

Accessory-Kits for the Box-PC BPCWL02 Series Box-PC BPCAL02 Series

Shuttle offers a wide range of accessories for the Box-PC series BPCWL02/BPCAL02. These include accessory kits for mounting the chassis and various daughter boards for additional connections, for RF modules or for the extended DC voltage range.



Images for illustration only



Caution: Only suitably trained persons may open the barebone and install optional components!

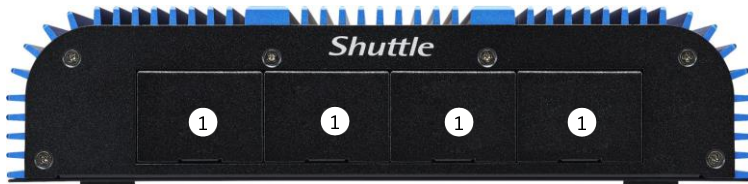
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Box-PC Overview

Shuttle's Box-PC series in a ruggedized box design for high durability consists of compact fanless IPC systems with modular expansion for wide-range industrial applications.

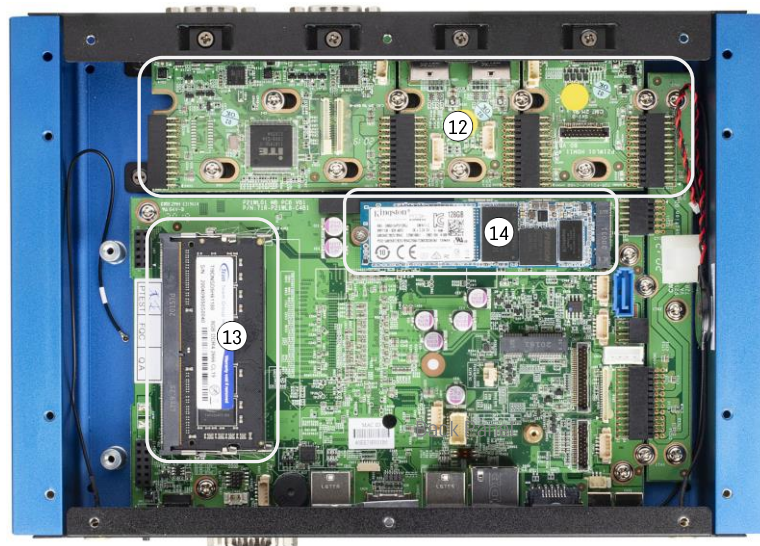
Front panel



Back panel



Inside View



Front Panel

Back Panel

1. The front panel has four sections to support optional I/O expansion kits

Example for optional I/O ports:



2. Audio Line Out (Headphones output)
3. Microphone input
4. Gigabit LAN port (Intel i211, black)
5. Gigabit LAN port (Intel i219LM, yellow)
6. 4x USB 3.2 Gen 1 Type A port
7. HDMI port
8. COM port (RS232)
9. DC-in connector for power adapter
10. Power button
11. 2x WLAN antenna (optional)
12. Area for optional daughter boards

13. 2x SO-DIMM slot supports DDR4-2400
14. M.2-2280/2260 M slot for SSD card (NVMe/SATA)

The picture shows optional components (12, 13 and 14) that are not included in the barebone product.

Optional Mounting Kits

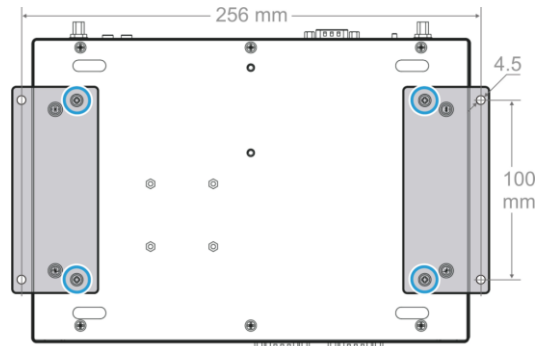
The Box-PC can be placed horizontally on its rubber feed or can be mounted in the following three ways:

Ear Mount Brackets (**MRS01**)

EAN Code: 4046047104024

The Shuttle Box-PC Accessory **MRS01** consists of two Ear Mount brackets and four M3 screws.

The brackets can be mounted on the underside of the Box-PC chassis (see drawing). The Box-PC can then be affixed to a surface with four M4 screws (mounting dimension: 256 mm x 100 mm).

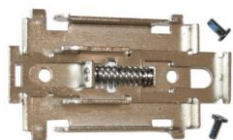


DIN Rail Clip (**MDR01**)

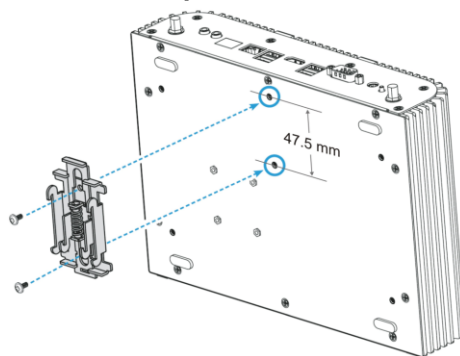
EAN Code: 4046047104017

The Shuttle Box-PC Accessory **MDR01** consists of a DIN-Rail clip and two M3 screws.

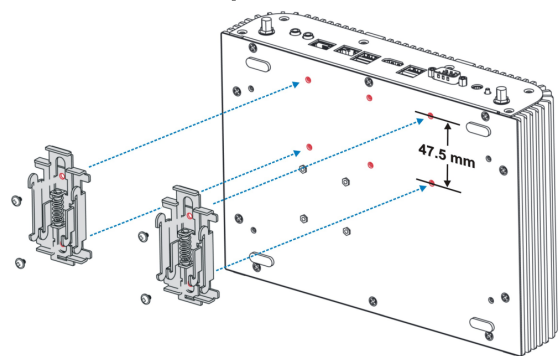
The clip can be mounted on the underside of the Box-PC chassis (see drawing). The Box-PC can then be mounted on a standard 35 mm DIN-Rail, e.g. inside equipment racks.



1x DIN Rail Clip **MDR01** for BPCWL02



2x DIN Rail Clips **MDR01** for BPCAL02

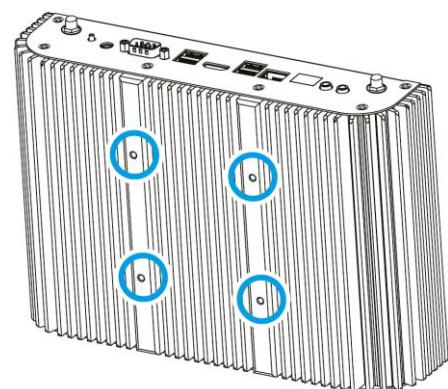


VESA Mount

The Shuttle Box-PC features four threaded M4 holes on the upper side for a standard 75 x 75 mm VESA mount, which allows for installation on to walls or large displays.

Shuttle does not offer a VESA mount as an accessory product as there are many options available in the market (VESA arm, wall mount, etc). Use a suitable product from a retailer that supports the 75x75 mm VESA standard and can support a load of at least 5 kg.

