



VP2110 Smart UPS Manual

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1 Introduction

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1.1 About this User Manual

Conventions

In the two following charts you will find the conventions used in the user manual regarding utilized spellings and symbols.

Style	Utilization
bold	Blocks, surface elements, window and dialog names of the software. Accentuation of warnings and advices. [OK] Push buttons in brackets File Save Notation for menus and menu entries
Source Code	File name and source code.
Hyperlink	Hyperlinks and references.
<CTRL>+<S>	Notation for shortcuts.

Symbol	Utilization
	This symbol calls your attention to warnings.
	Warning of damages by electrostatic discharge (ESD = Electrostatically Sensitive Device).
	Warning of hot surface! Do not touch without appropriate precautions.
	Here you can obtain supplemental information.
	Here you can find additional information.
	Here is an example that has been prepared for you.
	Step-by-step instructions provide assistance at these points.
	Instructions on editing files are found at these points.
	This symbol warns you not to edit the specified file.

1.1.1 Warranty

Restriction of warranty

We reserve the right to change the contents of the documentation and the software without notice. Vector Informatik GmbH assumes no liability for correct contents or damages which are resulted from the usage of the documentation. We are grateful for references to mistakes or for suggestions for improvement to be able to offer you even more efficient products in the future.

1.1.2 Registered Trademarks

Registered trademarks

All trademarks mentioned in this documentation and if necessary third party registered are absolutely subject to the conditions of each valid label right and the rights of particular registered proprietor. All trademarks, trade names or company names are or can be trademarks or registered trademarks of their particular proprietors. All rights which are not expressly allowed are reserved. If an explicit label of trademarks, which are used in this documentation, fails, should not mean that a name is free of third party rights.

- ▶ Windows, Windows 7, Windows 8.1, Windows 10, Windows 11 are trademarks of the Microsoft Corporation.

1.2 Important Notes

**WARNING!**

We provide our important notes and safety instructions in several languages, including English (EN) and German (DE). For more details, see the relevant section:

- ▶ EN: [Important Notes - Details](#)
- ▶ DE: [Wichtige Hinweise](#)

2 VP2110 Smart UPS

In this chapter you find the following information:

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2.1 Scope of Delivery

- ▶ VP2110 Smart UPS
- ▶ Cables and accessories
 - 2x Power Cable Molex Mini-Fit 6mm² (part number 22583)
 - Connector Set Power Out for VP2110 (part number 22597)
 - Cable Ignition <> Binder 3-pin (part number 22557)
 - Vector SYNCcableXL (part number 05018)
 - Cable VP7 Ignition <> Binder 3-pin (part number 22632)
 - Ethernet Cable 10Gbps 2m (part number 30016)
 - VSH Equipment Foot Kit (part number 05150)
- ▶ Documentation
 - Manual QuickStartGuide EN/DE (part number 80895)

2.2 Overview

The VP2110 Smart UPS is a compact and robust uninterruptible power supply for use in vehicles. It shows its strengths in particular in cooperation with the Vector Smart Loggers, but can also be operated autonomously. The Smart UPS can supply several loads with up to 240 W in total via five outputs. All outputs are short-circuit-proof and switch off automatically on overload.

The Smart UPS has a wide-range input and is suitable for both 12 V and 24 V vehicle electrical systems.

With the built-in SuperCaps, the Smart UPS can reliably supply loads by itself. For longer backup times with high loads, the Smart UPS has an integrated charge controller and a connector for an external battery.

To avoid a permanent power drain from the vehicle electrical system, the Smart UPS only draws power if ignition/KL 15 is active. The status of KL 15 is also used to control supplying the loads.

In conjunction with a Smart Logger, extended operating modes are possible, such as a controlled follow-up time after ignition off for uploading data to the cloud.

In addition, the Smart UPS can automatically switch off other consumers if required. This can ensure, for example, that there is enough energy left for a Smart Logger to shut down safely.

Highlights

Overview of Advantages:

- ▶ Designed for in-vehicle use
- ▶ Wide-range input for 12 V and 24 V electrical systems
- ▶ Wide operating temperature range
- ▶ Compact and robust design
- ▶ Five individually switchable and individually fused outputs with a total power budget of 240 W
- ▶ Internal SuperCaps to support backup loads
- ▶ Built-in charge controller for optional connection of an external battery to increase backup time
- ▶ Communication interface for a Smart Logger
- ▶ Emulated ignition output for controlling loads
- ▶ Tool-free connector system on the power outputs
- ▶ Highly configurable behaviour

2.3 Smart UPS Behavior and Operating States

The Smart UPS has several operating states which are described below:

► STANDBY

In this state, the Smart UPS is waiting to be used, while preserving the internally and externally stored energy.

In STANDBY, all PWR OUTs and IGN OUT are off.

The Smart UPS will monitor the IGN IN and if it detects it is active, it will enter the NORMAL state. Depending on the charging level of the external and internal energy storages, the Smart UPS may delay the transition to NORMAL for a few seconds to pre-charge the built-in super caps to a sufficient energy level.

The Smart UPS also monitors all wake-up sources as triggers to transition to PRE-RUN. These sources are:

- Front button
- Internal timer
- External remote control
- IO connector wake-up pin

With no external battery attached and insufficient internal energy level, wake-up to PRE-RUN is disabled. This also holds true, if the PRE-RUN timeout is configured too short.

► PRE-RUN

PRE-RUN is a state where all attached loads are powered, as if in NORMAL operating mode. Intended use is to get the complete measurement setup up and running while the vehicle is still dormant, allowing first cycle respectively first message data acquisition.

In this state, IGN OUT and all configured PWR OUTs are enabled.

An attached Smart Logger will boot up and start its measurement when power is provided and the emulated ignition signal is on.

