Tecomat Foxtrot

Dear customers, dear designers

You get into the hand the new issue of the catalog of programmable controllers produced by Teco a.s. company.

With respect to the total scale of an assortment we devoted this catalog to so called small automation, ie. TECOMAT FOXTROT, INELS and RFox systems.

Systems based on the new FOXTROT platform are smaller by their dimensions, but not their functionality in comparison with big modular system TECOMAT TC700. On the other way, you can find there the most of functions and features you know from big programmable controllers..

TECOMAT FOXTROT programmable controllers (PLC) are determined for any demanding industrial control tasks and are developed according to IEC EN 61131 standard.

INELS and the wireless system RFox are based on the same basis. They are compatible with FOXTROT but they are mostly oriented to the branch of intelligent electrical installation.

We are sure that assortment mentioned in this catalog covers all Your automation projects.

Teco a.s.

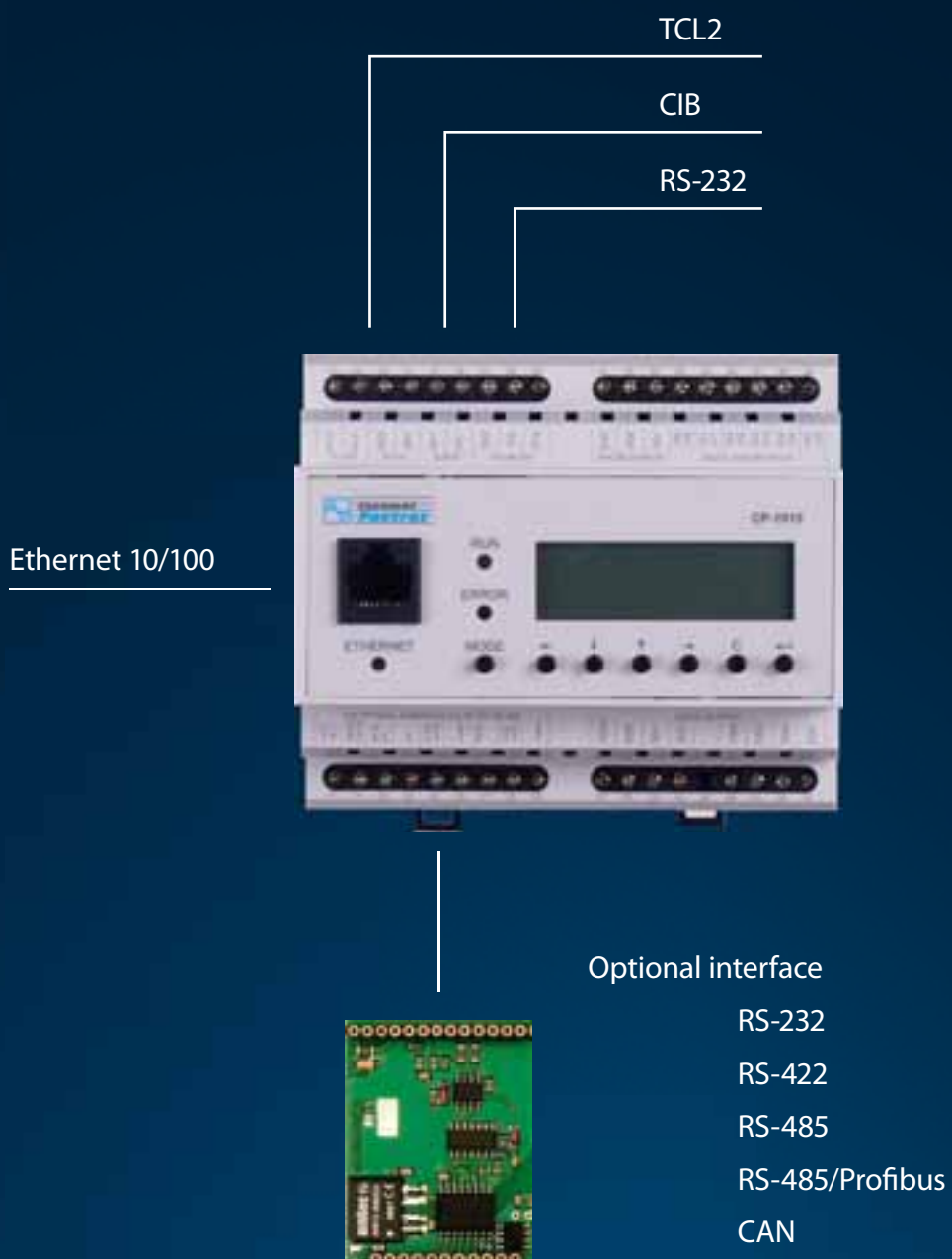
Foxtrot
PLC Basic modules
INELS Basic modules

Foxtrot
PLC Expansion modules

Foxtrot
Communication modules

Displays
Operator panels

CIB
Sensors and actuators for electrical installation bus



Optional interface

- RS-232
- RS-422
- RS-485
- RS-485/Profibus
- CAN
- LON
- M-Bus
- Parallel I/O

TECOMAT FOXTROT communication lines fundamental scheme.

Units connected to the system are mentioned in other parts of the catalog.

PLC Foxtrot
Basic modules

CP-1004

CP-1014

CP-1005

CP-1015

CP-1016

PLC TECOMAT FOXTROT – basic modules

Type	DI	DO	AI	AO	Comm
CP-1004	**4× DI/ HSC 4× DI/ AI**	**6× RO**			Ethernet 10/100, RS-232, 1× optional interface, TCL2, CIB
CP-1014	**4× DI/ HSC 4× DI/ AI**	**6× RO**			Ethernet 10/100, RS-232, 1× optional interface, TCL2, CIB, LCD, buttons

Basic features

- CP-1014 with built-in LCD 4×20 characters and 6 buttons.
- Available coding: ASCII, CP1250 (Central European), CP1251 (Cyrillic), CP1252 (Western European), CP1253 (Greek).
- Other features are identical with CP-1004.
- 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.
- 4 inputs alternate binary inputs and high speed counters (HSC) functions.
- 4 inputs alternate binary inputs and analog inputs.
- 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.

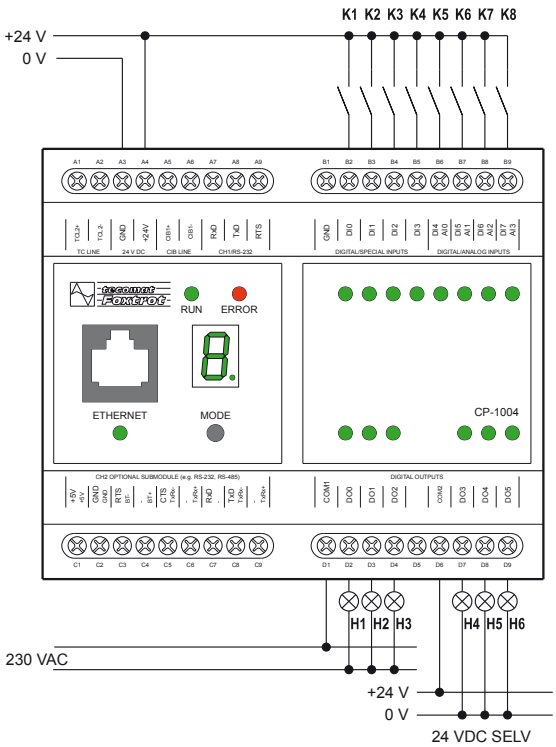
Connecting

- 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 any internal data point with time stamp.

Connection example



CPU features

CPU	32bit RISC procesor
PLC Instruction cycle	0.2 ms/ 1 k 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 remnant
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)

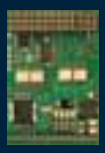
Digital inputs (DI0-DI7)

No. of inputs × groups	8 × 1
Option: High speed counter	4 (DI0–DI3)
Option: Analog inputs	4 (DI4–DI7)
Common wire	minus (GND)
Galvanic isolation	No
Input voltage for log. 0 (U_L):	0 V DC; (–5 ÷ +5 V DC)
Input voltage for log.1 (U_H):	+24 V DC; (+15 ÷ +30 V DC)
Input current for log.1 (I_H):	typ. 5 mA
Delay 0 –> 1/1 –> 0:	5 µs/ 5 µs (DI0 – DI3) 5 ms/ 5 ms (DI4 – DI7)

CP-1004

CP-1014

Related products:



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

Submodules with communication interfaces: MR-01xx

High speed counters (DI0-DI3)

No. of counting inputs	4
Input frequency	5 kHz/20 000 edges/ sec
Pulse width	min. 50 µs
Delay 0 –> 1/1 –> 0:	5 µs/ 5 µs
Range	max. 32 bit; 0 ÷ 4 294 967 296
Modes	One, two way counter, encoder, pulse and period measuring

Analog inputs (DI4–DI7)

Number of inputs	4
Common wire	minus (GND)
Galvanic isolation	No
Resolution/ Range	10 bit/0 ÷ 10 V
Conversion time	350 µs/1 input
Max. error at 25 °C	±3 % of full range

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 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

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

Power supply

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

Dimensions and weight

Dimensions	90 × 105 × 65 mm
Weight	250 g

Operating conditions

Operating temperature	–25 ÷ +55 °C
Storage temperature	–25 ÷ +70 °C
Electric strength	According EN 60950
IP Degree of protection (IEC EN 60529)	IP 10 B
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 mm²

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 04	CP-1004, CPU, ETH100/ 10, 1×RS-232, 1×SCH, 4×DI/ AI, 4×DI/ HSC, 6×RO 230 V/ 3A,1×CIB, prg. MOSAIC
TXN 110 14	CP-1014, CPU+LCD4×20, ETH100/ 10, 1×RS-232, 1×SCH, 4×DI/ AI, 4×DI/ HSC, 6×RO 230 V/ 3A, 1×CIB, prg. MOSAIC

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

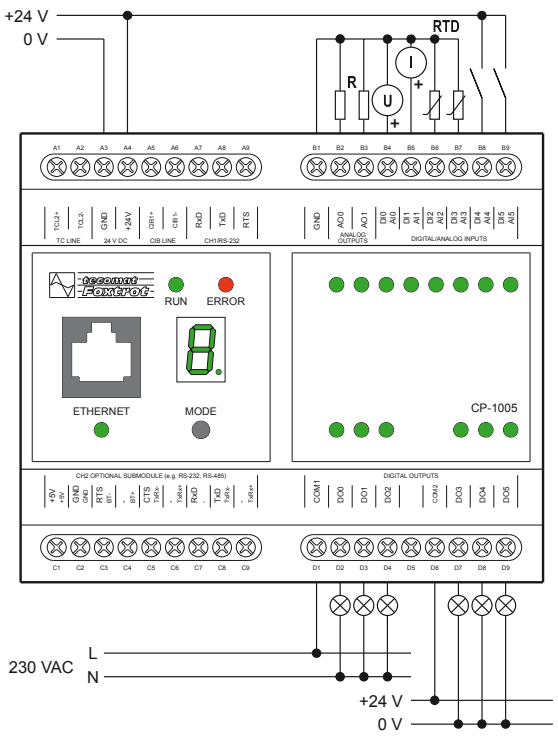
Basic features

- 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.

Connection example



- 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.

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)

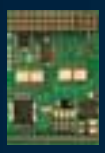
Alternative function of AI0–AI5

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

CP-1005

CP-1015

Related products



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

Submodules
with communication
interfaces:
MR-01xx

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)

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

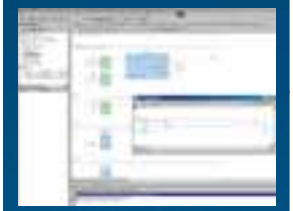
Operating temperature	–25 ÷ +55 °C
Storage temperature	–25 ÷ +70 °C
Electric strength	According IEC EN 61131-3
IP Degree of protection IEC EN 60529	IP 10B
Overvoltage category	II
Degree of pollution (IEC EN 61131-2)	2
Working position	Vertical
Installation	On DIN rail
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm²

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

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

PLC TECOMAT FOXTROT – basic module with 28 I/O

PRELIMINARY

Type	DI	DO	AI	AO	Comm
CP-1016	**1× HSC 1× 230V AC**	**10× RO 2× SSR**	**12× UI (AI/contacts)**	**2×**	Ethernet 10/ 100, RS-232, 1× optional interface, TCL2, CIB, LCD, keyboard, RFox

CP-1016

CP-1016

Submodules with communication interfaces: MR-01xx

Basic features

- Programmable controller (PLC) according to IEC EN 61131.
- Outstanding integration of controller together with the IT and telecommunications technologies in one device.
- Built in RFox Master – wireless I/O system in the 868.35 MHz band.
- Built-in LCD 4×20 characters and 6 keys.
- Available coding: ASCII, CP1250 (Central European), CP1251 (Cyrillic), CP1252 (Western European), CP1253 (Greek).
- Powerful CPU with unique combination of on board I/Os suitable for HVAC applications.
- Each of 12 universal inputs can be configured as binary input for potential free contact or as analog input.
- Inputs AI6 ÷ AI12 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. Measuring range is set by the user SW configuration.
- No. of I/O is expandable up to 148 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).
- 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 (9 modules width) for standard circuit breaker cabinets.
- Power supply, serial ports, TCL2, CIB buses and I/O are connected by screw terminals. Wireless master is available on the front panel on the SMA (F) antenna connector.
- CIB on the basic module is active –it has embedded power supply for max. 2 W of load on the bus.
- 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 control system in process and building control, mainly in HVAC applications.
- 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.