Example: VESA Wall Mount



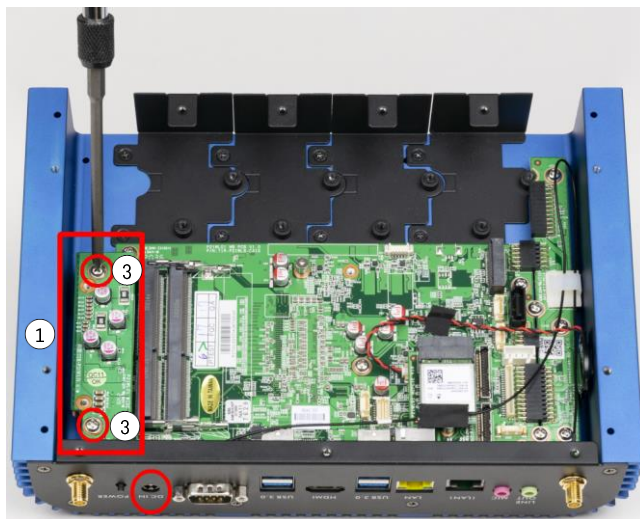
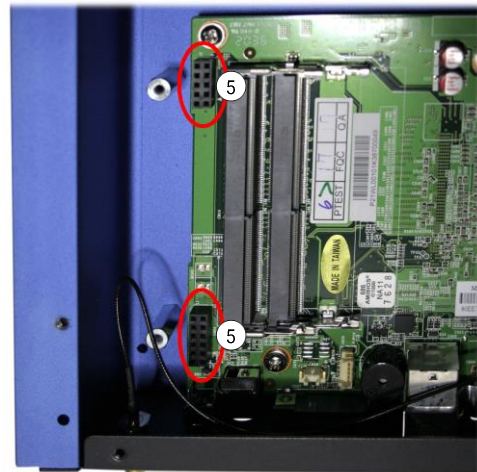
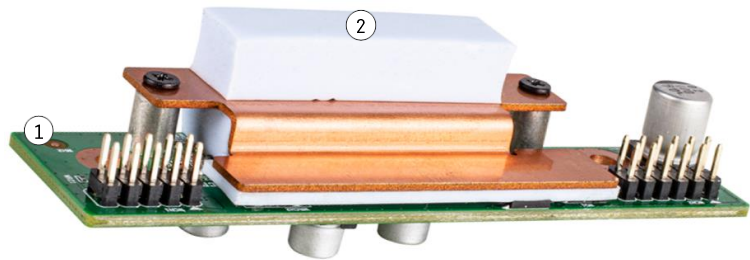
Mounting holes: 75 x 75 mm

Wide Range DC-Input Extension (**VOL01**)

EAN Code: 4046047104000

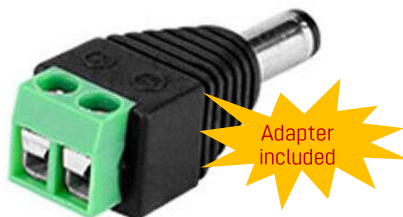
The DC input connector of the Box-PC normally supports **19V** input voltage and a suitable 90W power adapter is included in the scope of delivery.

To be able to use other power sources, the input voltage range can be extended to **9 ... 36 V DC** by adding the **optional voltage regulator modul (VOL01)**.



Scope of Delivery:

- Daughterboard [1] including thermal pad [2]
- 2x silver screw [3]
- 5.5 x 2.5mm female DC power plug with screw terminal



Installation Guide:

- Open the chassis of the Box-PC. For this, unscrew ten screws of chassis cover on the bottom [4]. Then remove the cover.
- Take the VOL01 daughterboard [1], remove the protective film from the thermal pad [2].
- Connect the VOL01 daughterboard to the onboard headers of the mainboard [5] and fix it with two silver screws [3]
- Install other components if necessary and finally screw down the chassis cover.

Power Adapter for wide temperature range (**PA1501**)

EAN Code: 4046047104031

With standard components, the Box-PC supports an operating temperature range of 0 ... +40 °C.

The following components are required to support the extended temperature range of -20 ... +60 °C of the Box-PC:

1. Special 150W power adapter **PA1501**
Model: SINPRO SPU151A-107 (19V, 7.89A, 150W)
2. Industrial-grade RAM/SSD components with an operating temperature range of -40 ... +85 °C

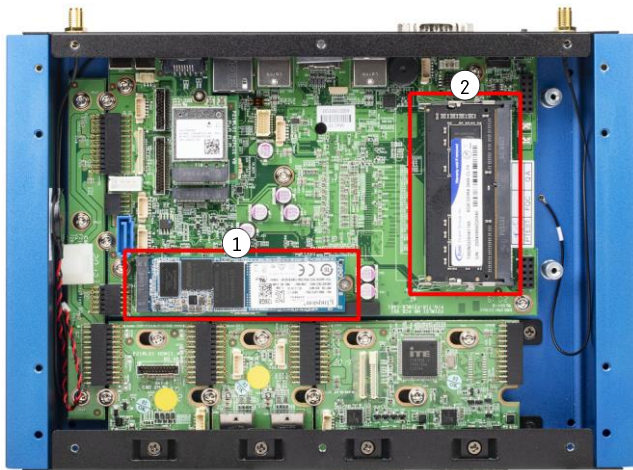


AC power cord is included

Operation Temperature			
Box-PC	RAM	M.2 SSD	Power Adapter
0 ... +40 °C (default)	0 ... +85 °C (commercial-grade)	0 ... +70 °C (commercial-grade)	0 ... +40 °C (default)
-20 ... +60 °C (wide temperature)	-40 ... +85 °C (industrial-grade)	-40 ... +85 °C (industrial-grade)	-20 ... +70 °C (PA1501)



Location of the **DC-input connector** at the back panel of the Box PC for the external power adapter

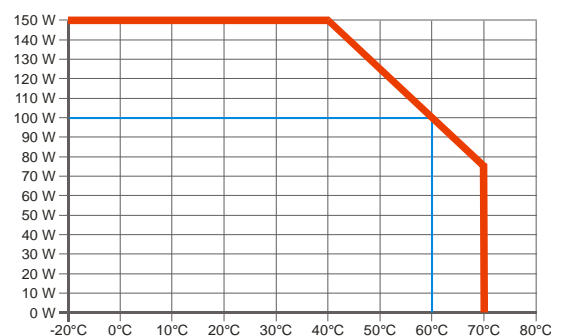


Placement of RAM and SSD memory:

- [1] SSD card in M.2 format (60 or 80 mm length) supports SATA or PCIe (NVMe) interface
- [2] one or two SO-DIMM RAM modules up to 32 GB each supports DDR4-2400 (PC4-19200) or higher

Power Adapter Shuttle PA1501 specifications:

- Adapter Model SINPRO SPU151A-107
- Wide Input Voltage range: 90-260 VAC at 47-63 Hz
- IEC-320-C14 Input Inlet
- DC output connector: 2.5/5.5 mm
- Output voltage: 19 V, max. 7.89 A
- Operating Temperature: -20 ... +70 °C
- Output wattage at 0-40 °C: max. 150 W
- Output wattage at 60 °C: max. 100 W



Temperature de-rating curve of the PA1501 power adapter

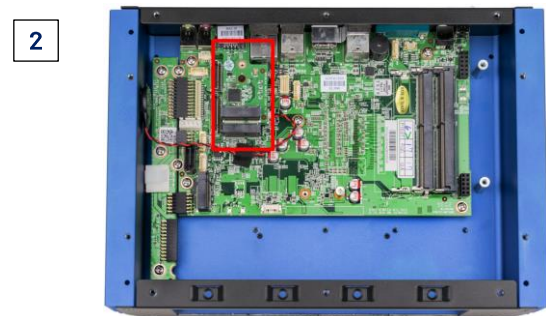
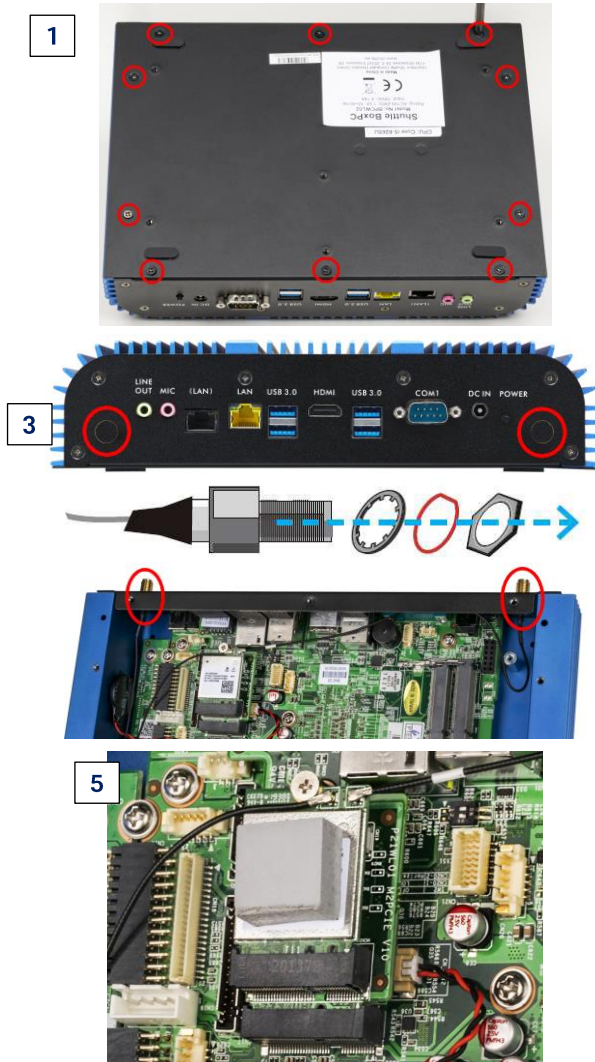
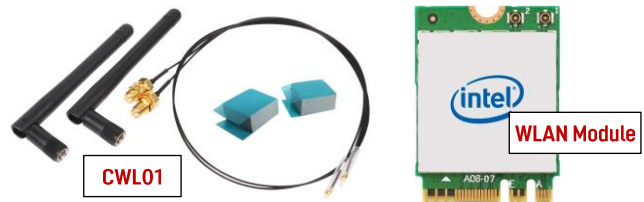
WLAN function (CWL01)

EAN Code: 4046047104048

To expand the Box-PC with a WLAN function, you need a M.2-2230 WLAN module and this accessory kit:

CWL01: Two external antennas, cables, thermal pads

Perforations provided on the back panel of the BoxPC for mounting the WLAN antennas. The WLAN module is not included.



