 cable for external I/ O modules, 20 pin/ 20 pin, unshielded 1m
TXN 102 13.04	KB-0213 cable for external I/ O modules, 20 pin/ free end, shieldes-(faston 2.8), 1m

TXN 102 40

TXN 102 30

TXN 102 32



KB-0211
KB-0212
KB-0213

TECO Advanced Automation

TECOMAT TC700 –External output modules

Type	OR-0422	OR-0424	OR-0427	OS-0425	OS-0426	OS-0428
Number of outputs	8	16	8	16	16	16
Switching voltage max.	230 V AC	230 V AC	230 V AC	230 V DC	230 V AC	24 V DC
Switching current	3 A	3 A	16 A	0.5 A	3 A	50 mA
Type of output	Relay contact	Relay contact	Relay contact	Solid State Relay DC	Solid State Relay AC	Semiconductor DC
Connecting	Screw type terminal	Screw type terminal	Screw type terminal	Screw type terminal	Screw type terminal	Screw type terminal

Basic features

- External relay and solid state relay modules are designed as end terminals of high density I/O modules OS-7410, OS-7411 and IS-7510.
- External modules give wide choice of output elements for different loads and different contact configuration.
- Module with relays in sockets is available for easy relay replacement.
- Modules with solid state relay allow to reach high lifetime.
- Each output element on the external module has its own protection element (varistor)
- Status of each output is indicated by the LED on module.
- Other details are given in tables.

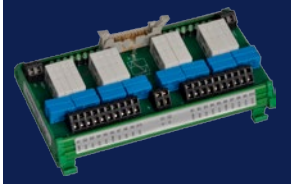
Connecting

- External output modules are interconnected with the TC700 modules in the rack by parallel cables KB-0211, KB-0212, KB-0213 with plug-in connectors.
- External modules are designed for mounting on DIN rail.
- Terminals of external modules are designed to be the last terminal in the control panel directly wired to the load.

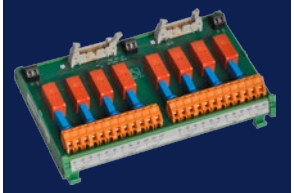
Use

- To switch on/off the loads of controlled process or machine at the 24 V DC or 230 V AC levels.
- External modules are usefull where high density of I/O modules in the rack has to be connected quickly and with minimum wiring inside the control panel.
- They are usefull when final switching element (relay, SSR) has to be accessible e.g. for later replacing.
- They give more variety in types of switching element driven by one type of output module in the rack.

