

## 4. PP45 5.7" LCD color touch screen

### 4.1 Order data

| Model number                | Short description                                                                                                                                                                                                                                                                                                                                              | Figure                                                                             |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 4PP045.0571-062             | Power Panel PP45, touch screen, 5.7" QVGA color LCD, backlighting, 10 touch keys, 64 MB DRAM, 32 KB SRAM, x86 100 MHz Intel compatible, removable application memory (CompactFlash), Ethernet 10/100, X2X Link, 2 x USB, IP 65 protection (front side).<br>Application memory must be ordered separately!<br>Order TB103 and TB704 terminal blocks separately. |  |
| <b>Required accessories</b> |                                                                                                                                                                                                                                                                                                                                                                |                                                                                    |
| 0TB103.9                    | Accessory terminal block 3-pin, screw clamp, 3.31 mm², protection against vibration with the screw flange.                                                                                                                                                                                                                                                     |                                                                                    |
| 0TB103.91                   | Accessory terminal block 3-pin, cage clamp, 3.31 mm², protection against vibration with the screw flange.                                                                                                                                                                                                                                                      |                                                                                    |
| 0TB704.9                    | Accessory terminal block, 4-pin, screw clamp, 1.5 mm²                                                                                                                                                                                                                                                                                                          |                                                                                    |
| 0TB704.91                   | Accessory terminal block, 4-pin, cage clamp, 2.5 mm²                                                                                                                                                                                                                                                                                                           |                                                                                    |
| 0AC201.9                    | Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell                                                                                                                                                                                                                                                                                                          |                                                                                    |
| 4A0006.00-000               | Lithium battery, 3 V / 950 mAh, button cell                                                                                                                                                                                                                                                                                                                    |                                                                                    |
| 4A0064.00-000               | 5 DIN A4 legend sheets, 16 fields for a total of 40 devices, CorelDraw template can be downloaded online.                                                                                                                                                                                                                                                      |                                                                                    |
| 5CFCRD.0064-03              | CompactFlash 64 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                      |                                                                                    |
| 5CFCRD.0128-03              | CompactFlash 128 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                     |                                                                                    |
| 5CFCRD.0256-03              | CompactFlash 256 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                     |                                                                                    |
| 5CFCRD.0512-03              | CompactFlash 512 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                     |                                                                                    |
| 5CFCRD.1024-03              | CompactFlash 1024 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                    |                                                                                    |
| 5CFCRD.2048-03              | CompactFlash 2048 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                    |                                                                                    |
| 5CFCRD.4096-03              | CompactFlash 4096 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                    |                                                                                    |
| 5CFCRD.8192-03              | CompactFlash 8192 MB ATA/IDE SiliconSystems                                                                                                                                                                                                                                                                                                                    |                                                                                    |
| <b>Optional accessories</b> |                                                                                                                                                                                                                                                                                                                                                                |                                                                                    |
| 4PP045.IF10-1               | PP45 interface module, 1 RS232 interface                                                                                                                                                                                                                                                                                                                       |                                                                                    |
| 4PP045.IF23-1               | 2005 Interface Module, 1 RS485/RS422 interface (RS422: electrically isolated, RS485: electrically isolated and network capable), 1 CAN interface (electrically isolated and network capable).                                                                                                                                                                  |                                                                                    |
| 4PP045.IF24-1               | PP45 interface module, 1 Profibus DP slave interface (electrically isolated and network capable), 1 RS232/RS422/RS485 interface (RS422/RS485: electrically isolated and network-capable)                                                                                                                                                                       |                                                                                    |
| 4PP045.IF33-1               | PP45 interface module, 2 CAN (electrically isolated and network capable).                                                                                                                                                                                                                                                                                      |                                                                                    |