Scope of Delivery:

Antenna Kit CWL01:

- 2x external WLAN antennas
- 2x internal WLAN cables
- 2x thermal pads

WLAN card (not included):

- M.2-2230 WLAN card with two antenna connectors for example: Model Intel AX200NGW.NV supports Wi-Fi 6 (WLAN-ax, 2T2R) and Bluetooth 5.2

Installation Guide:

1. Open the chassis of the Box-PC. For this, unscrew ten screws of chassis cover on the bottom. Then remove the cover.
2. Locate the empty M.2-2230 slot for the WLAN card
3. On the back panel are two perforations to install the external antennas. Carefully remove the perforations with a 6 mm screwdriver. Take the SMA connectors of the supplied antenna cables and lead it through the openings. Check the socket alignment and only push horizontally. Do not turn or twist the cable. Use the lock to affix the SMA connector from the outside.
4. Install the WLAN card into the M.2-2230 slot with one screw. Then carefully connect the antenna cables to the WLAN card. Attention: the small MHF IV (I-PEX4) connectors for the antenna cables on the WLAN adapter can easily be damaged. It is recommended to work with a magnifying glass and good lighting.
5. Take the supplied thermal pads and stick them on top of each other onto the WLAN card.
6. Install other components if necessary and finally screw down the chassis cover and install the external WLAN antennas.

2.5G LAN Upgrade (IDL11)

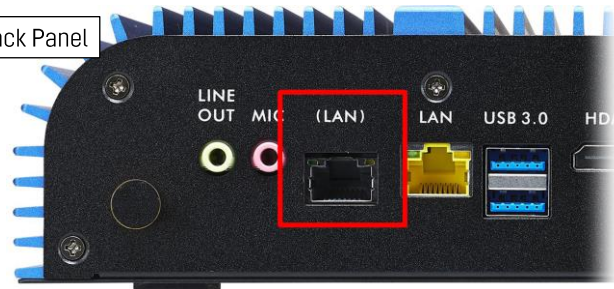
EAN Code: 4046047103973

The Box-PC **BPCWL02** is delivered with two Gigabit LAN ports in the back panel as standard. The black LAN port can optionally be upgraded to 2.5 Gbps speed (Intel i226 chip) with the accessory **IDL11**.

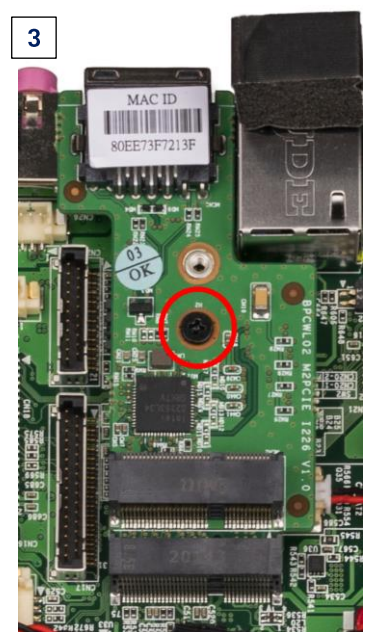
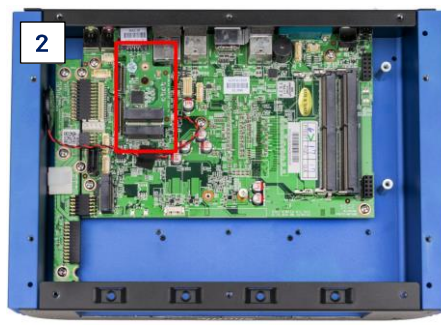
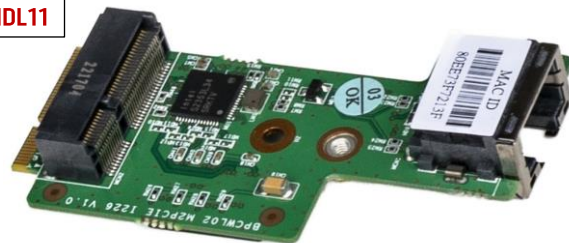
Note: The accessory IDL11 does **not** need to be used with the Box-PC **BPCAL02**, because its network ports already support 2.5 Gbps speed.

Box-PC Model	IDL11 can be useful?
BPCWL02	Yes
BPCAL02	No

Back Panel



IDL11



Scope of Delivery:

- 2.5G LAN daughter board (Intel i226 chip)

Note: the LAN daughter board features a M.2-2230 slot which can be used for an optional WLAN module.

Installation Guide:

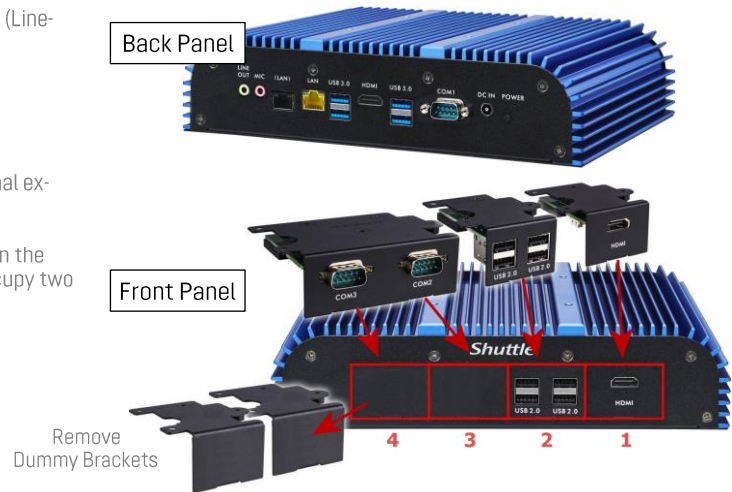
1. Open the chassis of the Box-PC. For this, unscrew ten screws of chassis cover on the bottom. Then remove the cover.
2. Locate the installed LAN daughter board.
3. Undo the black screw and remove the current LAN daughter board. Then install the new daughter board **IDL11** and affix with the screw.
4. Install other components if necessary and finally screw down the chassis cover.

Optional Front Panel I/O Ports

The **Back Panel** features various fixed connections such as Audio (Line-out, Mic-in), Dual LAN, 4x USB 3.2, HDMI, COM and DC-Input.

The **Front Panel** is subdivided into four sections to support optional expansion kits in order to add I/O ports.

Every optional expansion kit is required to start from Section 1 (on the right) with the second kit occupying Section 2 etc. Some kits occupy two sections.



First steps to install optional I/O ports

Caution: Only suitably trained persons may open the barebone and install optional components! For safety reasons, please ensure that the power cord is disconnected before opening the case. The following steps explain how to install an optional front panel connector.

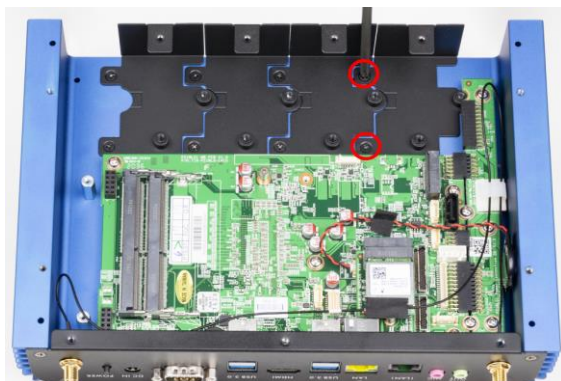
(1) Unscrew ten screws of the base plate and remove it.



