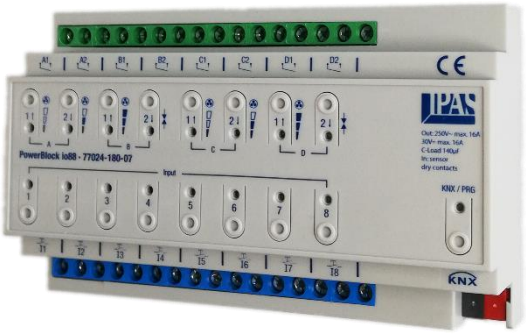
Operating and mounting instructions
PowerBlock io88
Order number: 77024-180-07

General usage

Power Block series consists of different devices types. It can be installed in a standard distribution board.

- 4 DIN Rail module for 4 outputs and 6 inputs
- 4 DIN Rail module for 8 outputs
- 4 DIN Rail module for 8 inputs 230 VAC
- 4 DIN Rail module for 4 Blinds/Shuter 24 VDC
- 8 DIN Rail module for 8 outputs and 8 inputs
- 8 DIN Rail module for 16 outputs



Overview of the functionalities:

Outputs	
BINARY (POWER LEDs SUPPORTED)	SHUTTER / BLIND
Bus failure Central ON/OFF Counters Scenes Timers Alarms Disable function Manual control	Bus failure Scenes Presets Alarms Disable function Manual control Facade control Shutter slits control True height positioning for shutter/blind

ADVANCED FUNCTIONS	FAN COIL (FC)
Analog & digital alarms Scene controler Timers (with cyclic sending of time remaining Overwrite end user parameters Logic functions Setpoints PI Controller Behaviour at bus recovery	Fan Auto/Manual Operation modes (Fan & Valve restrictions) Manual fan speed with multiple DPTs obj. Remaining time to change filter Fan speed timers/delays/cyclic Scenes and Day & Night object Purge valve Thermostat monitoring Alarms

Device type and accessories

At present the following device types are available in the PowerBlock control group:

Product	Description	Order No.:
PowerBlock o8	8 capacitive outputs	77024-180-01
PowerBlock o8m	8 capacitive outputs	77024-180-04
PowerBlock o16	16 capacitive outputs	77024-180-02
PowerBlock o16m	16 capacitive outputs	77024-180-05
PowerBlock io64	4 capacitive outputs + 6 analog / digital inputs	77024-180-03
PowerBlock io88	8 capacitive outputs + 8 analog / digital inputs	77024-180-07
PowerBlock s4 DC	4 Jalousie Ausgänge 24VDC	77024-180-11
InBlock i8HV	8 x 230VAC inputs	77024-180-30
NTC Temp.sensor		72130-185-01

Scope of delivery

The following individual components are included in the delivery of the PowerBlock device:

- KNX Actuator
- KNX bus connector
- KNX protection cap
- 8x 2,7k resistors
- Operating and mounting instructions

Application programs

The following application program is currently available for the PowerBlock device:

- 77024-PowerBlock io88-07-0110 – Version 1.0

Installation device

Risk of death by electric shock.

- The device is intended for interior installation in dry rooms.
- The device must only be installed and commissioned by an accredited electrical engineer.
- When planning and installing systems, the guidelines, rules and regulations, as well as the valid KNX guidelines of the respective country must be observed.
- For the installation the device must be switched to zero potential.
- The device must not be opened.
- Any faulty devices are to be sent together with a return delivery to the manufacturer.
- Make sure that the signal lines connected to the inputs (including extensions via other terminals) are safely isolated (SELV) from other lines and devices.
- **The inputs in the lower connection area must NOT be connected to 230V**

