

EDGE PC Barebone SPCEL02P

PoE enabled

ROBUST INDUSTRY PC WITH VESA/DIN-RAIL MOUNT & PoE

The Shuttle Edge PC SPCEL02P is a fanless IPC barebone in a robust 450 ml metal chassis and intended for DIN-Rail or VESA mounting. It is flexible in use and designed for maintenance-free 24/7 operation at ambient temperatures of up to 40°C. Inside there is an Intel Celeron "Elkhart Lake" processor with slots for RAM module, M.2 SSD card and WLAN card. The small housing offers an amazing variety of connections, including dual LAN, COM port and Digital I/O. Power is supplied either via the DC input or via a network cable using the PoE function. This product is targeted at professional applications such as edge computing (IoT gateway), automation, digital signage, control, data logging and video surveillance.



INDUSTRIAL DESIGN

■ Rugged aluminum chassis (blue-green) ■ Weight: 970/1200 g net/gross ■ Dimensions: 120 x 75 x 51 mm (WDH), 460 ml ■ Mounting: VESA (100x100 & 50x50 mm) & DIN Rail ■ Supports 24/7 Nonstop Operation ■ Operating temperature: 0 ... 40 °C (20-80% RH, non-condensing)

OPERATING SYSTEM

■ An operating system is not included
■ Supports Windows 10, Windows 11 and Linux (all 64-bit)
Windows 10/11 Driver Download: <https://go.shuttle.eu/SPCELO203>

PROCESSOR

■ Intel Celeron J6412 "Elkhart Lake", 4-core, 2.0~2.6 GHz, TDP: 10 W
■ Soldered System-on-Chip processor (SoC) ■ Passive Cooling

MEMORY/STORAGE/M.2 slots

■ One 260-pin SO-DIMM slot supports up to 32GB DDR4-3200 RAM
■ One M.2-2242/2280 M slot supports M.2-SSDs with SATA interface
■ One M.2-2230 E slot supports M.2 WLAN modules with 2 ext. antennas
Note: If a M.2 WLAN module is installed, then the M.2-SSD card is limited to M.2-2242 format

CONNECTORS

■ 1x HDMI 2.0b ■ 2x USB 3.2 Gen2 Type A ■ 1x USB 2.0 Type A
■ 2x 2.5G RJ45 LAN-Ports (Intel 226V) ■ Digital Input/Output (4+4)
■ 1x COM (RS232/422/485) ■ DC Input ■ Power Button ■ Power LED

DC INPUT & PoE Function

■ DC-Input supports 12-24V DC wide range voltage (the power source used should support at least 65W output wattage)
■ 3-pin terminal connector with terminal block – the third pin "IGN" acts as input for the car ignition lock which enables delayed on/off switching of the Edge PC
■ Adapter cable for external power adapter included (supports 5.5/2.5 mm DC plug), **Note:** the power adapter is not included
■ Alternatively, the PoE feature (Power-over-Ethernet) allows the Edge PC to be supplied with power via the right RJ45/LAN port. 1)

OTHER

■ Hardware TPM 2.0 module Infineon SLB9670VQ2
■ EMC certifications: CE, FCC, VCCI, BSMI, EN 50121-3-2
■ Safety certifications: CB/IEC62368-1:2014/2018, cTUVus/UL62368-1:2019 ■ Vibration and shock: EN61373, MIL-STD-810G
■ Warning of hot surface: risk of burns!

OPTIONAL SHUTTLE ACCESSORIES

■ **WLN-M3** - WLAN kit with Intel AX200 module supports WiFi 6 and BT 5.2, including two 10-cm antenna cables and two external antennas
■ **PE90** - Power Adapter 90W / 19V with 5.5/2.5 mm DC plug
■ **HDD01** - Additional 2.5" bay for a SSD with SATA interface