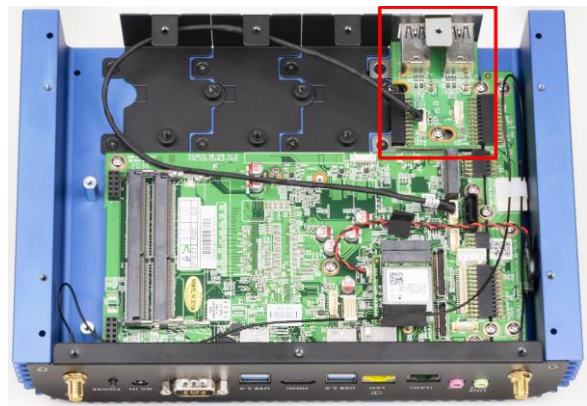
(2) Unscrew another ten screws of the front cover and remove it.




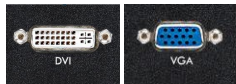





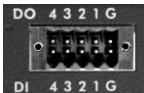


(3) The first extension kit has to be installed on the right side (see picture). Undo two screws to remove Dummy Bracket on the right side. Temporarily remove another Dummy Bracket to be able to install the new extension.



(4) Then install the I/O board according to the further instructions.



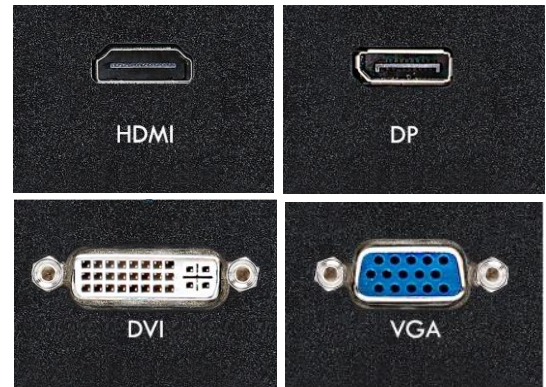
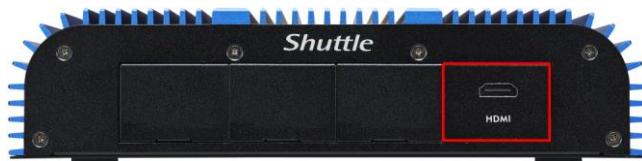
Overview: Front Panel Accessories

PORT	ORDER No.	EAN CODE	IMAGE	OCCUPIED SECTIONS	MAX. KITS	NOTE															
HDMI 2.0 HDMI 1.4 DP 1.2 DVI-I VGA	DHD11 DHD01 DDP01 DDV01 DVG01	4046047103928 4046047103911 4046047103898 4046047103904 4046047103935	 	1	see table	<div>Possible graphics ports configurations:</div> <table><tr><th>Port</th><th>BPCWL02</th><th>BPCAL02</th></tr><tr><td>1</td><td>HDMI 1.4 fixed onboard</td><td>HDMI 2.0 fixed onboard</td></tr><tr><td>2</td><td>HDMI 1.4, DP, DVI-I, VGA</td><td>HDMI 1.4/2.0, DP, DVI-I, VGA</td></tr><tr><td>3</td><td>VGA *)</td><td>HDMI 1.4/2.0, DP, DVI-I, VGA</td></tr><tr><td>4</td><td>—</td><td>DP *), VGA *)</td></tr></table> <div>*) Adapter cable CED01 required and no Hot Plug support</div>	Port	BPCWL02	BPCAL02	1	HDMI 1.4 fixed onboard	HDMI 2.0 fixed onboard	2	HDMI 1.4, DP, DVI-I, VGA	HDMI 1.4/2.0, DP, DVI-I, VGA	3	VGA *)	HDMI 1.4/2.0, DP, DVI-I, VGA	4	—	DP *), VGA *)
Port	BPCWL02	BPCAL02																			
1	HDMI 1.4 fixed onboard	HDMI 2.0 fixed onboard																			
2	HDMI 1.4, DP, DVI-I, VGA	HDMI 1.4/2.0, DP, DVI-I, VGA																			
3	VGA *)	HDMI 1.4/2.0, DP, DVI-I, VGA																			
4	—	DP *), VGA *)																			
4x USB 2.0	USB01	4046047103997		1	2 (4)	USB hub device Note: USB 2.0 ports allow up to 500mA/2.5W power output, but if only low power devices like mouse/keyboard are connected, then up to 4 USB kits (with 16 USB ports) can be used															
SINGLE COM	CRS01	4046047103874		1	1	Supports RS232 only (passive cable adapter)															
DUAL COM	CSD01	4046047103881		2	1	Supports RS232/RS422/RS485 (includes an additional I/O controller chip)															
LTE/4G KIT WITH 2 ANTENNAS	LTE01	4046047104055		2	1	Not included: M.2 LTE/4G card and Nano SIM Compatible with e.g. Huawei ME906S, Sierra EM7455, Quectel EM06E etc.															
4x LAN PORTS (2.5 GBPS)	IDL01	4046047103966		2	1	In addition to the existing 2x 1G LAN ports you can add four LAN ports with 2.5G speed <u>Note:</u> then only M.2 SSD cards with SATA interface are supported (no more PCIe/NVMe)															
Dig. I/O-KIT 4x In / 4x Out	DIO11	4046047103959		1	4	up to four Digital I/O expansion kits each with 4x Input and 4x Output															
INPUT FOR CAR-IGNITION LOCK	DIO01	4046047103942		1	1	Input for car ignition lock enables delayed on/off switching of the BoxPC <i>Please contact Shuttle for further information.</i>															
PORT FOR EXT. POWER-BUTTON	PWR01	4046047103980		1	1	Screw terminals for a cable for an external power button															

Graphics Ports

Besides the fixed HDMI port on the back panel, **additional graphics ports** can be added in front panel:

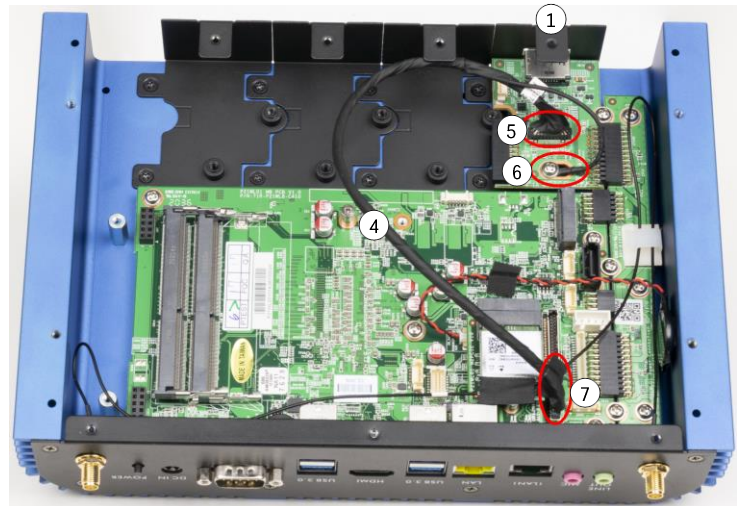
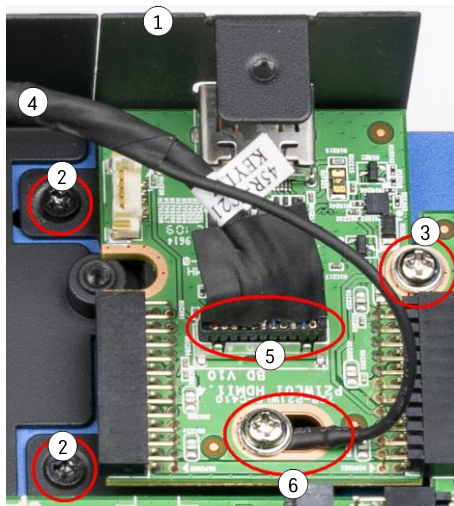
Graphics Port (Accessory Name)	Max. Video Resolution/Frames per Second
HDMI 2.0 Port (DHD11) EAN Code: 4046047103928	1080p/60, 2160p/60 (digital with audio)
HDMI 1.4 Port (DHD01) EAN Code: 4046047103911	1080p/60, 2160p/30 (digital with audio)
DisplayPort 1.2 (DDP01) EAN Code: 4046047103898	1080p/60, 2160p/60 (digital with audio)
DVI-I Port (DDV01) EAN Code: 4046047103904	1080p/60 (digital or analog)
VGA Port (DVG01) EAN Code: 4046047103935	1080p/60 (analog)



