

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.

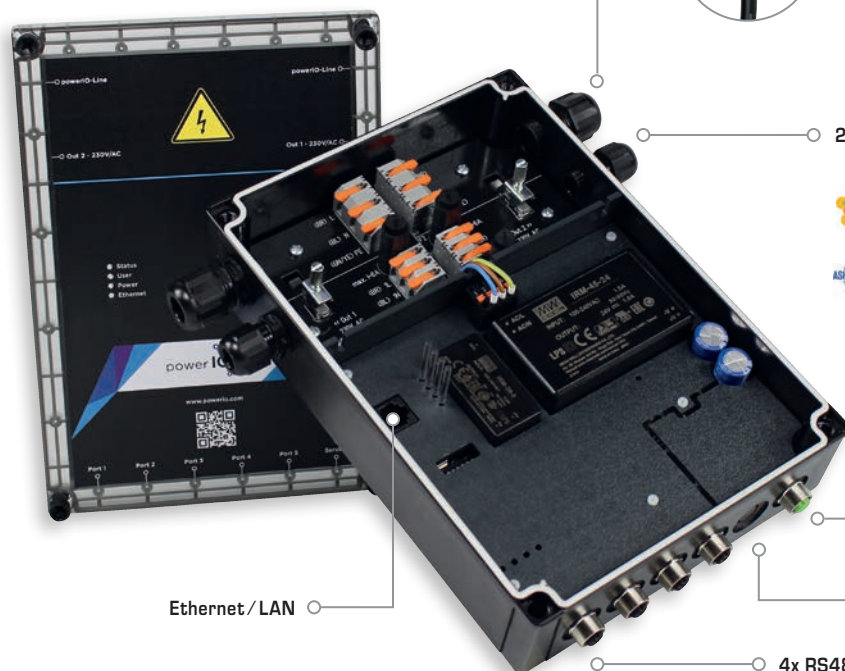
powerIO® System

Type / WG02!	Description	(Parts No.)	Item No.	Price
Starter set				
	powerIO®-Starter Set	(T1.Z121)	3PIO-1502-0000-000	1.735,02 €
	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.

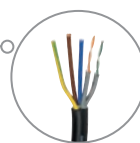
powerIO®-Box

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
Main components				



powerIO®-Box

(T1.B100)

3PIO-1101-0000-000

1.735,02 €

Decentralised automation box

230V voltage supply, Ethernet communication,
Gateway function

2x 230 V outputs up to 6 A

4x M12 coupling, A-coded for RS485 connections
incl. 24 V / 2 A 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 (4 A).

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 10 m

Data: 2 x (2 x 0,34 mm²), shielded

Power: 3 x 4,00 mm²

(T1.L100)

3PIO-1201-0000-000

16,21 €/m

Power: 3 x 2,50 mm²

(T1.L200)

3PIO-1203-0000-000

15,76 €/m



powerIO®-Start Unit

(T1.S110)

3PIO-1102-0000-000

300,74 €

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				
	powerIO®-Rio1 Expansion box for non-communicative sensors / actuators	(T1.R100)	3PIO-1104-0100-000	461,52 €
	6x Digital input 1x Analogue input 0–10 V 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 0–10 V 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)			
	powerIO®-Rio 4DI Digital input modules for the activation of messages (24 V)	(T1.R100-4DI)	3PIO-1104-0300-000	141,12 €
	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)			
	powerIO®-Rio 8DI	(T1.R100-8DI)	3PIO-1104-0400-000	150,37 €
	8x Digital input with counting function (any other design as above)			
	powerIO®-Hub Distributor for hybrid cable powerIO®-Line	(T1.H100)	3PIO-1106-0000-000	196,63 €
	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)			
	powerIO®-Booster Power output amplification on 24 V end	(T1.R350)	3PIO-1105-0000-000	230,18 €
	Input U = 230 V AC Output U = 24 V DC / I = 2 A 2x M12 connectors each with 24V DC outlet and Modbus RTU Dimensions 160 x 140 x 81 mm (W x H x D)			
	powerIO®-HK Distributor for controlling thermal drives (such as underfloor heating circuit distributor or concrete core heating distributor)	(T1.R310)	3PIO-1110-0000-000	403,68 €
	12x Digital output 24 V 2x Digital input 2x Analogue input (0–10 V, PT1000, Ohm) 230 V AC power supply Connection via Modbus RTU, DIN rail or wall-mounting (optionally with magnetic feet) Dimensions 326.5 x 90 x 52 mm (W x H x D)			
	powerIO®-Y Distributor Box Distributor box for connection of 2 RS485 nodes per port (1–4) to the powerIO® box			
	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)			
	2x cable gland	(T1.Y100)	3PIO-1107-0100-000	28,92 €
	1x cable gland 1x M12 socket, 5-pin, A-coded	(T1.Y200)	3PIO-1107-0200-000	45,11 €
	2x M12 socket, 5-pin, A-coded	(T1.Y300)	3PIO-1107-0300-000	61,30 €

powerIO® System

Type / WG02I	Description	(Parts No.)	Item No.	Price
--------------	-------------	-------------	----------	-------

Service Tool



powerIO®-Bluetooth Dongle

(T1.D100)

3PIO-1103-0000-000

229,03 €

Communication with powerIO®-App

For plugging into service port of the powerIO®-Box.
For commissioning/servicing the sensors/actuators.

