# VL BPC 100…

## Valueline configurable box PC



Data sheet
3063_en_E

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## 1 Description

The VL BPC 1000 is a configurable box PC that can be mounted either directly on a wall or on a DIN rail. The VL BPC 1000 utilizes the Intel® Atom™ N455 1.66 GHz CPU, chosen for its balance of processing power and energy efficiency. The small footprint, fanless design and rich I/O capability make the VL BPC 1000 a product that can be used in a wide variety of applications. The three built-in COM ports enable connections to legacy RS-232 devices. One of the COM ports can also be configured for RS-422 or RS-485 protocols.

The VL BPC 1001 is built on the exact same platform as the VL BPC 1000. While the VL BPC 1000 is configurable, the VL BPC 1001 has a fixed configuration that does not include a CompactFlash® card or operating system.

## 2 Features

- Energy-efficient Intel Atom processors
- Fanless design
- DIN rail- and wall-mounting options
- CompactFlash (CF) support
- Embedded operating system support
- Three COM ports

**NOTE:**
Protective earth ground and circuit ground (return) are connected.

Make sure you always use the latest documentation.
It can be downloaded at phoenixcontact.net/products.

This data sheet is valid for all products listed on the following page:

# 3 Ordering data

### Products

| Description | Type | Order No. | Pcs. / Pkt. |
|---|---|---|---|
| **Industrial PC,** configurable | **VL BPC 1000** | 2701291 | 1 |
| **Industrial PC,** preconfigured for wall mounting with 2 GB RAM, does not include operating system or CompactFlash card | **VL BPC 1001** | 2701290 | 1 |

### Accessories

| Description | Type | Order No. | Pcs. / Pkt. |
|---|---|---|---|
| **Adapter,** DIN rail | **UTA 107/30** | 2320089 | 1 |
| **CompactFlash card**, 1 GB | **VL 1 GB CF** | 2913155 | 1 |
| **CompactFlash card**, 2 GB | **VL 2 GB CF** | 2913156 | 1 |
| **CompactFlash card**, 4 GB | **VL 4 GB CF** | 2913157 | 1 |
| **CompactFlash card**, 8 GB | **VL 8 GB CF** | 2913158 | 1 |
| **CompactFlash card**, 16 GB | **VL 16 GB CF** | 2701668 | 1 |
| **CompactFlash card**, 32 GB | **VL 32 GB CF** | 2701669 | 1 |

### Replacement parts

| Description | Type | Order No. | Pcs. / Pkt. |
|---|---|---|---|
| **Connector,** printed circuit board for power input | **MSTB 2,5/ 3-STF** | 1786844 | 50 |

# 4 Technical data

| General data | |
|---|---|
| Dimensions (width x height x depth) | 155 x 145 x 49 mm |
| Ambient temperature (operating) | 0 … 50°C |
| Ambient temperature (storage/transport) | -40 … 70°C |
| Permissible humidity (relative) | 5 … 95% |
| Weight | 1.4 kg |
| Degree of protection | IP20 |
| Mounting | Wall or NS 35 DIN rail (EN 60715) |
| LED indicators | Power, CF, Run, Error |

| Electrical data | |
|---|---|
| Power supply, nominal | 24 V DC |
| Power supply, range | 19.2 … 28.8 V DC |
| Power consumption, typical[1] | 12.5 W @ 24 V |
| Power consumption, maximum[2] | 23.8 W @ 19.2 V |
| Recommended power supply size | 2.5 A or greater |
| Type of connection | Removable Combicon screw-type |
| Conductor size | 0.2 … 2.5 mm² (24 … 12 AWG) |
| Torque | 0.5 … 0.6 Nm |
| RTC battery, typical life | 5 years |

[1] Windows® XP OS, 8 GB CF card, loopback plugs in all COM and LAN ports, running burn-in test at 20%