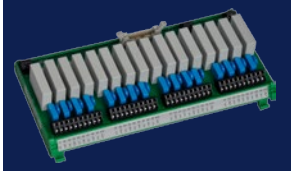
OR-0422



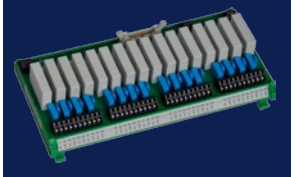
OR-0424



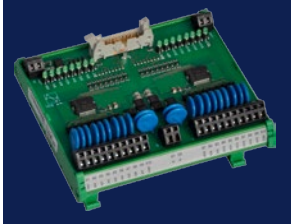
OR-0427



OS-0425



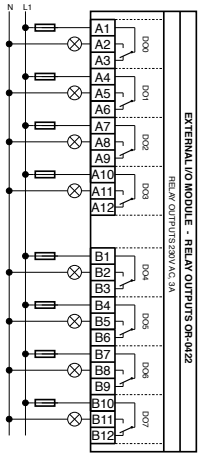
OS-0426



OS-0428

Connection examples

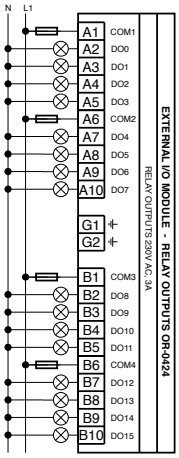
OR-0422



Conductors cross-section

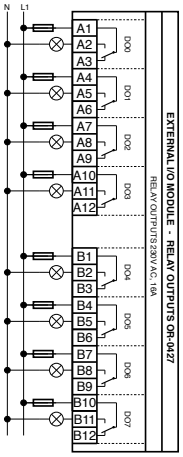
max. 2,5 mm²

OR-0424



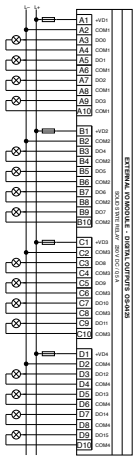
max. 2,5 mm²

OR-0427



max. 2,5 mm²

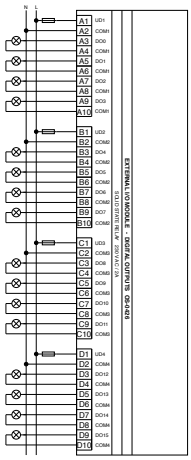
OS-0425



Conductors cross-section

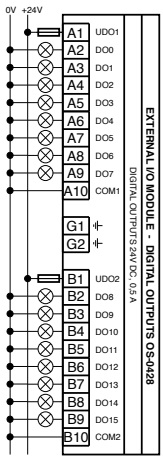
max. 2,5 mm²

OS-0426



max. 2,5 mm²

OS-0428



max. 2,5 mm²

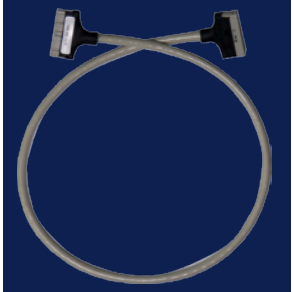
Binary outputs	OR-0422	OR-0424	OR-0427	OS-0425	OS-0426	OS-0428
No. of outputs / groups	8/ 8 independent contacts	16/ 4	8/ 8 independent contacts	16/ 4	16/ 4	16/ 2
Output status indication	Yes/ LED	Yes/ LED	Yes/ LED	Yes/ LED	Yes/ LED	Yes/ LED
Galvanic isolation	Yes, also among contacts	Yes	Yes, also among contacts	Yes	Yes	No GI is a part of TC700 module in the rack
Type of output	Relay contact (NO)	Relay contact (NO)	Relay contact 4x NO/NC	Solid State relay	Solid State relay (zero switching relay)	Solid State relay (protected output)
Common pole	No	Yes, for each group	No	Yes, for each group	Yes, for each group	Yes, for each group
Switching voltage	12 V – 250 V	12 V – 250 V	12 V – 250 V	1 V DC ÷ 300 V DC	12 V AC ÷ 265 V AC	11 V AC ÷ 30 V DC
Switching current	max. 3 A 6A/ short peak	max. 3 A, 6A/ short peak	max. 16 A	max. 0.5 A	max. 3 A	max. 0.5 A
Common pole current	N/ A	10 A	N/ A	max. 16 A	max. 16 A	max. 8 A
Leakage current	N/ A	N/ A	N/ A	<100 µA	<1 mA	<300 µA
Mechanic lifetime (operations)	5 000 000	5 000 000	5 000 000	N/ A	N/ A	N/ A
Electric lifetime (operations)	400 000/ Resist. load 7 000/ DC13 inductive load 100 000/ AC13 inductive load	400 000/ Resist. load 7 000/ DC13 inductive load 100 000/ AC13 inductive load	400 000/ Resist. load 7 000/ DC13 inductive load 100 000/ AC13 inductive load	N/ A	N/ A	N/ A
Switch on/switch off period	5 ms/ 6 ms	5 ms/ 6 ms	5 ms/ 6 ms	100 µs / 250 µs	10 ms/ next crossing the zero	400 µs / 400 µs
Short-circuit protection	External	External	External	External	External	Internal
Overload protection	Yes, < 6,5A	Yes, thermal protection	Yes, thermal protection	No	No	Yes, thermal protection
Spike suppressor of inductive load	Internal varistor	Internal RC snubber	Internal RC snubber	Internal RC and varistor snubber	Internal RC and varistor snubber	External RC, diode or varistor snubber
Insulation voltage between inputs and internal circuits	3750 V AC	3750 V AC	3750 V AC	4000 V AC	4000 V AC	