Technical data

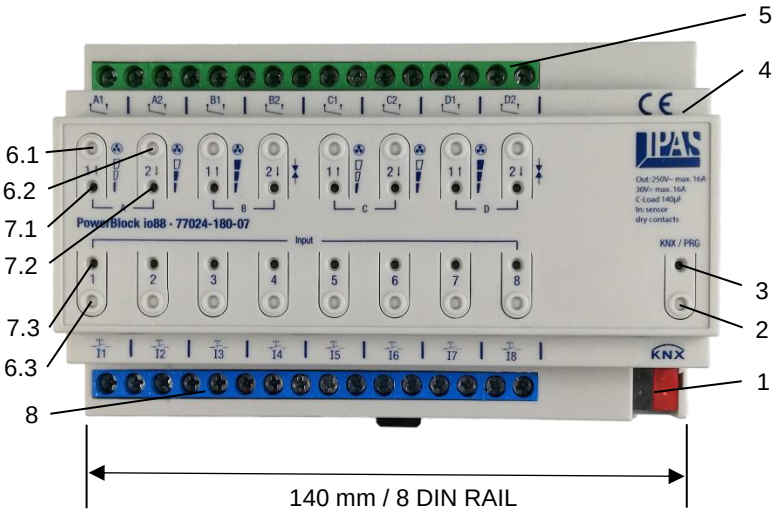
POWER AND OUTPUTS SPECIFICATIONS		
Power supply	Supply Voltage: Max. Consumption: Additional power supply:	21..30VDC 9,4mA No
Number of outputs	Contacts:	8 Dry contacts (potential-free)
Output configuration		Up to 8 outputs Up to 4 channels
Maximum switching capacity per output	AC rated current / voltage: Capacity Load: DC rated current / voltage:	 16A / 230VAC 50/60Hz max. = 140µF 16A / 30VAC
Maximum inrush current per output	max. 200µs: max. 20ms:	800A 165A
Maximum load per output	Resistive: Incandescent lamps: Halogen lamps 230V: Flurescent lamps uncorrected / not compensated: LED lamps: Motor power:	2500W 2000W 2000W 1000W 400W 1380W
Max. total current of the actuator		60A
Phases switching distribution		1 independent phase allowed for the outputs.
Output life expectance	Mechanical: Electrical:	$> 1x10^6$ operations (at 60 times/min)

		$> 4x10^4$ cycles with resistive load at maximal current.
Connections	KNX bus connector: Terminal screw block: Tightening torque for terminal screw:	0,8 mm Ø solid Max. 6 mm Ø solid Maximum 0.6 Nm
Number of inputs	Total Inputs	8 binary or IPAS NTC Temperature sensor (72130-185-01)
Type of inputs	Binary / Analog	Ready for: - Dry contacts - Standard movement detector with dry contact output - Sensor temperature NTC - Monitorized inputs with end line resistor
Scanning voltage	Common input:	3,3V
Input current	Per input:	0,3mA
Protection		Short-circuit proof
Max. cable lenght	For binary and analog inputs:	40m
Connections	KNX: (black/red), TP Terminal screw block: Tightening torque for terminal screw:	0,8 mm Ø solid max. 6 mm Ø solid Maximum 0.6 Nm

GENERAL SPECIFICATIONS		
Control and display elements	Programming button: LED, red: 8 x buttons: (for manual channels control) 8 x LEDs red, above: 8 x LEDs red, below:	To assign the physical address. Displays addressing mode To switch On/Off outputs / Move Up/Down channels / Select Fan Speed, switch valve output To display actual outputs/channels status Display activity at the input
Mechanical data	REG casing 4TE: Width: Hight: Lenght: Weight Mounting:	Plastic ABS – V0 71 mm 58 mm 90 mm 348 g 35 mm DIN rail
Electrical safety	Pollution class: Protection type:* Protection class:** Overvoltage category: KNX Bus:	2 IP20 III III SELV DC 30V
EMC requirements	Complies with:	EMC directive 2014/30/EU
Environmental conditions	Weather resistance: Environmental conditions in operation: Storage emperature: Transportation temperature: Rel. humidity: (non condensing)	EN 50090-2-2 -5°C to +45°C -25°C to +55°C -25°C to +70°C 5 % to 93 %
Certification CE-Signage	KNX registered: According to EMC-Guidelines:	Yes (Residential and commercial buildings), Low Voltage guidelines

* (according to EN 60529); ** (according to IEC 1140)

Location and function of the LEDs and control elements



1: KNX bus connector
2: Programming button
3: Programming LED
4: SD card slot (only for internal use)
5: Outputs connector: Channel A, B

6.1: Manual control (See Annex 1)
Blind channel:
- Long press: Move Up (LED blinks while moving)
- Short press: Stop/Step
Binary channel:
- Short press: Output toggles to ON/OFF

6.2: Manual control (See Annex 1)
Blind channel:
- Long press: Move Down (LED blinks while moving)
- Short press: Stop/Step
Binary channel:
- Short press: Output toggles to ON/OFF

6.3: Manual control (See Annex 1)
Binary input: Manuel Test

6.4: Manual control (See Annex 1)
Binary input: "Manual operation" / "Input 1..3 OR Input 4...6 Range status selector switch"

7.1: LED output/channel status
Binary channel LED ON = Output ON, LED OFF = Output OFF / Shutter: LED blinks while moving UP

7.2: LED output/channel status
Binary channel LED ON = Output ON, LED OFF = Output OFF / Shutter: LED blinks while moving DOWN

7.2: LED input/channel status
Binary channel LED ON = Input ON, LED OFF = Input OFF

8: Connection for inputs 1 - 8

Mounting and wiring

As an REG device, the Power Block series are suitable for mounting in distribution boxes on 35 mm DIN rails and wall boxes.