[2] Windows XP OS, 8 GB CF card, loopback plugs in all COM and LAN ports, USB ports fully loaded, running burn-in test at 100%

| Computer data | |
|---|---|
| Operating system (configurable option) | Windows® Embedded Standard 2009<br>Windows Embedded Standard 7 |
| Processor | 1.66 GHz Intel® Atom™ N455 processor |
| Data storage (configurable option) | CompactFlash® (bootable) |

| Processor data | |
|---|---|
| Processor | Intel Atom N455 |
| Clock speed | 1.66 GHz |
| Cache | 512 kB L2 cache |
| Number of cores | 1 |
| Number of threads | 2 |
| Maximum TDP | 6.5 W |
| Maximum RAM | 2 GB |
| RAM type | DDR3 SODIMM |
| Number of memory channels | 1 |

| Interfaces | |
|---|---|
| USB | 4x Type A, USB 1.1/2.0 |
| Serial connection | 2x 9-pos. D-Sub (male) for RS-232<br>1x 9-pos. D-Sub (male), jumper selectable for RS-232/422/485 |
| Super I/O chipset | ITE IT8781F |
| Video | VGA (DB-15, female) |
| Video chipset | Integrated |
| Number of Ethernet connectors | 2 |
| Ethernet connection | 10/100/1000 Mbps |
| LAN chipset | Realtek® 8111D PCI-E |

| Mechanical tests | |
|---|---|
| Shock test according to IEC 60068-2-27 | 15g with 11 ms impulse |
| Vibration resistance according to EN 60068-2-6 | 1g |

| Conformance | |
|---|---|
| Conformance for EMC directives | |
| UL | UL 508 |

# 5 Dimensions

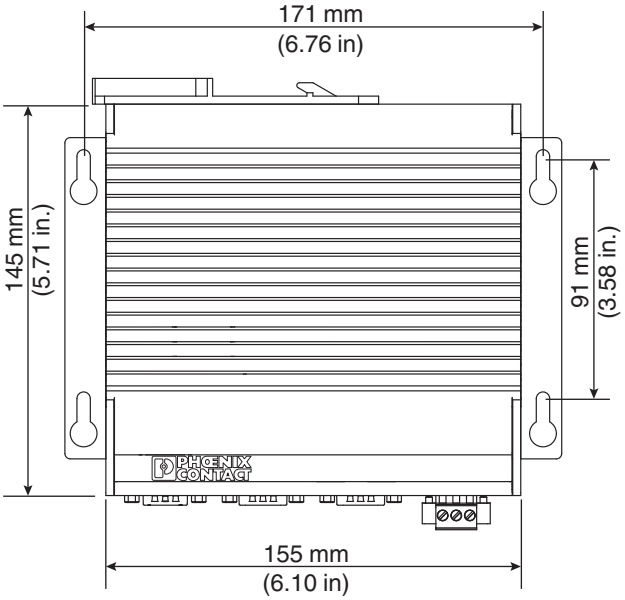



Figure 1 Dimensions

# 6 Installation

The VL BPC 100… can be mounted on an NS 35 DIN rail or attached to a flat mounting surface such as a wall (mounting method must be selected when ordered).

Be sure sufficient clearance exists for routing cables to the connectors. When installing the VL BPC 100… in a cabinet, follow these general rules:

– Verify clearances within the cabinet. Typically, leave at least 5 cm (2 in.) on each side. Depending on cable routing, additional space may be required.
– Drill all holes and make all cuts before beginning installation. Be sure to protect already installed components from shavings.
– Supporting panels must be at least 14 gauge to provide proper support.
– Make sure that there is adequate space around the heat sink (on the back of the VL BPC 100…) and air inlets and outlets to provide sufficient cooling.

## 6.1 DIN rail mounting

To install on DIN rail:

1. Angle the VL BPC 100… so the top edge of the mounting plate hangs on the top edge of the DIN rail.
2. Rotate the bottom of the VL BPC 100… down against the lower edge of the DIN rail. Press in until the latch snaps closed.
3. Secure with clamps.

