4PP065.0571-P74

1 Order data

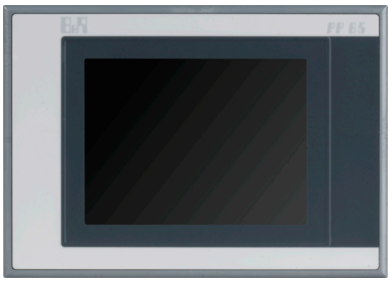
Model number	Short description	Figure
	Power Panel 65	
4PP065.0571-P74	Power Panel PP65, 5.7" QVGA color TFT display with touch screen (resistive), 128 MB DRAM, 232 kB SRAM, Compact-Flash slot, 1x ETH 10/100, 1x POWERLINK, 2x USB, IP65 protection (front), order application memory separately Order 0TB103 terminal block separately	
	Required accessories	
	Accessories	
0TB103.9	Connector 24 VDC - 3-pin, female - Screw clamp terminal block 3.31 mm²	
0TB103.91	Connector 24 VDC - 3-pin, female - Cage clamp terminal block 3.31 mm²	
	CompactFlash cards	
0CFCRD.0512E.01	CompactFlash 512 MB extended temp.	
0CFCRD.2048E.01	CompactFlash 2048 MB extended temp.	
5CFCRD.0512-06	CompactFlash 512 MB B&R (SLC)	
5CFCRD.1024-06	CompactFlash 1 GB B&R (SLC)	
5CFCRD.2048-06	CompactFlash 2 GB B&R (SLC)	
5CFCRD.4096-06	CompactFlash 4 GB B&R (SLC)	
	Optional accessories	
	Batteries	
0AC201.91	Lithium batteries 4 pcs., 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	Interface modules	
4PP065.IF10-1	PP65 interface module, 1 RS232 interface	
4PP065.IF23-1	PP65 interface module, 1 RS232 interface, 1 RS485/RS422 interface, RS422 electrically isolated, RS485 electrically isolated and network-capable, RS232/RS485/RS422 in one connector, 1 CAN interface electrically isolated and network-capable, order 0TB704 terminal block separately	
4PP065.IF24-1	PP65 interface module, 1 PROFIBUS DP slave interface electrically isolated and network-capable, 1 RS232 interface, 1 RS422/RS485 interface, RS422/RS485: electrically isolated and network-capable, RS232/RS422/RS485 in one connector	
4PP065.IF33-1	PP65 interface module, 2 CAN interfaces electrically isolated and network-capable, order 0TB704 terminal block separately	
	USB accessories	
5MMUSB.2048-01	USB 2.0 flash drive 2048 MB B&R	

Table 1: 4PP065.0571-P74 - Order data

2 Technical data

Model number	4PP065.0571-P74
General information	
B&R ID code	0xA964
LEDs	
Quantity	4
CF (CompactFlash)	Orange
Status	Red/Green
EPL (POWERLINK)	Red/Green
User	Green
Battery	
Type	Renata 950 mAh
Service life	4 years [1)]
Removable	Yes, accessible from the outside
Variant	Lithium ion
Backup capacitor	
Buffer time	10 min
Certifications	
CE	Yes
UL	cULus E115267 Industrial control equipment
EAC	Yes