BSK modules



powerIO®-BSK ECO

(T1.BSK1-AMP-24-ECO)

3PIO-1108-0100-000

117,98 €

Fire damper module for
1 fire damper (24 V or 230 V),
without galvanic isolation (ECO)

2 x digital input
1 x digital output relay 230 V / 5 A

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)

BSK connection via terminal blocks

(T1.BSK1-24-ECO)

3PIO-1108-0200-000

117,98 €

Housing protection class **IP 67**

(any other design as above)

powerIO®-BSK 24

(T1.BSK2-AMP-24)

3PIO-1108-0300-000

166,56 €

Fire damper module for
2 fire dampers (24 V or 230 V),
with galvanic isolation

4 x Digital input
2 x Digital output relay 230 V / 16 A

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)

BSK connection via terminal blocks

(T1.BSK2-24)

3PIO-1108-0400-000

166,56 €

Housing protection class **IP 67**

(any other design as above)



powerIO®-BSK 230

(T1.BSK2-AMP-230)

3PIO-1108-0500-000

175,81 €

Fire damper module for
2 fire dampers (230 V),
with galvanic isolation

4 x Digital input
2 x Digital output relay 230 V / 16 A

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)

BSK connection via terminal blocks

(T1.BSK2-230)

3PIO-1108-0600-000

175,81 €

Housing protection class **IP 67**

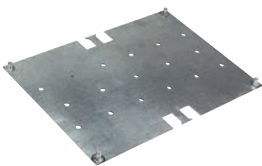
(any other design as above)



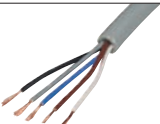
powerIO[®] System

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	229,03 €
	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	229,03 €
	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	300,74 €

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	60,14 €
	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	84,44 €

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	31,31 €
		5 m	2000-9141-0100-021	39,60 €
		10 m	2000-9141-0100-031	52,90 €
	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	59,02 €
		5 m	2000-9111-0000-041	66,86 €
		10 m	2000-9111-0000-051	80,29 €
	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	83,29 €
	M12 installation cable PVC cable, shielded, 5-pin (5 x 0.25 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	2,43 €/m



powerIO® Accessories				
Type / WG02	Description	(Parts No.)	Item No.	Price
Connection accessories				
	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	(T1.Z122)	3PIO-1602-0000-000	65,93 €
	M12-Y-adapter M12, 5-pin, A-coded. 1x socket / 1x connector → 1x connector	(T1.Z110)	3PIO-1603-0000-000	46,26 €
	M12 coupling M12, 5-pin, A-coded, 1x socket unassembled	(T1.Z111)	3PIO-1604-0000-000	16,66 €
	M12 connector M12, 5-pin, A-coded, 1x connector unassembled	(T1.Z112)	3PIO-1605-0000-000	15,36 €
	M12 flange coupling VWM M12, 5-pin, A-coded. 1x socket for front-of-wall mounting	(T1.Z113)	3PIO-1607-0000-000	17,35 €
	M12 flange connector VWM M12, 5-pin, A-coded, 1x connector for front-of-wall mounting	(T1.Z114)	3PIO-1608-0000-000	18,51 €
	M12 flange coupling HWM M12, 5-pin, A-coded. 1x socket for rear-wall mounting	(T1.Z115)	3PIO-1609-0000-000	17,35 €
	M12 flange connector HWM M12, 5-pin, A-coded, 1x connector for rear-wall mounting	(T1.Z116)	3PIO-1610-0000-000	17,35 €
	M12 protection cap Protection cap for unused M12 sockets	(T1.Z117)	3PIO-1606-0000-000	3,47 €
	Ethernet connector Connector for the powerIO®-Line to the powerIO®-Box or powerIO®-Start Unit (included in scope of delivery of the powerIO®-Box)	(T1.Z101)	3PIO-1402-0000-000	10,41 €
	Shield terminal for connecting the shield of the powerIO®-Line to the powerIO®-Box (included in scope of delivery of the powerIO®-Box)	(T1.Z100)	3PIO-1401-0000-000	8,10 €