Universal inputs (DI0/AI0–DI12/AI12)

No. of inputs	13
Configurable inputs	Current/ RTD measurement Binary input see other table
Common wire	minus (GND)
Galvanic isolation	No

Analog inputs (AI0–AI12)

Resolution	12 bit
Conversion time	100 µs per input
Sample repetition period	5 ms
Protection type	Overvoltage, integrated

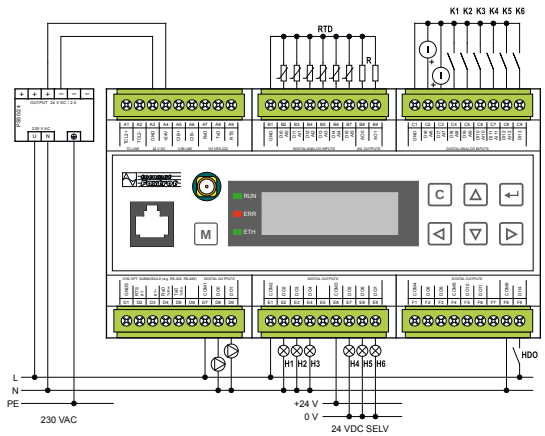
Function: binary inputs (DI0–DI12)

Type of input	Potential free contact
Min. impedance of input circuit for log. 0 (UL)	1500 Ω
Max. impedance of input circuit for log. 1 (UH)	100 Ω
Input current for log. 1 (IH)	typ. 2 mA
Delay 0 –> 1/ 1 –> 0	1 ms/ 1 ms

Features of CPU

CPU	32 bit RISC processor
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 file	2 MB
Memory card slot	Yes, MMC/ SD, SDHC
Memory for variables	64 kB/ 32 kB retained
No. of IEC timers/counters	4096/ 8192

Connection example



Measurement ranges

Current	
Input impedance	100 Ω
Input range	0 ÷ 20 mA, 4 ÷ 20 mA (AI6–AI12)
Max. error at 25 °C	±0.4 % of full range
Overvoltage allowed	+50 mA (between AI and AGND)
Detection of open input circuit	yes, in status word
Resistance Temperature Detectors (RTD)	
Input impedance	Typ. 5 kΩ
Input range Pt1000 1.385	–90 ÷ + 270 °C
Pt1000 1.391	–90 ÷ + 400 °C
Ni1000 1.617	–60 ÷ + 155 °C
Ni1000 1.500	–60 ÷ + 200 °C
Resistance transmitter	0 ÷ 1000 Ω
KTY81-121	–55 ÷ 125 °C
Max. error at 25 °C	± 0.5 % of full range
Overvoltage allowed	±35 V (between AI and AGND)
Sensor disconnection detection	yes, in status word

High speed counters DI13

No. of counting inputs	1
Input frequency	5 kHz/ 20 edges/s
Pulse width	min. 50 µs
Delay 0 –> 1/1 –> 0	5 µs/5 µs
Range of counter register	max. 32 bit; 0 ÷ 4 294 967 296
Modes	Counter, pulse width measuring

Digital input 230V AC DI14

Galvanic isolation	Yes, 4 kV
Input voltage for log. 0 (UL)	max. 80 V AC
Input voltage for log.1 (UH)	min. 160 V AC;
Input current for log.1 (IH)	typ. 5 mA
Delay 0 –> 1/1 –> 0	10 ms/ 10 ms

Analog outputs (AO0–AO1)

No. of inputs × groups	2 × 1
Common wire	minus (AGND)
Galvanic isolation	No
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 AGND)

SSR outputs (Solid state Relay) (DO0–DO1)

No. of outputs	2
Galvanic isolation	Yes
Type of output	Semiconductor controlled, switching in 0 V
Switched voltage	max. 250 V AC
Switched current	min. 5 mA; max. 0.7 A
Short-term output overload	max. 1 A
Current through joint terminal	max. 10 A
Time of close/open the contact	typ. 1 µs
Switching frequency without load	max. 400 switches/ minute

Dimensions and weight

Dimensions	90 × 160 × 65 mm
Weight	250 g

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 (DO2–DO11)

No. of outputs	10 in 4 groups
Galvanic isolation	Yes (also among groups)
Type of contact/ type of output	Electromechanical relay, NO, 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 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

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
Installation bus	1× CIB (19.2 kbps) (Common installation bus)
Wireless network	1× slot for RFox master module 868.35 MHz, bidirectional with acknoledgement

Power supply

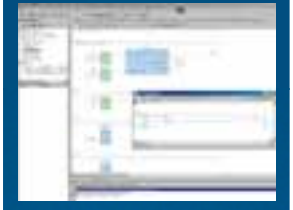
Power supply voltage(SELV)	+24 V DC
Allowed range	–15% ÷ +25% (20.4 ÷ 30 V DC)
Max. Input power	10 W
Galvanic isolation	No, only relay outputs and CH2
Memory backup	Built in Li-Ion accumulator (500 hours); Holder for CR2032 lithium battery (20 000 hours)

Operational conditions

Operating temperature	–25 ÷ + 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 mm²

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 16	CP-1016, CPU + LCD 4×20, ETH10/ 100, 1×RS-232, 1×SCH, 13×AI/ DI, 2×AO, 10×RO, 2×SSR, 1×CIB, RFox, prg. MOSAIC

PLC TECOMAT FOXTROT – submodules with binary inputs and outputs

Type	DI	DO	AI	AO	Comm
PX-7811	7×				
PX-7812	4×	3×			

PX-7811

PX-7812

Basic features

- Submodules PX-781x are designed to be inserted in slot CH2. These submodules can enlarge number of I/O on the FOXTROT basic module. (not for CP-1016).
- Inserting PX-781x in the slot excludes using the communication interface at the same time.
- PX-7811 enable to add 7 binary inputs. PX-7812 enable to add 4 binary inputs and 3 binary outputs on the terminals C1–C9

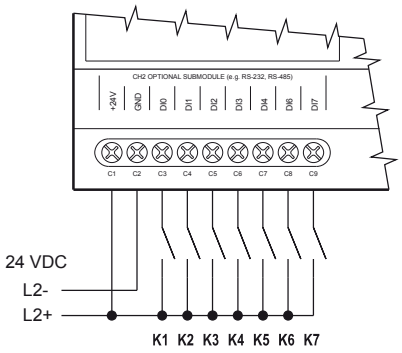
Connecting

- The basic module must be opened. The slot is placed on the CPU PCB which is at the middle inside PCB.
- The module has to be placed on the free pins of slot in proper orientation.

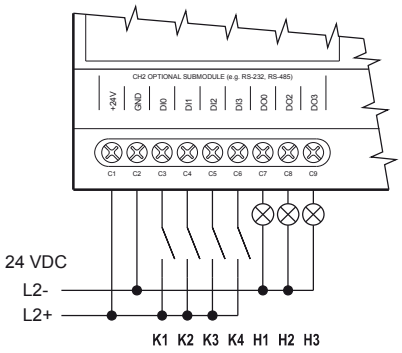
Use

- In case of applications where more I/O are needed and no other serial communication is required.

PX-7811 Connection example



PX-7812 Connection example



Binary Inputs	PX-7811	PX-7812
No. of inputs × groups	7×1	4×1
Common wire	minus (GND)	minus (GND)
Galvanic isolation	Yes	Yes
Input voltage for log. 0 (UL):	0 V DC; (–15 ÷ +5 V DC)	0 V DC; (–15 ÷ +5 V DC)
Input voltage for log.1 (UH):	+24 V DC; (11 ÷ 30 V DC)	+24 V DC; (11÷ 30 V DC)
Input current for log.1 (IH):	typ. 3 mA	typ. 3 mA
Delay 0 –> 1/1 –> 0:	5 ms/ 5 ms	5 ms/ 5 ms

Binary outputs		PX-7812
No. of outputs × groups		3×1
Galvanic isolation		Yes
Type of output		Transistor, protected output
Common wire		Minus (GND)
Switched voltage		11 ÷30 V DC
Switched current		max. 0.5 A
Current through joint terminal		max. 2 A
Cut-off current		max. 300 µA
Time of close/open the contact		400 µs/ 400 µs
Short-circuit protection/ Short circuit current limitation		Yes, internal/ < 1.1 A
Reversing of polarity protection		Yes
Spike suppressor of inductive load		External (RC circuit, varistor, diode)

Power supply

Internal	On slot pin

Dimensions and weight

Dimensions	63 × 11 × 52 mm
Weight	30 g

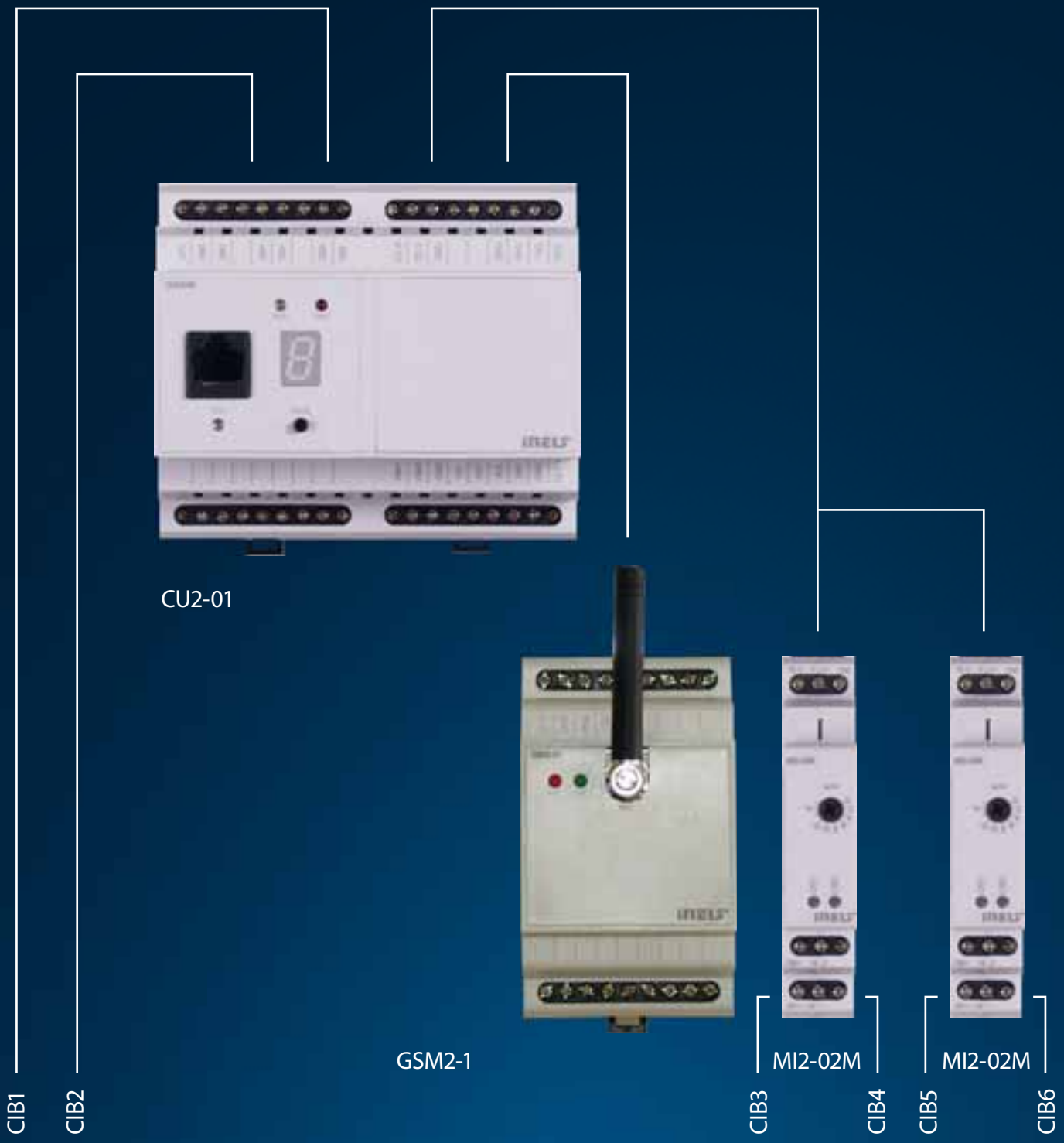
Operating conditions

Operating temperature	–25 ÷ +55 °C
Storage temperature	–25 ÷ +70 °C
Electric strength	According EN 60950
Overvoltage category	II
Degree of pollution IEC EN 61131-2	2

Order number

TXN 178 11	PX-7811, (7×DI), 24 V DC, GO, autoidentification
TXN 178 12	PX-7812, 4×DI, 3×DO, 24 V DC/0,5A, GO, autoidentification

INELS
Central unit



INELS system communication lines fundamental scheme.

Units connected to the system are mentioned in CIB part.

INELS – basic module

Type	DI	DO	AI	AO	Comm
CU2-01M	**4× + 1×**		**1×**	**2×**	2× CIB Ethernet 10/100, RS-232, TCL2

CU2-01M

IDM – Software for parametrization

Basic features

- Basic module and heart of the INELS system.
- It is based on the design of basic module FOXTROT and the concept of two wire bus CIB (Common Installation Bus)
- Basic module CU2-01M is designed for residential house and other building control, where quick parameterization without programming skill is emphasized.
- All standard and frequently used functions in building control are available in IDM – software running on PC.
- IDM is designed to configure network of CIB units – sensors and actuators and to set their interactions based on events.
- Among standard functions you can find time schedule for each room, switch on/off the light immediately or with delay, short or long pushbutton click, dimming, alarm handling, sending and receiving SMS, correction of temperature, grouping of lights and switching actuators etc.
- Built in web server enables to monitor or to control all the system locally or from internet network.
- It has very low consumption.

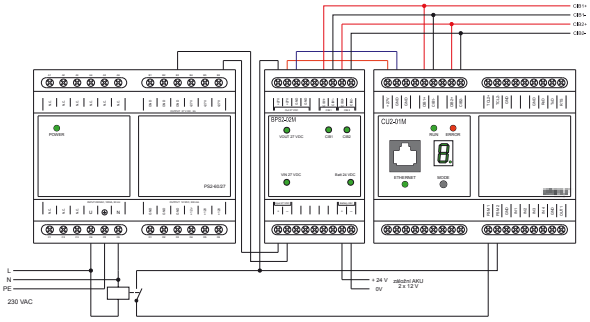
Connecting

- Ethernet on RJ45 connector enables to connect notebook or PC directly or via LAN using the standard UTP CAT5 cables.
- All other connections can be done on screw terminals.
- Basic module has 2 masters of CIB. There must be added BPS2-02M between power supply and CIB terminals on basic module to create full functional CIB with communication and power supply. Up to 64 CIB units can be connected to 2 CIB masters embedded in basic module.
- Other 4 CIB masters can be added via TCL2 bus available on basic module by MI2-02M modules. Each module has 2 CIB masters. Then up to 6× 32 = 192 CIB modules can be connected to one basic module.
- RS-232 serial port on the CU2-01M enables connect directly GSM module for direct communication with mobile phones via SMS.
- 4 potential free contacts can be connected to 4 inputs on CU2-01M.
- Power supply 24 V DC must be connected to CU2-01M. Using 27.2 V DC power supply block enables to charge directly the external pair of 12 V backup lead accumulators. The accumulator can back up the whole CIB installation including the basic module. The backup period depends only on the capacity of the accumulator.

Use

- For building control where standard functions and no comprehensive integration through communication with other systems is required.
- For implementation where programming skill is not available.
- Can be used also where control room and visualization in SCADA system is required. OPC server is available.