Power supply	OR-0422	OR-0424	OR-0427	OS-0425	OS-0426	OS-0428
Power supply voltage	24 V DC/ 250mA	24 V DC/ 250mA	24 V DC/ 250mA	24 V DC	24 V DC/ 250 mA	24 V DC/ 350 mA
Power consumption	Max. 3 W	Max. 5.5 W	Max. 6.6 W	Max. 7 W	Max. 7 W	Max. 5.5 W
Module power dissipation	Max. 3 W	Max. 5.5 W	Typ 4.2 W	Max. 10 W	Max. 65 W	Max. 5.5W

Dimensions and weight	OR-0422	OR-0424	OR-0427	OS-0425	OS-0426	OS-0428
Dimensions	162 × 92 × 60 mm	162 × 92 × 54 mm	203 × 125 × 54 mm	247 × 125 × 54 mm	247 × 125 × 54 mm	143 × 125 × 54 mm
Weight	300 g	300 g	300 g	300 g	300 g	300 g

Order number

TXN 104 22	OR-0422, 8 × RO, 230 V AC/ 4 A, Relays in sockets, individual contacts,
TXN 104 24	OR 0424, 2 × 8 RO, 230 V AC/ 4 A, Relays with output protection with RC, grouped contacts
TXN 104 25	OS-0425, 16 × DO, 230 V DC/ 0.5 A, SSR DC, with output protection, direct connection of the load
TXN 104 26	OS-0426, 16 × DO, 230 V AC/ 2 A SSR AC, with output protection, direct connection of the load
TXN 104 27	OR-0427, 8 × RO, 230 V AC/ 16 A, Relays with output protection, individual contacts
TXN 104 28	OS-0428, 16 × DO, 24 V DC/ 50 mA, SSR DC with output protection, grouped contacts
TXN 102 11.04	KB-0211 cable for external I/ O modules, 20 pin/ 20 pin, shielded – (faston 2.8), 1m
TXN 102 12.04	KB-0212 cable for external I/ O modules, 20 pin/ 20 pin, unshielded 1m
TXN 102 13.04	KB-0213 cable for external I/ O modules, 20 pin/ free end, shieldes-(faston 2.8), 1m



KB-0211
KB-0212
KB-0213

TECO Advanced Automation

TECOMAT TC700 – Relay and 230 V AC output modules

Type	OR-7451	OR-7453	OS-7405
Number of outputs	16	8	16
Switching voltage max.	250 V AC	250 V AC	230 V AC
Switching current	3 A	3 A	0.25 A
Type of output	Relay contact	Relay contact	Solid State relay
Connecting	20 pin removable Screw type connector Screwless connector	20 pin removable Screw type connector Screwless connector	20 pin removable Screw type connector Screwless connector

Basic features

- Expansion modules with 8 or 16 relay outputs for enlarging number of I/O of the TC700 configuration.
- Outputs are organized in groups with one common wire, or with 8 separated normally open and normally closed contacts.
- Galvanic isolation of outputs from internal circuits of controller is provided.
- Status of the module and of each output is indicated by LED on the front panel.
- Modules can be placed in any position of the rack.
- Modules support a hot-swap. This feature is programmable and must be enabled by the programmer.
- Other details are given in tables.

Connecting

- Front end connectors are ordered separately since user can choose the screw/screwless one.
- Modules are to be fixed in the rack by one screw at the top of the module.
- Modules are addressed by their position in the rack.
- Modules are power supplied from the rack. The loads must be supplied from external power supply.

Use

- To switch on/off the loads of controlled process or machine at the 24 V DC or 230 V AC levels.

