PLC TECOMAT FOXTROT – basic modules

Type	DI	DO	AI	AO	Comm
CP-1005		**6× RO**	**6× (AI/DI)**	**2×**	Ethernet 10/100, RS-232, 1× optional interface, TCL2, CIB
CP-1015		**6× RO**	**6× (AI/DI)**	**2×**	Ethernet 10/100, RS-232, 1× optional interface, TCL2, CIB, LCD, Keyboard

CP-1005

CP-1015

Related products

Submodules with binary I/O
PX-7811, PX-7812

Submodules
with communication
interfaces:
MR-01xx
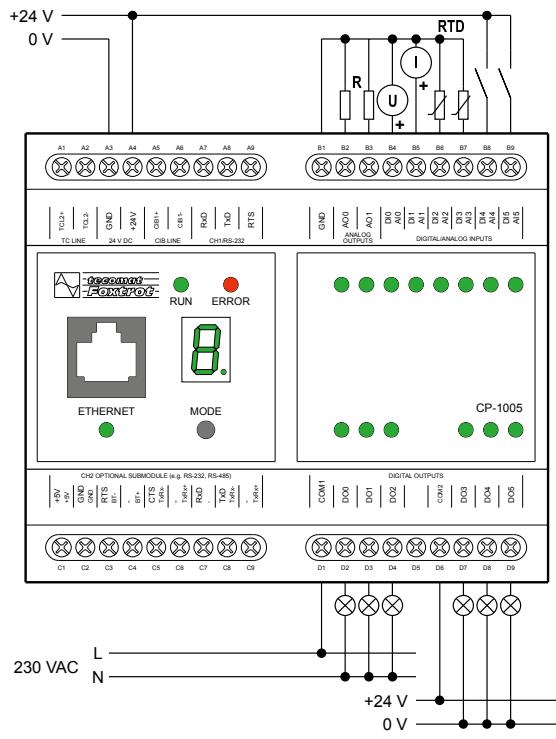
Basic features
- CP-1015 with built-in LCD 4×20 characters and 6 keys.
- Available coding: ASCII, CP1250 (Central European), CP1251 (Cyrillic), CP1252 (Western European), CP1253 (Greek).
- Other features are identical with CP-1005.
- Programmable controller (PLC) according to IEC EN 61131.
- Outstanding integration of controller together with the IT and telecommunication technologies in one device.
- Powerful CPU with integrated binary inputs and relay outputs.
- 6 inputs alternate binary inputs and analog inputs.
- Type of analog input (U,I,RTD) can be configured individually by the jumper. Measuring range is set by the user SW configuration.
- 6 relay outputs in two groups on board.
- Optional slot can be inserted by additional 7×DI or 4×DI/ 3×DO on submodules PX-7811 or PX-7812.
- No. of I/O is expandable up to 134 I/O, resp. up to 10 modules on high speed internal serial bus TCL2 (345 kbps).
- Other I/O can be expanded also by 2 wire electrical installation bus CIB (19.2 kbps).

CPU features
- Free programmable according IEC EN 61131-3
- On-line programming
- Programming and data communication (in LAN, WiFi, WAN, Internet) is available on Ethernet port (100 Mbps) with fixed IP address.
- 2 serial ports: one RS-232, the second one with optional interface from the family MR-01xx (up to 345 kbps or 12 Mbps for Profibus DP), configurable UART.

- Built-in PROFIBUS DP Master on serial port or built-in BACnet and MODBUS/TCP protocols on Ethernet.
- Built-in web server, free creation of user internal web site stored on memory card (XML technology).
- Own comfort web site of any controlled object.
- Memory expandable by SD/SDHC/MMC cards, built in file system compatible with FAT12, 16, 32.
- Internal Real Time Clock circuit.

Connecting
- Compact form-factor for DIN rail mounting (6 modules width) for standard circuit breaker cabinets.
- Power supply, serial ports, TCL2, CIB buses and I/O are connected by screw terminals.
- For Ethernet port standard UTP CAT5 cables with RJ45 connector can be used.
- More PLC TECOMAT can be networked by Ethernet (LAN/ WAN) or by RS-485 bus.

Use
- Can be used as powerful PLC in machinery, process control, building or transport automation tasks.
- Can be used as programmable data or protocol converter 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.

Connection example

Features of CPU

CPU	32 bit RISC procesor
PLC Instruction cycle	0.2 ms/ 1k instructions
Real Time Clock (RTC)	Yes
Backup period of RAM and RTC	500 h without battery 20 000 h with battery
User program memory	192+64 kB
Program memory backup	Yes
Internal data memory (DataBox)	0.5 MB
Archive memory for the project resource files	2 MB
Memory card slot	Yes, MMC/ SD, SDHC
Memory for variables	64 kB/ 32 kB retained
No. of IEC timers/counters	4096/ 8192

Communication

Ethernet; supported protocols	1× 10/ 100Base TX, TCP/ IP, UDP/ IP, HTTP, SMTP, MODBUS TCP, BACnet
Serial ports	1× RS-232;1× free slot for optional interface (see submodules MR-0xxx)
System I/O bus	1× TCL2 (RS-485, 345 kbps)
Communication over expansion modules	8× CIB, MP-Bus, OpenTherm, GSM/ SMS, GPRS, RFox
Installation bus	1× CIB (19.2 kbps) (Common installation bus)