Table 2: 4PP065.0571-P74 - Technical data

Model number	4PP065.0571-P74
Controller	
Bootloader, operating system	
PP65 supported starting with version	Automation Runtime, A3.01
Processor	
Type	Geode LX800, 32-bit x86
Clock frequency	500 MHz
L1 cache	128 kB (64 kB I-cache / 64 kB D-cache)
L2 cache	128 kB
Expanded command set	MMX technology, 3D Now
Floating point unit (FPU)	Yes
Flash	4 MB (for firmware)
Cooling	Passive via heat sink
Mode/Node switches	2, 16 positions each
Remanent variables	32 kB
Watchdog	MTCX [2)]
Real-time clock	
Accuracy	At 25°C: Typ. 30 ppm (2.5 seconds) per day [3)]
Battery-backed	Yes
Power failure logic	
Controller	MTCX [2)]
Buffer time	10 ms
Graphics	
Controller	Geode LX800
Memory	8 MB shared memory (allocated in RAM)
Standard memory	
RAM	128 MB DDR SDRAM
User RAM	232 kB SRAM
PP65 Compact IF slot	1
Display	
Type	TFT color
Diagonal	5.7" (144 mm)
Colors	262,144
Resolution	QVGA, 320 x 240 pixels
Contrast	350:1
Viewing angles	
Horizontal	Direction R / Direction L = 60°
Vertical	Direction U = 65° / Direction D = 50°
Backlight	
Brightness	500 cd/m²
Half-brightness time	50,000 h
Touch screen	
Technology	Analog, resistive
Controller	B&R, 12-bit
Transmittance	70% ±10%
Screen rotation	Yes (see chapter "Installation", section "Screen rotation")
Interfaces	
CompactFlash slot 1	
Quantity	1
Type	Type I
Variant	Primary IDE device
USB	
Quantity	2
Type	USB 2.0
Variant	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), high speed (480 Mbit/s)
Current-carrying capacity	Max. 500 mA per connection
Ethernet	
Quantity	1
Controller	Intel 82551ER
Variant	Shielded RJ45 port (10/100 Base-T)
Transfer rate	10/100 Mbit/s
Max. baud rate	100 Mbit/s
Cables	S/STP (Category 5)
LED status indicators	Link/Activity

Table 2: 4PP065.0571-P74 - Technical data

Model number	4PP065.0571-P74
POWERLINK	
Quantity	1
Fieldbus	POWERLINK (V1/V2)
Type	Type 4 [4]
Variant	Shielded RJ45 port
Transfer rate	100 Mbit/s
Transfer	100 Base-T (ANSI/IEEE 802.3)
Status LED	Link/Activity
Cable length	Max. 100 m between two stations (segment length)
Electrical properties	
Nominal voltage	24 VDC ±25%
Nominal current	0.45 A
Inrush current	Max. 2.8 A
Power consumption	Typ. 10 W
Galvanic isolation	No
Operating conditions	
Installation elevation above sea level	
0 to 2000 m	No limitation
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Degree of protection per EN 60529	Back: IP20 (only with an inserted CompactFlash card) Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection
Ambient conditions	
Temperature	
Operation	0 to 50°C
Storage	-20 to 70°C
Transport	-20 to 70°C
Relative humidity	
Operation	10 to 90%, non-condensing
Storage	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <90%, non-condensing
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Mechanical properties	
Housing	
Material	Polyester
Front	Multi-layered panel overlay
Dimensions	
Width	203 mm
Height	145 mm
Depth	56.5 mm
Weight [5]	0.75 kg

Table 2: 4PP065.0571-P74 - Technical data

1) Typical service life (at 50% buffer operation: 25°C when device off, 50°C when device on).
Maximum service life in 24h operation (no buffer): 6 years at 25°C, 5 years at 50°C.
Maximum service life when device switched off: 2 years at 25°C, 1 year at 50°C.
2) Maintenance Controller Extended.
3) At max. specified ambient temperature: Typ. 50 ppm (4 s); worst case 100 ppm (8 s)
4) See the help system in Automation Studio under "Communication / POWERLINK / General information / Hardware - IF/LS".
5) Weight including fasteners and battery (46.5 g) but without an interface module.

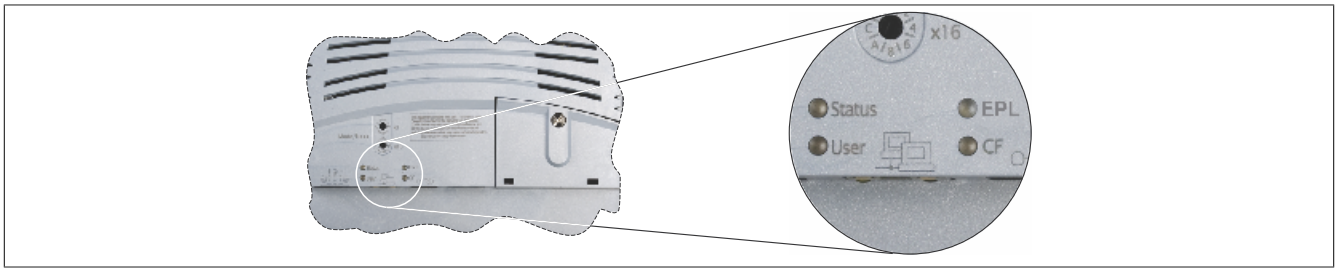
3 Supported interface modules

Support for interface modules is provided starting with the following Automation Runtime versions:

	Interface modules			
	4PP065.IF10-1	4PP065.IF23-1	4PP065.IF24-1	4PP065.IF33-1
Automation Runtime version	A3.01	A3.01	A3.07	A3.01

4 Diagnostic LEDs

There are four diagnostic LEDs on the back of the PP65.



Information:

The behavior of the Status LED has changed starting with AR J2.96, E3.01 and B3.06.

4.1 Diagnostic LEDs up to AR I2.96, D3.01 and A3.06

LED	Color	Status	Description
Status	Red	On	Error/Reset
	Orange	On	Boot or Ready mode
User	Green	On/Off	LED operable by the user (with the AsHW library)
EPL	See "EPL LED" on page 4.		
CF	Orange	On	CompactFlash card being accessed

4.2 Diagnostic LEDs starting with AR J2.96, E3.01 and B3.06

LED	Color	Status	Description
Status	see following table "Status LED blink codes"		
User	Green	On/Off	LED operable by the user (with the AsHW library)
EPL	See "EPL LED" on page 4.		
CF	Orange	On	CompactFlash card being accessed

Blink codes (200 ms pattern)	Function
	Error/Reset
	No errors, normal operation
	Battery not installed or battery capacity too low
	CompactFlash media not found
	Reserved for future blink codes

Because blink codes can only signal one error at a time, errors with higher priority take precedence. Fatal errors have a higher priority than less significant errors (e.g. low battery capacity).

4.3 EPL LED

The EPL LED is a green (Status) / red (Error) dual LED. The status of the LEDs has different meanings depending on the operating mode (Ethernet TCP/IP mode, POWERLINK V1 or POWERLINK V2).

Ethernet TCP/IP mode

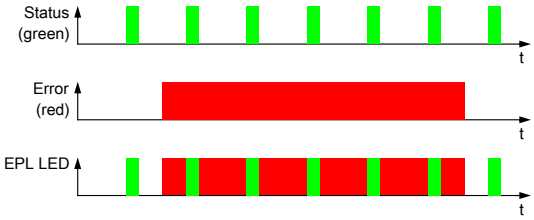
The POWERLINK interface can be operated purely as an Ethernet TCP/IP interface.

Green - Status	Description
On	POWERLINK interface operating purely as an Ethernet TCP/IP interface

POWERLINK V1

EPL LED		Status of the POWERLINK station
Green	Red	
On	Off	The POWERLINK station is running with no errors.
Off	On	A fatal system error has occurred. The error type can be read using the PLC logbook. An irreparable problem has occurred. The system cannot properly carry out its tasks. This state can only be changed by resetting the module.
Blinking alternately		The POWERLINK managing node has failed. This error code can only occur when operated as a controlled node. This means that the configured station number lies within the range 0x01 - 0xFD.
Off	Blink code	System error: The red blinking LED signals an error code (see "System stop error codes" on page 6).

POWERLINK V2

Red - Error	Description
On	The POWERLINK interface is in an error state (failed Ethernet frames, increased number of collisions on the network, etc.). If an error occurs in the following statuses, then the green LED blinks over the red LED: • BASIC_ETHERNET • PRE_OPERATIONAL_1 • PRE_OPERATIONAL_2 • READY_TO_OPERATE Example: 

