

MODBUS/BACNET



POWER IO

System for decentralised building automation
General overview

Building automation is used to control heating, ventilation and air conditioning equipment. The powerIO®-System provides more efficient control, better monitoring and more reliable operational management than previous conventional systems. And does this independently of control system providers.

The installation system has outstanding compatibility with all sensors and actuators from leading manufacturers, and can be enhanced with all of the popular protocols. The system mainly consists of three parts:

powerIO®-Line

A hybrid cable which transmits data via Ethernet (TCP/IP, 100 Mbit/s) and also power (230 V). This makes it possible to transmit data and provide sensors and actuators with power over long distances with a single cable.

powerIO®-Box

The powerIO®-Line connects the powerIO®-Boxes. Several communicative sensors and actuators can be connected over short distances with standardised industrial M12 plug-in connections with the boxes.



Control in accordance with IEC 61131-3

You can optionally create a CODESYS® controller from any powerIO®-Box and use HLK libraries from www.hvac-automation.com

powerIO®-App

The app turns your Smartphone into a measuring device. This gives you control over the communicative sensor system. You can start up and test devices independently of the manufacturer. Manual intervention and various service functions can be carried out using the Bluetooth connection or via WLAN.



Download the powerIO®-App
www.powerio.com/app

OVERVIEW OF THE ADVANTAGES:

Easy connection of the systems thanks to standardised M12 plug-in connectors. The error quota is reduced. A practical aid in times of skill shortages!

Fewer problems with interfaces. Coordination problems (cable installations, among other things) between electrical systems and measuring and control equipment are a thing of the past.

More reliability during operational management due to preventive messages. Optimum for predictive maintenance.

More information content can be transmitted. Ideal for communicative devices and intelligent sensors. Makes better system optimisation and monitoring possible.

Powerful, also for large systems.

And long distances can also be achieved due to the 230 V powerIO®-Line.

COST-EFFECTIVE

Reduction of cabling and cabinets by up to 70%

FLEXIBLE

Open system for easy and fast expansion

DEPENDABLE

Better control, higher safety, fewer connection faults, more data

powerIO® System

Type / WG02!	Description	(Parts No.)	Item No.	Price
Starter set				
	powerIO®-Starter Set	(T1.Z121)	3PIO-1502-0000-000	1652,40 €
	1 x (T1.B100) powerIO®-Box			
	1 x (T1.S110) powerIO®-Start Unit			
	1 x (T1.L100) powerIO®-Line, 20 m			
	1 x (T1.Z109) Installation cable, 5 m			
	1 x (T1.Z104) M12 connecting cable, 2 m			
	1 x (T1.Z105) M12 connecting cable, 5 m			
	1 x (T1.Z106) M12 connecting cable, 10 m			
	1 x (T1.Z107) M12 connecting cable, 2 m			
	1 x (T1.Z114) M12 flange connector, front-of-wall mounting			
	1 x (T1.Y200) powerIO®-Y distributor			
	1 x (T1.D100) powerIO®-Bluetooth Dongle			

Note: Only one starter set is available per customer. Product is not discountable.

powerIO®-Box

Decentralised automation box
Serial to TCP conversion



powerIO®-Line

Hybrid cable for transmitting data
(Ethernet TCP/IP, 100 Mbit/s) and power (230V)

2x 230 V / 6 A outputs



WLAN / Bluetooth service port

Plug-in location for expansion cards

4x RS485
M12, 5-pin plug-in connections with 24V power supply and bus

Ethernet / LAN

powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
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Main components



powerIO®-Box

(T1.B100) 3PIO-1101-0000-000 **1652,40 €**

Decentralised automation box

230V voltage supply, Ethernet communication, Gateway function
2x 230V outputs up to 6A
4x M12 coupling, A-coded for RS485 connections incl. 24V/2A DC voltage supply (ports 1 to 6)
1x optional plug-in location (port 5)
1x M12 service interface for commissioning with Smartphone app incl. shield terminal, Ethernet, fine fuse (4A).
Dimensions 180 x 255 x 64 mm (W x H x D) (plus cable lead-in and M12 ports)
Can be extended with a CODESYS® runtime licence and HVAC libraries.

