PLC Tecomat SmartFox – basic module with 20 I/O
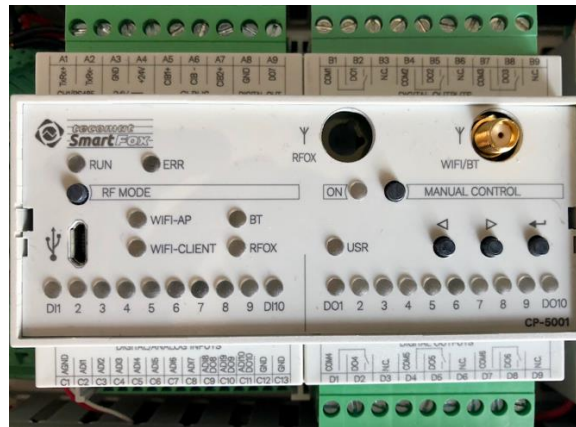
Type	DI	DO	AI	AO	Comm
CP-5001		6x RO 4x LSS	10x AI/DI		WiFi, Bluetooth, RS-485 2x CIB, RFox II

Basic features

- Programmable controller (PLC)
- Outstanding integration of controller together with the IT and telecommunications technologies in one device.
- Built in RFox II Master – wireless I/O system in the 868.1 MHz band.
- Powerful CPU with unique combination of on board I/Os suit-able for HVAC applications.
- Each of 10 universal inputs can be confi gured as binary input for 24V, as potential free contact or as analog input.
- Inputs ADI3 ÷ ADI4 can be configured by the jumpers as current inputs 4(0) ÷ 20 mA.
- Other inputs can be configured for one of RTD range or voltage range.
- Additional I/Os can be expanded also by two 2-wire electrical installation buses CIB (19.2 kbps / 115 kbps).

CPU features

- Easy and intuitive graphical programming.
- Multi-platform IDE runs on Windows, MAC and Linux.
- Programming and data communication is available over USB or WiFi connection.
- WiFi interface supports AP mode, client mode or both at the same time.
- Bluetooth connection to mobile phone.
- 1 serial port with RS-485 interface.
- 2 CIB interfaces for remote I/O modules.
- RFox II interface for wireless remote I/O modules.
- Built-in JSON driver for SCADA.
- Built-in web server.
- Internal Real Time Clock circuit.
- Internal remanent magneto-resistive memory.

Connecting

- Removable screw terminals.
- Compact form-factor for DIN rail mounting (6 modules width) for standard circuit breaker cabinets.
- CIB interfaces are active – they have embedded power supply for 24W of load on each bus.
- More PLCs can be networked by WiFi or by RS-485 bus.

Use

- Can be used as a powerful control system in process and building control, mainly in HVAC applications.
- Can be used as an intelligent IoT hub with PLC logic.
- Can be used as independent programmable data logger of any measured or internal data point with time stamping.

Features of CPU

CPU	32-bit RISC processor
Real Time Clock (RTC)	Yes
Backup period of RAM	Infinite
Backup period of RTC	TBD
User program memory	16 kB Flash 32 kB RAM

Universal inputs (ADI1 – ADI10)

No. of inputs	10
Configurable inputs	Voltage/resistance/ RTD measurement, current (ADI3, ADI4 only), binary 24V input, binary contact
Common wire	minus (GND)
Galvanic isolation	No

Function: binary inputs 24V (ADI1-ADI10)

Type of input	Digital 24V
Input voltage for log. 0 (U_L)	0 V DC; ($-5 \div +3$ V DC)
Input voltage for log.1 (U_H)	+24 V DC; ($+7 \div +30$ V DC)
Input current for log. 1 (I_H)	1.2 mA @ 24 V

Function: binary inputs contact (ADI1-ADI10)

Type of input	Potential free contact
Min. impedance of input circuit for log. 0 (U_L)	50 kΩ
Max. impedance of input circuit for log. 1 (U_H)	100 Ω
Input current for log. 1 (I_H)	1.8 mA
Delay 0 –> 1/ 1 –> 0 DI1 ÷ DI2 DI3 ÷ DI10	10 µs 1 ms

Max. error at 25 °C	
0 ÷ 2.5 kΩ	±0.4 % of full range
0 ÷ 100 kΩ	±2 % of full range

Analog inputs (ADI1-ADI10)

Resolution	12 bit
Conversion time	32 µs per input
Protection type	Overvoltage, integrated

Measurement ranges

Current (ADI3, ADI4 only)	
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 AGND)
Voltage	
Input range	0 ÷ 2 V, 0 ÷ 10 V
Input impedance 0 ÷ 2 V 0 ÷ 10 V	50 kΩ 24 kΩ
Max. error at 25 °C	±1.5 % of full range
Resistance Temperature Detectors (RTD)	
Input impedance	Typ. 5 kΩ
Input range Pt1000 1.385 Pt1000 1.391 Ni1000 1.500 Ni1000 1.618 KTY81-121 NTC10k 3435 NTC10k 3977 NTC12k 3740	−90 ÷ + 320 °C −90 ÷ + 320 °C −60 ÷ + 200 °C −60 ÷ + 200 °C −55 ÷ + 125 °C −40 ÷ + 130 °C −40 ÷ + 130 °C −30 ÷ + 130 °C
Resistance	
Input range	0 ÷ 2.5 kΩ, 0 ÷ 100 kΩ

LSS outputs (DO7-DO10)

No. of outputs	4
Galvanic isolation	No
Type of output	Semiconductor low-side switch
Switched voltage	5 ÷ 30 V
Switched current	1 A
Short-term output overload	3.5 A
Turn-on/turn-off time	typ. 9 µs / 13 µs
On-state resistance	typ. 160 mΩ
Protection type	Overvoltage, overcurrent, overtemperature, integrated

Note: DO8-DO10 share pins with ADI8-ADI10

Relay outputs (DO1-DO6)

No. of outputs	6
Galvanic isolation	Yes (also among each others)
Type of output	Electromechanical relay, NO, non-protected output
Switched voltage	min. 5V, max. 250V
Switched current	min. 100mA, max. 16A
Turn-on/turn-off time	typ. 10ms / 4ms
Threshold limits of switched loads: for resistive load for inductive load DC13 for inductive load AC15	max. 16 A at 30 V DC or 230 V AC max. 16 A at 30 V DC max. 16 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

Communication

Serial ports	1x RS-485
Installation bus	2x CIB (19.2 kbps / 115 kbps)
Wireless network	WiFi Bluetooth RFox II (868.1 MHz)

Power supply

Power supply voltage (SELV)	+24 V DC
Allowed range	−15% ÷ +25% (20.4 ÷ 30 V DC)
Max. input power PLC CIB buses	4 W up to 48 W
Galvanic isolation	No, only relay outputs
Memory backup	Infinite (magneto-

	resistive memory)
RTC backup	TBD

Operational conditions

Operating temperature	−20 ÷ +55 °C
Storage temperature	−25 ÷ + 70 °C
IP Degree of protection (IEC EN 60 529)	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