MODELS OF THE SPCELxx/SPCNVxx EDGE PC SERIES

Product UPC-Code	PoE Function	Operating Temperature	SoC Processor (soldered)	Front I/O	Rear I/O	Mounting	DC-Input
SPCEL02 887993007212	—	0 ... 40 °C	Intel Celeron J6412 (4-core, 2.0-2.6 GHz, 10 W)	1x HDMI 2.0, 2x USB 3.2, 1x USB 2.0 2x 2.5G LAN	COM (RS232/422/485) DIO: 4x in, 4x out	VESA mount & DIN-Rail	12-24 V DC Power adapter <u>not</u> included
SPCEL02P 887993602240	PoE(PD) 1)						
SPCEL03 887993007229	—	-20 ... 60 °C 2)	Intel Atom x6413E (4-core, 1.5-3.0 GHz, 9 W)	2x HDMI 2.0, 1x DP 2x USB 3.2, USB 2.0 2.5G LAN	2.5G LAN, 2x Audio Nano SIM (opt. 4G) Micro-SD card reader	VESA mount	12-20 V DC Power adapter is included
SPCEL12 887993007243	—	0 ... 40 °C	Intel Celeron J6412 (4-core, 2.0-2.6 GHz, 10 W)				
SPCNV03 Coming Soon	—	-20 ... 55 °C	NVIDIA Jetson Orin Nano 8 GB RAM, 40 TOPS AI-Perf.	1x HDMI 1.4b, 2x USB 3.2, 1x USB 2.0 2.5G+1G LAN	COM (RS232/422/485) DIO: 4x in, 4x out	VESA mount & DIN-Rail	12-24 V DC Power adapter <u>not</u> included
SPCNV13 Coming Soon			NVIDIA Jetson Orin NX (w. fan) 16 GB RAM, 100 TOPS AI-Perf.				

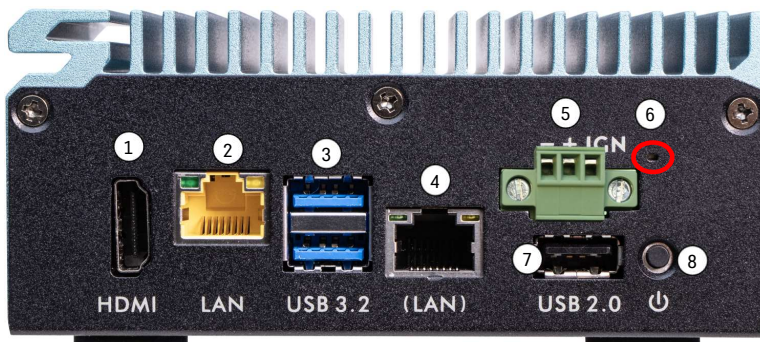
1) **SPCEL02P:** The PoE feature allows this Edge PC to be powered over the LAN cable and thus it becomes a "Powered Device" (PD).

Attention: in PoE mode, the maximum permissible power consumption of all connected USB devices is 6 W in total

2) **SPCEL03:** at ambient temperatures >40°C, the RAM memory module and SSD card must support the extended temperature range (-40...+85 °C)

Front and Back Panel

Front panel



1. HDMI 2.0b port
2. 2.5G LAN port (RJ45, Intel 226V)
3. 2x USB 3.2 Gen 2 port (Type-A)
4. 2.5G LAN port (RJ45, Intel 226V) with PoE function (Power-over-Ethernet) ¹⁾
5. 3-pin DC-in connector supports 12-24V DC ²⁾
6. LED indicator for power state
7. USB 2.0 (Type A)
8. Power button

Back panel

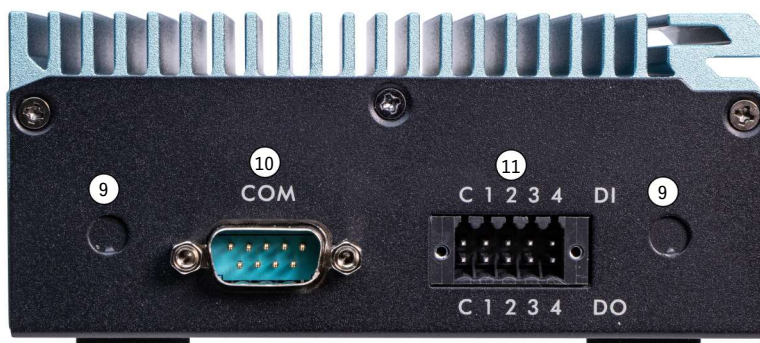


Photo with optional WLAN kit

9. 2x perforation for external WLAN antenna
10. COM port supports RS232/RS422/RS485
11. Digital I/O (4x Input, 4x Output)

Bottom side



12. Four rubber feet
13. Rating label

- ¹⁾ The PoE feature allows this Edge PC to be powered over the LAN cable and thus it becomes a "Powered Device" (PD). Attention: in PoE mode, the maximum permissible power consumption of all connected USB devices is 6 W in total
- ²⁾ DC connector: In this photo the supplied pluggable terminal block is already installed. It uses screw terminals to clamp connecting wires (-/+) coming from the power source. The third pin "IGN" acts as input for the car ignition lock which enables delayed on/off switching of the Edge PC.