powerIO®-Line

Hybrid cable for connecting the powerIO®-Boxes

Sold by the metre, minimum ordering quantity 10m
Data: 2 x (2 x 0,34 mm²), shielded
Power: 3 x 4,00 mm²



(T1.L100) 3PIO-1201-0000-000 **15,44 € / m**

Power: 3 x 2,50 mm² (T1.L200) 3PIO-1203-0000-000 **15,01 € / m**

powerIO®-Start Unit

(T1.S110) 3PIO-1102-0000-000 **286,42 €**

Switch, allows connection of up to 3x powerIO®-Lines and 2x RJ45 Ethernet cables
(e.g. for control, touch panel or network)

Top-hat rail installation for switch cabinet or sub-distributor
4TE housing / dimensions 72 x 90 x 65 mm (B x H x T)




See next page for more information and accessories.

powerIO® System


Type / WG02I	Description	(Parts No.)	Item No.	Price
Expansion components				
	<p>powerIO®-Rio1</p> <p>Expansion box for non-communicative sensors / actuators</p> <p>6x Digital input 1x Analogue input 0–10V 1x Analogue input, passive (PT1000) 3x Digital outputs pot.-free (I_{max} 16 A) 4x Digital outputs 24 V/0.5 A 1x Analogue outputs 0–10V</p> <p>Each output with manual override (switch/potentiometer). Addressable using rotary switch. Connected via Modbus RTU. Dimensions 160 x 140 x 83 mm (W x H x D)</p>	(T1.R100)	3PIO-1104-0100-000	439,54 €
	<p>powerIO®-Rio 4DI</p> <p>Digital input modules for the activation of messages [24V]</p> <p>4x Digital input with counting function 24 V AC/DC power supply Connection via Modbus RTU Housing protection class IP67 Dimensions 160 x 140 x 81 mm (W x H x D)</p>	(T1.R100-4DI)	3PIO-1104-0300-000	134,40 €
	<p>powerIO®-Rio 8DI</p> <p>8x Digital input with counting function (any other design as above)</p>	(T1.R100-4DI)	3PIO-1104-0400-000	143,21 €
	<p>powerIO®-Hub</p> <p>Distributor for hybrid cable powerIO®-Line</p> <p>Input terminals for power and Ethernet CAT6 hybrid cable with shield terminals, output terminals for 2x power and Ethernet CAT 6, hybrid cable with shield terminals HUB functionality for Ethernet CAT6 distribution via connection to "Ethernet" additional card at powerIO®-Box. Dimensions 160 x 140 x 83 mm (W x H x D)</p>	(T1.H100)	3PIO-1106-0000-000	187,27 €
	<p>powerIO®-Booster</p> <p>Power output amplification on 24V end</p> <p>Input U = 230V AC Output U = 24V DC / I = 2A 2x M12 connectors each with 24V DC outlet and Modbus RTU Dimensions 160 x 140 x 81 mm (W x H x D)</p>	(T1.R350)	3PIO-1105-0000-000	219,22 €
	<p>powerIO®-HK Distributor</p> <p>for controlling thermal drives (such as underfloor heating circuit distributor or concrete core heating distributor)</p> <p>8x Digital output 2x Digital input 2x Passive analog input PT1000 Modbus RTU using M12, 5-pin, A-coded plug connections. Suitable for installation on distributors. Dimensions 327 x 74 x 66 mm (W x H x D)</p>	(T1.R300)	3PIO-1110-0000-000	384,46 €
	<p>powerIO®-Y Distributor Box</p> <p>Distributor box for connection of 2 RS485 nodes per port (1-4) to the powerIO® box</p> <p>Bridged bus and voltage, Connection terminals with lever (5x 3-pin / up to 4.00 mm²), Connection is established (see below for type) via cable gland and/or M12 socket Dimensions 85 x 85 x 51 mm (W x H x D)</p>			
	2x cable gland	(T1.Y100)	3PIO-1107-0100-000	27,54 €
	1x cable gland	(T1.Y200)	3PIO-1107-0200-000	42,96 €
	1x M12 socket, 5-pin, A-coded			
	2x M12 socket, 5-pin, A-coded	(T1.Y300)	3PIO-1107-0300-000	58,38 €