Green - Status	Description
Off NOT_ACTIVE	**Managing Node (MN)** The bus is monitored for POWERLINK frames. If a frame is not received within the configured time window (timeout), the interface switches immediately to the PRE_OPERATIONAL_1 state (single flash). If, however, POWERLINK communication is detected before this time passes, the interface goes directly into the BASIC_ETHERNET state (flickering). **Controlled node (CN)** The bus is monitored for POWERLINK frames. If a frame is not received within the configured time window (timeout), the interface switches immediately to the BASIC_ETHERNET state (flickering). If POWERLINK communication is detected before this time expires, however, the interface switches immediately to the PRE_OPERATIONAL_1 state (single flash).
Flickering green (approx. 10 Hz) BASIC_ETHERNET	The interface is in the BASIC_ETHERNET state and being operated purely as an Ethernet TCP/IP interface. **Managing node (MN)** This state can only be exited by resetting the interface. **Controlled node (CN)** If POWERLINK communication is detected while in this state, the interface switches to the PRE_OPERATIONAL_1 state (single flash). In this status, a lit red LED indicates a manager error.
Single flash (approx. 1 Hz) PRE_OPERATIONAL_1	The interface status is in the PRE_OPERATIONAL_1 state. **Managing node (MN)** The MN starts "reduced cycle" operation. Collisions are allowed on the bus. Cyclic communication is not yet taking place. **Controlled node (CN)** The CN waits until it receives an SoC frame and then switches to the PRE_OPERATIONAL_2 state (double flash). In this status, a lit red LED indicates a manager error.
Double flash (approx. 1 Hz) PRE_OPERATIONAL_2	The interface is in the PRE_OPERATIONAL_2 state. **Managing node (MN)** The MN begins cyclic communication (cyclic input data is not yet being evaluated). The CNs are configured in this state. **Controlled node (CN)** The interface is normally configured by the manager in this state. A command then switches the state to READY_TO_OPERATE (triple flash). In this status, a lit red LED indicates a manager error.
Triple flash (approx. 1 Hz) READY_TO_OPERATE	The interface is in the READY_TO_OPERATE state. **Managing node (MN)** Cyclic and asynchronous communication is taking place. Received PDO data is ignored. **Controlled node (CN)** The configuration of the interface is complete. Normal cyclic and asynchronous communication is taking place. The PDO data sent corresponds to the PDO mapping. Cyclic data is not yet being evaluated, however. In this status, a lit red LED indicates a manager error.
On OPERATIONAL	The interface is in the OPERATIONAL state.
Blinking (approx. 2.5 Hz) STOPPED	The interface is in the STOPPED state. **Managing node (MN)** This status is not possible for the MN. **Controlled node (CN)** No output data is being produced, and no input data is being received. It is only possible to switch to or leave this state after the manager has given the appropriate command.

System stop error codes

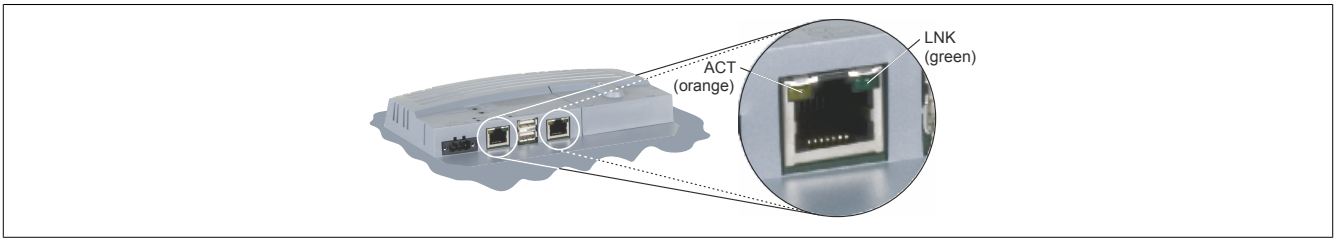
Incorrect configuration or defective hardware can cause a system failure error.
The error code is indicated by the red EPL Error LED using four switch-on phases. Each switch-on phase has a duration of either 150 ms or 600 ms. The error code is repeated every 2 seconds.