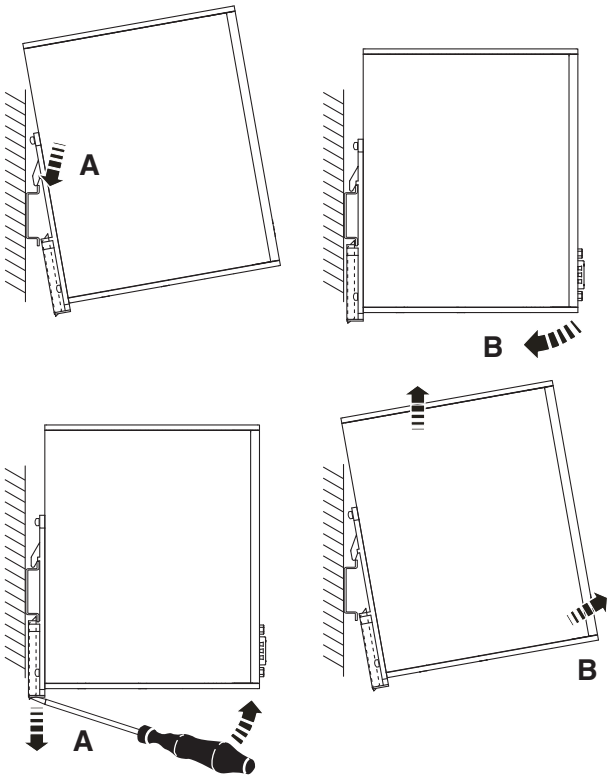



Figure 2 DIN rail installation and removal

To remove from DIN rail:

1. Remove rail clamps and cables, as necessary.
2. Use a screwdriver to release the latch.
3. Rotate the bottom of the VL BPC 100… away from the rail and then lift it off the rail.

## 6.2 Wall mounting

1. Mark mounting holes in the mounting surface (wall) as indicated in Figure 2. Alternatively, hold the VL BPC 100… in position and mark the holes on the wall.
2. Drill holes in the wall as required. Mounting hardware (not included) will depend on the type of mounting surface.
3. Secure the VL BPC 100… to the wall using appropriate hardware.

# 7 Interfaces

After mounting the VL BPC 100…, make any necessary cable connections.

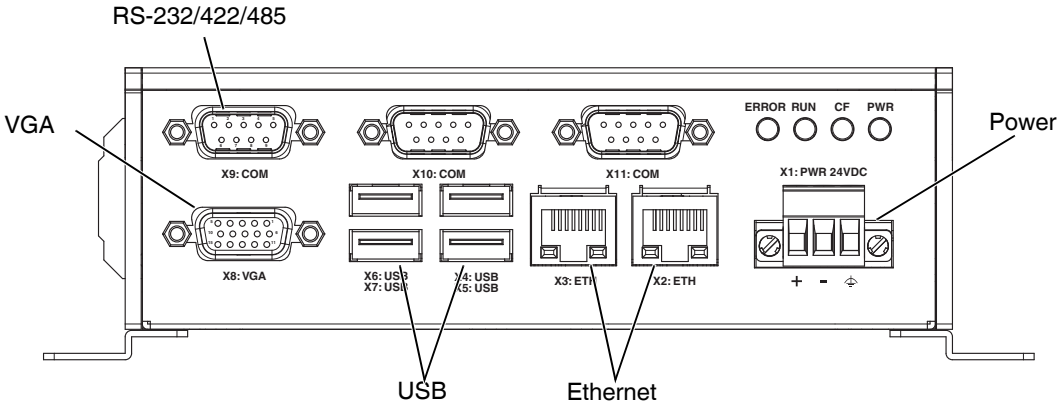



Figure 3 Connectors

The connections available are:

– Ethernet (ETH): Two RJ45 connectors allow the computer to communicate on a 10/100/1000 Base-T Ethernet network.
– Serial (COM): Three 9-pos. D-Sub ports allow connection of serial devices. Two ports operate on the RS-232 layer; one port can be configured to communicate on the RS-232, RS-422 or RS-485 physical layer (see “Serial communication” on page 7 for jumper settings).
– USB (USB): USB devices connect using Type A connectors. The VL BPC 100… has four USB ports.
– VGA (VGA): This port connects the VL BPC 1000 to an external analog display with a corresponding VGA connector.

**External display**

External analog displays can be connected to the VGA port of the VL BPC 100… (see Figure 3). An Extended Display Identification Data (EDID) display will download its capabilities to the display driver while non-EDID displays will not. In either case, additional settings can be applied through the Intel® Graphics Media Accelerator.