Warning of hot surface: risk of burns!

REQUIRED COMPONENTS

The following components need to be added to make it a fully-configured Edge PC

Shuttle Edge PC Barebone SPCELO2P



Memory Module (RAM)

supports one SO-DIMM memory module (260-pin) DDR4-3200, max. 32 GB

M.2-2242
L: 42 mm



M.2 SSD card (SATA)

supports one M.2-2242 SSD card with SATA interface (not PCIe/NVMe)

Note: A longer M.2-2280 card is also supported, if no WLAN module is installed.

M.2-2280
L: 80 mm



Power Source via DC-Input or PoE

DC input supports 12-24 V DC

The power source should support $\geq 65W$

As a power source, use e.g. a DIN Rail power supply, a car battery, or a standard power adapter with a 2.5/5.5 mm DC-plug.

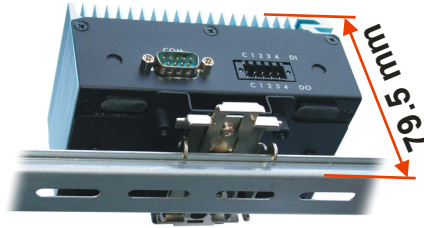
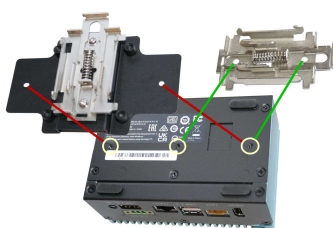
Alternatively, the PoE feature (Power-over-Ethernet) allows the Edge PC to be supplied with power via the right LAN port.



Operating System

Windows 10/11 or Linux (64-bit only)

ACCESSORIES INCLUDED



DIN-Rail clip

The clip can be mounted on the underside of the Edge PC – various orientations are possible. The Edge PC can then be mounted on a standard 35 mm DIN-Rail, e.g. inside equipment racks.

Note: The black mounting plate also supports 50x50 mm VESA mounting.



VESA Mount

Supports 100x100 mm VESA mounting



DC-Input connector including cable adapter

The pluggable terminal block uses screw terminals to clamp connecting wires (-/+) coming from the power source. You can use the supplied adapter cable to connect a standard power adapter with a 2.5/5.5 mm DC-plug.

OPTIONAL ACCESSORIES FROM SHUTTLE



WLAN Kit **WLN-M3**

Wi-Fi 6 WLAN card including two external antennas.

Note: If a WLAN module is installed, then the M.2-SSD card is limited to M.2-2242 format (with 42 mm length).



Power Adapter

PE65 (65 W) or **PE90** (90 W)

Input: 100-240 VAC, EU-Plug

Output: 19 VDC, max. 65/90W

DC-Plug: 2.5/5.5 mm



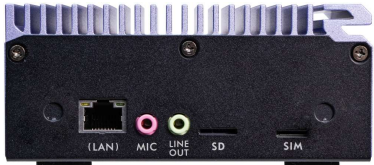
2.5" bay for SSD drive

HDD01

Additional 2.5" drive bay is attached to the Edge PC and supports one 2.5" SSD drive with SATA interface.

Available in Shuttle's Systems Configurator: shop.shuttle.eu.