Possible graphics ports configurations:

Port	BPCWL02	BPCAL02
1	HDMI 1.4, fixed onboard	HDMI 2.0 fixed onboard
2	HDMI 1.4, DP, DVI-I, VGA	HDMI 1.4/2.0, DP, DVI-I, VGA
3	VGA *)	HDMI 1.4/2.0, DP, DVI-I, VGA
4	—	DP *), VGA *)

*) Adapter cable **CED01** required and no Hot Plug support

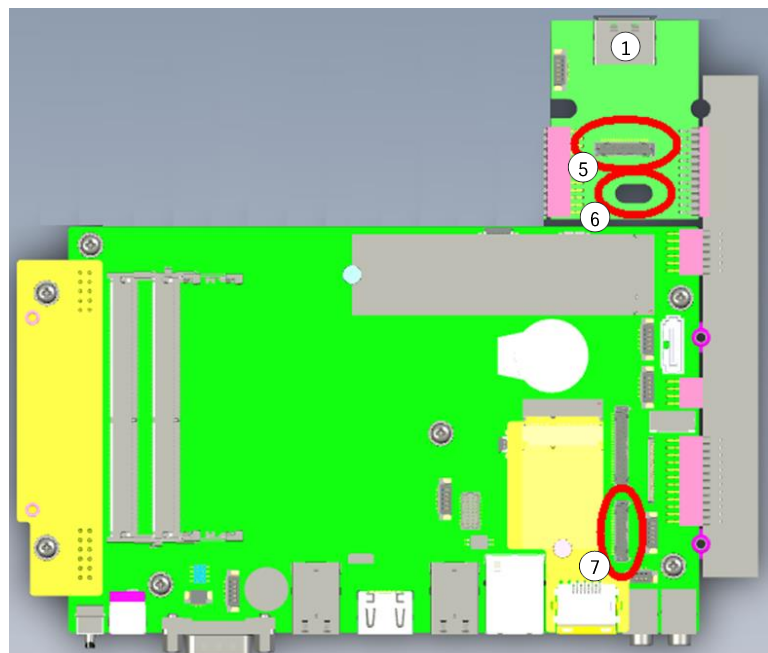


Scope of Delivery:

- Daughterboard with graphics port [1]
- Internal DDI graphics cable [4]
- Silver screw [3]

Installation Guide:

- Open the chassis of the Box-PC and remove a Dummy Bracket to have space for the new graphics port in the front panel. Temporarily remove another Dummy Bracket to be able to install the new extension.
- Install the daughterboard [1] with two black screws [2] and one silver screw [3]
- Take the DDI cable [4] and connect one end to the daughter board [5] and fix the grounding cable with a silver screw [6]. Connect the other end to the 21-pin onboard header [7].
- Install other components if necessary and finally screw down the chassis cover.



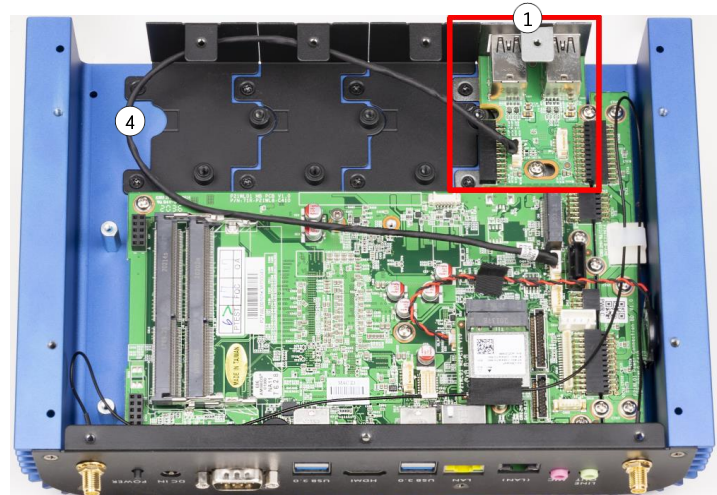
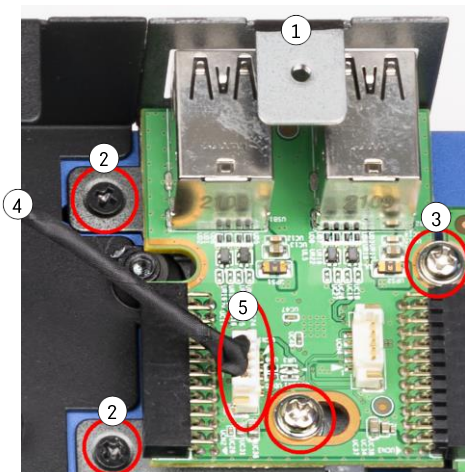
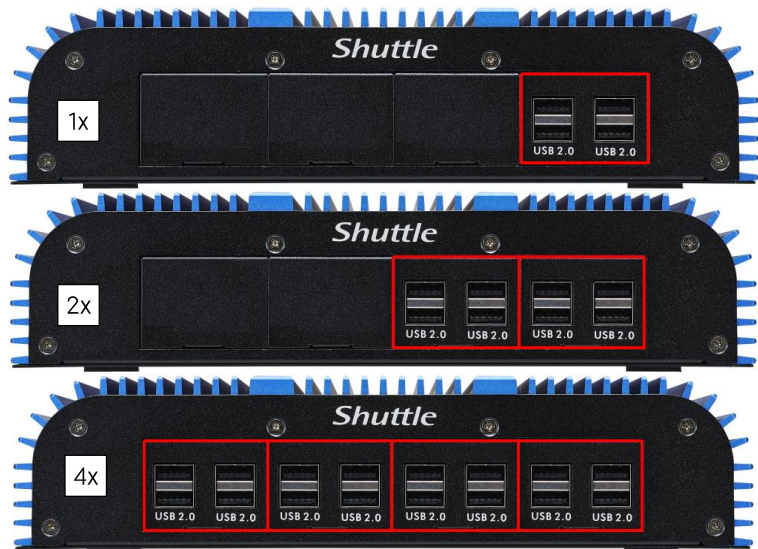
Quad USB 2.0 Ports (USB01)

EAN Code: 4046047103997

One USB01 kit adds four USB 2.0 ports on the front panel of the Box-PC.

Two USB01 kits allow to add eight USB ports and each USB 2.0 port allows up to 500mA/2.5W power output.

You can even install up to **four USB01 kits** with a total of 16 USB 2.0 ports, **but only 8 USB 2.0 ports support 500mA/2.5W power output**, the other USB 2.0 ports must be connected to low power devices such as mice and keyboards.



Scope of Delivery:

- Daughterboard with 4x USB 2.0 ports [1]
- Internal 5-pin USB cable [4]
- Silver screw [3]

Installation Guide:

- Open the chassis of the Box-PC and remove a Dummy Bracket to have space for the new USB extension in the front panel. Temporarily remove another Dummy Bracket to be able to install the new extension.
- Install the daughterboard [1] with two black screws [2] and one silver screw [3]
- Take the cable [4] and connect one end to the daughter board [5]. Connect the other end to one of the four onboard USB headers [6].
- Install other components if necessary and finally screw down the chassis cover.