Connection example



Inputs

No. of inputs	4× no potential contact
No. of inputs for power supply monitoring	1× DI 24 V 1× AI (0 ÷ 30 V for battery monitoring)

Relay outputs

No. of outputs	1×

Communication

Ethernet supported protocols	1×10/ 100Base TX TCP/IP, UDP/IP, HTTP
System I/O bus	1× TCL2 (RS-485, 345 kbps)
Installation bus	1×CIB (19.2 kbps) (Common installation bus)

Power supply

Power supply voltage(SELV)	+24 V DC
Allowed range	–15 % ÷ +25 % (20.4 ÷ 30 V DC)
Max. current consumption	110 mA
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

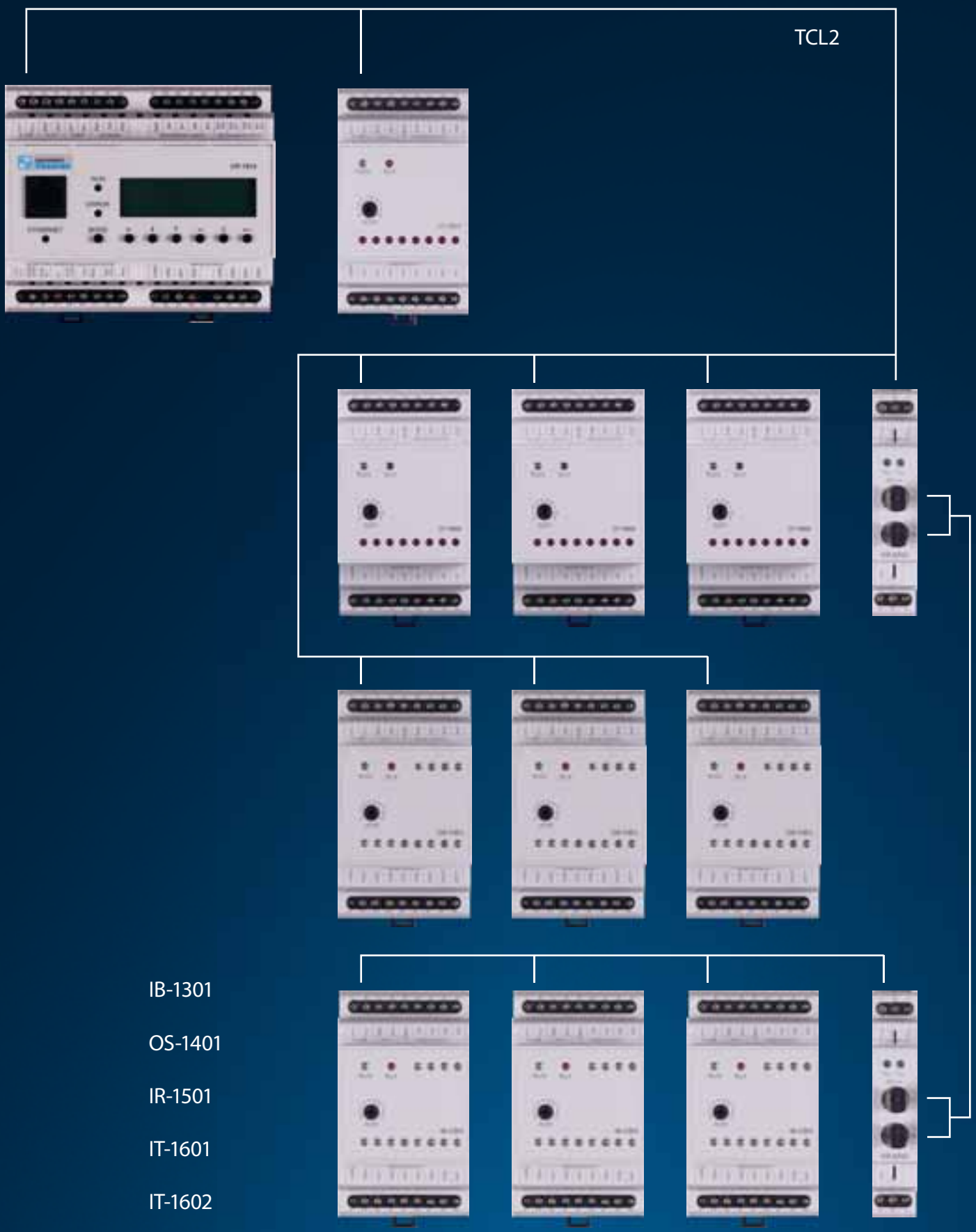
Operating conditions

Operating temperature	–25 ÷ +55 °C
Storage temperature	–25 ÷ +70 °C
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 mm²

Order number

CU2-01M	CU2-01M, CPU - ETH100/10, 1×RS-232, 2× CIB, 4× DI, 2× PSM (power supply monitor), 1× RO, configured by IDM software

Foxtrot
PLC Expansion modules



PLC TECOMAT FOXTROT – expansion module with binary inputs

Type	DI	DO	AI	AO	Comm
IB-1301	12				TCL2

IB-1301

Basic features

- Expansion module with 12 binary inputs for enlarging I/O number of the PLC FOXTROT basic modules.
- Module is for connecting input signals at the 24 V DC level with the common wire minus.
- All inputs are individually configurable.
- 4 inputs (DI0–DI3) are quick with the low pass filter 5 µs and can be configured for special functions identical with high speed inputs on basic module CP-1004.
- Special functions are: one or two way counters, counters with control, position incremental encoder, period and phase shift measurement up to 5 kHz and latch for short spikes min. 50 µs.
- Galvanic isolation of inputs.
- Status of the inputs is indicated by LED on the front panel.

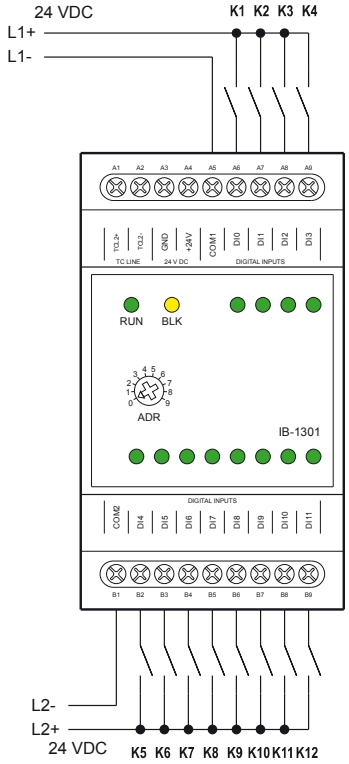
Connecting

- Compact form-factor for DIN rail mounting (6 modules width) for standard circuit breaker cabinets.
- Module can be connected to the central module directly on the distance up to 400 m by shielded twisted pair (TCL2). Using the converter KB-0552 the distance can be enlarged by fibre optic up to 1.7 km!
- Module address on TCL2 expansion bus must be set manually by the rotary switch on the front panel.
- Power supply, TCL2 and I/O are connected by screw terminals.

Use

- As local I/O as well as remote I/O of TECOMAT FOXTROT PLC for sensing discrete sensors and switches at the 24 V DC level.
- For sensing high speed impulses up to 5 kHz.
- For sensing position incremental encoders.

Connection example



Digital inputs (DI0-DI11)

No. of inputs × groups	4× 1, 8× 1
Option: High speed counter	4 (DI0 ÷ DI3)
Common wire	minus (GND)
Galvanic isolation	Yes
Input voltage for log. 0 (UL):	0 V DC; (–5 ÷ +5 V DC)
Input voltage for log.1 (UH):	+24 V DC; (15÷30 V DC)
Input current for log.1 (IH):	typ. 5 mA
Delay 0 –> 1/1 –> 0:	5 µs/ 5 µs (DI0÷DI3) 5 ms/ 5 ms (DI4÷DI11)

High speed counters (DI0-DI3)

No. of counting inputs	4
Input frequency	5 kHz/ min. 50 µs
Delay 0 –>1/1 –> 0:	5 µs/ 5 µs
Range of counters	max. 32 bit; 0÷4 294 967 296
Modes:	One, two way counter, encoder, pulse and period measuring

Communication

System I/O bus	1× TCL2 (RS-485, 345 kbps)

Power supply

Power supply voltage (SELV)	+24 V DC
Allowed range	–15 % ÷ +25 % (20.4 ÷ 30 V DC)
Max. input power	2.5 W
Galvanic isolation	No

Dimensions and weight

Dimensions	90 × 53 × 65 mm
Weight	80 g

Operating conditions

Operating temperature	–25÷55 °C
Storage temperature	–25÷70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60950	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 mm²

Order number

TXN 113 01	IB-1301, 12×DI 24 V DC, galvanically isolated

PLC TECOMAT FOXTROT – expansion module with binary outputs

Type	DI	DO	AI	AO	Comm
OS-1401		12			TCL2

OS-1401

Basic features

- Expansion module with 12 semiconductor outputs for enlarging I/O number of the PLC FOXTROT basic modules.
- Module is used for connecting loads at 24 V DC. Switching current is 4× 2 A per output and 8× 0.5 A per output.
- Galvanic isolation of outputs.
- Status of the outputs is indicated by LED on the front panel.

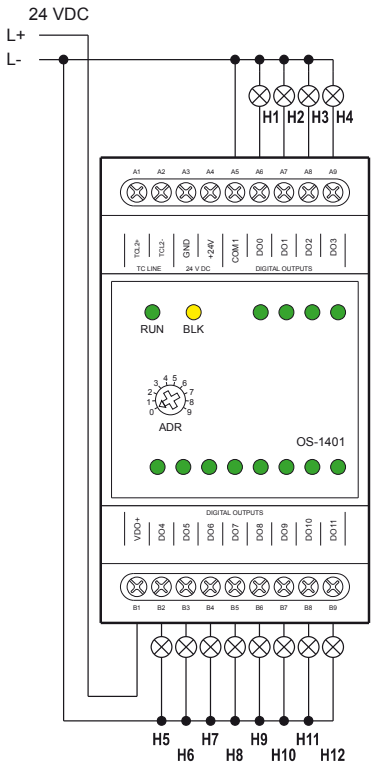
Connecting

- Compact form-factor for DIN rail mounting (3 modules width) for standard circuit breaker cabinets.
- Module can be connected to the basic module directly on the distance up to 400 m by shielded twisted pair (TCL2). Using the converter KB-0552 the distance can be enlarged by fibre optic up to 1.7 km!
- Module address on TCL2 expansion bus must be set manually by the rotary switch on the front panel.
- Power supply, TCL2 and I/O are connected by screw terminals.

Use

- As local I/O as well as remote I/O of TECOMAT FOXTROT PLC.
- For switching loads by semiconductor at 24 V DC level.

Connection example



Binary outputs (DO0–DO11)

No. of outputs × groups	12×1
Galvanic isolation	Yes
Type of output	Transistor
Common wire	Plus
Switched voltage	9.6 ÷ 28.8 V DC
Switched current	max. 2 A (DI0–DI3) max. 0.5 A (DO4–DO11)
Current through joint terminal	max. 9 A (DO0–DO11) max. 4.4 A (DO0–DO3)
Cut-off current	<300 µA
Time of close/open the contact	400 µs/ 400 µs
Short-circuit protection **Short circuit current limitation**	Yes/ <4 A
Reversing of polarity protection	Yes
Spike suppressor of inductive load	External RC, varistor or diode snubber

Communication

System I/O bus	1× TCL2 (RS-485, 345 kbps)

Power supply

Power supply voltage (SELV)	+24 V DC
Allowed range	–15 % ÷ +25 % (20,4 ÷ 30 V DC)
Max. input power	2 W
Galvanic isolation	No

Dimensions and weight

Dimensions	90 × 53 × 65 mm
Weight	80 g

Operating conditions

Operating temperature	–25 ÷ 55 °C
Storage temperature	–25÷70 °C
Electric strength	according EN 60950
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 mm²

Order number

TXN 114 01	OS-1401, 12×DO 24 V DC, 8× 0.5 A, 4× 2 A, galvanically isolated

PLC TECOMAT FOXTROT – expansion module with binary inputs and relay outputs

Type	DI	DO	AI	AO	Comm
IR-1501	**4**	**8**			TCL2

IR-1501

Basic features

- Expansion module with 4 binary inputs and 8 relay outputs for enlarging I/O number of the PLC FOXTROT basic modules.
- Module is designated for connecting input signals at the 24 V DC level with the common wire minus and for loads at 24 V DC up to 230 V AC. Switching current is up to 3 A per output.
- Inputs are individually configurable.
- 4 inputs (DI0-DI3) are quick with the low pass filter 5 µs and can be configured for special functions identical with high speed inputs on the basic module CP-1004.
- Special functions are: one or two way counters, counters with control, position incremental encoders, period and phase shift measurement up to 5 kHz and latch for short spikes min. 50 µs.
- Galvanic isolation of inputs and outputs.
- Status of the inputs and outputs is indicated by LED on the front panel.

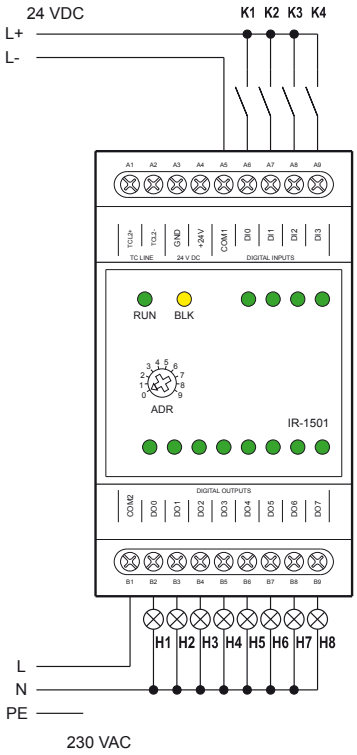
Connecting

- Compact form-factor for DIN rail mounting (6 modules width) for standard circuit breaker cabinets.
- Module can be connected to the central module directly on the distance up to 400 m by shielded twisted pair (TCL2). Using the converter KB-0552 the distance can be enlarged by fibre optic up to 1.7km!
- Module address on TCL2 expansion bus must be set manually by the rotary switch on the front panel.
- Power supply, TCL2 and I/O are connected by screw terminals.

Use

- As local I/O as well as remote I/O of PLC TECOMAT FOXTROT
- For switching loads by relay contacts for 24 V DC or 230 V AC level.
- For sensing discrete sensors and switches at the 24 V DC level.
- For sensing high speed impulses up to 5 kHz.
- For sensing position incremental encoders.

Connection example



Communication

System I/O bus	1× TCL2 (RS-485, 345 kbps)

Digital inputs (DI0–DI3)

No. of inputs × groups	4 × 1
Option: High speed counter	4 (DI0 ÷ DI3)
Common wire	minus (GND)
Galvanic isolation	Yes
Input voltage for log. 0 (UL):	0 V DC; (–5 ÷ +5 V DC)
Input voltage for log.1 (UH):	+24 V DC; (15 ÷ 30 V DC)
Input current for log.1 (IH):	typ. 5 mA
Delay 0 –> 1/1 –> 0:	5 µs/ 5 µs (DI0 ÷ DI3)

High speed counters (DI0–DI3)

No. of counting inputs	4
Input frequency	5 kHz/min. 50 µs
Delay 0 –> 1/1 –> 0:	5 µs/ 5 µs
Range of counters	max. 32 bit; 0÷4 294 967 296
Modes:	One, two way counter, encoder, pulse and period measuring

Relay outputs (DO0-DO7)

No. of outputs × groups	8 × 1
Galvanic isolation	Yes
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 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 cycles/ minute
Switching frequency with rated load	max. 20 cycles/ 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÷30V DC)
Max. input power	2.5 W
Galvanic isolation	No

Dimensions and weight

Dimensions	90 × 53 × 65 mm
Weight	80 g

Operating conditions

Operating temperature	–25 ÷ 55 °C
Storage temperature	–25 ÷ 70 °C
Electric strength	according EN 60950
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 mm²

Order number

TXN 115 01	IR-1501, 4×DI 24 V DC, 8×RO, 230 V/ 2 A, galvanically isolated

PLC TECOMAT FOXTROT – expansion modules with analog inputs and outputs

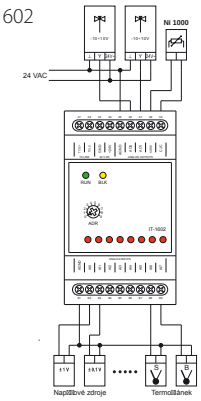
Type	DI	DO	AI	AO	Comm
IT-1601			**8×**	**2×**	TCL2
IT-1602			**8×**	**2×**	TCL2

Basic features

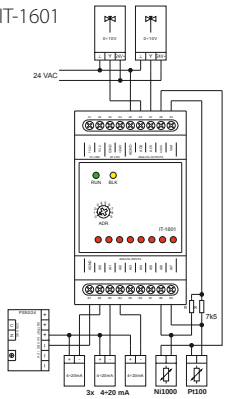
- Expansion modules with 8 analog inputs and 2 analog outputs for enlarging I/O number of the PLC FOXTROT basic modules.
- **IT-1601** measures current, voltage and RTD with 16bit resolution. Built-in reference voltage source.
- **IT-1602** measures thermocouples J, K, R, S, B and small voltages 0.1 V and 1 V with 16bit resolution.
- Analog outputs of both modules are voltage outputs with the resolution 10 bit.
- Cold junction temperature measurement with automatic compensation of it.
- Type and measurement range are set in the user program configuration.
- Built in linearization of the RTD measurement
- The value of input can be read as binary value or as percentage or directly in Celsius degree.
- All inputs are individually configurable.
- Galvanic isolation of inputs and outputs from internal bus and power supply.
- Overload, under load or input circuit break is indicated by LED on the front panel.