SHUTTLE SPCELxx EDGE PC Series — Comparison

	SPCEL02 SPCEL02P (PoE)	SPCEL03	SPCEL12
Color	Turquoise (Blue-Green)	Dark Grey	Purple
Operating Temperature	0 ... 40 °C Fanless cooling	-20 ... 60 °C Fanless cooling	0 ... 40 °C Fanless cooling
Processor	Intel Celeron J6412 4-core, 2.0-2.6 GHz, 10 W	Intel Atom x6413E 4-core, 1.5-3.0 GHz, 9 W	Intel Celeron J6412 4-core, 2.0-2.6 GHz, 10 W
RAM Slot	SO-DIMM slot supports max. 32 GB DDR4-3200		SO-DIMM slot supports max. 32 GB DDR4-3200
M.2 Slots	SSD: M.2-2242/2280 slot supports M.2 SSD card with SATA interface WLAN: M.2-2230 for WLAN card *)		SSD: M.2-2242/2280 slot supports M.2 SSD card with SATA interface WLAN: M.2-2230 for WLAN card *)
4G Slot	—		M.2-2242 slot supports 4G mobile network card (30x42 mm) *)
Front View			
Front Connectors	Power Button Power LED HDMI 2.0b 2x USB 3.2 Gen 2 Type A USB 2.0 Type A 2x LAN port (2.5 Gbps) DC input (supports 12-24V)		Power Button Power LED 2x HDMI 2.0b 1x DisplayPort 1.4 2x USB 3.2 Gen 2 Type A USB 2.0 Type A LAN port (2.5 Gbps) DC input (supports 12-20V)
Rear View			
Rear Connectors	Serial Port (RS232/422/485) Digital I/O ports (4x input, 4x output) 2x hole for optional WLAN antennas		LAN port (2.5 Gbps) 2x Audio (Mic-in, Line-out) Micro SD card reader slot Nano SIM slot (for mobile network) 2x hole for opt. WLAN/4G antennas
DC Input Power Adapter	DC Input supports 12-24V Euro block port with screw terminals Incl. adapter cable for 2.5/5.5 mm Power adapter not included		DC Input supports 12-20V Connector: 2.5/5.5 mm 65W power adapter included
PoE Function	SPCEL02: No SPCEL02P: Yes, supports PoE	No	No
VESA Mount	50x50 and 100x100 mm		100x100 mm
DINRail Mount	Including DINRail Clip		—
Optional Accessories	1) WLAN-Kit with two antennas 2) 2.5" bay for SSD with SATA 3) 65W power adapter		1) WLAN-Kit with 2 antennas 2) 4G antenna kit (without 4G card) 3) DIN-Rail Mounting Kit 4) 2.5" bay for SSD with SATA
Dimensions	120 x 75 x 51 mm (WxDxH) , 460 ml		120 x 75 x 51 mm (WxDxH) , 460 ml
UPC Code	SPCEL02: 887993007212 SPCEL02P: 887993602240	887993007229	887993007243

*) If a WLAN or 4G card is installed, then the M.2-SSD card is limited to M.2-2242 format.
SPCEL12 can be equipped with either a WLAN or 4G function.