Table 15: PP45 LCD color touch screen - Order data

## 4.2 Technical data

| Product ID                             | PP45 LCD color touch screen                             |
|----------------------------------------|---------------------------------------------------------|
| <b>Controller</b>                      |                                                         |
| Processor                              | ELAN SC520 100 MHz, Intel compatible                    |
| Main memory                            | 64 MB DRAM                                              |
| SRAM                                   | 32 KB, battery-backup                                   |
| CompactFlash slot                      | 1 slot for Type I CompactFlash card                     |
| Insert slot for PP45 interface modules | 1                                                       |
| Watchdog                               | Internal system management controller                   |
| Power failure logic                    | System management controller, 10 ms buffer time         |
| Battery                                | Lithium, 950 mAh, can be exchanged from the outside     |
| Real-time clock                        | Battery-buffered                                        |
| Mode/node switches                     | 2, 16 digits each                                       |
| <b>Display</b>                         |                                                         |
| Type                                   | LCD color                                               |
| Colors                                 | 256 colors                                              |
| Resolution                             | QVGA, 320 x 240 pixels                                  |
| Diagonal                               | 5.7"                                                    |
| Brightness                             | 140 cd/m <sup>2</sup>                                   |
| Half-brightness time                   | 55,000 h                                                |
| Front                                  | Multi-layered cover with insertion slots for key labels |
| <b>Keys</b>                            |                                                         |
| Touch keys                             | 10 (labeled with legend sheets)                         |
| <b>Interfaces</b>                      |                                                         |
| USB                                    | 2 x USB 2.0, type A connection                          |
| Ethernet                               | RJ 45 Twisted Pair (10 BaseT / 100 BaseT)               |
| X2X                                    | X2X Link master                                         |
| <b>24 VDC supply</b>                   |                                                         |
| Input voltage                          | 24 VDC $\pm$ 25%                                        |
| <b>General information</b>             |                                                         |
| Power consumption                      | Max. 8 W                                                |
| Certification                          | CE, C-UL-US, GOST-R (in development)                    |
| <b>Operational conditions</b>          |                                                         |
| Operating temperature                  | 0 to +50°C                                              |
| Relative humidity                      | 10% to 90%, non-condensing                              |
| Protection type                        | IP65 (front side) / IP20 (back side)                    |

Table 16: PP45 LCD color touch screen - Technical data

**PP45 5.7" LCD color touch screen • Additional technical data**

| Product ID                              | PP45 LCD color touch screen                                            |
|-----------------------------------------|------------------------------------------------------------------------|
| <b>Storage and transport conditions</b> |                                                                        |
| Temperature                             | -20°C to +70°C                                                         |
| Relative humidity                       | T ≤ 40°C: 5% to 90%, non-condensing<br>T > 40°C: < 90%, non-condensing |
| <b>Mechanical characteristics</b>       |                                                                        |
| Outer dimensions (W x H x D [mm])       | 203 x 145 x 56.4                                                       |
| Weight                                  | 0.5 kg                                                                 |

Table 16: PP45 LCD color touch screen - Technical data

**4.3 Additional technical data**

| Product ID                     | PP45 LCD color touch screen                                  |
|--------------------------------|--------------------------------------------------------------|
| <b>Controller</b>              |                                                              |
| Battery buffer current         | Max. 30 µA                                                   |
| Real-time clock resolution     | 1 s                                                          |
| Operating system               | Automation Runtime                                           |
| <b>24 VDC supply</b>           |                                                              |
| Input voltage (min./nom./max.) | 18 VDC / 24 VDC / 30 VDC                                     |
| Voltage monitoring             | An NMI is triggered if the input voltage falls below 15 VDC. |
| <b>General information</b>     |                                                              |
| B&R ID code                    | \$251A                                                       |

Table 17: PP45 LCD color touch screen - Additional technical data

## 4.4 Diagnostic LEDs

There are four diagnostic LEDs on the back of the PP45:

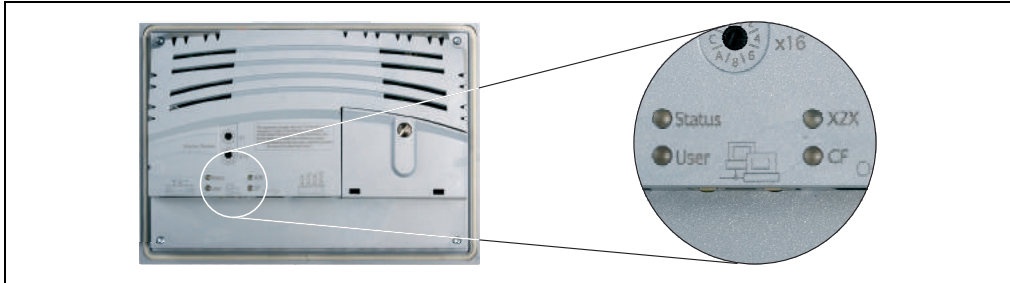


Figure 6: PP45 LCD color touch screen - Diagnostic LEDs

| LED    | Color                      | Status | Description                                                                                                                                         |
|--------|----------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Status | Red                        | On     | Error / Reset                                                                                                                                       |
|        | Green                      | On     | RUN                                                                                                                                                 |
|        | Orange                     | On     | Boot, Service or Diagnostics mode                                                                                                                   |
|        | Green on / Orange blinking |        | RUN, battery not OK                                                                                                                                 |
| User   | Green                      | -      | This LED can be operated by the user (with the AsHW library). This function is supported by Automation Runtime starting with Version N2.90 / A2.92. |
| X2X    | Orange                     | On     | The module sends data via the X2X Link interface.                                                                                                   |
| CF     | Orange                     | On     | Access to the CompactFlash card                                                                                                                     |

Table 18: PP45 LCD color touch screen - Diagnostic LEDs

There are two more LEDs right next to the Ethernet interface:

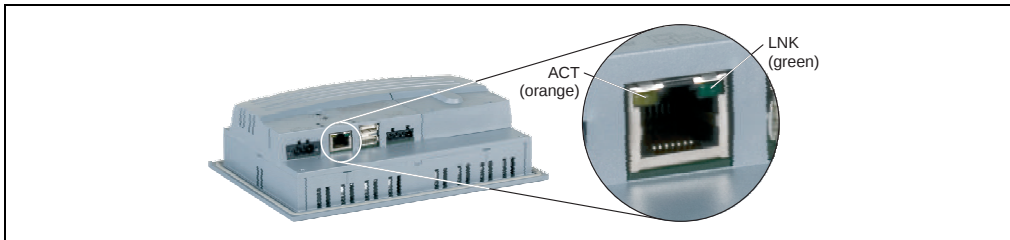


Figure 7: PP45 LCD color touch screen - Ethernet LEDs

| LED | Color  | Status   | Description                                        |
|-----|--------|----------|----------------------------------------------------|
| ACT | Orange | On       | No Ethernet activity on bus                        |
|     |        | Blinking | Ethernet activity on bus                           |
| LNK | Green  | On       | A link to the remote station has been established. |