To mount the device, it must be angled to slide onto the DIN rail from above and then locked into place with a downward movement.

Please make sure that the security latch at the bottom side of the device snaps into place and that the device is firmly attached to the rail. To dismount the device, the security latch can be pulled downwards with a suitable tool and then the device can be removed from the rail.

After the device has been inserted, the cables for the Outputs should be attached to the upper and lower connectors.

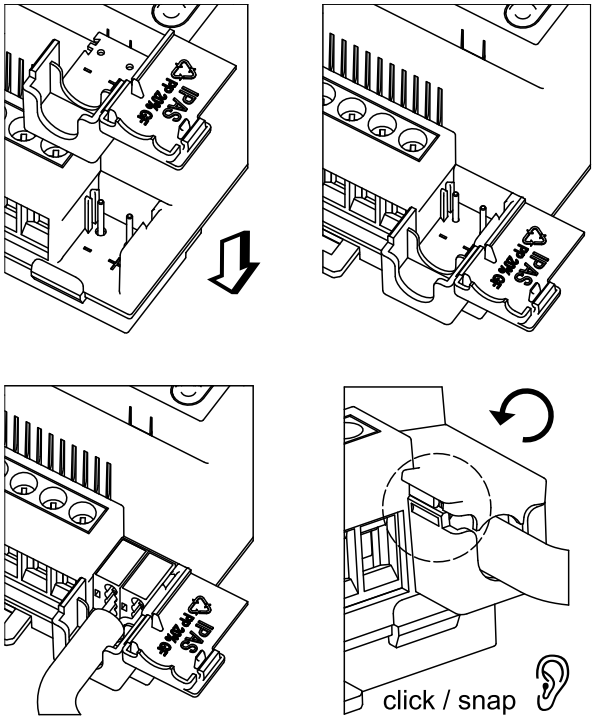
Please make sure that the cables are laid in a way that ensures sufficient distance between the inputs and outputs cables.

The inputs in the lower connection area must NOT be connected to 230V.

Make sure that the signal lines connected to the inputs (including extensions via other terminals) are safely isolated (SELV) from other lines and devices.

To connect the KNX cable, a standard KNX bus terminal and a protection cap are included with the device.

Please make sure that the KNX cable is installed with the protection cap as shown in the drawing below.