Connection example

IT-1602



IT-1601



Measurement ranges IT-1601

Voltage	
Input impedance	> 100 kΩ (1 V; 2 V) > 20 kΩ (5 V; 10 V)
Input range	0 ÷ +10 V; 0 ÷ +5 V 0 ÷ +2 V; 0 ÷ +1 V
Max. error at 25 °C	±0.3 % of full range
Allowed overvoltage	±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 AGND)
Detection of open input circuit	yes, in status word
Resistance Temperature Detectors (RTD)	
Recommended external resistors	MT-1690 (TXN 116 90)
Input impedance	>100 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 AGND)
Sensor disconnection detection	yes, in status word

Communication

System I/O bus	1×TCL2 (RS-485, 345 kbps)

Dimensions and weight

Dimensions	90 × 53 × 65 mm
Weight	80 g

Order number

TXN 116 01	IT-1601, 8 × AI: 16bit (0÷10 V, 0÷20 mA, Pt100, Pt1000, Ni1000), 2×AO: 8 bit/ 0÷10 V, galvanically isolated
TXN 116 02	IT-1602, 8 × AI: 16bit (thermocouples J, K, R, S, B), 2 × AO: 8 bit/ 0÷10 V, galvanically isolated

Connecting

- Compact form-factor for DIN rail mounting (3 modules width) for standard circuit breaker cabinets.
- Module can be connected to the basic module directly on the distance up to 400 m by shielded twisted pair (TCL2). Using the converter KB-0552 the distance can be enlarged by fibre optic up to 1.7 km!
- Module address on TCL2 expansion bus must be set manually by the rotary switch on the front panel.
- Power supply, TCL2 and I/O are connected by screw terminals.

Use

- As local I/O as well as remote I/O of TECOMAT FOXTROT PLC
- For precise measurement of analog signals of any standardized types.
- For continuously controlled actuators like valves, drives etc.

Analog inputs (AI0–AI5)

No. of inputs × groups	8 × 1
Configurable inputs:	Voltage/ Current/ RTD measurement.
Common wire	minus (AGND)
Galvanic isolation	Yes
Resolution	16 bit
Conversion time	65 ms per input
Sample repetition period	500 ms
Protection type	Overvoltage, integrated

Analog outputs

No. of inputs × groups	2 × 1
Common wire	minus (AGND)
Galvanic isolation	Yes
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 AGND)

Measurement ranges IT-1602

Voltage	
Input impedance	>1MΩ
Input range	-1 ÷ +1 V -0.1 ÷ +1 V
Max. error at 25 °C	±0.3 % of full range
Allowed overvoltage	±35 V (between AI and AGND)
Thermocouples	
Input impedance	100 Ω
Input range for types	J, K, R, S, B
Max. error at 25 °C	± 0.5 % of full range
Overvoltage allowed	+50 mA (between AI and AGND)
Sensor disconnection detection	yes, in status word

Power supply

Power supply voltage (SELV)	+24 V DC
Allowed range	–15 % ÷ +25 % (20.4 ÷ 30 V DC)
Max. input power	IT-1601: 4.5 W; IT-1602: 2.5 W
Galvanic isolation	No

Operating conditions

Operating temperature	–25 ÷ 55 °C
Storage temperature	–25 ÷ 70 °C
Electric strength	according EN 60950
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 mm²

IT-1601

IT-1602

Foxtrot
Communication modules

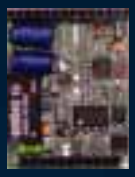
Interface/Protocol

RS-232

RS-422

RS-485

Profibus DP Slave



M-Bus

LON

TCL2

CIB

MI2-012M

MP-Bus

UC-1203

OpenTherm

UC-1204

Fibre optic multimode

KB-0552

CIB

BPS2-01M

BPS2-02M

DTNVEM/CIB

Ethernet

SX-1162

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 slot CH2. These submodules can enlarge communication flexibility of the FOXTROT basic modules.
- As an alternative, inserting PX-781x with binary I/O will enlarge the number of I/O where no communication interface is required (not for CP-1016).
- Selection of interface module is a selection of the physical layer of communication. The higher layers as protocols and communication modes can be set in configuration tool of MOSAIC.

Connecting

- Submodules are inserted in the slot which is inside the basic module.
- The basic module has to be opened. The slot is placed on the CPU PCB which is the middle.
- The module has to be placed on the free pins of slot in proper orientation.
- The signal layout of terminals C1–C9 is a part of documentation of each sub module.

Use

- In all cases where Foxtrot has to be adapted to communicate with other device or with other Foxtrot.

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

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

Operating conditions

Operating temperature	–25 ÷ +55 °C
Storage temperature	–25 ÷ +70 °C
Overvoltage category	II
Degree of pollution IEC EN 61131-2	2

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

FOXTROT/INELS – CIB master module

Type	DI	DO	AI	AO	Comm
MI2-02M					TCL2, 2× CIB

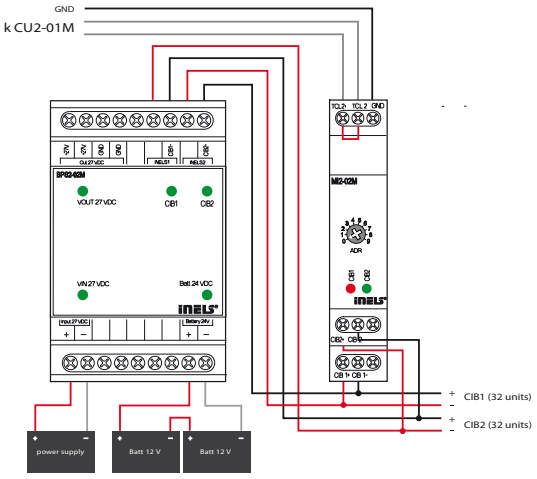
Basic features

- MI2-02M module is designed to enlarge the number of CIB branches connected to one basic FOXTROT or INELS module.
- One MI2-02M module contains 2 masters of CIB and enables to connect additional 64 CIB units (2×32).
- Up to 4 MI2-02M modules can be connected to FOXTROT basic module to control additional 256 CIB units and up to 2 MI2-02M to INELS basic module to control additional 128 CIB units
- Status run/error indicates LED on the front panel.

Connecting

- Compact form-factor for DIN rail mounting (1 module width) for standard circuit breaker cabinets.
- MI2-02M is connected on TCL2 bus directly to basic module or anywhere in distance max. 300 m on metallic cable.
- Unique address on TCL2 has to be set manually on the rotary encoder on front panel
- MI2-02M modules are not counted to the limit of 10 peripheral modules on TCL2 bus.
- Each branch of CIB on the module MI2-02 has to be connected to the power supply through the module BPS2-02M.
- Through it all units on the CIB branch are supplied including MI2-02M itself.

Connection example



Communication

System I/O bus	1× TCL2 (RS-485, 345 kbps)
Installation bus	2× CIB for 64 units total (19.2 kbps) (Common installation bus)

Power supply

Power supply voltage (SELV)	24 ÷ 27.2 V DC / 25 mA from the CIB bus
Allowed range	–15 % ÷ +25 % (20.4 ÷ 30 V DC)
Max. Input power	2.5 W
Galvanic isolation	No

Dimensions and weight

Dimensions	90 × 18 × 65 mm
Weight	75 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 30
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	On DIN rail
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm²

MI2-02M

Related products

BPS2-02M

BPS2-01M

Teco a.s. supplies units under the name INELS

Order number

TXN 131 28	MI2-02M, CIB, 2× Bus Master

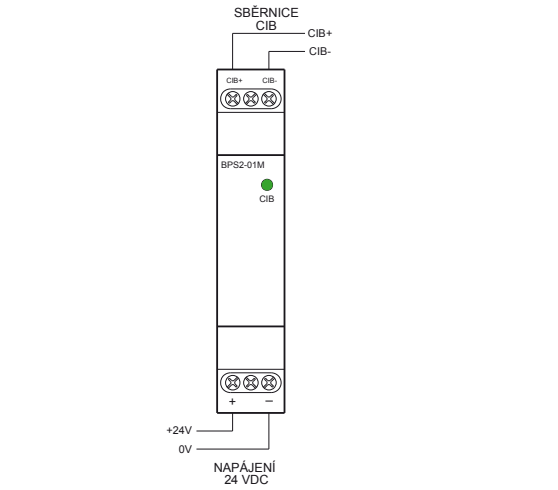
FOXTROT/INELS – CIB impedance separator

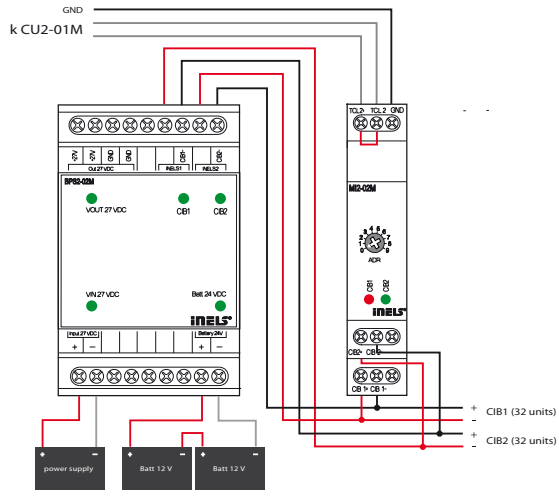
Type	DI	DO	AI	AO	Comm
BPS2-01M					1× CIB
BPS2-02M					2× CIB

Basic features

- Both modules are designed to adapt the power supply impedance for the needs of CIB bus.
- This module has the terminals for direct connection of pair of backup accumulators.
- Accumulators provide uninterruptible supply in case of fail of standard power line. This function is enabled by using PS2-60/27 power supply which provides 230 V AC/ 27.2 V DC voltage conversion.
- On the output terminals of the module is uninteruptible voltage on level 27.2 / 24 V DC to supply the controller as well as power on CIB terminals.
- To make a proper project of CIB power supplying, it is necessary to calculate layout of the loads, cross sections of used wires, voltage drops on longer branches and their combinations using free topology.
- Modules, especially BPS1-01M, can be used for additional supplying the bus in distance bigger than 200 m.
- The status of power supply is indicated by LED on front panel.
- Modules are delivered under the name INELS, which is compatible with the CIB.

Connection example



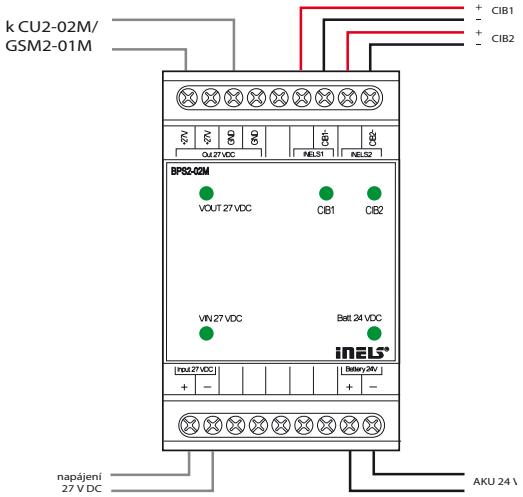


Connection

- Compact form-factor for DIN rail mounting (1 or 2 module width) for standard circuit breaker cabinets.
- Modules are connected directly to power supply 24 V / 27.2 V DC, on the module output there is connected CIB branch.

Use

- BPS2-01M is used to supply one CIB branch, typically for FOXTROT basic modules where only one CIB master is built-in.
- BPS2-02M is designed to supply 2 branches CIB either with connection of CU2-01M or MI2-02M.



Power supply

Input power supply voltage (SELV)	+24 ÷ 27.2 V DC
Output voltage on CIB	2 × +24 ÷ 27.2 V DC, 1 A
Output voltage for controller	1 × +24 ÷ 27.2 V DC, 1 A
Output backup voltage	1 × 24 V DC
Accumulators	2 × 12 V in serial

Dimensions and weight

BPS2-01M	
Dimensions	90 × 18 × 65 mm
Weight	75 g
BPS2-02M	
Dimensions	90 × 52 × 65 mm
Weight	100 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 30
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	On DIN rail
Connections	screw terminals
Conductors cross-section	max. 2.5 mm²

Teco a. s. supplies units under the name INELS

Order number

BPS2-01M	BPS2-01M, CIB, 1× CIB impedance separator
BPS2-02M	BPS2-02M, CIB, 2× CIB impedance separator, accumulator connection

BPS2-02M

BPS2-01M

FOXTROT – MP-Bus and OpenTherm communication

PRELIMINARY

Type	DI	DO	AI	AO	Comm
UC-1203					TCL2, MP-Bus
UC-1204					TCL2, OpenTherm

UC-1203

UC-1204

Basic features

- The module **UC-1203** is designated for the TECOMAT FOXTROT basic module communication channels expansion by Belimo's company MP-Bus that is used for valve drives and air-condition shutters control.
- MP-Bus is supplied from 24 V DC/AC.
- Up to 8 Belimo MFT drives on one bus.
- Possibility to connect 1 temperature sensor (RTD Ni1000, Pt1000, resistance transmitter 1000 Ω) or contact to each drive.
- measured temperature (or contact status) is transferred to the system and it is available as standard analog (binary) input.
- The module **UC-1204** is designated for the TECOMAT FOXTROT basic module communication channels expansion by OpenTherm protocol for bidirectional communication with boilers equipped with this protocol.
- **Supported protocol**
  OT/+ (OpenTherm/plus) and OT/– (OpenTherm/Lite).

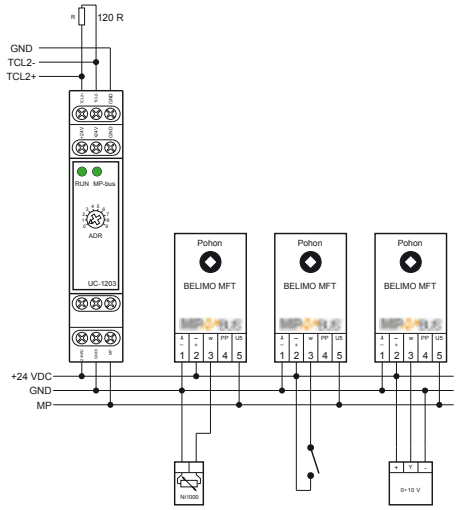
Connection

- Mechanical construction is suitable for the installation on DIN rail.
- Modules are realized as TCL2 bus communication expansion modules.
- UC-1203 MP-Bus module installation: for recommended cables and lengths see MP-Bus specification (Belimo company manuals)
- UC-1204 OpenTherm module installation: 2-wire cable, not twisted, 50 m at max., cable resistance 2×5 Ω, any polarity.