Table 19: PP45 LCD color touch screen - Diagnostic LEDs

4.5 Connection elements

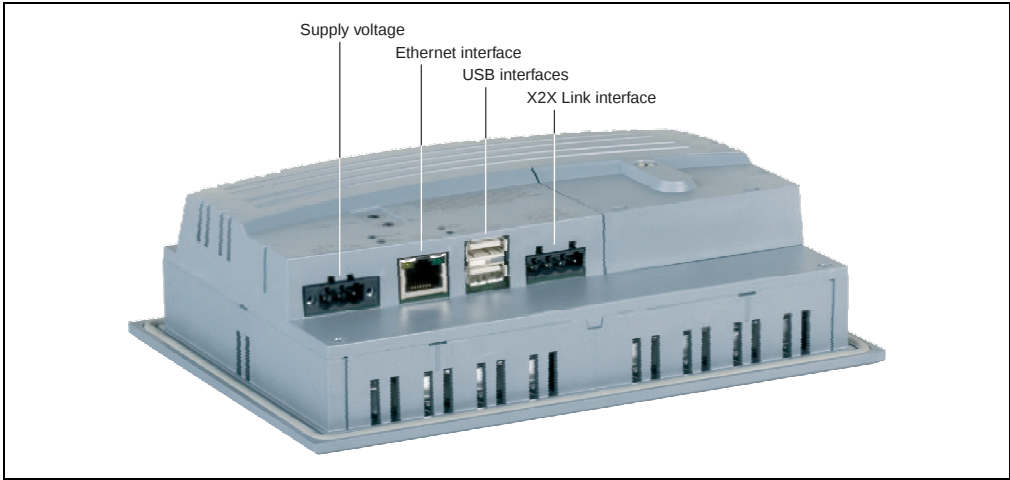


Figure 8: PP45 LCD color touch screen - Connection elements

4.5.1 X2X Link interface

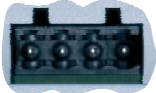
| Interface                                                                                                                                                                                                                                                                                                                                                          | Pin assignments      |                                                       |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------------------------|-------------------|
| <div>Application interface<br/>X2X Link</div> <div><div>X2X<br/>X2X⊥<br/>X2XI<br/>SHLD</div><div><div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div><div>1234</div></div><div></div><div>4-pin multipoint connector</div></div> | Terminal             | X2X Link                                              |                   |
|                                                                                                                                                                                                                                                                                                                                                                    | 1                    | X2X                                                   | X2X data          |
|                                                                                                                                                                                                                                                                                                                                                                    | 2                    | X2X⊥                                                  | X2X ground        |
|                                                                                                                                                                                                                                                                                                                                                                    | 3                    | X2X\                                                  | X2X data inverted |
|                                                                                                                                                                                                                                                                                                                                                                    | 4                    | SHLD                                                  | Shield            |
|                                                                                                                                                                                                                                                                                                                                                                    | Required accessories |                                                       |                   |
|                                                                                                                                                                                                                                                                                                                                                                    | 0TB704.9             | Accessory terminal block, 4-pin, screw clamp, 1.5 mm² |                   |
|                                                                                                                                                                                                                                                                                                                                                                    | 0TB704.91            | Accessory terminal block, 4-pin, cage clamp, 2.5 mm²  |                   |
|                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                       |                   |

Table 20: PP45 LCD color touch screen - Pin assignments - X2X Link

#### 4.5.2 USB interface

This Power Panel 45 device has a USB 2.0 (Universal Serial Bus) host controller with two USB ports, which are easily accessible for the user.

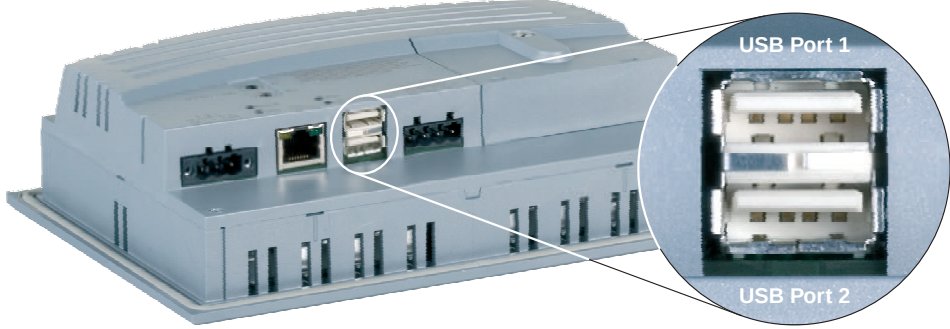
| USB interface                                                                      |                                                                            |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
|  |                                                                            |
| Transfer rate <sup>1)</sup>                                                        | Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 Mbit/s) |
| Power supply                                                                       | Max. 500 mA per port <sup>2)</sup>                                         |

Table 21: PP45 LCD color touch screen - USB interface

1) The actual value depends on the operating system or diver being used.