SHUTTLE EDGE PC BAREBONE SPCELO2P — SPECIFICATIONS

FANLESS AND SILENT	Completely fanless, virtually noiseless Large aluminium heatsink Passive cooling through convective heat transfer Ideal for noise-sensitive environments Fanless means less dust inside the case and thus virtually no maintenance required.
24/7 NONSTOP OPERATION	This device is approved for 24/7 permanent operation.
CHASSIS	Rugged cassis made of aluminium Colour: turquoise (blue-green) Dimensions: 120 x 75 x 51 mm (WxDxH) , 460 ml (Height: ca. 53 mm including rubber feet) Weight: 720/970 g net (without/with accessories) and 1.2 kg gross
OPERATION POSITIONS	1) Mounted on a DIN-Rail, e.g. inside equipment racks 2) Vertical, e.g. VESA-mounted behind an appropriate monitor (supports 50x50 and 100x100 mm VESA standard) 3) Standing on its rubber feet like a desktop PC
OPERATING SYSTEM	This system comes without operating system. It is compatible with: - Windows 10/11 (64-bit) - Linux (64-bit) Download Windows-10/11 drivers here: https://go.shuttle.eu/SPCELO203
PROCESSOR	Intel® Celeron® Prozessor J6412, Quad Core CPU clock frequency: 2.0 GHz, max. Turbo frequency: 2.6 GHz Code name: "Elkhart Lake" 10 nm process, FCBGA1493 package (soldered) CPU cores / Threads: 4 / 4 L2 Cache: 1.5 MB Thermal Design Power (TDP): 10 W System-on-Chip processor (SoC) with integrated graphics processor, no additional chipset required
PROCESSOR COOLING	Fanless cooling system with passive heat sink, virtually noiseless
INTEGRATED GRAPHICS	The Graphics Processing Unit (GPU) is integrated in the processor. Intel® UHD Graphics (Intel Gen 10), graphics frequency: 400~800 MHz Execution Units (EU): 16, Shader: 128 Max. Shared Memory (graphics memory): 8 GB Supports DirectX 12, Intel Quick Sync Video, Shared Memory Codec Support in Hardware: h265 (8-/10-bit), h264, VP8, VP9, AVC (only decoding: AV1, VC-1)
UEFI FIRMWARE	16 MB Flash ROM with AMI UEFI BIOS Firmware Based on the Unified Extensible Firmware Interface (UEFI) Supports Wake-on-LAN (WOL) from S3, S4, S5 ACPI states Supports boot up from external flash memory cards (USB or SD card) Hardware TPM v2.0: Infineon SLB9670VQ2
MEMORY SUPPORT	1x SO-DIMM slots with 260 pins Supports DDR4-3200 (PC4-25600) SDRAM at 1.2V Supports one RAM module with max. 32 GB capacity Supports one unbuffered DIMM module (no ECC)
M.2 SLOT FOR SSD CARDS	M.2-2242/2280 slot with <u>SATA</u> interface - supports SSD cards in M.2-2242 format (length: 42 mm) - only supports SSD cards in M.2-2280 format (length: 80 mm) if no WLAN card is installed - only supports SSD cards with SATA interface (not PCIe/NVMe)
M.2-2230 SLOT FOR WLAN CARDS	M.2-2230-E slot with these Interfaces: PCI-Express X2 and USB 2.0 Supports M.2 cards with a width of 22 mm and a length of 30 mm (type 2230) Supports WLAN expansion cards (optional Shuttle accessory: WLN-M3) <u>Note:</u> If a M.2 WLAN module is installed, then the M.2-SSD card is limited to M.2-2242 format with 42 mm length <u>Note:</u> Also supports an AI accelerator module for AI applications [3]

DUAL 2.5G LAN	Dual network with two RJ45 ports with two status LEDs each Used network chips: 2x Intel i226-V Ethernet Controller (PCIe) Supports 100 / 1.000 / 2.500 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)
FRONT PANEL CONNECTORS	- Power Button - Power LED - HDMI 2.0b digital video and audio output - 2x USB 3.2 Gen 2 Type A (max. 10 Gbps) - USB 2.0 Type A - 2x 2.5G network port (LAN, RJ45) - DC input supports 12-24 V (3-pin Euroblock) [2]
BACK PANEL CONNECTORS	- Serial Port supports RS232/422/485 (D-Sub) - Digital I/O ports (2x5-pin connector with 4 inputs and 4 outputs) [1] - 2x perforated 6.5 mm holes for optional WLAN antennas DC Input
DC-INPUT CONNECTOR	DC-Input connector (3-pin Euroblock) supports a wide voltage range: 12-24V DC. Required output wattage of the power source: ≈65 W The pin "IGN" acts as input for the car ignition lock which enables delayed on/off switching of the Edge PC. The supplied adapter cable supports standard power adapters with 5.5 / 2.5 mm DC plug. A power adapter is not included in the scope of delivery. For further information see [2]
POWER-OVER-ETHERNET (POE)	The right RJ45 network port of the Edge-PC supports the PoE function. - Compliant with IEEE 802.3at PoE standard - Power available at the Edge-PC (PD): max. 25.5 W - Power delivered by PSE: max. 30.0 W - Maximum power consumption of the connected USB devices = 6 W For further information see [4].
SUPPLIED ACCESSORIES	- Multi-language user guide (EN, DE, FR, ES, JP, RU, SC, TC) - Bracket #1 supports 100 x 100 mm VESA mounting standard - Bracket #2 supports 50 x 50 mm VESA mounting standard - DIN-Rail Clip for 35-mm DIN-Rail mounting (in combination with bracket #2) - Seven screws M3 x 6 mm (5x black and 2x silver) - Two thermal pads for a single-side or double-side RAM module Note: additional thermal pads for SSD card and WLAN module are already installed - 3-pin Phoenix connector for the DC-input port - 2x5-pin connector/adapter for the DIO port <u>Note:</u> power adapter and Driver-DVD are <u>not</u> included in the scope of delivery. Download Windows-10/11 drivers here: https://go.shuttle.eu/SPCEL0203
OPTIONAL ACCESSORIES	1) WLN-M3: WLAN kit including Wi-Fi 6 card (M.2-2230), 2x antenna cable (10 cm), 2x external antennas 2) PE90: Power Adapter (19V / 90W) 3) HDD01: additional 2.5" bay for a SSD drive with SATA interface
ENVIRONMENTAL SPECIFICATIONS	Operating temperature range: 0 - 40 °C (32 - 104 °F) Relative humidity range: 20 - 80 % (non-condensing) <u>Warning:</u> Never touch the heatsink during or just after operation, as it can get very hot during normal operation. Be sure to wait for the heatsink to cool off before touching it.
CERTIFICATIONS / COMPLIANCE	EMI: CE, FCC Class A, VCCI, BSMI, EN 50121-3-2 Safety: CB/IEC 62368-1:2014/2018, cTUVus / UL62368-1:2019, BSMI Vibration and Shock: EN61373, MIL-STD-810G This device is classed as a technical information equipment (ITE) in class B and is intended for use in living room and office. The CE-mark approves the conformity by the EU directives: (1) 2014/30/EU relating to electromagnetic compatibility (EMC) (2) 2014/35/EU relating to Electrical Equipment designed for use within certain voltage limits (LVD) (3) 2009/125/EC relating to eco design requirements for energy-related products (ErP)