Key
● ... 150 ms
\- ... 600 ms
Pause ... 2 second delay

Error description	Error code displayed by red EPL LED									
RAM error	●	●	●	-	Pause	●	●	●	-	Pause
Hardware error	-	●	●	-	Pause	-	●	●	-	Pause

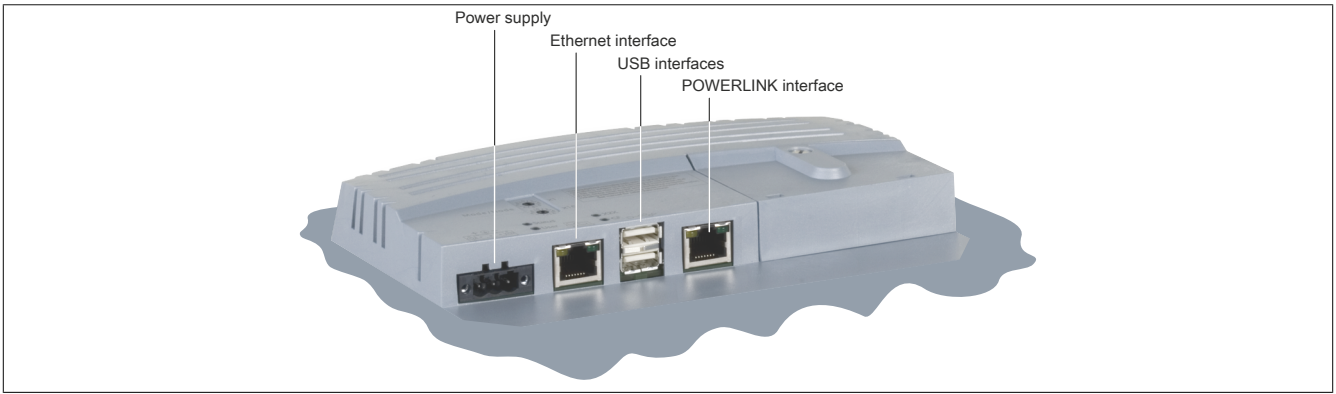
4.4 ACT / LNK LEDs for the RJ45 interfaces

There are two additional LEDs each for the Ethernet and POWERLINK interfaces.



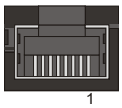
LED	Color	Status	Description
ACT	Orange	On	No Ethernet or POWERLINK activity on the bus
		Blinking	Ethernet or POWERLINK activity on the bus
LNK	Green	On	Link established to the remote station

5 Connection elements



5.1 POWERLINK interface

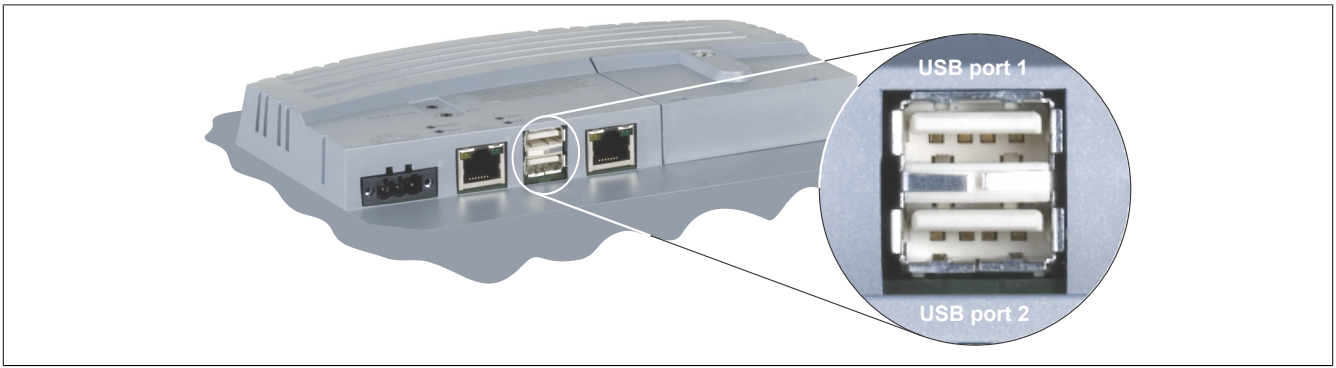
Interface	Pinout		
	Terminal	POWERLINK	
POWERLINK interface	1	RXD	Receive signal
	2	RXD\	Receive signal inverted
	3	TXD	Transmit signal
	4	Termination	Termination
	5	Termination	Termination
	6	TXD\	Transmit signal inverted
	7	Termination	Termination
	8	Termination	Termination



Shielded RJ45 port

5.2 USB interface

This Power Panel 65 features a USB 2.0 (Universal Serial Bus) host controller with two USB interfaces that are accessible externally for the user.