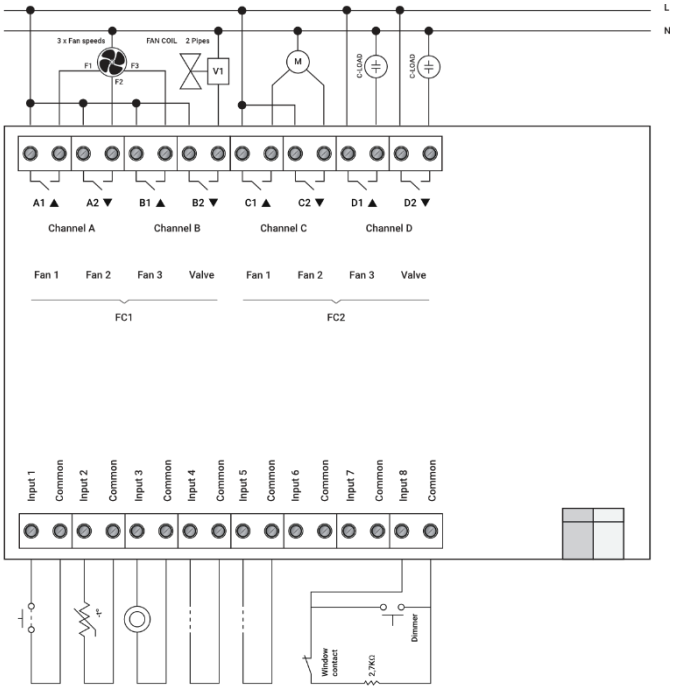


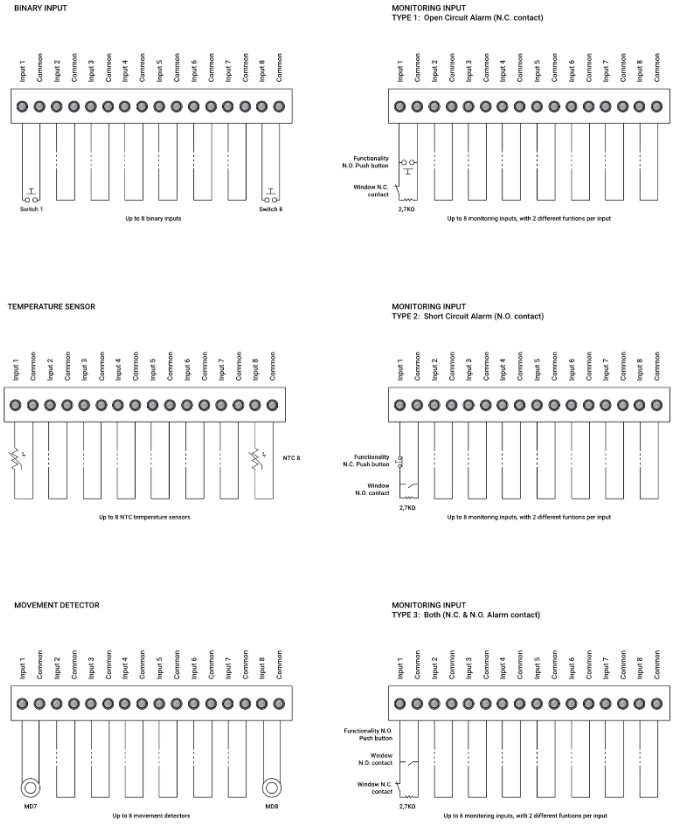
OUTPUT / INPUTS SCHEMATIC

Each channel can be configured to be used as 2 binary outputs or as one blind channel. **The outputs can be supplied by one phase.** Inputs can be configured to receive binary and analog signals (movement detector, temperature sensor and monitored input).

The example circuit diagram uses 1 phase for the output channels A, B, C and D.

Connection examples:





ANNEX 1: Manual Control

The **outputs** of the actuator have 2 push buttons and 2 status LEDs for each output channel on the front side. These buttons can be activated to control each and every channel/output individually if you select "yes" in the relevant parameter options in Binary outputs and/or Shutter/Blinds. The LEDs represent:

For Binary outputs

- The top row: channels A1, A2, B1, B2, C1, C2, D1, D2

For Shutter/blinds:

- The top row: A1 -> UP, A2 -> DOWN, B1 -> UP, etc.

The **inputs** of the actuator have 1 push button and 1 status LED for each input on the below LED row

- These buttons can be activated to control each and every input individually if you select “yes” in the relevant parameter options in Binary Input.
- The LEDs indicate the actual status of the 8 inputs

MANUAL CONTROL – PARAMETER

The Parameter Mode allows you to control all the channels of the actuator as configured in the ETS. The Action simulates a telegram received at the switching object of the selected channel.

BINÄRY	**SHUTTER/BLIND**
Press action: Sends Toggle ON/OFF command “0/1” to the “Switching” object. .  LED = ON (indicates channel status)  LED = OFF (indicates channel status)	Long press action (Channel output 1): Sends a UP command “0” to the “Move” object. Long press action (Channel output 2): Sends a DOWN command “1” to the “Move” object. Short press action (any output) (while shutter/blind is moving) of same button: Sends a Stop command to the “Stop…” object.  LED blinks while moving UP/DOWN during parameterized time.

Binary Inputs

Press the Input 1 - 8 button: Sends Toggle ON/OFF command 0/1 to the "associated object" of the input (simulates the close/open action on the binary contact)

 LED = ON (indicates the input status -> input contact closed)

 LED = OFF (indicates the chanalstatus on -> Input contact open)

MANUAL CONTROL – TEST

The Test Mode allows you to test all the loads/wiring connected to the channels. It is independent from the ETS configuration of the actuator (since the “Manual Control / Param mode + Test mode” is a default option, you can use the Test mode even before programming the actuator).

Important note: Should a blind/shutter be connected to a channel, the 2 channels may never be closed at the same time. Therefore, even in Test mode, if the channel is configured as a blind, this safety measure is implemented. For this reason, it is better to first commission the OUTPUT: CHANNEL TYPE SELECTION before using the Test mode.

To change into the test mode, any button can be used depending of the channel configuration:

- If “Binary” or” Fan Coil” channel is configured: Press any button for at least 500ms
- If “Blind” channel is configured: Press the two buttons of any channel at the same time for at least 500ms

To change back to the normal “Parameter Mode” the same procedure should be repeated. Be aware by changing back to “Parameter Mode” the device will restart. Also after the device has restarted and if the channel is configured to be a blind channel, it will do a calibration movement on the first movement command.

 In order to indicate that the actuator is in Manual Control / Test Mode, the LED of the selected channel is continuously making a short blinking action every second; no matter whether the channel is ON (LED ON) or OFF (LED OFF).

The Action switches/moves the channel, as you can see in the table below:

BINÄRY	**JALOUSIEN/BLENDE**
Press action: Sends toggle ON/OFF command to the relay (ON = Contact closed / OFF = Contact open)  LED = ON (indicates channel status)  LED = OFF (indicates channel status)	Rising edge press action (Channel X): Contact closed Falling edge press action (Channel X): Contact open  LED = ON (indicates channel status)  LED = OFF (indicates channel status)