2) For safety, every USB port is equipped with a maintenance free "USB current-limiting circuit breaker" (max. 500 mA)

## Warning!

Peripheral USB devices can be connected to the USB interfaces. Due to the vast number of USB devices available on the market, B&R cannot guarantee their performance. B&R does assure the performance of all USB devices that they provide.

## Important!

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables, etc.

### 4.5.3 Ethernet interface

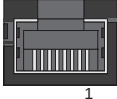
| Interface                                                                                                                                         | Pin assignments |             |                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|--------------------------|
|                                                                                                                                                   | Terminal        |             |                          |
|  <p>1</p> <p>RJ45 twisted pair socket<br/>(10BaseT/100BaseT)</p> | 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              |

Table 22: PP45 LCD color touch screen - Pin assignments - Ethernet interface

### 4.5.4 Supply voltage

The pin assignments can be found either in the following table or printed on the back of the Power Panel. The Power Panel has reverse polarity protection that prevents the supply voltage from being connected incorrectly, which would damage the device. Overload protection must be provided by an external fuse (5 A, fast-acting).

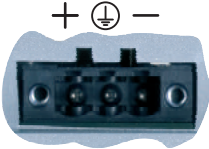
| Supply voltage                                                                                                       | Pin assignments             |                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                      | Terminal                    | Assignment                                                                                                              |
|  <p>3-pin multipoint connector</p> | +                           | + 24 VDC                                                                                                                |
|                                                                                                                      | ⏏                           | Functional grounding                                                                                                    |
|                                                                                                                      | —                           | GND                                                                                                                     |
|                                                                                                                      | <b>Required accessories</b> |                                                                                                                         |
|                                                                                                                      | 0TB103.9                    | Accessory terminal block 3-pin, screw clamp, 3.31 mm <sup>2</sup> , protection against vibration with the screw flange. |
|                                                                                                                      | 0TB103.91                   | Accessory terminal block 3-pin, cage clamp, 3.31 mm <sup>2</sup> , protection against vibration with the screw flange.  |

Table 23: PP45 LCD color touch screen - Pin assignments - Supply voltage

## Important!

The pin's connection to the functional ground (e.g. switching cabinet) should be as short as possible. We recommend using the largest possible conductor cross section on the supply plug.