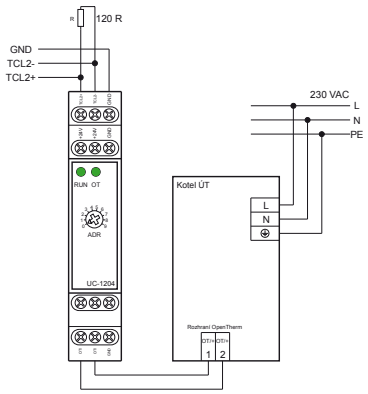
Use

- It can be used in measuring and control tasks and in building management systems (HVAC).

UC-1203 Connection example (MP-Bus)



UC-1204 Connection example (OpenTherm)



Communication	UC-1203	UC-1204
System I/O bus	1× TCL2 (RS-485, 345 kbps) up to 300 m, without branches , bus termination 120 Ω	
Installation bus	MP Bus	OpenTherm

Power supply	
Power supply voltage (SELV)	+24 V DC
Allowed range	–15 % ÷ +25 % (20.4 ÷ 30 V DC)
Max. input power	2.5 W
Galvanic isolation	No

Dimensions and weight	
Dimensions	90 × 18 × 65 mm
Weight	75 g

Operating conditions	
Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 30
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	On DIN rail
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm^2

Teco a. s. supplies units under the name INELS

Order number

TXN 112 03	UC-1203, MP-Bus – Communication module for Belimo's servodrive connection
TXN 112 04	UC-1204, OpenTherm – Communication module for boilers connection

FOXTROT – TCL2 bus optical interconnection module

Type	DI	DO	AI	AO	Comm
KB-0552					TCL2 MM optic fibre

KB-0552

Basic features

- The module is designated for TCL2 bus protocol conversion from metallic wires – RS-485 to the optical fibre and it is conform to the transfer speed 345 kbps.
- Using more converters on one TCL2 bus allows to create star topology which lines are created by optical fibres.

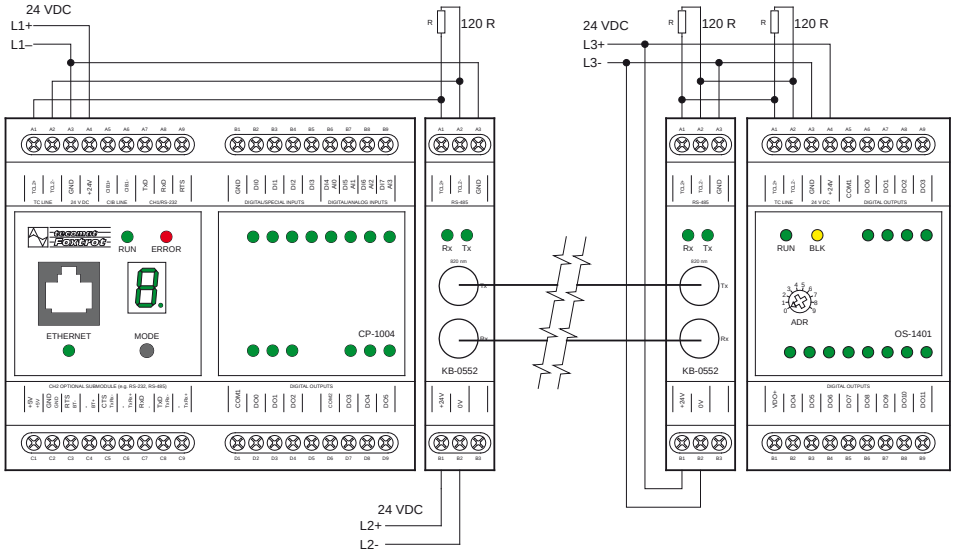
Connection

- The module is connected to the power supply and TCL2 bus by screw-type terminals.
- A pair of optical fibres MM (multimode) is connected by ST connectors. The length of the optical cable is up to 1750 m.

Use

- A pair of KB-0552 modules allows to connect FOXTROT systeM-bus by optical fibres with ST connectors.
- The module is designated for installations where it is necessary to use galvanically separated connection that eliminates electromagnetic disturbance influence, it means mainly for outside installations, industrial plants etc.

Connection example



Communication

System I/O bus	1× TCL2 (RS-485, 345 kbps)
Fibre optic installation	Multimode, glass fibre, ST connector
Optical radiation wave length	820 nm
Ultimate operating range 62.5/125 mm	15 dB, min. 8 dB
Transmitter optical output	–12 dBm, min. –15 dBm
Total optical output	0.355 mW
Optical power input „log.0" 0 to +70°C	–24.0 ÷ –10.0 dBm
Optical power input „log.0" (25 °C)	–25.4 ÷ –9.2 dBm
Optical power input „log.1"	Max. –40 dBm

Optical cables – other parameters

Operating temparature	–40 ÷ 80°C
Temperature during installation	0 ÷ 70°C
Cable attenuation per 1 km of the length	3.5 dBm
Delay given by propagation velocity	5 ns/m
Cable extrinsic diameter (2 fibres)	3 ÷ 6 mm

Power supply

Power supply voltage (SELV)	+24V DC
Allowed range	–15 % ÷ +25 % (20.4 ÷ 30 V DC)
Max. input power	1.2 W
Galvanic isolation	No

Dimensions and weight

Dimensions	90 × 18 × 65 mm
Weight	75 g

Operational conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 20
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	On DIN rail
Optic fibre connection	Duplex 2×ST
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm²

Order number

TXN 105 52	KB-0552, TCL2 converter to multimode glass optic fibre

Communication Modules – Ethernet switch 10/100BaseTX

PRELIMINARY

Type	DI	DO	AI	AO	Comm
SX-1162					5× 10/100BaseTX

SX-1162

Basic features

- 5× UTP ports 10BaseT/100BaseTX according the standard IEEE 802.3.
- Housing designed for the DIN rail installation and into standard switchboards.
- Can be connected together to create bigger LAN.
- Protocol/functions supported.
  - All protocols based on Ethernet.
  - Auto-MDIX.
  - Internal table for 2000 MAC addresses.
  - Filter for non-valid packets.
  - Security functions according 802.1x.
  - Protection against broadcast and multicast storm (Port overflow).

Connecting

- RJ45 connector for standard UTP CAT5 cables.
- Screw terminals for 24 V DC power supply.

Use

- Switch is designed to create small LAN of devices compatible with 10/100baseTX just centralized in electrical switch board, together with FOXTROT basic modules

Communication

Standard	10/ 100base TX, IEEE 802.3
Number of ports	5× TX

Dimensions and weight

Dimensions	90 × 36 × 65 mm
Weight	75 g

Power supply

Power supply voltage(SELV)	+24 V DC / 40mA
Allowed range	–15 % ÷ +25 % (20,4 ÷ 30V DC)
Max. input power	1 W
Galvanic isolation	Yes, each port

Operating conditions

Operating temperature	0 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 10B
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	on DIN rail
Connections	5× RJ45 Power supply: screw terminals
Conductors cross-section	max. 2.5 mm^2

Order number

TXN 111 62	SX-1162, Ethernet switch, 5× 10/ 100base TX, IEE 802.3

Komunikace
Ethernet, GSM, modemy

LAN/Ethernet

SX-1162

105FX

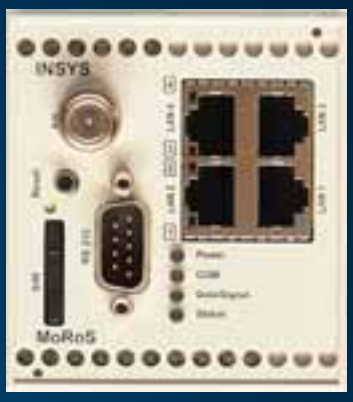
306FX2

GSM

GSM2-1

INSYS GSM

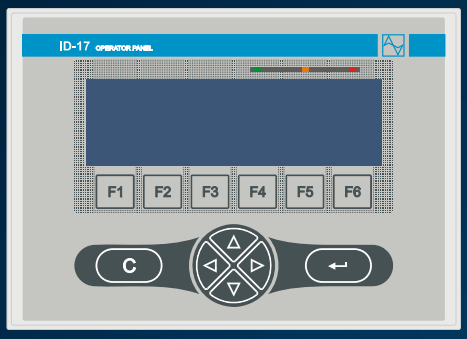
INSYS GPRS
Ethernet



MoRoS 1.3 Pro

Displays
Operating panels

ID-14



ID-17

ID-15, ID-25

Alphanumeric panel with LCD and keyboard

Type	DI	DO	AI	AO	Comm
ID-14					TCL2

ID-14

ID-14 + CP-1004

Basic features

- Alphanumeric operator panel for programmable controllers TECOMAT FOXTROT and TECOMAT TC700.
- It has monochromatic backlit LCD with 4×20 characters.
- Keyboard with 25 keys, 6 of them (F1-F6) can be used as user defined keys.
- There can be up to 4 panels ID-14 connected on the one TCL2 bus.
- Panel enables to display characters in following code pages: CP852, CP1250, CP1251 (Cyrillic), CP1252 and Kamenicky.
- Programming is done directly in MOSAIC in Panel Maker. PLC TECOMAT communicates with the panel using the TER (Terminal) functional block.

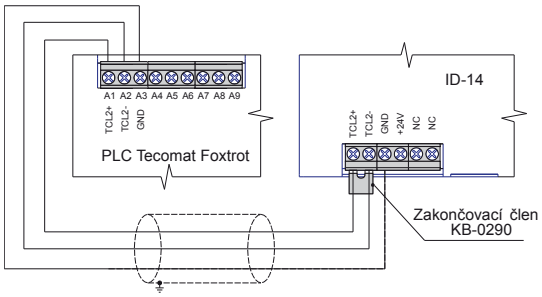
Connection

- It can be connected to central module by TCL2 bus up to 300 m via metallic cable.
- Using the fibre optic convertor, it can be connected up to 1.7 km!
- Panel ID-14 can be mechanically fixed with FOXTROT central module in one ensemble and can be placed in the door of control panel.
- The panel is connected to FOXTROT PLC directly through screw-type terminals and to the TC700 series PLC via terminal board KB-0220.
- Unique address on TCL2 bus must be set in the service mode using keyboard and display.

Use

- The operator panel is used for entering commands and parameters, displaying a system status and textual user messages.

Connection example



Connection scheme of more ID-14 to one line

Communication

System I/O bus	1× TCL2 (RS-485, 345 kbps) up to 300 m
Galvanic isolation of communication	No

Power supply

Power supply voltage(SELV)	+24 V DC
Allowed range	–15% +25% (20.4 ÷ 30 V DC)
Max. input power	3 W
Galvanic isolation of power supply	No

Display and keyboard

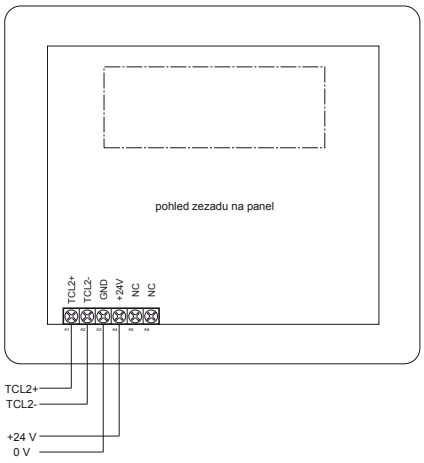
Size of characters	3.5 mm
Number of characters	4×20 characters
Keyboard	Membrane
Keys	25 keys 10× numeric 4× cursor 6× functional 5× other

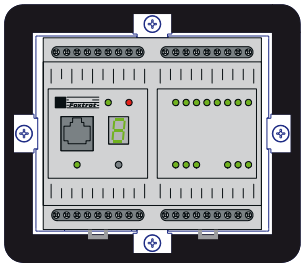
Dimensions and weight

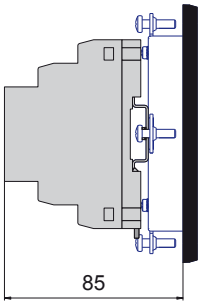
Dimensions	123 × 141 × 25 mm
Weight	560 g

Operational conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–20 ÷ +60 °C
IP Degree of protection IEC EN 60529	IP 54 – front panel IP 20 – whole product
Overvoltage category	II
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	In control panel doors On DIN rail with SM-9024
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm²







Order number

TXN 054 33	ID-14 display 4×20 characters, 25 keys, set for installation in the control panel doors
TXF 790 25	SM-9025 set for DIN rail installation on the ID-14 panel (for compact installation together with CP-100×)
TXF 790 24	SM-9024 set for ID-14 installation on the DIN rail (for installation inside the control panel)
TXN 102 20	KB-0220, terminal board for TCL2 bus connection to TC700

Graphic touchscreen color panels

Type	DI	DO	AI	AO	Comm
ID-15 (wall mounted)					Ethernet
ID-25 (for control panels)					Ethernet

Basic features

- Graphical panel with color touchscreen with VGA resolution.
- Low power input, without cooling, low heat radiation in closed spaces too, wide range operating temperature.
- Installed web browser. It can display built-in web pages in FOXTROT, TC700 and INELS systems or any page on the web after connection to Internet.
- ID-15 is designated for the installation on the wall where no access from other side is available. Electrical installation box KO110/L is a part of delivery. KO100E box for flush mounting can be used too.
- ID-25 is designated for installation in the control panel doors or there where the access from the back side is available.
- Other features are common for both panels.
- Panels are equipped with the color TFT display 5.7" with the resolution 640×480 pixels (VGA).
- The Corian front panel with dimensions 180×150 mm is delivered in black and white colors. Other colors and designs are possible on the basis of the special order.

Connection

- It is connected directly to Tecomat FOXTROT, TC700 or INELS CPUs via Ethernet 10/100 interface (RJ45 connector) or the LAN network by standard UTP cable (RJ45).
- Power supply 24 V DC is connected by screw terminals.

Use

- It is used where graphics with high resolution, space saving and low power consumption are necessary.
- It is designated mainly for local displaying of web pages stored in TECOMAT FOXTROT or TC700 created by WebMaker tool or in CU2-01 INELS CPU created by IDM configuration software.
- It is designated to interiors mainly as a comfortable Room/ House manager in the living rooms, office rooms etc.
- It can be used as a free programmable display with Linux operating system.