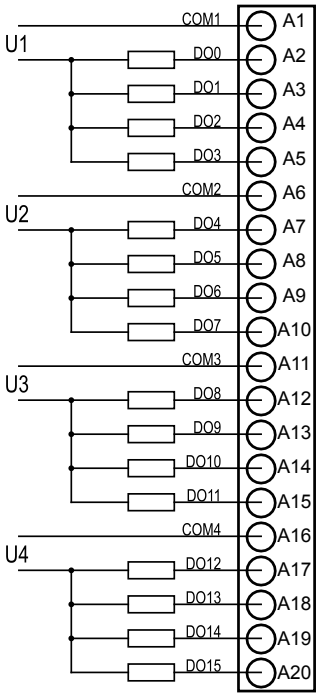
OR-7451

OR-7453

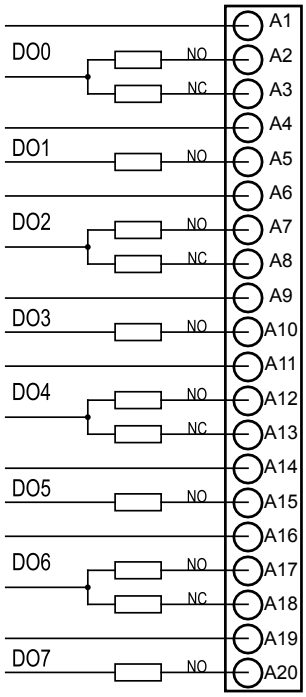
OS-7405

Connection examples

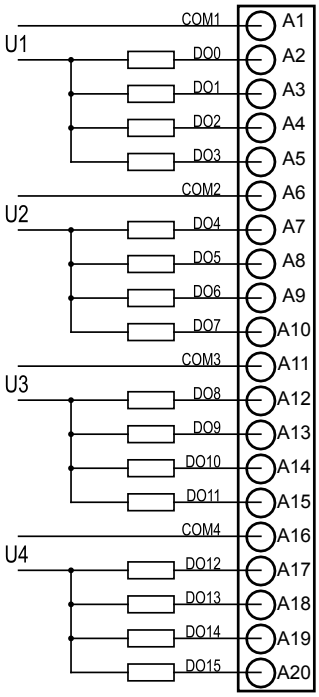
OR-7451



OR-7453



OS-7405



Conductors cross-section

max. 2,5 mm^2 | max. 2,5 mm^2 | max. 2,5 mm^2

Binary outputs	OR-7451	OR-7453	OS-7405
No. of outputs / groups	16/ 1	8/ 8	16/ 4
Galvanic isolation	Yes	Yes	Yes
Type of output	Relay contact NO	Relay contact 4× NO/NC 4× NO	Solid State relay (zero switching relay)
Common pole	yes	Each contact separated	Yes, for each group
Switching voltage	12 V – 250 V	12 V - 250 V	20 V AC ÷ 250 V AC
Switching current	max. 3 A	max. 3 A	max. 0.25 A, min. 5 mA
Common pole current	max. 10 A	N/ A	max. 4 A
Leakage current	N/A	N/ A	<100 µA
Mechanic lifetime (operations)	5 000 000	5 000 000	N/ A
Electric lifetime (operations)	400 000/ Resist. load 7 000/ DC13 inductive load 100 000/ AC13 inductive load	400 000/ Resist. load 7 000/ DC13 inductive load 100 000/ AC13 inductive load	N/ A
Switch on/switch off period	5 ms/ 6 ms	5 ms/ 6 ms	10ms (Next crossing the zero)
Short-circuit protection	external	external	-
Overload protection	Yes <6,5A	Yes, thermal protection	-
Spike suppressor of inductive load	External RC, varistor or diode snubber	External RC, varistor or diode snubber	External RC, varistor snubber
Insulation voltage between inputs and internal circuits	3750 V AC	3750 V AC	3750 V AC

Power supply	OR-7451	OR-7453	OS-7405
Power supply voltage from the rack	24 V DC	24 V DC	24 V DC
Power consumption	Max. 3.8 W	Max. 2.4 W	Max. 1.8 W
External power supply for output circuits	24 V DC/ 350 mA	24 V DC/ 350 mA	24 V DC/ 230 V AC
Module power dissipation	Max. 3.8 W	Max. 2.4 W	Max. 5 W

Dimensions and weight	OR-7451	OR-7453	OS-7405
Dimensions	137 × 30 ×198 mm	137 × 30 ×198 mm	137 × 30 ×198 mm
Weight	300 g	300 g	300 g