Footnotes:

[1] The Digital I/O connection (DIO) with 2x5 pins has 4 inputs and 4 outputs for digital signals in addition to the ground (C = Common).

Technical features

- Isolation Voltage: 2500 Vrms

4x Digital Outputs:

- Voltage Rating: 0...30 V (Open collector, pull-up)

- Output Current: max. 30 mA

4x Digital Inputs:

- Logical 0: 0-3 V or close to ground

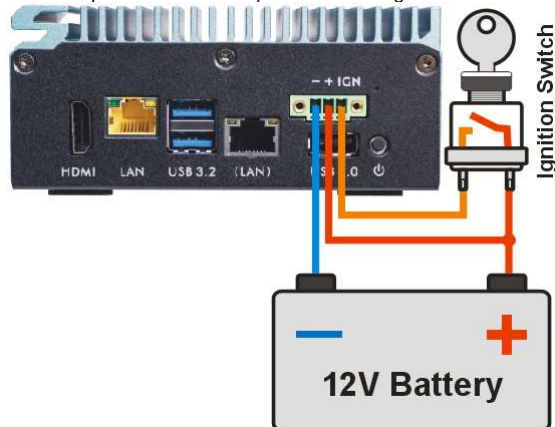
- Logical 1: 5-30V or open

Instructions and test program with source code: <https://go.shuttle.eu/HJbZW>

Please contact Shuttle Support Hotline for further questions: support@shuttle.eu

[2] The DC input connector is designed as a 3-pin Euroblock with pluggable terminal block which uses screw terminals to clamp connecting wires (-/+) coming from the power source. The permissible input voltage range is 12-24 V and the power source should support an output wattage of at least 65 W. You can use the supplied adapter cable to connect a standard power adapter with a 2.5/5.5 mm DC-plug, such as the Shuttle accessory PE65 or PE90.

The third pin "IGN" acts as input for the car ignition lock which enables delayed on/off switching of the Edge PC.



The switch-on delay (0, 5, 10, 30, 60 sec.) and switch-off delay (0, 1, 3, 5, 10, 30, 60, 90, 120, 240, 360 min.) can be set in the BIOS setup under the "NVR Power Delay" menu item on the "Advanced" tab. You can enter the BIOS setup program by pressing the "Del" key shortly after switching on the PC.