powerIO® System


Type / WG02I	Description	(Parts No.)	Item No.	Price
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Service Tool				
	powerIO®-Bluetooth Dongle Communication with powerIO®-App For plugging into service port of the powerIO®-Box. For commissioning/servicing the sensors/actuators.	(T1.D100)	3PIO-1103-0000-000	218,12 €

BSK modules

	powerIO®-BSK ECO Fire damper module for 1 fire damper (24V or 230V), without galvanic isolation (ECO) 2x digital input 1x digital output relay 230V/5A 24 V AC/DC power supply Connection via Modbus RTU BSK connection via AMP socket Housing protection class IP 54 Dimensions 110 x 110 x 66 mm (W x H x D)	(T1.BSK1-AMP-24-ECO)	3PIO-1108-0100-000	112,36 €
	BSK connection via terminal blocks Housing protection class IP67 (any other design as above)	(T1.BSK1-24-ECO)	3PIO-1108-0200-000	112,36 €

	powerIO®-BSK 24 Fire damper module for 2 fire dampers (24V or 230V), with galvanic isolation 4x Digital input 2x Digital output relay 230V / 16A 24 V AC/DC power supply Connection via Modbus RTU BSK connection via AMP socket Housing protection class IP 54 Dimensions 160 x 140 x 81 mm (W x H x D)	(T1.BSK2-AMP-24)	3PIO-1108-0300-000	158,63 €
	BSK connection via terminal blocks Housing protection class IP67 (any other design as above)	(T1.BSK2-24)	3PIO-1108-0400-000	158,63 €

	powerIO®-BSK 230 Fire damper module for 2 fire dampers (230V), with galvanic isolation 4x Digital input 2x Digital output relay 230V / 16A 230 V AC power supply Connection via Modbus RTU BSK connection via AMP socket Housing protection class IP 54 Dimensions 160 x 140 x 81 mm (W x H x D)	(T1.BSK2-AMP-230)	3PIO-1108-0500-000	167,44 €
	BSK connection via terminal blocks Housing protection class IP67 (any other design as above)	(T1.BSK2-230)	3PIO-1108-0600-000	167,44 €

powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
Expansion cards powerIO®-Box T1				
	Expansion card "Ethernet" M12, 4-pin D-coded Allows connection of an M12 Ethernet cable (T1.Z102). Incorporation of other IP subscribers with up to 100 Mbit/s.	(T1.C100-ETH)	3PIO-1301-0000-000	218,12 €
	Expansion card "RS485" M12, 5-pin A-coded Extends port 5 with an RS485 COM port. With 24 V on M12 pins as output voltage.	(T1.C100-RS485-24)	3PIO-1302-0000-000	218,12 €
	Expansion card "RS232" M12, 5-pin A-coded Extends port 5 with an RS232 COM port. With 24 V on M12 pins as output voltage.	(T1.C100-RS232-24)	3PIO-1303-0000-000	286,42 €