## 7.1 Service panel

**NOTE: Electrostatic discharge!**

The device contains components that can be damaged or destroyed by electrostatic discharge. When handling the device, observe the necessary safety precautions against electrostatic discharge (ESD), in accordance with EN 61340-5-1 and EN 61340-5-2.

Jumpers on the circuit board provide the ability to configure the VL BPC 100… for specific applications. To access the jumpers:

1. Turn off the VL BPC 100… and disconnect the power supply.
2. Remove the VL BPC 100… to an ESD safe location.

3. Remove the four screws securing the access plate and remove the plate.

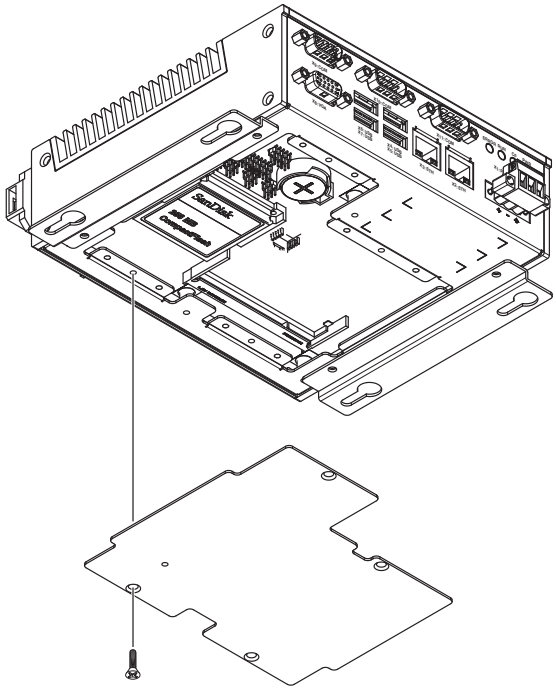


Figure 4 Service panel removal

There are two blocks of jumpers.

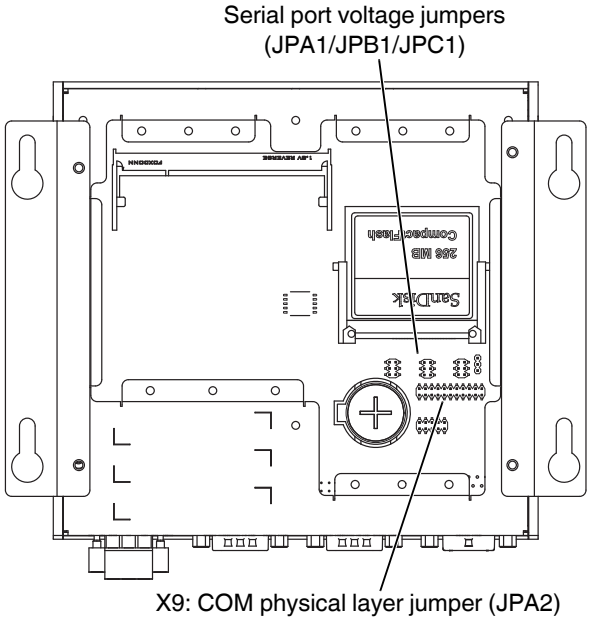



Figure 5 Jumper block locations

To move a jumper, it may be gently grasped using a small needle-nose pliers or large tweezers. Pull it straight out until it is clear of the pins. Reposition it over the desired pins and insert it straight on to the pins.

### 7.2 Power connection

A 3-position, screw-type Combicon connector (MSTB 2,5/ 3-STF) is provided for connecting a power source to the VL BPC 100….

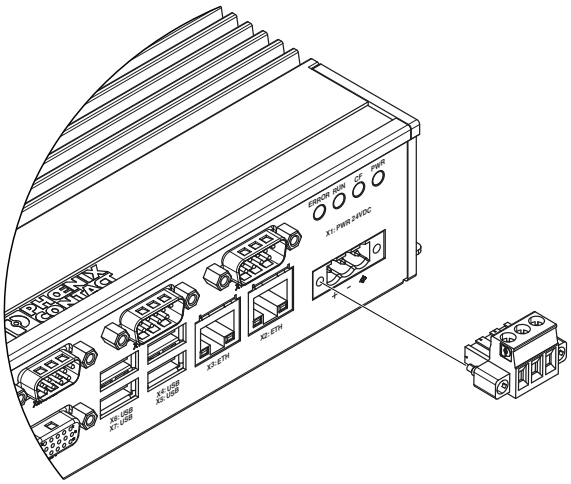


Figure 6 Power connector

Connect power source to the included power connector. This connector supports wire sizes from 0.2 to 2.5 mm² (24 to 12 AWG). Torque the wire retaining screws in the connector to 0.5 Nm (4.4 $lb_f$-in.) torque. Secure the connector to the VL BPC 1000 chassis.