Order number	
TXN 174 51	OR-7451, 16 × RO GI, 16 × NO contacts
TXN 174 53	OR-7453, 8 × RO, GI, 4 × NO contacts, 4 × both NO/ NC contacts
TXN 174 05	OS-7405, 16 × DO, GI, 230 V AC, 0.5 A, Solid state relay
TXN 102 30	Connector, screwless type, 20 pins, pitch 5.08
TXN 102 31	Connector, screw type, parallel direction, 20 pins, pitch 5.08
TXN 102 32	Connector, screw type, right angle, 20 pins, pitch 5.08

TXN 102 40

TXN 102 30

TXN 102 32

TECOMAT TC700 - Binary input/output combined modules

Type	IS-7510	IR-7551
Binary inputs DI, binary outputs DO	32 DI / 32 DO	8 DI / 8 RO
Input voltage	24 V DC/ AC	24 V DC/AC
Output voltage	24 V DC/ 24 V DC	230 V AC
Connecting	4 × 20pin DIN 41651 Flat Cable Connector	20pin Screw type connector Screwless connector

Basic features

- Combined expansion input /output modules for enlarging number of I/O of the TC700 configuration.
- Inputs and outputs are organized in groups with common wire.
- Galvanic isolation of inputs and outputs from internal circuits of controller is provided.
- Status of the module and of each input and output is indicated by LED on the front panel.
- Modules can be placed in any position of the rack.
- Modules support a hot-swap. This feature is programmable and must be enabled by the programmer.

Connecting

- Front end connectors are ordered separately since user can choose the screw/screwless one.
- The high density modules IS-7510 has to be connected by the cable to external input/output modules with protection elements.
- Modules are to be fixed in the rack by one screw at the top of the module.
- Modules are addressed by their position in the rack.
- Modules are power supplied from the rack. The loads must be supplied from external power supply.

Use

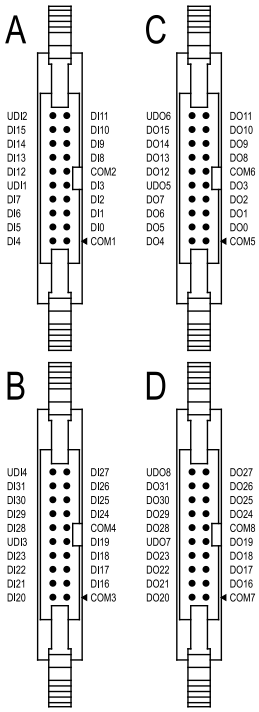
- Modules are to connect binary, logic input and output signals, provide galvanic isolation, filtering of breakdowns and at the other side to switch on/off the loads of controlled process or machine at the 24 V DC or 230 V AC levels. Suitable when it is necessary to add some inputs or outputs and to spare positions in the rack.

IS-7510

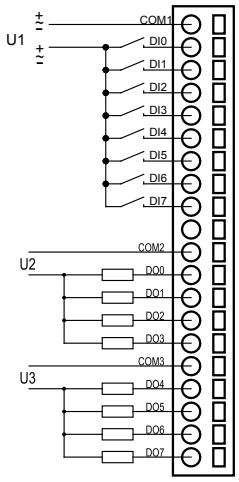
IR-7551

Connection examples

IS-7510



IR-7551



	IS-7510	IR-7551
Conductors cross-section	4× 20pin DIN 41651 Flat Cable Connector	20pin Screw/screwless connector TXN 102 3 max. 2.5 mm2

Binary inputs	IS-7510	IR-7551
No. of inputs/ groups	32/ 4	8/ 1
Type of input according to IEC EN 61131-2	Type 3	Type 3
Common wire	Minus	Minus, plus or alternating
Input voltage	24 V DC	24 V DC/ AC
Input current at log. 1	max. 3 mA	max. 10 mA
Time of open/ close the input	5 ms/ 5 ms	5 ms/ 5 ms
Galvanic isolation	Yes	Yes
External supply voltage of module input circuits	24 V DC	24 V AC/DC
Max. power consumption from external source (1 group)	30 mA	
Insulation voltage among inputs and internal circuits	500 V DC	3750 V AC
Insulation voltage among groups of inputs	500 V DC	–