COM Ports (Serial Interface)

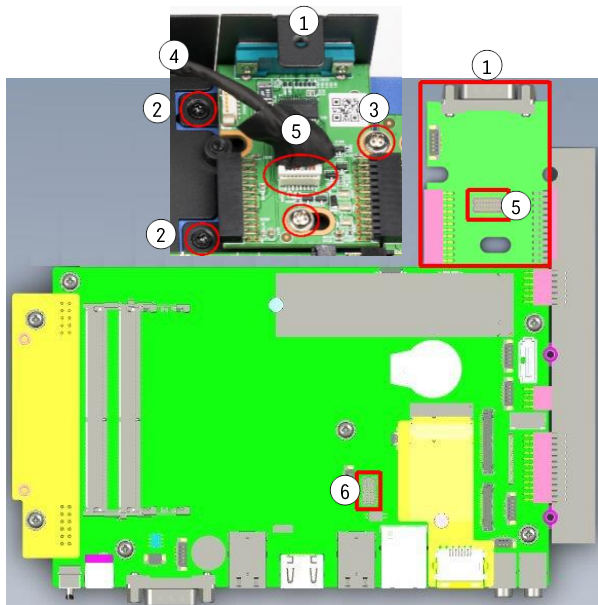
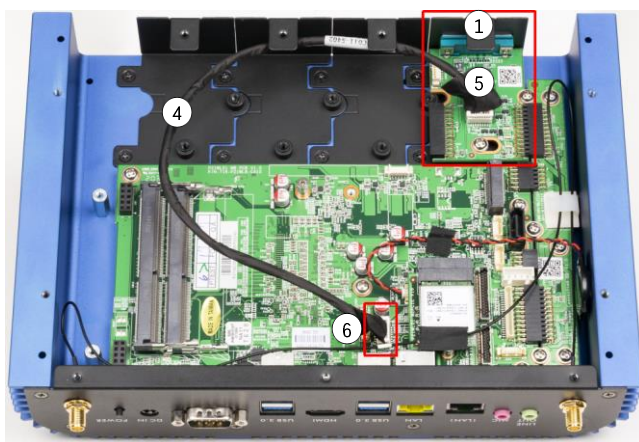
Besides the fixed RS232 COM port on the back panel, up to three additional Serial COM ports can be added in front panel.

EAN Code: 4046047103874 / 4046047103881



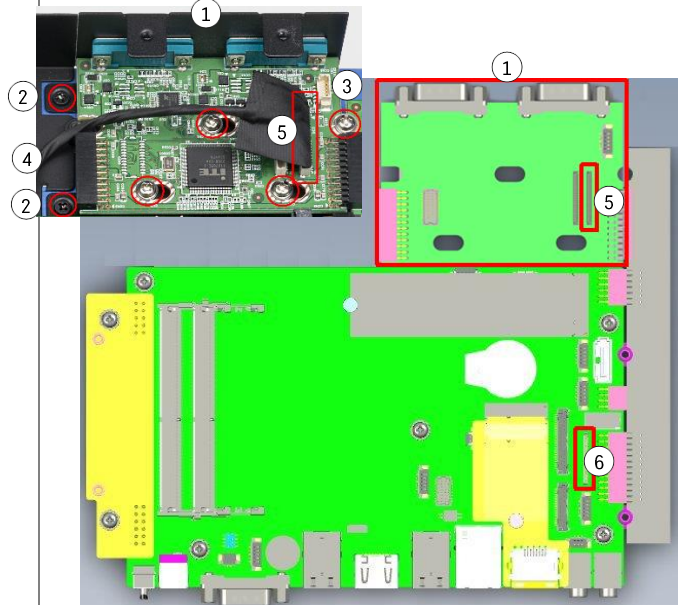
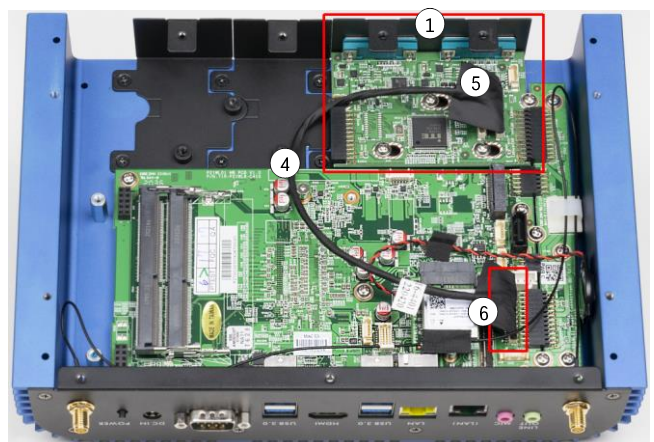
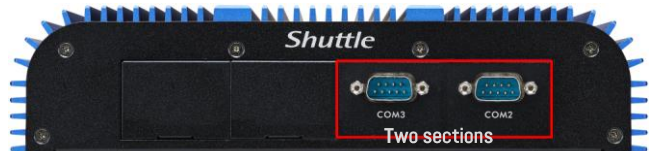
Single COM-Port (CRS01)

DHD01 is a passive COM port adapter which supports RS232 only.



Dual COM-Port (CSD01)

DHD11 provides two COM ports which support RS232/RS422/RS485.



Scope of Delivery:

- Daughterboard with Single or Dual COM-Port [1]
- Internal cable [4]
- 1x silver screw [3]

Installation Guide:

- Open the chassis of the Box-PC and remove one (or two) Dummy Bracket(s) to have space for the new USB extension in the front panel. Temporarily remove another Dummy Bracket to be able to install the new extension.
- Install the daughterboard [1] with two black screws [2] and one silver screw [3]
- Take the cable [4] and connect one end to the daughter board [5]. Connect the other end to the appropriate onboard header as shown in the picture [6].
- Install other components if necessary and finally screw down the chassis cover.

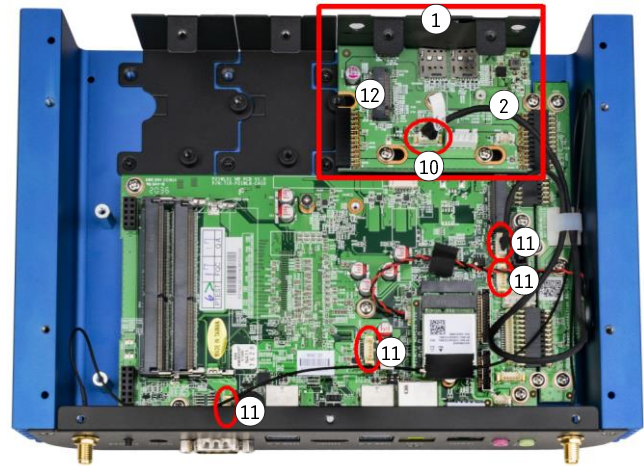
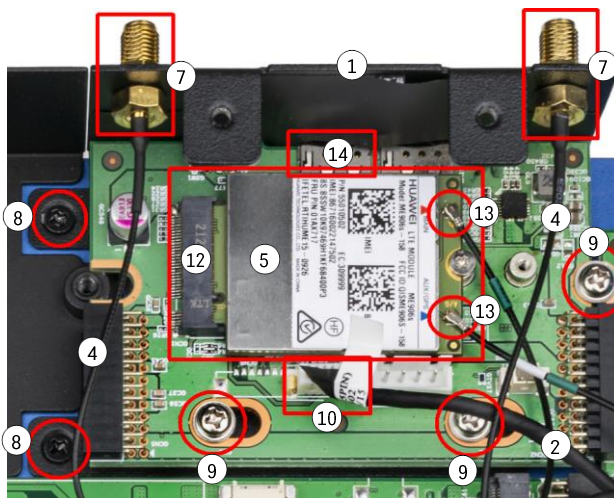
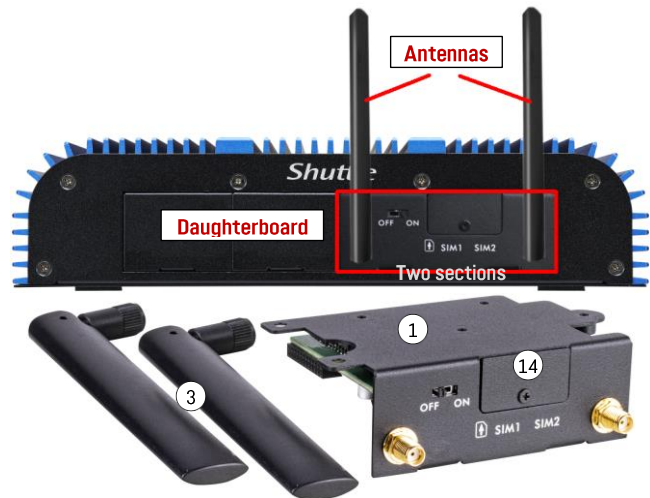
LTE/4G Kit with antennas (LTE01)

EAN Code: 4046047104055

The Box-PC can be upgraded with an LTE/4G function for mobile network. These components are required:

Component	Description
LTE/4G kit (LTE01)	Daughterboard for the front panel of the Box-PC including two external antennas with cables
SIM card *)	Activated Nano SIM card (only one SIM card is supported)
LTE/4G card *)	LTE/4G card in M.2-3042 format e.g. Huawei ME906S, Sierra EM7455, Quectel EM06E or similar models

*) SIM card and LTE/4G card must be purchased by the user.