Installation board powerIO®-Box T1

	Installation board Simple preinstallation for electrical installation, 4 threaded bolts for screwing on the powerIO®-Box (series T1) at a later date. Aluminium installation board with cut-out for installation to pipes using lashing straps.	(T1.Z119)	3PIO-1403-0000-000	57,28 €
	Installation board with magnets Simple preinstallation for electrical installation, 4 threaded bolts for screwing on the powerIO®-Box (series T1) at a later date. Aluminium installation board with pre-installed magnets for attaching to air ducts, for example.	(T1.Z125)	3PIO-1404-0000-000	80,42 €

powerIO® Accessories

Type / WG02	Description	(Parts No.)	Item No.	Price	
Connecting cable					
	M12 connecting cable PVC cable, shielded, 5-pin, A-coded, M12 connector <-> open end	(ALG)	ALG M12-A5M PVC xx		
		2 m	2000-9141-0100-011	29,82 €	
		5 m	2000-9141-0100-021	37,71 €	
	M12 connecting cable PVC cable, shielded, 5-pin, A-coded, M12 connector <-> M12 socket	(VLG)	VLG M12-A5 PVC xx		
		2 m	2000-9111-0000-031	56,21 €	
		5 m	2000-9111-0000-041	63,68 €	
			10 m	2000-9111-0000-051	76,47 €
	M12 Ethernet cable M12 connector, 4-pin, D-coded <-> RJ45 connector Ethernet cable for direct connection to the powerIO®-"Ethernet" expansion card	(T1.Z102)	3PIO-1601-0000-000	79,32 €	
	M12 installation cable PVC cable, shielded, 5-pin (5x0.25 mm ²), open ended, same colour code as M12 cable Sold by the metre, minimum ordering quantity 10 m	(T1.Z109)	3PIO-1202-0000-000	2,31 €/m	

powerIO® Accessories

Type / WG02	Description	(Parts No.)	Item No.	Price
Connection accessories				
	<p>M12-Y-distributor M12, 5-pin, A-coded, 1x connector → 2x sockets For connecting two M12 connectors to one M12 socket. Bus and voltage are available at both connections. Can be plugged directly into the powerIO®-Box for connecting two sensors / actuators. Length 300 mm</p>	(T1.Z122)	3PIO-1602-0000-000	62,79 €
	<p>M12-Y-adapter M12, 5-pin, A-coded. 1x socket / 1x connector → 1x connector</p>	(T1.Z110)	3PIO-1603-0000-000	44,06 €
	<p>M12 coupling M12, 5-pin, A-coded, 1x socket unassembled</p>	(T1.Z111)	3PIO-1604-0000-000	15,87 €
	<p>M12 connector M12, 5-pin, A-coded, 1x connector unassembled</p>	(T1.Z112)	3PIO-1605-0000-000	14,63 €
	<p>M12 flange coupling VWM M12, 5-pin, A-coded. 1x socket for front-of-wall mounting</p>	(T1.Z113)	3PIO-1607-0000-000	16,52 €
	<p>M12 flange connector VWM M12, 5-pin, A-coded, 1x connector for front-of-wall mounting</p>	(T1.Z114)	3PIO-1608-0000-000	17,63 €
	<p>M12 flange coupling HWM M12, 5-pin, A-coded. 1x socket for rear-wall mounting</p>	(T1.Z115)	3PIO-1609-0000-000	16,52 €
	<p>M12 flange connector HWM M12, 5-pin, A-coded, 1x connector for rear-wall mounting</p>	(T1.Z116)	3PIO-1610-0000-000	16,52 €
	<p>M12 protection cap Protection cap for unused M12 sockets</p>	(T1.Z117)	3PIO-1606-0000-000	3,30 €
	<p>Ethernet connector Connector for the powerIO®-Line to the powerIO®-Box or powerIO®-Start Unit (included in scope of delivery of the powerIO®-Box)</p>	(T1.Z101)	3PIO-1402-0000-000	9,91 €
	<p>Shield terminal for connecting the shield of the powerIO®-Line to the powerIO®-Box (included in scope of delivery of the powerIO®-Box)</p>	(T1.Z100)	3PIO-1401-0000-000	7,71 €



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