Digital inputs (DI0–DI5) — Alternative function of AI0–AI5

No. of inputs × groups	6 × 1
Option: Analog inputs	See Analog inputs
Common wire	minus (GND)
Galvanic isolation	No
Input voltage for log. 0 (UL):	0 V DC; (−5 ÷ +5 V DC)
Input voltage for log. 1 (UH):	+24 V DC; (12 ÷ 30 V DC)
Input current for log. 1 (IH):	typ. 5 mA
Delay 0 –> 1/1 –> 0:	1 ms/ 1 ms

■ Analog inputs (AI0-AI5)

No. of inputs × groups	6 × 1
Configurable inputs:	Voltage/ Current/ RTD measurement Binary input See other tables.
Common wire	minus (GND)
Galvanic isolation	No
Resolution	14 bit
Conversion time	80 µs per input
Sample repetition period	480 µs
Protection type	Overvoltage, integrated
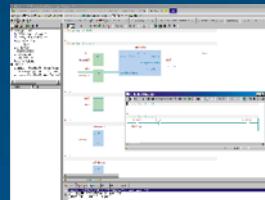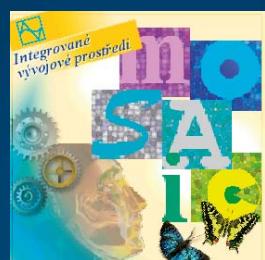
■ Measurement ranges

Voltage

Input impedance	> 50 kΩ
Input range	0 ÷ +10 V 0 ÷ +5 V 0 ÷ +2 V 0 ÷ +1 V 0 ÷ 0.5 V
Max. error at 25 °C	±0,3 % of full range
Overvoltage allowed	±35 V (between AI and AGND)

Current

Input impedance	100 Ω
Input range	0 ÷ 20 mA 4 ÷ 20 mA
Max. error at 25 °C	± 0.4 % of full range
Overvoltage allowed	+50 mA (between AI and GND)
Detection of open input circuit	yes, in status word

Resistance Temperature Detectors (RTD)

Input impedance		> 50 kΩ
Input range	Pt100 1.385	−90 ÷ +400°C
	Pt100 1.391	−90 ÷ +400°C
	Pt1000 1.385	−90 ÷ +400°C
	Pt1000 1.391	−90 ÷ +400°C
	Ni1000 1.617	−60 ÷ +200°C
	Ni1000 1.500	−60 ÷ +200°C
	OV1000	0 ÷ 1000 Ω
	NTC termistor 12 k / 25 °C	−40 ÷ +125 °C
Max. error at 25 °C		± 0.5 % of full range (for Pt100 the error is higher)
Overvoltage allowed		±35 V (between AI and GND)
Sensor disconnection detection		yes, in status word

■ Analog outputs (AO0–AO1)

No. of inputs × groups	2 × 1
Common wire	minus (GND)
Galvanic isolation	Not
Resolution	10 bit
Conversion time	10 µs per output
Max. output current	10 mA
Output range	0 ÷ 10 V
Max. error at 25 °C	±2 % of full range
Protection type	Overvoltage, integrated
Allowed overload	+20 V (between AI and GND)

■ 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

■ Relay outputs (DO0-DO5)

No.of outputs × groups	3 × 2
Galvanic isolation	Yes (also among groups)
Type of contact/ type of output	Electromechanical relay, non-protected output
Switched voltage	min. 5 V; max. 250 V
Switched current	min. 100 mA; max. 3 A
Short-term output overload	max. 4 A
Current through joint terminal	max. 10 A
Time of close/open the contact	typ. 10 ms/ 4 ms
Threshold limits of switched loads:	
for resistive load	max. 3 A at 30 V DC or at 230 V AC
for inductive load DC13	max. 3 A at 30 V DC
for inductive load AC15	max. 3 A at 230 V AC
Switching frequency without load	max. 300 switches/ minute
Switching frequency with rated load	max. 20 switches/ minute
Mechanical/ Electrical lifetime at max. load	min. 5 mil./ 100 thous. cycles
Short-circuit protection	None
Spike suppressor of inductive load	External RC, varistor or diode snubber
Insulation voltage	3750 V AC

■ Power supply

Power supply voltage(SELV)	+24 V DC
Allowed range	−15 % ÷ +25 % (20.4 ÷ 30 V DC)
Max. input power	8 W
Galvanic isolation	No
Memory backup	Built-in Li-Ion accumulator (500 hours) Holder for CR2032 lithium battery (20 000 hours)

■ Dimensions and weight

Dimensions	90 × 105 × 65 mm
Weight	250 g

■ Operating conditions

Operating temperature	−20 ÷ +55 °C
Storage temperature	−25 ÷ +70 °C
Electric strength	According IEC EN 61131-3
IP Degree of protection IEC EN 60529	IP 10B
Overvoltage category	II
Degree of pollution (IEC EN 61131-2)	2
Working position	Vertical
Installation	On DIN rail
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm^2

■ Software tools available in MOSAIC

PLC simulator	Built-in
Alfanumeric display simulator	Panel Simulator
Editor of alfanumeric display	PanelMaker
Editor of graphic display	Graphic PanelMaker
Editor of internal WEB pages (XML)	WebMaker
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, file system operation library, library for sending and receiving SMS, control library, library supporting INELS units etc.

■ Order number

TXN 110 05	CP-1005, CPU, ETH100/10, 1×RS-232, 1×SCH, 6×AI/DI, 2×AO, 6×RO 230 V/ 3A, 1×CIB, prg. MOSAIC
TXN 110 15	CP-1015, CPU+LCD 4×20, ETH100/10, 1×RS-232, 1×SCH, 6×AI/DI, 2×AO, 6×RO 230 V/ 3A,1×CIB, prg. MOSAIC