USB interface	
Transfer rate [1]	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), high speed (480 Mbit/s)
Power supply	Max. 0.5 A per port [2]

1) The actual value depends on the operating system or driver used.
2) Each USB interface is protected by a maintenance-free "USB current-limiting switch" (max. 0.5 A).

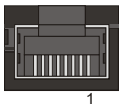
Warning!

Peripheral USB devices can be connected to the USB interfaces. Due to the large number of USB devices available on the market, B&R cannot guarantee their functionality. Functionality is ensured when using the USB devices available from B&R.

Notice!

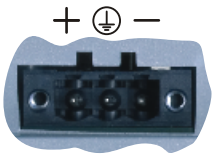
Because this interface is designed according to general PC specifications, extreme care should be taken with regard to EMC, wiring, etc.

5.3 Ethernet interface

Interface	Pinout		
	Terminal	Ethernet	
Ethernet interface	1	RXD	Receive signal
	2	RXD\	Receive signal inverted
1	3	TXD	Transmit signal
RJ45 twisted pair female connector (10BaseT / 100BaseT)	4	Termination	Termination
	5	Termination	Termination
	6	TXD\	Transmit signal inverted
	7	Termination	Termination
	8	Termination	Termination

5.4 Power supply

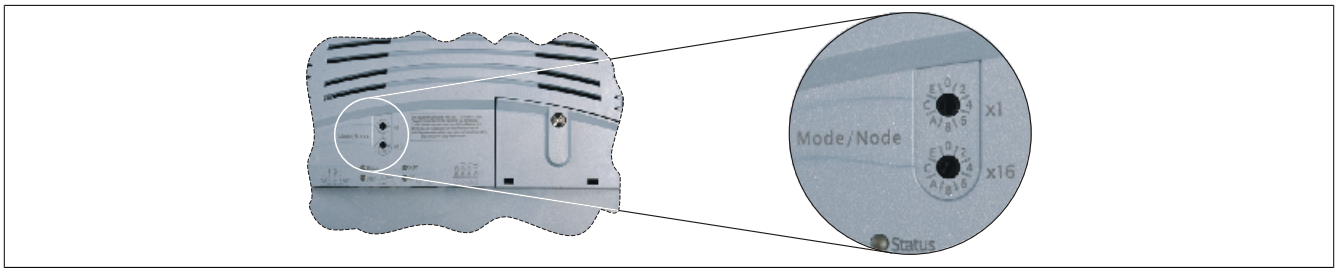
The pinout is listed in the following table and printed on the back of the Power Panel. The Power Panel has reverse polarity protection that prevents the supply voltage from being connected incorrectly and damaging the device. Overload protection must be provided by an external fuse (5 A, fast-acting).

Power supply	Pinout	
	Terminal	**Assignment**
	+	24 VDC
	⏚	Functional ground
	−	GND
3-pin male multipoint connector	**Required accessories**	
	0TB103.9	Connector, 24 VDC, 3-pin female, 3.31 mm² screw clamps, protected against vibration by the screw flange
	0TB103.91	Connector, 24 VDC, 3-pin female, 3.31 mm² cage clamp terminal block, protected against vibration by the screw flange

Notice!

The functional ground must be connected to ground (e.g. control cabinet) using the shortest possible path. Using the largest possible conductor cross section on the power supply connector is recommended.