Scope of Delivery (LTE01 and CLT01):

- LTE Daughterboard [1]
- Internal 5-pin USB cable [2]
- Silver screw [9]
- Two LTE Antennas [3] with antenna cables [4]

Also needed:

- LTE/4G card in M.2-3042 format [5], for example: Quectel EM06-E, Huawei ME906S or Sierra EM7455
- One activated Nano SIM card [6]

Installation Guide:

- Open the chassis of the Box-PC and remove two Dummy Brackets to have space for the LTE daughterboard extension in the front panel. Temporarily remove another Dummy Bracket to be able to install the new extension.
- Take the daughterboard [1] and install the SMA connectors of the LTE antenna cables into the holes of the bracket [7].
- Install the daughterboard [1] with two black screws [8] and four silver screw [9].
- Take the USB cable [2]. Connect one end to the daughterboard [10] and the other end to one of the four onboard USB headers [11].
- Install LTE/4G card [5] into the M.2 slot [12] with one screw.
- Connect the LTE antenna cables to the LTE/4G card [13].
- The SIM slot is accessible from the outside of the LTE daughterboard. Insert the Nano SIM card [6] into the SIM 1 slot [14].
- Install other components if necessary and finally screw down the chassis cover.



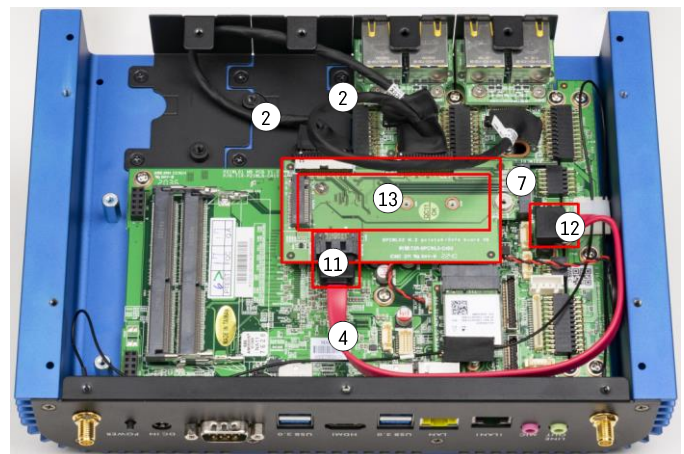
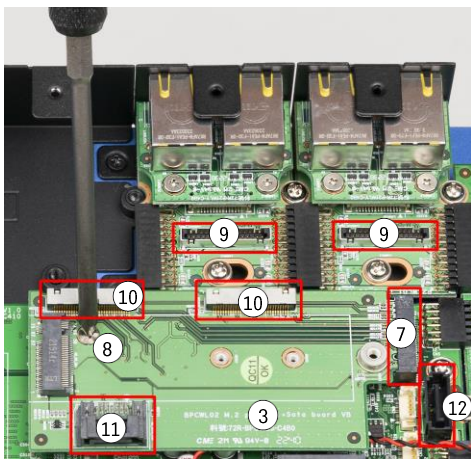
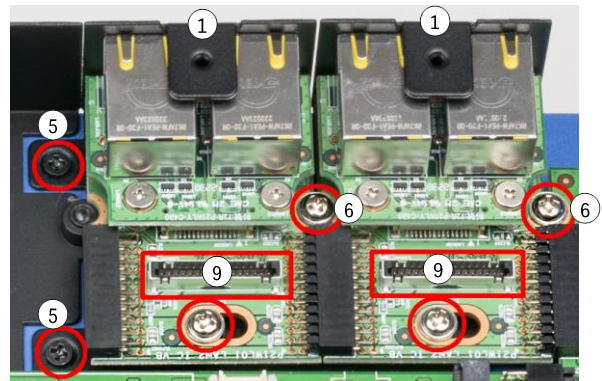
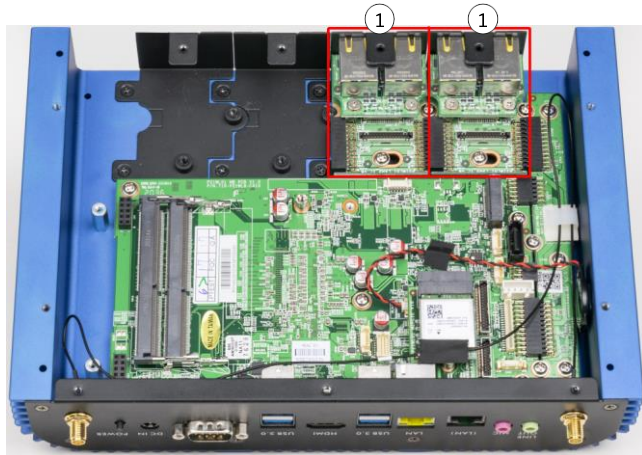
Quad 2.5G LAN Ports (IDL01)

EAN Code: 4046047103966

Besides the fixed Dual Gigabit LAN ports on the back panel, **four additional 2.5G LAN ports (Intel i226)** can be added in front panel.

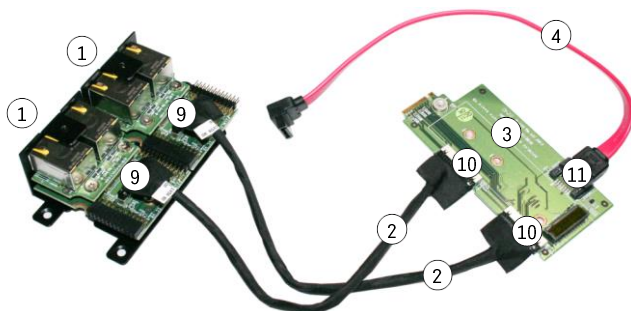
Important notes if this accessory is installed:

- 1) M.2 SSD with a SATA interface is required (PCIe/NVMe not supported)
- 2) Ambient temperature max. 40 °C (not compatible to the extended temperature range)
- 3) Special BIOS version required, please contact support@shuttle.eu



Scope of Delivery:

- 2x daughterboard with Dual LAN connectors [1]
- 2x internal PCIe cable [2]
- 1x daughterboard with M.2 slot [3]
- 1x internal SATA cable [4]
- 3x silver screw [6]



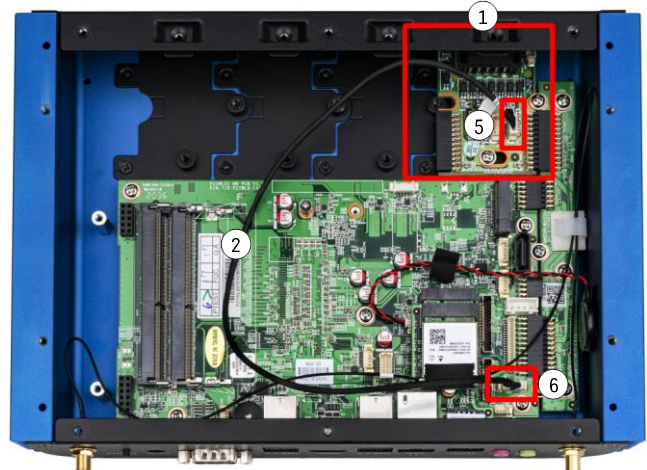
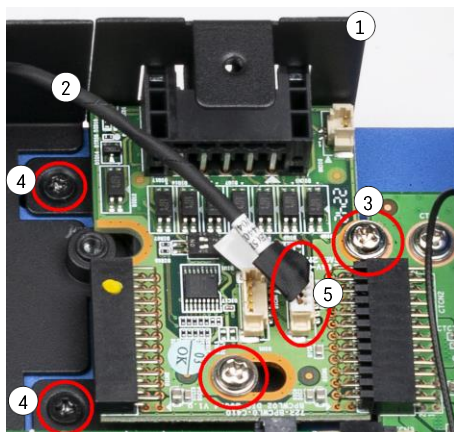
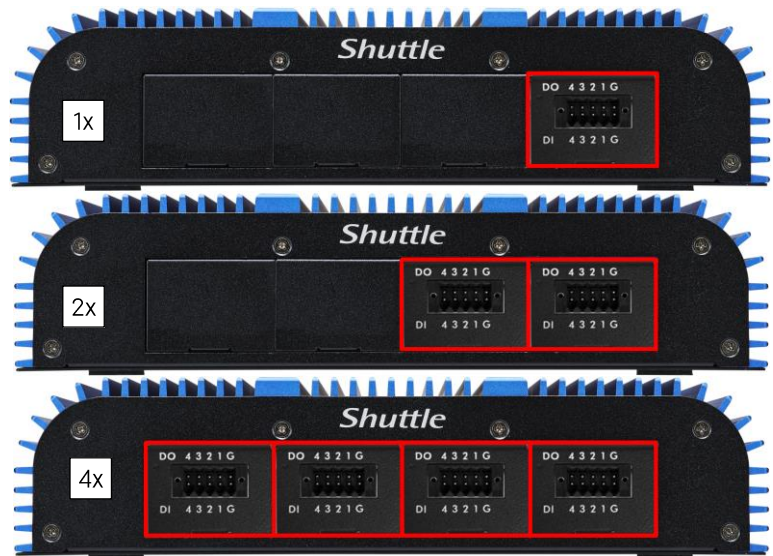
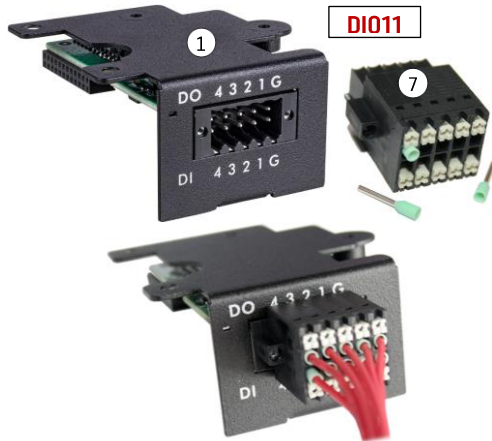
Installation Guide:

- Open the chassis of the Box-PC and remove two Dummy Brackets to have space for the new LAN extension in the front panel. Temporarily remove another Dummy Bracket to be able to install the new extension.
- Install the two LAN daughterboards [1] with four black screws [5] and four silver screws [6]
- Take the daughterboard with M.2 slot [3], insert it into the onboard M.2-slot [7] and fix it with one screw [8]. Attention: the new M.2 slot [13] supports M.2-2280 SSD modules with SATA interface only (PCIe/NVMe not supported).
- Take the two internal PCIe cables [2] and connect [9] with [10].
- Take the SATA cable [4] and connect [11] with [12].
- Install other components if necessary and finally screw down the chassis cover.
- **Special BIOS version required**, please contact support@shuttle.eu

Digital I/O – 4x Input / 4x Output (DIO11)

EAN Code: 4046047103959

Up to four Digital Input/Output expansion kits DIO11 can be installed to the front panel of the Box-PC. Each DIO11 kit provides 4x Digital Inputs and 4x Digital Outputs.



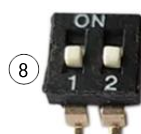
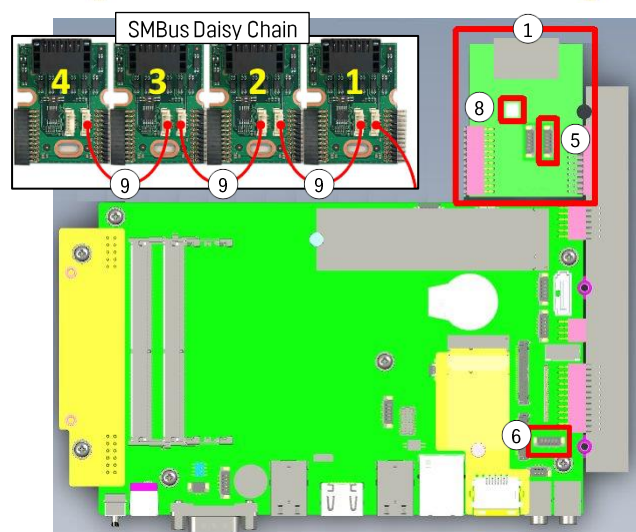
Scope of Delivery:

- Daughterboard with Digital Inputs/Outputs [1]
- Internal 5-pin SMBus cable (same cable as for USB) [2]
- External 2x5-pin connector/adaptor [7]
- Silver screw [3]

Installation Guide:

- Open the chassis of the Box-PC and remove a Dummy Bracket to have space for the new Digital Input/Output extension in the front panel. Temporarily remove another Dummy Bracket to be able to install the new extension.
- Install the daughterboard [1] with two black screws [4] and two silver screw [3]
- Take the SMBus cable [2]. Connect one end of the cable to the daughter board [5]. Connect the other end to the SMBus header of the mainboard [6].
- Use the DIP switch [8] of the Daughterboard [1] to set the desired SMBus address for the I/O (see table below)
- Install up to four Digital I/O daughterboards and pass the SMBus signal from one card to another (daisy chain) [9].
- Install other components if necessary and finally screw down the chassis cover.

Please find a testing program here: <https://go.shuttle.eu/8pLTP/> and contact Shuttle Support Hotline for further questions support@shuttle.eu



Device	SW1	SW2	Address	LED
1	0	0	0x4E	Off
2	1	0	0x4C	Green
3	0	1	0x4A	Orange
4	1	1	0x48	Green+Orange

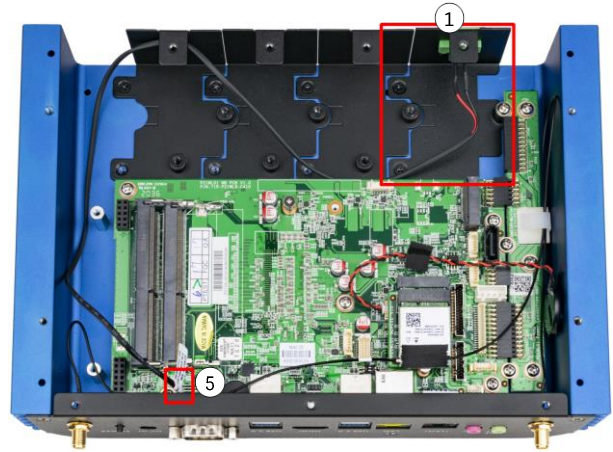
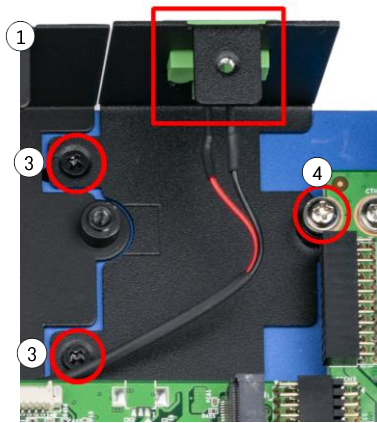
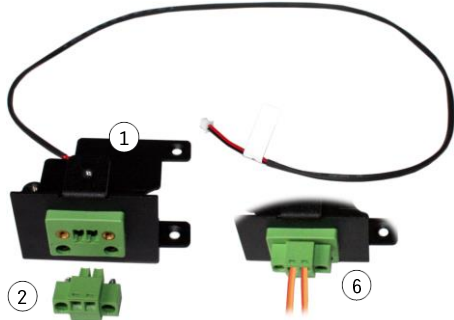
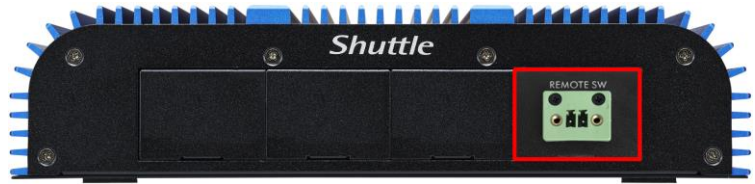


Connector for external Power Button (PWR01)

EAN Code: 4046047103980

With the expansion kit PWR01 you can connect an external power button to the Box-PC.

Connect the wires of an external power button to the terminal block of PWR01. The external button is not included.



Scope of Delivery:

- Bracket with connector for external power button [1]
- Terminal block [2]
- Silver screw [4]

Installation Guide:

- Open the chassis of the Box-PC and remove one Dummy Bracket to have space for the new extension in the front panel. Temporarily remove another Dummy Bracket to be able to install the new extension.
- Install the PWR01 bracket [1] with two black screws [3] and one silver screw [4]
- Connect the internal cable of PWR01 to the onboard header [5].
- Connect the external cables of the external power button to the terminal block [2] and fix it to the PWR01 [6]. The external cable and power button is not included.
- Install other components if necessary and finally screw down the chassis cover.