[3] Supports AI accelerator module for AI applications

The M.2-2230 slot of this Edge PC can also be used with an AI accelerator module instead of a WLAN card. The following AI module was successfully tested:

Model: Hailo-8

- Form factor: M.2-2230 Key A+E

- Interface: PCIe Gen-3.0, 2 lanes

- AI compute power: 26 Tera-Operations Per Second (TOPS)

- Typical TDP: 2.5 W

<https://hailo.ai/products/ai-accelerators/hailo-8-ai-accelerator/#hailo8-overview>

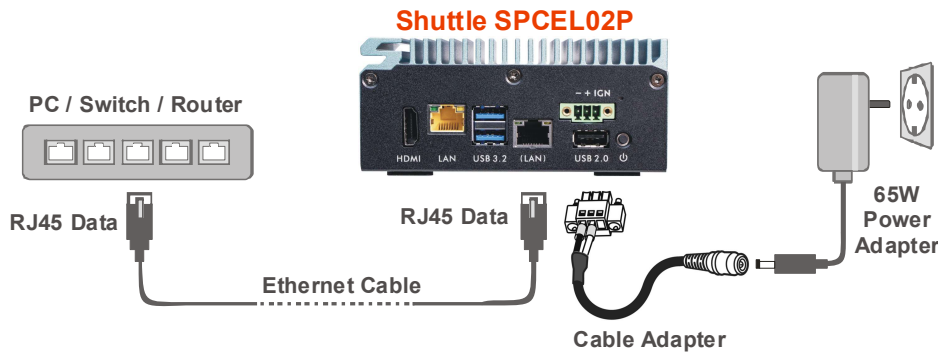


Footnotes:

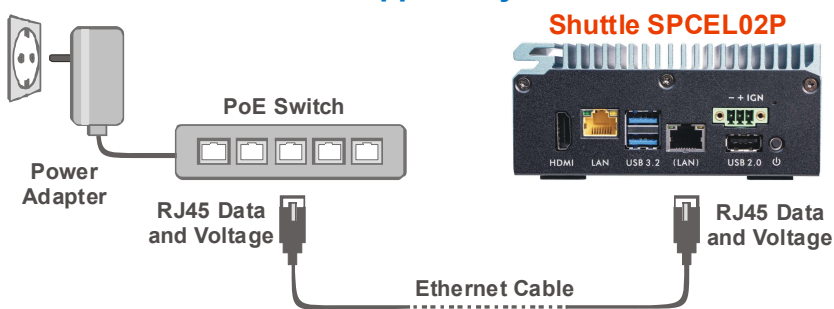
[4] Power-over-Ethernet (PoE)

The Edge-PC SPCEL02P supports a PoE function via the right RJ45/LAN port on the front. This allows you to supply the PC either via the DC input or via the PoE-capable LAN port. With PoE the Edge-PC receives power over the same network cable that transports data, and so does away with the need for a nearby power outlet and an additional power cable. With PoE, the Edge-PC becomes a Powered Device (PD) and on the other side of the network cable is the power source (Power Sourcing Equipment = PSE): either a PoE-capable Ethernet switch or a PoE power injector (power output at least 30 W). Please note that the output power of the three USB ports of the Edge PC is limited during PoE operation: the connected USB devices must not consume more than 6 W in total.

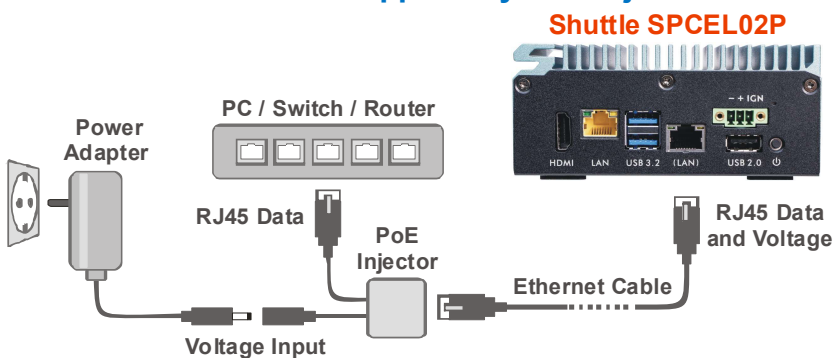
Solution 1: SPCEL02P supplied by Power Adapter



Solution 2: SPCEL02P supplied by PoE Switch



Solution 3: SPCEL02P supplied by PoE Injector



Note: A power adapter is not included in the scope of delivery.