TXN 102 30

TXN 102 32

Binary outputs	IS-7510	IR-7551
No. of outputs / groups	32 / 4	8 / 2
Type of input	Semiconductor switch	Relay contact NO
Galvanic isolation	yes	yes
Common wire	Minus, for each group	yes
Switching voltage	24 V DC	12 – 250 V
Switching current	max. 0.05 A	3 A
Common pole current	max. 2 A	max. 10 A
Leakage current	max. 300 µA	
Switch-on/switch-off period	400 µs / 400 µs	5 ms/ 6 ms
Mechanical lifetime (operations)	N/A	5.10^6 switchings
Electrical lifetime (operations)	N/A	400 000 switchings
External supply voltage of module input circuits	24 V DC	
Max. power consumption from external source (1 group)		
Short-circuit protection	No	External
Overload protection	No	External
Spike supressor of inductive load	External RC element, varistor, snubber	External RC element, varistor, snubber
Insulation voltage among outputs and internal circuits	500 V DC	3 750 V AC
Insulation voltage among groups of outputs	500 V DC	1 000 V AC

Power supply	IS-7510	IR-7551
Power supply voltage (SELV)	Internal 24 V from the rack	Internal 24 V from the rack
Module power loss	15 W	4 W
Power consumption	1.5 W	2 W

Dimensions and weight	IS-7510	IR-7551
Dimensions	137 × 30 × 198 mm	137 × 30 × 198 mm
Weight	300 g	300 g

Order number	
TXN 175 51	IR-7551 8 inputs 24 V DC/ AC, 5 ms, common pole for group of 8 inputs, 8 outputs 230 V AC/ 3 A, relay contacts NO,
TXN 175 10	IB-7510 32 DI, 24 V DC, 5 ms, 32 DO, 24 V DC, basic module for external modules IB-04xx, OS-04xx and OR-04xx
TXN 102 30	Connector, screwless type, 20 pins, pitch 5.08 mm
TXN 102 31	Connector, screw type, parallel,20 pins, pitch 5.08 mm
TXN 102 32	Connector, screw type, right angle, 20 pins, pitch 5.08 mm
TXN 102 45	4 IDC connectors according to DIN41651 for flat cables, 20 pins
TXN 102 11.04	KB-0211 cable for external I/ O modules, 20 pin/ 20 pin, shielded – (faston 2.8), 1m
TXN 102 12.04	KB-0212 cable for external I/ O modules, 20 pin/ 20 pin, unshielded 1m
TXN 102 13.04	KB-0213 cable for external I/ O modules, 20 pin/ free end, shieldes-(faston 2.8), 1m

TECOMAT TC700 – Analog modules

Type	IT-7601	IT-7602	IT-7604	IT-7606	OT-7652
Analog inputs/outputs	8 AI	16 AI	8 AI	32 AI	8 AO
Input/output range	Standard U, I	Standard U, I	Standard U, I, RTD, thermocouples	Standard U, I, RTD	Standard U, I
Connecting	2× 20pin Screwless connector	2× 20pin Screwless connector	2× 20pin Screwless connector	2× 20pin Screwless connector	20pin Screw type connector Screwless conector

Basic features

- Expansion modules with 8, 16 or 32 analog inputs or 8 analog outputs for enlarging number of I/O of the TC700 configuration.
- Inputs are differential (IT-7601, IT-7602 and IT-7604) or organized in one group with common minus pole (IT-7606).
- Outputs are organized in one group with common minus pole (OT-7652)
- Galvanic isolation of inputs/outputs from internal circuits of the controller is provided.
- Each analog channel can be configured individually in the Mosaic development environment.
- Status of the module and of each input/output is indicated by LED on the front panel.
- Sensor defect signalization.
- Module IT-7604 ensures linearisation and conversion according to the type of sensor like Celsius centigrades for thermocouples and resistance sensors.
- Module provides the cold junction compensation for thermocouples.
- Modules can be placed in any position of the rack.
- Modules support a hot-swap. This feature is programmable and must be enabled by the programmer.
- Other details are given in the tables below.