ID-15

ID-15

ID-25

ID-25

Examples of pages created in WebMaker

Display

Display type	Color TFT LCD
Display size	5,7" (180 ×150 mm)
Resolution	VGA (640 × 480)
Keyboard	Touchscreen

Power supply

Power supply voltage(SELV)	+24 V DC/ 200 mA
Allowed range	–15% +25% (20.4 ÷ 30 V DC)
Max. input power	5 W with full backlit
Galvanic isolation of power supply	No

Communication

Interface	Ethernet 10/100baseTX, IEEE 802.3
Galvanic isolation of communication	Yes

Dimensions and weight

Dimensions	180 × 150 × 55 mm
Weight	1015 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 10B
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	ID-15: Into installation box ID-25: Into control panel
Connections	Ethernet: RJ45 Power supply: Screw-type terminals
Conductors cross-section	max. 2.5 mm^2

Order number

TXN 054 34	ID-15; 5.7" TFT 640×480; touchscreen; 100/10 Ethernet; built into the wall
TXN 054 36	ID-25; 5.7" TFT 640×480; touchscreen; 100/10 Ethernet; built into the control panel

Graphic panel with keyboard

PRELIMINARY

Type	DI	RO	AI	AO	Comm
ID-17	**4**	**2**			TCL2

ID-17

Basic features

- Graphic operator panel used for programmable controllers TECOMAT FOXTROT and TECOMAT TC700.
- It is equipped with monochromatic (blue) backlit LCD with 240×64 pixels.
- Keyboard with 12 keys, 6 of them (F1 - F6) can be used as user defined keys.
- Equipped with 4 binary inputs 24 V DC – for example for external buttons.
- Equipped with 2 relay outputs (up to 230 V AC) – for example for siren.
- Internal memory for control files 2 MB.
- Support for multilanguage objects/texts – up to 15
- Available code pages/fonts
  - CP1250, Central European
  - CP1251, Cyrillic
  - CP1252, Western European
  - CP1253, Greek
  - User fonts – defined by the user – big digits, own symbols

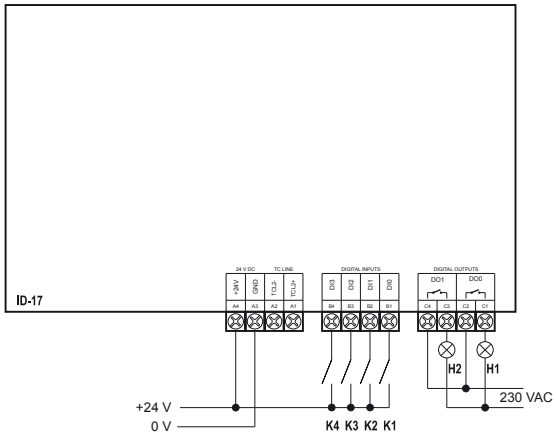
Connection

- It can be connected to central module by TCL2 bus up to 300 m via metallic cable.
- Using the fibre optic convertor, it can be connected up to 1.7 km!
- Unique address on TCL2 bus can be set in the service mode using keyboard and display.
- It is possible to connect 1 graphical display ID-17 to the internal bus TCL2 that does not increase number of peripheral I/O modules.

Use

- The operator panel is used for entering commands and parameters, displaying a system status and textual user messages.
- Graphics is created with GPMaker – an integrated part of Mosaic
- Available objects:
  - Static/ dynamic text
  - Static/dynamic/animated image
  - Container – multipage image
  - Display – value viewing
  - Password
- Managers:
  - Images
- Fonts
- Foreign-language texts

Connection example



Display

Display size	127 × 33 mm
Resolution, color	240 × 64, white on blue background
Keyboard	Membrane
Keys number	12×: 4× cursor, 1×Clear, 1×Enter, 6× for user defined functions

Communication

System I/O bus	1× TCL2 (RS-485, 345 kbps)
Galvanic isolation of communication	No

Relay outputs

No. of outputs	2
Galvanic isolation	Yes
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

Binary inputs

No. of inputs	4
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; (+15 ÷ +30 V DC)
Input current for log.1 (IH):	typ. 5 mA
Delay 0 –> 1/1 –> 0	5ms/ 5ms

Power supply

Power supply voltage(SELV)	+24 VDC/ 70 mA
Allowed range	–15 % +25 % (20.4 ÷ 30 V DC)
Max. input power	2 W
Galvanic isolation	No

Dimensions and weight

Dimensions	143 × 202 × 36 mm
Weight	1100 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 10B
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	In the control panel
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm²

Order number

TXN 054 37	ID-17, Graphic operator panel, monochrom LCD, 240×64 px, 12 keys

CIB
electrical installation bus

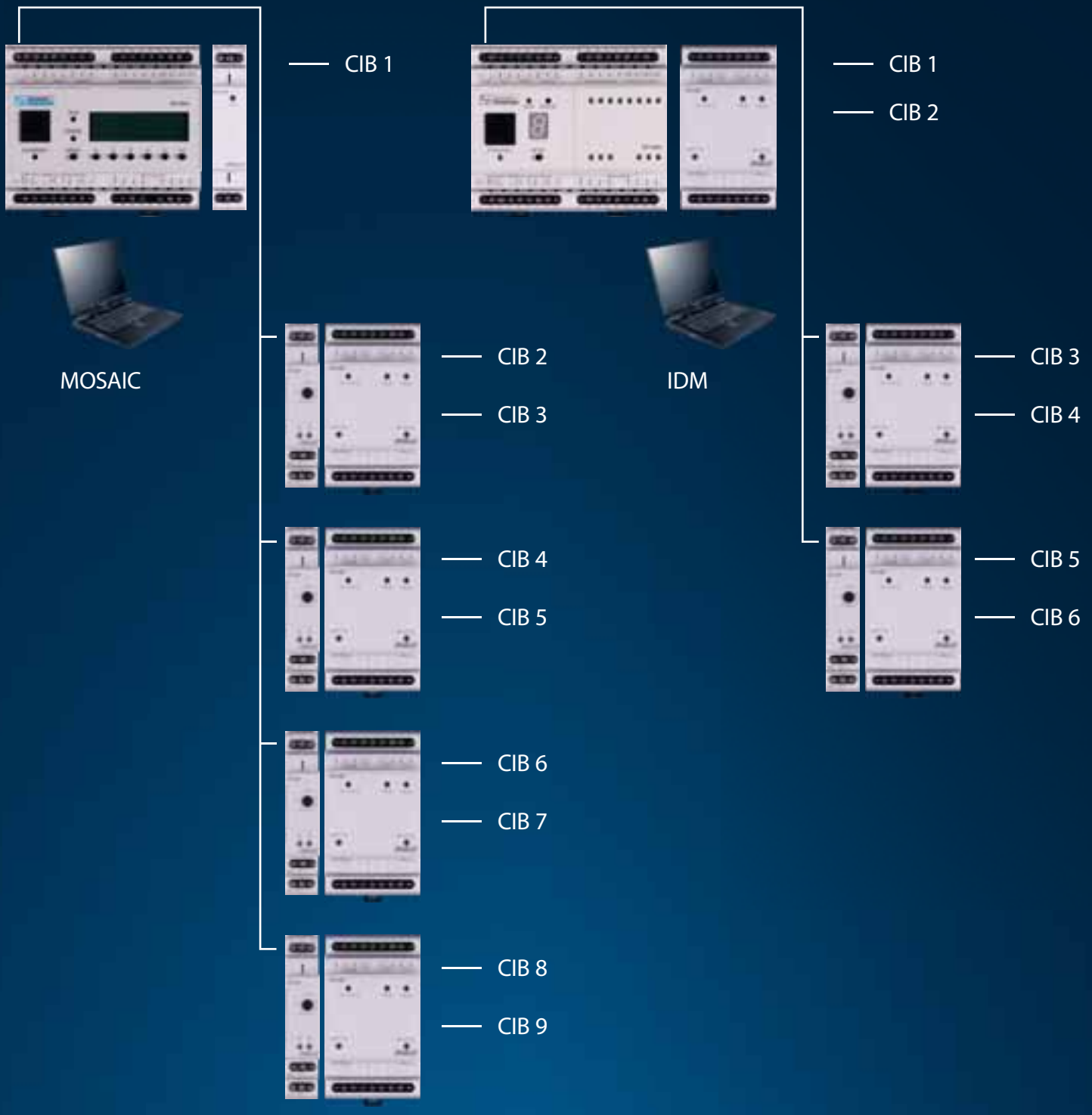
CIB is supported by FOXTROT and INELS central units.

FOXTROT

- up to 9 branches
- free programming in MOSAIC

INELS

- up to 6 branches
- parameterization in IDM



CIB
Common Installation Bus

- Teco company came in 2007 on the market with new concept of building control system based on the principle of centralized management of peripheral units connected to the system as simple as possible, only by two wires and any topology.
- We optimized the protocol of this bus so that bus guaranteed response time was from the entry through the central module to output to 150 ms at full occupancy. Period which is shorter than 300 ms people do not feel as a delay. Therefore this solution is suitable for example to light control.
- CIB bus is not limited to buildings and electrical installation by its concept but it can be used anywhere in the industrial control where the response to 150 ms is enough.
- This concept we call CIB – Common Installation Bus and we fully integrated it into the Foxtrot PLC central units and in agreement with the ELKO EP Ltd. into a joint project INELS II which took the company ELKO EP as the innovation of the INELS system first generation.
- Teco company is a supplier of both central units and the communication firmware of all INELS II units. Teco guarantees the compatibility of both systems Foxtrot and INELS with the CIB.
- The company Teco a.s. is a supplier of an assortment of the system INELS II compatible with the CIB.

CIB units
Interior control modules
basic assortment

RCM2

WSB2-20

WSB2-40

WSB2-80

CIB interior control module

Type	DI	DO	AI	AO	Comm
RCM2-01			2		CIB

Basic features

- Device is designed as an interior device for monitoring and setting the required temperature and other values as a Room Control Manager.
- It has the LCD to display one value - temperature, time, humidity, velocity etc. and the amount of graphic icons frequently used for heating, ventilation and air-conditioning (HVAC).
- Moving through the menu and settings are performed by rotary element with the pushbutton for acknowledgement.
- Built-in temperature sensor. The additional temperature sensor can be connected. It can be placed on most suitable place in the room.
- The device is fully free programmable through the MOSAIC/ Foxtrot. Programmer can control any icon as a binary output and the displayed number as numerical value. The unit will give the information about the rotation and click on pushbutton.

Connecting

- The device is to be wired by two wires of CIB, which provide both power supply and communication channel.
- The device is for mounting on the wall on the flush box.

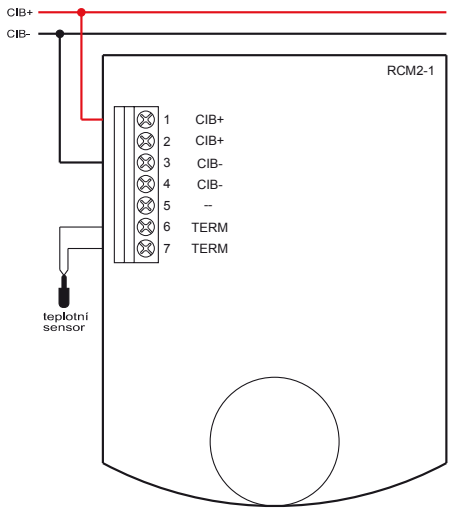
Use

- As a Room Control Manager to each room or space where individual control of temperature and air ventilation is required.

RCM2-01

RCM2-01

Connection example



Control

Display	LCD with the number and set of graphic icons useful in HVAC area.
Control element	Rotary encoder with pushbutton (for mode selection or setting the correction etc.)

Analog inputs

Inputs	1× internal sensor 1× NTC 12k external temperature sensor
Range of measured temperature	0 ÷ + 45 °C
Accuracy	± 0.6 °C

Power supply/Communication

Power supply	Bus CIB/ 24 V (27 V)
Current consumption	17 mA

Dimensions and weight

Dimensions	90 × 115 × 39 mm
Weight	130 g

Operating conditions

Operating temperature	0 ÷ +60 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 20
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	Any
Installation	On the wall
Connections	screw terminals
Conductors cross-section	max. 2.5 mm²

Order number

TXN 131 57	RCM2-01, CIB, interior room control unit

CIB – flush mounted group pushbuttons (design ELEGANT)

Type	DI	DO	AI	AO	Comm
WSB2-20	**2**	**2 LED**	**1**		CIB
WSB2-40	**4**	**4 LED**	**1**		CIB
WSB2-80	**8**	**8 LED**	**1**		CIB

Basic features

- The wall switches with push-buttons.
- Each element has one push button in upper and one pus-button in lower part.
- Each element has 2 LED indicators. Red one and green one.
- Devices are delivered in 1, 2 and 4 gang versions.
- It is possible to assign any meaning to each push button and each LED. System can evaluate e.g. the length of pressing.
- The sequence of commands can be assigned to one click: e.g. to draw the blinds, Light on, setting the level of light intensity by the dimmer. Switch the TV on.
- There is the internal temperature sensor in all versions.

Connecting

- The device is to be wired by two wires of CIB, which provide both power supply and communication channel.
- The device is for mounting on the wall in the flush box.

Use

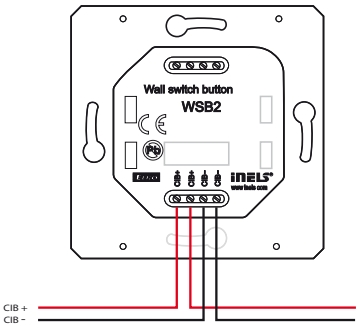
- The basic sensor device is used as a general purpose device for setting the binary (on/off) information.
- The WSB2 devices are compatible with design ELEGANT and can be combined with the frames of this family.

WSB2-20

WSB2-40

WSB2-80

Connection example



Binary inputs	WSB2-20	WSB2-40	WSB2-80
Input type	2× Push-button	4× Push-button	8× Push-button

Analog inputs	WSB2-20	WSB2-40	WSB2-80
Input type	Built-in temperature sensor	Built-in temperature sensor	Built-in temperature sensor

Binary outputs	WSB2-20	WSB2-40	WSB2-80
Input type	1× red LED, 1× green LED	2× red LED, 2× green LED	4× red LED, 4× green LED

Power supply	WSB2-20	WSB2-40	WSB2-80
Power supply communication	24 V (27 V) from the bus CIB	24V (27 V) from the bus CIB	24 V (27 V) from the bus CIB
Current consumption	25 mA	25 mA	25 mA

Dimensions and weight	WSB2-20	WSB2-40	WSB2-80
Dimensions	84 × 89 × 30 mm	84 × 89 × 30 mm	84 × 89 × 30 mm
Weight	68 g	68 g	70 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 20
Overvoltage Category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	On the wall, flush mounted
Connections	screw terminals
Conductors cross-section:	0.5 ÷ 1 mm^2

Teco a. s. supplies units under the name INELS

Order number

WSB2-20	WSB2-20, CIB, push buttons – 2 gang
WSB2-40	WSB2-40, CIB, push buttons – 4 gang
WSB2-80	WSB2-80, CIB, push buttons – 8 gang

CIB units
for mounting into the flush box

Inputs

IB2-20B

IB2-40B

IB2-80B

Switching

SA2-01B

SA2-02B

Dimming

LM2-11B

DAC2-04B

CIB – flush mounted input modules

Type	DI	DO	AI	AO	Comm
IM2-20B	2×		1		CIB
IM2-40B	4×		1		CIB
IM2-80B	8×		1		CIB

Basic features

- Device is designed to connect and sensing other device with potential free output contact.
- Several inputs on each device can be used as balanced or double balanced inputs for security detectors. It enables to recognize 4 situations: no alarm, alarm, broken circuit and tamper.
- On board power supply 12 V DC can be used for local supplying of security sensors.
- Input for external temperature sensor.
- Status of Run/Error is indicated by the LED on the front panel.