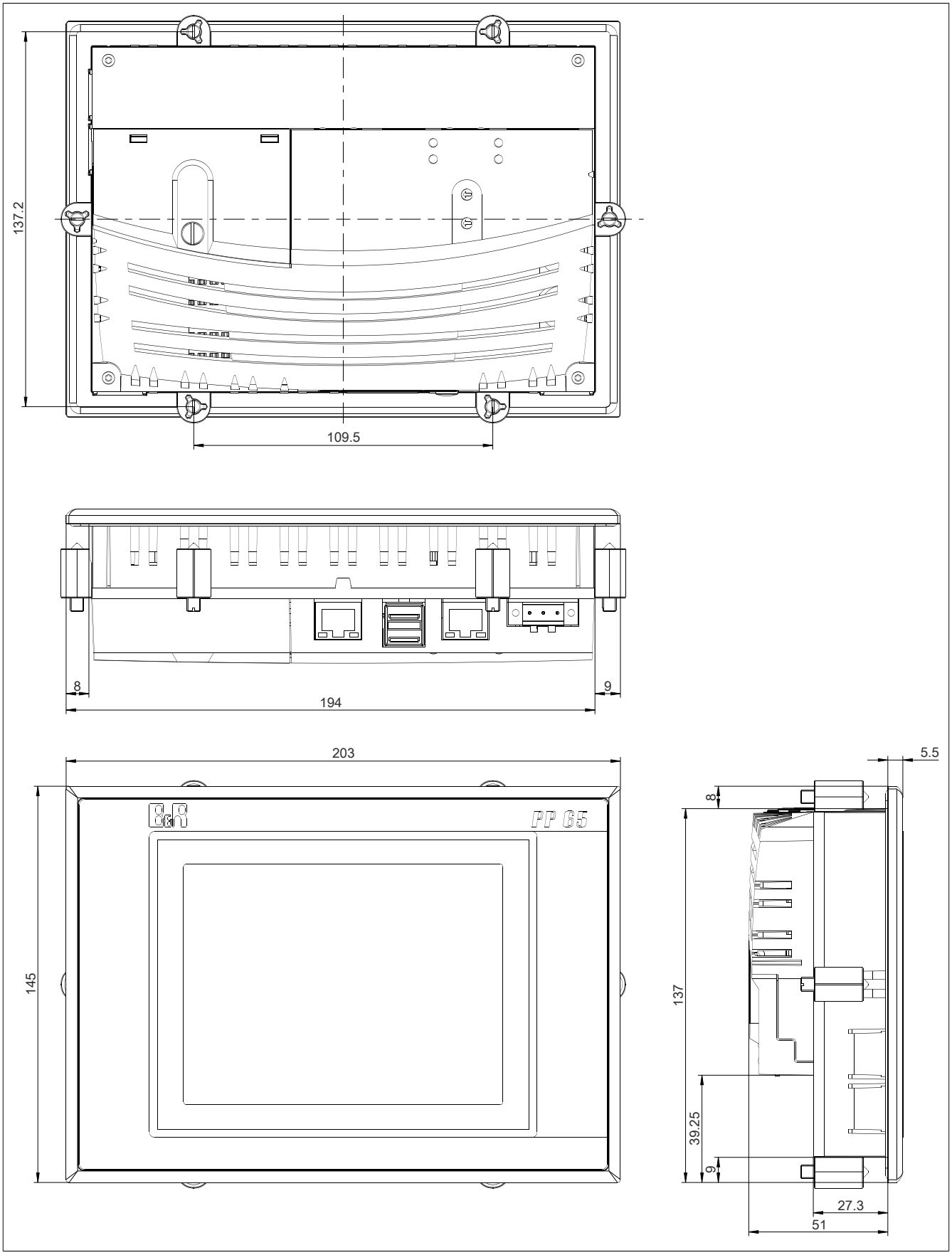
6 Operating mode and node number switches



The Power Panel 65 is equipped with 2 hex switches that can be used as operating mode or node number switches. Switch positions 0x01 to 0xFE are used to set the INA node number of the Ethernet interface.

Switch position	Description
0x00	Reserved
0x01 to 0xFE	**INA node number** of the Ethernet interface
0xFF	**Diagnostic mode:** Starts up the CPU in diagnostic mode. Does not initialize program sections in User RAM and User FlashPROM. After diagnostic mode, the CPU always starts up with a warm restart.

7 Dimensions



Installation cutout: 188 ±0.5 mm x 130 ±0.5 mm