Connecting

- Front end connectors are ordered separately since user can choose the screw/screwless one.
- The analog input /output modules can be connected through the cable to external input/output modules with protection elements.
- Modules are to be fixed in the rack by one screw at the top of the module.
- Modules are addressed by their position in the rack.
- Modules are power supplied from the rack. The loads must be supplied by external power supply.

Use

- IT-7601 is the module designed for common measurement of voltage or current signals.
- IT-7602 is the high-speed module for the connection of quickly changing voltage or current signals.
- IT-7604 is the universal module that serves not only for connecting voltage or current analog signals but mainly for direct connection of signals from thermocouples and resistance sensors.
- IT-7606 is the module with high density of inputs designed for the connection of high amount of slowly changed analog signals, mainly from RTD.
- OT-7652 is the output module used for the operation of continuously controlled devices or instruments.

IT-7601

IT-7602

IT-7604

IT-7606

Analog inputs	IT-7601	IT-7602	IT-7604	IT-7606
No. of inputs/ groups	8/ 1	16/ 2	8/ 1	32/ 1
Type of input	differential	differential	differential	with common pole
Input configuration	SW configuration independent for each channel	SW configuration independent for each channel	SW configuration independent for each channel	SW configuration independent for each channel
Input voltage range/ resolution for 1 bit	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV ± 1 V/ 32 µV ± 0.5V/ 16 µV ± 0.2V/ 6.4 µV ± 0.1V/ 3.2 µV	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV ± 1 V/ 32 µV ± 0.5 V/ 16 µV ± 0.2 V/ 6.4 µV ± 0.1 V/ 3.2 µV	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV ± 1 V/ 32 µV ± 0.5 V/ 16 µV
Input current ranges /resolution for 1 bit	0 ÷ 20 mA/ 0.32 µA +4 ÷ 20 mA/ 0.32 µA ± 20 mA/ 0.64 µA 0 ÷ 5 mA/ 80 nA ± 5 mA/ 160 nA	0 ÷ 5 mA ±5 mA 0 ÷ 20 mA 4 ÷ 20 mA ± 20 mA	0 ÷ 20 mA/ 0.32 µA +4 ÷ 20 mA/ 0.32 µA ± 20 mA/ 0.64 µA 0 ÷ 5 mA/ 80 nA ± 5 mA/ 160 nA	0 ÷ 20 mA/ 0.32 µA +4 ÷ 20 mA/ 0.32 µA ± 20 mA/ 0.64 µA 0 ÷ 5 mA/ 80 nA ± 5 mA/ 160 nA
RTD / resolution for 1 bit			Pt100 (W_{100}=1.385; 1.391) /0.1°C Pt1000 (W_{100}=1.385; 1.391) /0.1°C Ni1000 (W_{100}=1.617; 1.500) /0.1 °C OV100/ 0.002 Ω OV1000/ 0.02 Ω	Pt1000 (W_{100}=1.385; 1.391) /0.1°C Ni1000 (W_{100}=1.617; 1.500) /0.1 °C OV1000/ 0.02 Ω
Thermocouples / resolution for 1 bit	–	–	J, K, R, S, T, B, N types/ 0.1 °C	-
A/D converter resolution	16 bit	16 bit	16 bit	16 bit
Conversion method	Multiplexed sigma-delta modulation	Multiplexed sigma-delta modulation	Multiplexed sigma-delta modulation	Multiplexed sigma-delta modulation
Conversion time of 1 channel	typ. 65 ms	typ. 1.5 ms	typ. 65 ms	typ. 65 ms
Sample repeating period	typ. 520 ms	typ. 12 ms	typ. 520 ms	typ. 2.08 s
Galvanic isolation	Yes	Yes	Yes	Yes
Insulation voltage among inputs and internal circuits	500 V DC	500 V DC	500 V DC	500 V DC
Type of protection	yes, integrated overvoltage protection	yes, integrated overvoltage protection yes	yes, integrated overvoltage protection yes	external diodes
Detection of open input (current loop)	yes, for 4 ÷ 20 mA only	yes, for 4 ÷ 20 mA only	yes, for 4 ÷ 20 mA only	yes, for 4 ÷ 20 mA only

Power supply	IT-7601	IT-7602	IT-7604	IT-7606	OT-7652
Power supply voltage (SELV)	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack
Power input	3 W	4.5 W	3 W	3 W	4.2 W