| PIN NO. | DESCRIPTION |
|---|---|
| ⏚ (FE) | Chassis Ground |
| – | 0 V DC |
| + | +19.2…28.8 V DC |

**NOTE:**

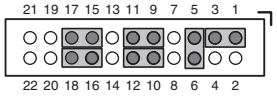
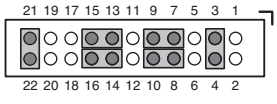
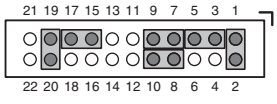
The ⏚ of the VL BPC 1000 must be connected to a functional ground.

### 7.3 Serial communication

Port **X9: COM** can be configured to communicate on the RS-232, RS-422 or RS-485 physical layer. This is set using jumpers on the motherboard.

**NOTE:**

The COM port cable must be less than 30 m when the port is configured for RS-422/RS-485. Longer cable lengths can be achieved by using an external surge suppression device.

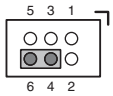
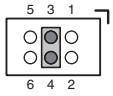
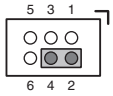
| JPA2 | |
|---|---|
| **Function** | **Jumper position** |
| RS-232 (default) |  |
| RS-422 |  |
| RS-485 |  |



The function of the pins in the D-Sub connector varies with the different configuration settings.

| DB-9 Pin | RS-232 | RS-422 | RS-485 |
|---|---|---|---|
| 1 | DCD | TXD- | TXD- |
| 2 | RXD | TXD+ | TXD+ |
| 3 | TXD | RXD+ | Do not use |
| 4 | DTR | RXD- | Do not use |
| 5 | GND | GND | GND |
| 6 | DSR | Do not use | Do not use |
| 7 | RTS | Do not use | Do not use |
| 8 | CTS | Do not use | Do not use |
| 9 | Function setup by JPA1 | Function setup by JPA1 | Function setup by JPA1 |

Pin 9 in the COM port (DB-9) connector can be configured to provide different voltages using the appropriate jumper setting.

| JPA1/JPB1/JPC1 | |
|---|---|
| **Function** | **Jumper position** |
| +12 V output |  |
| RI Input (default) |  |
| +5 V output |  |



Ports X10 and X11 are limited to RS-232 only.

# 8 Operation

## 8.1 LED operation

Four LEDs are located on the bottom of the VL BPC 100….
These LEDs provide operating information.

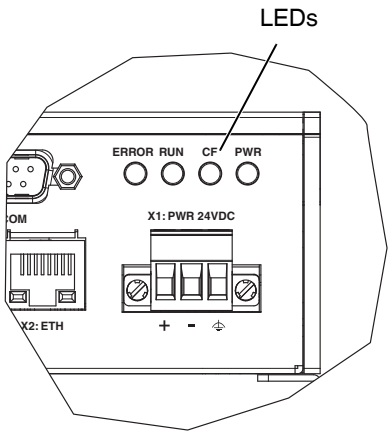



Figure 7 LED layout

| LED | Indication | Description |
|---|---|---|
| ERROR | Orange<br><br>Red | Indicates reduced performance due to processor temperature<br>Indicates an over-temperature condition has caused the processor to shut down |
| RUN | | Reserved for future use |
| CF | Flashes green | Indicates CompactFlash activity |
| PWR | Green | When 24 V DC is applied and the power switch is turned on |

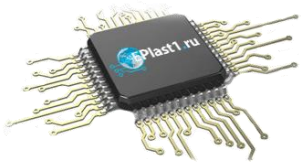
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