## 4.6 Operating mode and node number switches

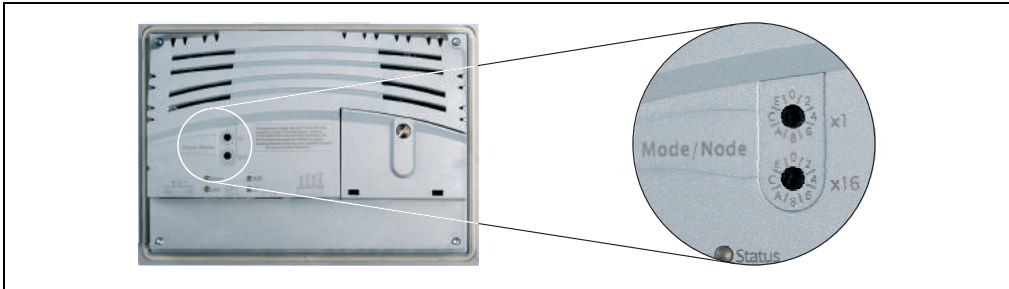


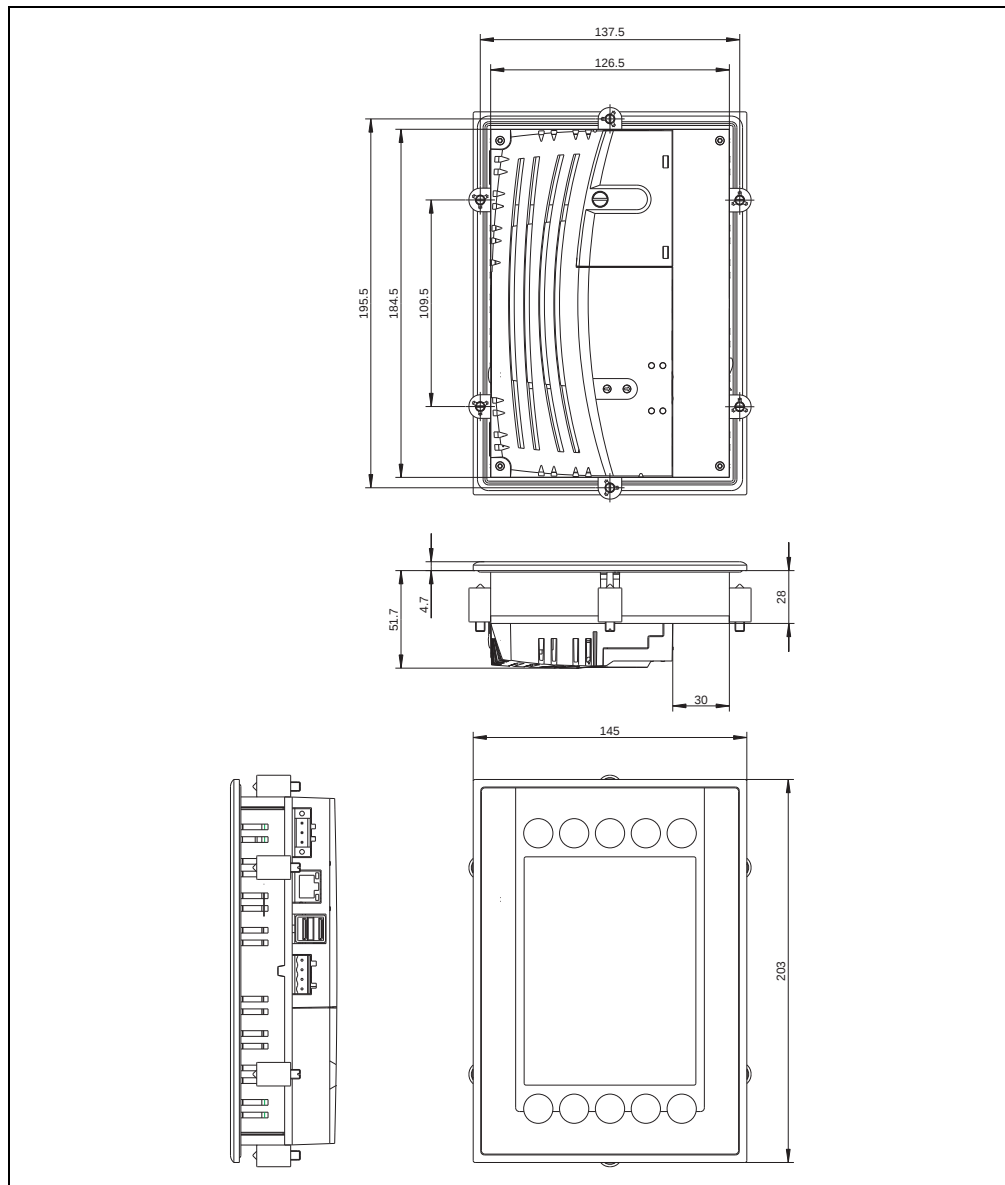
Figure 9: PP45 LCD color touch screen - Operating mode and node number switches

The Power Panel 45 device is equipped with 2 hex switches, which are used as operating mode or node number switches. Switch positions 01 - FE are used to set the INA station number of the Ethernet interface.

| Switch position | Description                                                                                                                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00              | <b>Boot mode:</b><br>The CPU is started in boot mode.                                                                                                                                                 |
| 01 - FE         | <b>INA node number</b> of the Ethernet interface                                                                                                                                                      |
| FF              | <b>Diagnostics mode:</b><br>The CPU boots in Diagnostics mode. Program sections in User RAM and User FlashPROM are not initialized. After diagnostics mode, the CPU always boots with a cold restart. |

Table 24: PP45 LCD color touch screen - Switch positions of the operating mode and node number switches

## 4.7 Dimensions



Installation cutout: 186.1 mm x 128.1 mm