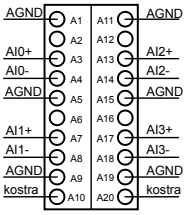
Dimensions and Weight	IT-7601	IT-7602	IT-7604	IT-7606	OT-7652
Dimensions	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm
Weight	300 g	300 g	300 g	300 g	300 g

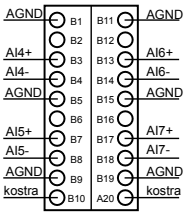
Analog outputs

	OT-7652
No. of outputs/ groups	8/ 1
Type of output	Active voltage output/ passive current output
Output voltage range/ resolution for 1 bit	0 ÷ +10.0 V/ 0.16 mV –5.0 ÷ +5.0 V/ 0.16 mV –10.0 ÷ +10.0 V/ 0.32 mV
Output current ranges/ resolution for 1 bit	0 ÷ +20.0 mA/ 0.32 µA 4 ÷ +20.0 mA/ 0.32 µA
D/ A converter resolution	16 bit
Conversion method	Multiplexed D/A converter
Conversion time of 1 channel	20 ms
Sample repeating period	160 ms
Galvanic isolation	Yes
Insulation voltage among outputs and internal circuits	500 V DC
Type of protection	Integrated overvoltage protection
Detection of open output (current loop)	No
External power supply for output circuits	for current loop, max. 32 V DC

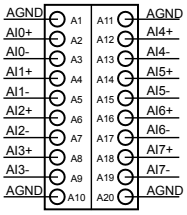
Connection

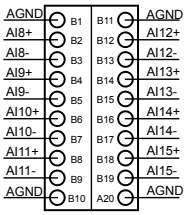
IT-7601



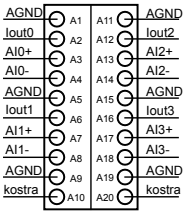


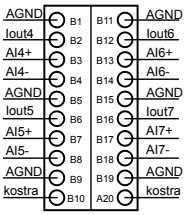
IT-7602





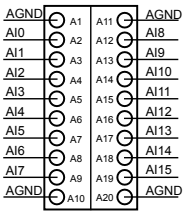
IT-7604

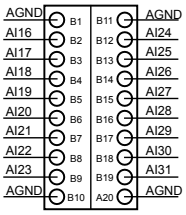




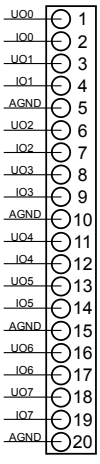
Connector	2× 20pin Screwless connector TXN 102 40	2× 20pin Screwless connector TXN 102 40	2× 20pin Screwless connector TXN 102 40
Conductors cross-section	max. 1 mm^2	max. 1 mm^2	max. 1 mm^2

IT-7606





OT-7652



Connector	2× 20pin Screwless connector TXN 102 40	20pin Screw type connector/ Screwless connector TXN 102 3×
Conductors cross-section	max. 1 mm^2	max. 2.5 mm^2

Order number

TXN 176 01	IT-7601 8 analog differential inputs, galvanic isolation, for voltage or current measure
TXN 176 02	IT-7602 16 analog differential inputs, galvanic isolation, for voltage or current measure, 1.5 ms
TXN 176 04	IT-7604 8 analog differential inputs, voltage, current, RTD, thermocouples, galvanically isolated
TXN 176 06	IT-7606 32 analog inputs, voltage, current, Ni1000, Pt1000, galvanically isolated
TXN 176 52	OT-7652 8 analog outputs 0-10 V or 0-20 mA
TXN 102 30	Connector, screwless type, 20 pins, pitch 5.08 mm
TXN 102 31	Connector, screw type, parallel,20 pins, pitch 5.08 mm
TXN 102 32	Connector, screw type, right angle, 20 pins, pitch 5.08 mm
TXN 102 40	2 connectors, screwless type, 20 pins, pitch 3.5 mm

OT-7652

Example of external input module for analog signals

TXN 102 40

TXN 102 30

TXN 102 32