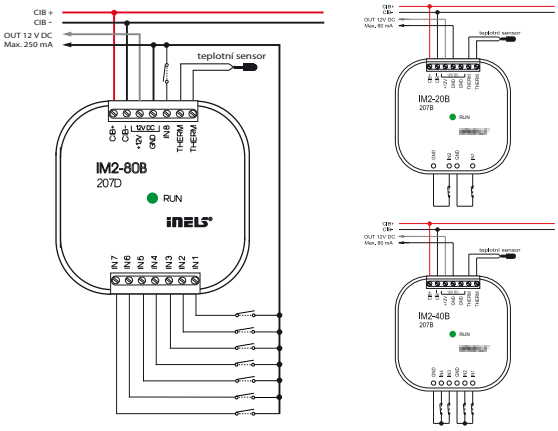
Connecting

- The device is to by wired be two wires of CIB, which provide both the power supply and communication channel.
- The device is for mounting into the flush box.

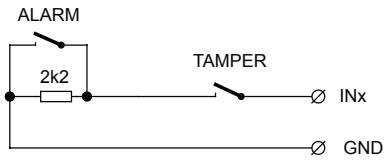
Use

- Sensing any device with potential free output contact like standard wall switches or push-buttons of any design, security sensors, fire detectors etc.

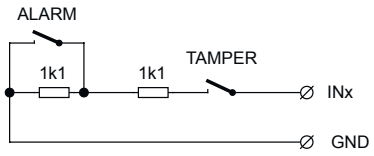
Connection example



Connecting balanced inputs



Connecting double balanced inputs



Binary inputs	IM2-20B 2× (IN1– IN2)	IM2-40B 4× (IN1–IN4)	IM2-80B 8× (IN1–IN8)
Input type	2× potential free contact	4× potential free contact	8× potential free contact
Balanced inputs	2× (IN1÷IN2)	2× (IN1÷IN2)	5× (IN1÷IN5)

Analog inputs	IM2-20B (THERM)	IM2-40B (THERM)	IM2-80B (THERM)
Input type	External temperature sensor NTC 12 k	External temperature sensor NTC 12 k	External temperature sensor NTC 12 k
Measurement range	–20 ÷ 100 °C	–20 ÷ 100 °C	–20 ÷ 100 °C
Accuracy	0.8 °C	0.8 °C	0.8 °C

Power supply/Communication	IM2-20B	IM2-40B	IM2-80B
Power supply/communication	24 V (27 V) from the bus CIB	24 V (27 V) from the bus CIB	24 V (27 V) from the bus CIB
On board local power supply	12 V DC for sensors	12 V DC for sensors	12 V DC for sensors
Current consumption	25 mA	25 mA	25 mA
Current consumption with full load on 12 V DC on board supply	60 mA	60 mA	100 mA

Dimensions and weight	IM2-20B	IM2-40B	IM2-80B
Dimensions	49 × 49 × 13 mm	49 × 49 × 13 mm	49 × 49 × 13 mm
Weight	30 g	32 g	24 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 30
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	Any
Installation	Flush mounted
Connections	screw terminals
Conductors cross-section	max. 2.5 mm²

Teco a.s. supplies units under the name INELS

Order number

IM2-20B	IM2-20B, CIB, 2×DI for dry contacts, 2 of them balanced, external temperature sensor
IM2-40B	IM2-40B, CIB, 4×DI for dry contacts, 2 of them balanced, external temperature sensor
IM2-80B	IM2-80B, CIB, 8×DI for dry contacts, 2 of them balanced, external temperature sensor

IM2-20B

IM2-40B

IM2-80B

CIB – flush mounted relay outputs

Type	DI	DO	AI	AO	Comm
SA2-01B		1×	1×		CIB
SA2-02B		2×	1×		CIB

Basic features

- Switching actuators with one resp. two relay NO contacts (NO – normally open) to switch-on/off the load.
- Each relay output is independently addressable and controlled.
- Input for external temperature sensor.
- Status of Run/Error is indicated by the LED on the front panel.

Connecting

- The device is connected by two wires of CIB, which provide both the power supply and communication channel.
- The device is designed for mounting into the flush box.

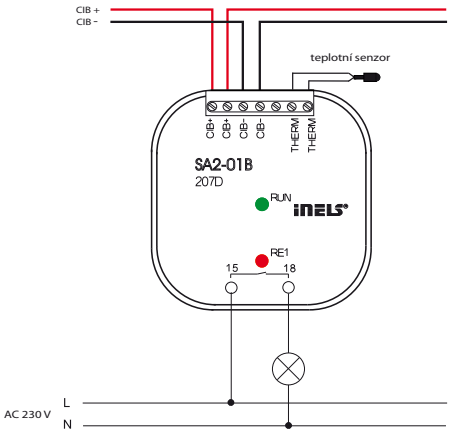
Use

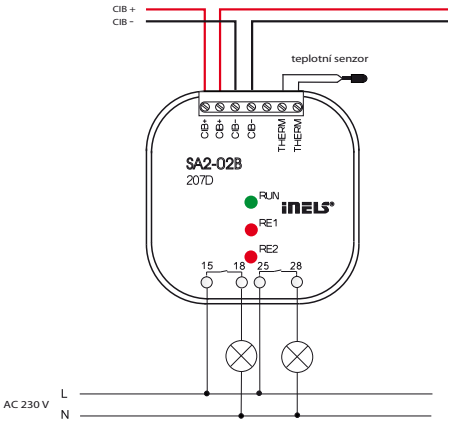
- The device is suitable where one or two contacts has to be controlled on the long distance with minimum wiring work.
- The care must be taken in the project and the max current and the protection of contacts for different type of loads bust be taken into account.

SA2-01B

SA2-02B

Connection example





Relay Outputs	SA2-01B	SA2-01B
No. of outputs	1× normally open contacts 16A/AC1	2× normally open contacts 8A/AC1
Galvanic isolation	Yes	yes
Switched voltage	min. 5 V DC; max. 250 V AC	min. 5 V DC; max. 250 V AC
Switched load	4000 VA/ AC1, 384 W/DC	2000 VA/ AC1, 192 W/DC
Peak current	30 A/ <3s	30 A/ <3s
Time of close/open the contact	typ. 10 ms/ 4 ms	typ. 10 ms/ 4 ms
Min. switched current	100 mA	100 mA
Switching frequency without load	max. 1200 min^{-1}	max. 1200 min^{-1}
Switching frequency with rated load	max. 6 min^{-1}	max. 6 min^{-1}
Mechanical lifetime at max load	30 mil. switchings	30 mil. switchings
Electrical lifetime at max load	70 000 switchings	70 000 switchings
Short-circuit protection	None	None
Spike suppressor of inductive load	External RC, varistor or diode snubber	External RC, varistor or diode snubber
Insulation voltage between relay outputs	1000 V AC	1000 V AC

Analog inputs	SA2-01B	SA2-02B
Input type	External temperature sensor NTC 12 k	External temperature sensor NTC 12 k
Measurement range	–20 ÷ 100 °C	–20 ÷ 100 °C
Accuracy	0.8 °C	0.8 °C

Power supply/ Communication	SA2-01B	SA2-02B
Power supply communication	24 V (27 V) from the bus CIB	24 V (27 V) from the bus CIB
On board local power supply	12 V DC for sensors	12 V DC for sensors
Current consumption	40 mA	60 mA

Operating conditions	
Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 30
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	Any
Installation	Flush mounted
Connections	screw terminals
Conductors cross-section	max. 2.5 mm^2
Relay output wires	2× (4×) wire 2.5 mm^2

Dimensions and weight

	SA2-01B	SA2-02B
Dimensions	49 × 49 × 21 mm	49 × 49 × 21 mm
Weight	43 g	63 g

Teco a.s. supplies units under the name INELS

Order number

SA2-01B	SA2-01B, CIB, 1 channel output – 1× relay contact NO 16A, indication of output status, contact $AgSnO_2$
SA2-01B/Ni	SA2-01B/Ni, CIB, 1 channel output – 1× relay contact NO 8A, indication of output status, contact AgNi
SA2-02B	SA2-02B, CIB, 2 channel output – 2× relay contact NO 16A, indication of output status, contact $AgSnO_2$
SA2-02B/Ni	SA2-02B/Ni, CIB, 2 channel output – 2× relay contact NO 8A, indication of output status, contact AgNi

CIB – flush mounted dimming unit

Type	DI	DO	AI	AO	Comm
LM2-11B	**1 (230 V AC)**		**1**	**1 (230 V AC)**	CIB

LM2-11B

Basic features

- 1-channel dimming unit is designated for dimming and switching RLC loads.
- The unit supports an autodetection of load type.
- It is equipped with 1 input 230 V AC and 1 semiconductor switched output 230 V AC.
- Maximum output power is 250 VA.
- It is equipped with reversible electronic fuse.
- The unit allows to measure the temperature using an external NTC thermistor connected to THERM input.
- The unit status is indicated by LED.

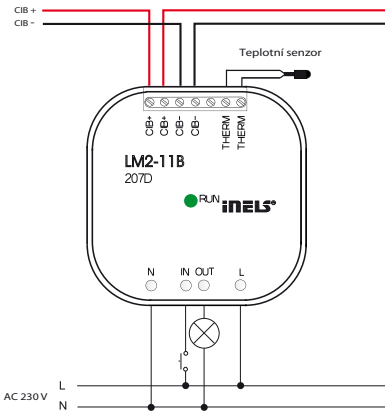
Connection

- The unit is connected by two wires of CIB, which provide both the power supply and communication channel.

Usage

- Dimming and switching of resistive, inductive or capacitive loads.
- It is used for creating of lighting scenes and transitions using continuous dimming and switching on.
- The unit seems to be an analog output for the CPU. The intensity of light and speed of building-up or slowing down.
- Inputs THERM allow to place an external temperature sensor to the space on requested place.

Connection example



Binary input

Input type	1× (IN)
	230 V AC

Analog input

Sensor type	1× (THERM)
Range	NTC thermistor
Accuracy	–20 ÷ 100°C
	0.8 °C

Analog output

Output type	1× 230 V AC, 0–100 % switched semiconductor
Load type	Resistive (bulb, halogen bulb 230 V), inductive (classic transformer for halogens) capacitive (electronic transformer for halogens)
Minimum switched output	10 VA
Maximum switched output	250 VA
Protection	Internal electronic reversible fuse
Galvanic isolation of output	yes
Isolation voltage between output and internal circuits	SELV according to EN 60950

Power supply

Power supply and communication	24 V (27 V) from CIB bus
Rated current	25 mA

Dimensions and weight

Dimensions	49 × 49 × 21 mm
Weight	45 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP30
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	Into electrical installation box
Connections	Screw terminals
Conductors cross-section	max. 1 mm²
Power input/output	4× wire 0.5 mm²

Teco a.s. supplies units under the name INELS

Order number

LM2-11B	LM2-11B, CIB, Dimming module, 1× 250 VA, external temperature sensor

CIB – flush mounted analog outputs

Type	DI	DO	AI	AO	Comm
DAC2-04B			**1×**	**4×**	CIB

DAC2-04B

Basic features

- Module with 4 independent voltage outputs 0–10 V or 1–10 V.
- Each analog output is independently addressable and controlled.
- Input for external NTC temperature sensor.
- Status of Run/Error is indicated by the LED on the front panel.

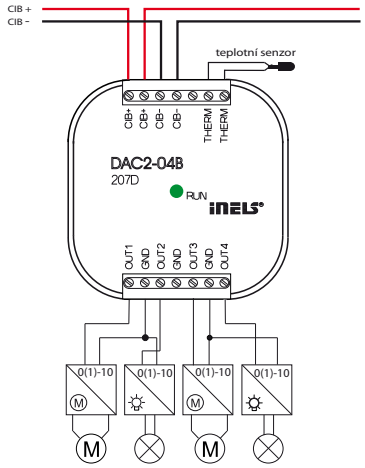
Connecting

- The module is connected by two wires of CIB, which provide both the power supply and communication channel.
- The module is designed for mounting into the flush box.

Use

- For control the device, where analog input is main control signal like:
  – Electronic ballast and dimmers for luminescent lamps
  – Thermo drives
  – Continuously controlled valves
  – Drives

Connection example



Analog outputs

Output range	1÷10 V or 0÷10 V
Output current	10 mA

Analog inputs 1× (THERM)

Input type	1× External temperature sensor NTC 12 k
Measurement range	–20 ÷ 100 °C
Accuracy	0.8 °C

Dimensions and weight

Dimensions	49 × 49 × 13 mm
Weight	33 g

Power supply/ Communication

Power supply communication	24 V (27 V) from the bus CIB
Current consumption	50 mA

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
IP Degree of protection IEC EN 60529	IP 20, IP40 covered in switchboard
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	flush mounting boxes
Connections	screw terminals
Conductors cross-section	max. 1 mm²

Teco a.s. supplies units under the name INELS

Order number

DAC2-04B	DAC2-04B, CIB, 4× AO, converter digital-analog 0(1) – 10 V

CIB units
for mounting on DIN rail

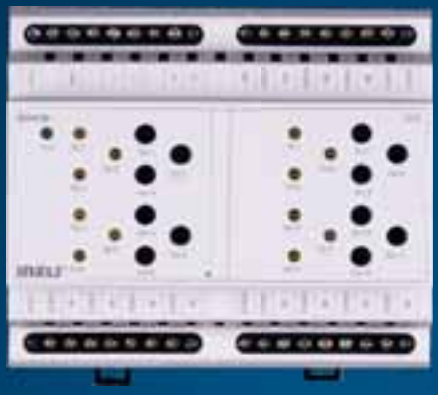
Inputs

IM2-140M

Switching

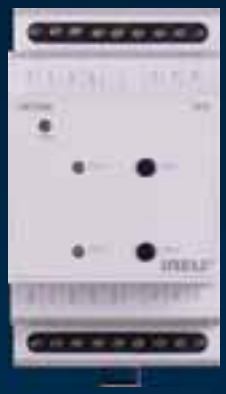
SA2-02M

SA2-04M



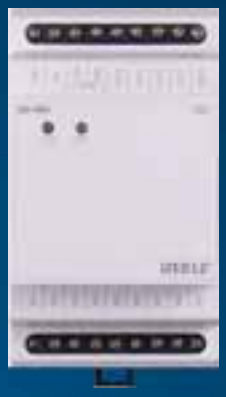
SA2-012M

Dimming



LBC2-02M

DA2-22M



DAC2-04M

CIB – DIN rail mounted input module

Type	DI	DO	AI	AO	Comm
IM2-140M	14×		1		CIB

IM2-140M

Basic features

- Device is designed to connect and sensing other device with potential free output contact.
- Several inputs on each device can be used as balanced or double balanced inputs for security detectors. It enables to recognize 4 situations: no alarm, alarm, broken circuit and tamper.
- On board power supply 12 V DC can be used for local supplying of security sensors.
- Status of Run/Error is indicated by the LED on the front panel.

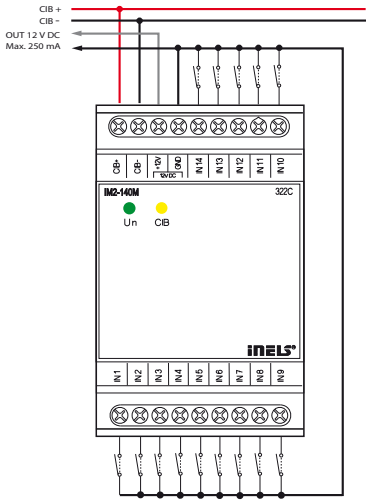
Connecting

- The device is to by wired be two wires of CIB, which provide both the power supply and communication channel.
- The device is for mounting on DIN rail in standard cabinets for circuit breakers.

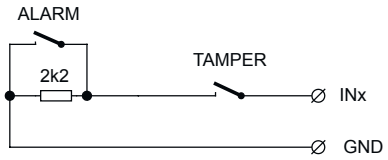
Use

- For centralized style of installation, where all sensors are wired into cabinet with the DIN rail
- Sensing any device with potential free output contact like standard wall switches or push-buttons of any design, security sensors, fire detectors etc.

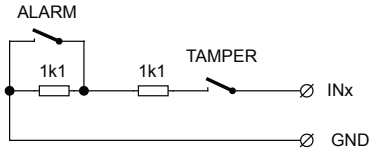
Connection example



Connecting balanced inputs



Connecting double balanced inputs



Binary inputs

	4× (IN1 ÷ IN14)
Input type	Potential free contact
Ballanced inputs	7× (IN1÷IN7)

Power supply/Communication

Power supply communication	24 V (27 V) from the bus CIB
On board local power supply	12 V DC/150 mA for sensors
Current consumption	25 mA
Current consumption with full load on 12 V DC on board supply	100 mA

Dimensions and weight

Dimensions	90 × 52 × 65 mm
Weight	100 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 30
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	Any
Installation	On DIN Rail
Connections	screw terminals
Conductors cross-section	max. 2.5 mm²

Teco a.s. supplies units under the name INELS

Order number

IM2-140M	IM2-140M, CIB, 14×IN universal inputs, 7 of them balanced

CIB –DIN rail mounted relay outputs

Type	DI	DO	AI	AO	Comm
SA2-02M		2×			CIB
SA2-04M		4×			CIB
SA2-012M		12×			CIB

Basic features

- The modules are designed to switch independent loads by the relay contact.
- Modules SA2-02M and SA2-04M have both NO/NC contacts (NO – normally open, NC – normally closed).
- Module SA2-012M has 3 groups of relays with one common pole and NO contacts.
- Each relay output is independently addressable and controlled.
- Each relay has its own push button on the front panel. It can be used to change the status of relay contact in mode without communication on CIB.
- In mode of communication, the push buttons are evaluated by the program as independent inputs.
- Each module is available with contacts AgSb for 16 A and AgNi for 8 A of switching current.
- Status of Run/Error is indicated by the LED on the front panel.

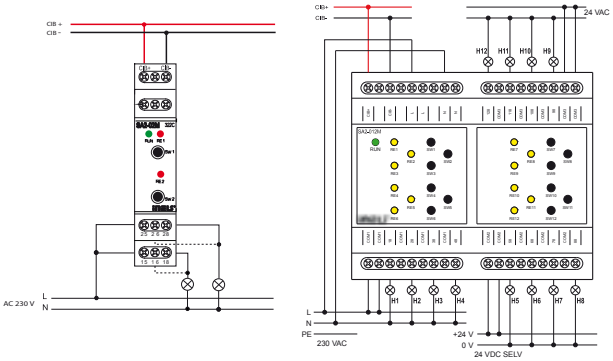
Connecting

- SA2-02M a SA2-04M are connected by two wires of CIB, which provide both the power supply and communication channel.
- SA2-012M must be connected to the power line 230 V AC to be supplied. CIB is used only for communication.
- The device is designed for mounting on the DIN rail.

Use

- The device is suitable to switch on/off the R, L, C loads.
- They are used for installations with central switchboard cabinet where all loads are connected to it in star topology.
- The care must be taken in the project and the max current and the protection of contacts for different type of loads must be taken into account.

Connection example



Binary inputs	SA2-02M	SA2-04M	SA2-012M
Type of input	2× push-button	4× push-button	12× push-button

Power supply	SA2-02M	SA2-04M	SA2-012M
Power supply communication	24 V (27 V) from the bus CIB	24 V (27 V) from the bus CIB	230 V AC
On board local power supply	12 V DC for sensors	12 V DC for sensors	12 V DC for sensors
Current consumption	55 mA	100 mA	50 mA

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 20, IP-40 in the covered cabinet
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	Any
Installation	On DIN rail
Connections	screw terminals
Conductors cross-section	max. 2,5 mm²

Relay Outputs	SA2-02M	SA2-04M	SA2-012M
No. of outputs	2× NO/NC contacts 16 A/AC1	4× NO/NC contacts 16 A/AC1	12× NO contacts 8 A/AC1
Galvanic isolation	yes	yes	yes
Switched voltage	min. 5 V DC; max. 250 V AC	min. 5 V DC; max. 250 V AC	min. 5 V DC; max. 250 V AC
Switched load	4000 VA/AC1, 384 W/DC	4000 VA/AC1, 384 W/DC	2000 VA/AC1, 240 W/DC
Peak current	30 A/ <3s	30 A/ <3s	20 A/ <3s
Time of close/open the contact	typ. 10 ms/ 4 ms	typ. 10 ms/ 4 ms	typ. 10 ms/ 4 ms
Min. switched current	100 mA	100 mA	10 mA
Switching frequency without load	max. 1200 min^{-1}	max. 1200 min^{-1}	max. 300 min^{-1}
Switching frequency with rated load	max. 6 min^{-1}	max. 6 min^{-1}	max. 15 min^{-1}
Mechanical lifetime at max load	30 mil. switchings	30 mil. switchings	10 mil. switchings
Electrical lifetime at max load	70 000 switchings	70 000 switchings	100 000 switchings
Short-circuit protection	None	None	None
Spike suppressor of inductive load	External RC, varistor or diode snubber	External RC, varistor or diode snubber	External RC, varistor or diode snubber
Insulation voltage between relay outputs	1000 V AC	1000 V AC	1000 V AC

Dimensions and weight	SA2-02M	SA2-04M	SA2-012M
Dimensions	90 × 18 × 65 mm	90 × 52 × 65 mm	90 × 105 × 65 mm
Weight	82 g	161 g	440 g

Teco a.s. supplies units under the name INELS

Order number

SA2-02M	SA2-02M, CIB, 2× relay contact NO/NC 16A, manual control, contact $AgSnO_2$
SA2-02M/Ni	SA2-02M/Ni, CIB, 2× relay contact NO/NC 8A, manual control, contact AgNi
SA2-04M	SA2-04M, CIB, 4× relay contact NO/NC 16A, manual control, contact $AgSnO_2$
SA2-04M/Ni	SA2-04M/Ni, CIB,4× relay contact NO/NC 8A, manual control, contact AgNi
SA2-012M	SA2-012M, CIB, 12× relay contact NO 8A, manual control,contact $AgSnO_2$

SA2-02M

SA2-04M

SA2-012M

CIB – DIN rail mounted 2-channel operating unit

Type	DI	DO	AI	AO	Comm
LBC2-02M	**2 (buttons)**	**2**		**2**	CIB

LBC2-02M

Basic features

- 2-channel operating unit is designated for dimming and switching dimmable lamp ballasts by analog output 1–10 V.
- Each channel 1–10 V is addressed and operated separately.
- It contains 2 relay outputs for switching ballast power supply. The relay switching is controlled depending on output voltage 1–10 V.
- Maximum output power is 16 A/ 4 kVA/ AC1 per contact.
- Both channels can be controlled by buttons in case that the unit is not connected to CIB.
- The channel status (switched on/off) and unit status (run/ error) are indicated by LED.

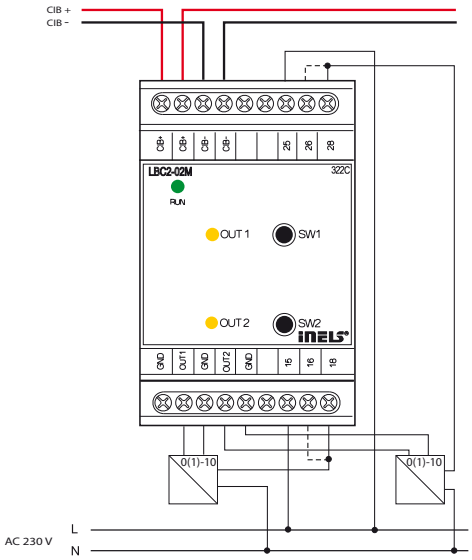
Connection

- The unit is connected by two wires of CIB, which provide both the power supply and communication channel.
- For outputs connection see figure/scheme.

Usage

- Dimming and switching of dimmable tube/ lamp ballasts.
- It is used for creating of lighting scenes and transitions using fluent dimming and switching on.
- The unit seems to be an analog output for the CPU. The intensity of light and speed of building-up or slowing down.

Connection example



Binary input

Input type	2 × button on front panel

Analog output

Range	2× 1 ÷ 10 V
Output current	2× 10 mA

Relay outputs

No. of outputs	2× NO/NC contacts – 16 A/AC1
Operation	Depending on output 1–10 V
Galvanic isolation	Yes
Switched voltage	250 V AC1
Switched power	4000 VA/ AC1, 384 W/ DC
Short-term output overload	30 A/ <3s
Min. switched current	100 mA
Switching frequency without load	max. 1200 min^{-1}
Switching frequency with rated load	max. 6 min^{-1}
Mechanical/ Electrical lifetime at max. load	30 mil. /70 000 switchings
Insulation voltage between relay outputs	1000 V AC

Power supply

Power supply and communication	24 V (27 V) from CIB bus
Rated current	60 mA

Dimensions and weight

Dimensions	90 × 52 × 65 mm
Weight	129 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 20, IP40 in the covered cabinet
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	In the control panel on DIN rail
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm^2

Teco a.s. supplies units under the name INELS

Order number

LBC2-02M	LBC2-02M, CIB, 2-channel unit for the operation of dimming lamp ballasts

CIB – DIN rail mounted 2-channel dimming unit

Type	DI	DO	AI	AO	Comm
DA2-22M	**2 (230 V AC)**			**2 (230 V AC)**	CIB

DA2-22M

Basic features

- 2-channel dimming unit is designated for dimming and swtching RLC loads.
- The unit supports an autodetection of load type.Jednotka podporuje autodetekci typu zátěže.
- It is equipped with 2 inputs 230 V AC and 2 semiconductor outputs 230 V AC.
- Maximum output power is 500 VA per output/channel.
- Both channels can be controlled by buttons in case that the unit is not connected to CIB.
- The unit allows to measure the temperature using an external NTC thermistor connected to THERM input.
- The channel status (switched on/off) and unit status (run/error) are indicated by LED.

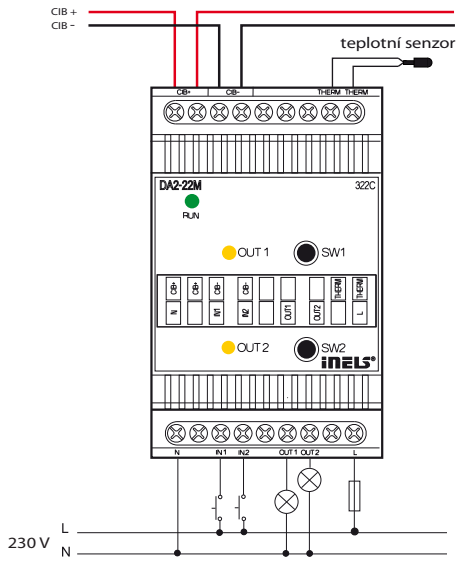
Connection

- The unit is connected by two wires of CIB, which provide both the power supply and communication channel.
- The potential L must be protected by external protection element according to the load type.

Usage

- Dimming and switching of resistive, inductive or capacitive loads.
- It is used for creating of lighting scenes and transitions using continuous dimming and switching on.
- The unit seems to be an analog output for the CPU. The intensity of light and speed of building-up or slowing down.
- Inputs THERM allow to designer to place an external temperature sensor to the space on requested place.

Connection example



Binary input	2× (IN1, IN2)
Input type	2× 230 V AC

Analog input	1× (THERM)
Sensor type	NTC thermistor
Range	+15 ÷ +35 °C
Accuracy	0.3 °C

Analog output	
Output type	2× 230 V AC, 0–100 % switched semiconductor
Load type	Resistive (bulb, halogen bulb 230 V) Inductive (classic transformer for halogens) Capacitive (electronic transformer for halogens)
Minimum switched output	10 VA
Maximum switched output	2 × 500 VA
Galvanic isolation of output	yes
Isolation voltage between output and internal circuits	SELV according to EN 60950

Power supply	
Power supply and communication	24 V (27 V) from CIB bus
Rated current	30 mA

Dimensions and weight	
Dimensions	90 × 52 × 65 mm
Weight	136 g

Operating conditions	
Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
Electric strength	according EN 60950
IP Degree of protection IEC EN 60529	IP 20, IP40 in the covered cabinet
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	In the control panel at DIN rail
Connections	Screw terminals
Conductors cross-section	max. 2.5 mm²

Teco a.s. supplies units under the name INELS

Order number

DA2-22M	DA2-22M, CIB, 2 × AO for dimming/ switching 500 W per channel, 2 × DI, external temperature sensor

CIB – DIN rail mounted analog outputs

Type	DI	DO	AI	AO	Comm
DAC2-04M				**4**	CIB

DAC2-04M

Basic features

- Module with 4 independent voltage outputs 0 ÷ 10 V or 1÷10 V
- Each analog output is independently addressable and controlled. Output range can be configured SW.
- Status of Run/Error is indicated by the LED on the front panel.

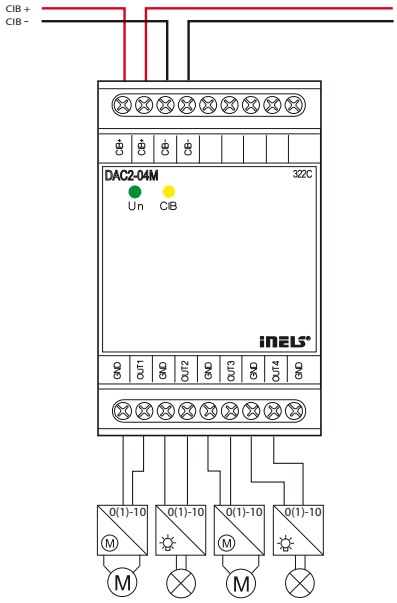
Connection

- The module is connected by two wires of CIB, which provide both the power supply and communication channel.
- The module is designed for DIN rail mounting.

Usage

- For control the device, where analog input is main control signal like:
  – Electronic ballast and dimmers for luminescent lamps
  – Thermo drives
  – Continuously controlled valves
  – Drives

Connection example



Analog outputs

Output range	4× 1 ÷ 10 V or 0 ÷ 10 V
Output current	4× 10 mA

Power supply

Power supply/ Communication	24 V (27 V) from the bus CIB
Current consumption	50 mA

Dimensions and weight

Dimensions	90 × 52 × 65 mm
Weight	102 g

Operating conditions

Operating temperature	–20 ÷ +55 °C
Storage temperature	–30 ÷ +70 °C
IP Degree of protection IEC EN 60529	IP 20, IP40 in the covered cabinet
Overvoltage category	III
Degree of pollution IEC EN 61131-2	2
Working position	any
Installation	on DIN rail
Connections	screw terminals
Conductors cross-section	max. 2,5 mm²

Teco a.s. supplies units under the name INELS

Order number

DAC2-04M	DAC2-04M, CIB, 4× AO, converter digital-analog 0(1)–10 V

Notes