Once IGN IN is found active, the Smart UPS enters NORMAL state.

If IGN IN does not turn active before the configurable PRE-RUN timeout expires, the Smart UPS will enter SHUTDOWN state.

You can abort the PRE-RUN state by pressing the **push button** for one second.

► NORMAL

Generally, the Smart UPS is in NORMAL state when IGN IN is on. This is the state where the vehicle is supposed to be running and where most of the measurement activities will be executed.

In this state, IGN OUT and all configured PWR OUTs are enabled.

Generally, this state is left if IGN IN is turned off.

There are use cases though, where a measurement is supposed to keep running for some time even if ignition is turned off. Such use cases are for example:

- measuring vehicle cool down phases
- measuring ignition on/off cycles
- bridging short driving pauses
- bridging driver changes

To allow these, the parameter **IGN IN Off Response Time** can be configured.

Each time IGN IN is turned off, this parameter will grant a grace period for IGN IN to turn on again, in which case the Smart UPS will remain in NORMAL state. This grace period can also be used to simply allow the measurement to run for an additional period before being shut down.

If IGN IN is turned off, and the configurable **IGN IN Off Response Time** has expired, the Smart UPS will enter FOLLOW-UP state if requested by a Smart Logger, or else will enter SHUTDOWN state.

► FOLLOW-UP

FOLLOW-UP is ultimately followed by SHUTDOWN. It is a state where a Smart Logger optionally can post-process its measurement, attend to maintenance tasks, or for example upload measurement data into the Logger Cloud.

Only Smart Loggers communicating with the Smart UPS via Ethernet can request and utilize this state. The Smart Logger extends the follow-up period as needed. If measurement hardware is no longer required, the Smart UPS can switch off such PWR OUTs to save energy.

IGN OUT and all configured PWR OUTs are enabled when entering this state.

FOLLOW-UP state is left for SHUTDOWN state controlled by the Smart Logger. Turning IGN IN on again in this state will have no effect on state transitions.

► SHUTDOWN

In this state, IGN OUT is disabled, so that attached loads sensitive to this signal will shut down. Also, all PWR OUTs configured as non-essential outputs are immediately turned off, saving energy for essential loads like the Smart Logger.

If the energy stored by the VP2110 Smart UPS is dropping below a critical level in any of the other states, the Smart UPS will always go into SHUTDOWN state to allow a graceful shutdown of the Smart Logger or other essential loads.

The Smart UPS enters STANDBY state once the Smart UPS senses that the energy flow through PWR OUT drops below a minimum threshold, or if the fixed shutdown timeout of 120 seconds expires.

► FORCED OFF

In this state, the Smart UPS is dormant until reactivated via the front button. It is intended to shut down the Smart UPS for transportation.

All outputs are switched off and the Smart UPS is only sensitive to the front button, ignoring all other inputs. All LEDs are permanently off.

This state can only be entered by pressing the front button for more than 10s, and it can only be left by pressing the front button for 1 second.

 ERROR

On errors like over temperature or other situations exceeding the device specification, the Smart UPS will try to gracefully shutdown external loads, before halting in ERROR state.

On unexpected errors, like internal hardware faults, the Smart UPS will immediately halt in ERROR state.

In this state, IGN OUT, all PWR OUT outputs and EXT BAT are switched off and no energy is drawn from PWR IN.

This state is indicated via a constantly red Power LED and an acoustic signal, which is turned off as soon as the front button is pressed.

Keeping the front button pressed for 1 second will put the Smart UPS in STANDBY state.

2.4 Interface and Connectors

2.4.1 Front Side

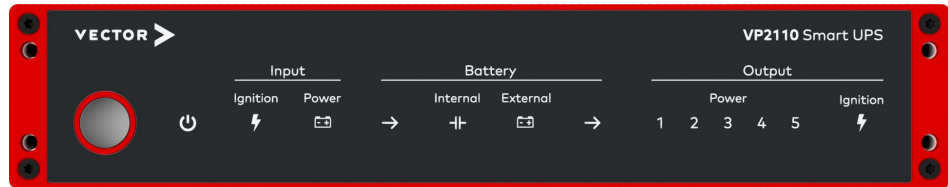


Figure 1: VP2110 front side

► Push button

The push button has several functions, some depending on the operating state of the Smart UPS. Please note that an action is only triggered after releasing the button:

Current State	Press and hold	New State
STANDBY	1 second	PRE-RUN . For this, PRE-RUN must be correctly configured and sufficient energy must be stored.
PRE-RUN	1 second	STANDBY. Aborts the PRE-RUN state.
ERROR	1 second	STANDBY. Any alarm is turned off once the button is pressed.
Any	10 seconds	FORCED OFF. Turns the Smart UPS permanently off.

► Power

This LED indicates the status of the Smart UPS.

Color	Description
Green	PRE-RUN, NORMAL, FOLLOW-UP or SHUTDOWN
Red (short pulses)	STANDBY
Red	ERROR
Red (fast flashing)	Shutting down external loads before halting in ERROR
Blue	Update of VP2110 Smart UPS in progress

► Input - Ignition

This LED indicates the status of the IGN IN input, which is a primary control signal for the Smart UPS.

Color	Description
Off	IGN IN is sensed as off
Green	IGN IN is sensed as on

▶ **Input - Power**

This LED indicates the status of the PWR IN input. Power is only drawn from PWR IN if IGN IN is high.

Color	Description
Green	Input voltage is within operational range
Red	Input voltage is either too low or too high for Smart UPS

▶ **Battery - Input (left arrow)**

This LED indicates whether the internal or external energy storage is being charged from PWR IN.

Color	Description
Off	Not charging energy storages
Green (pulsating)	Charging energy storages

▶ **Battery - Internal**

This LED indicates the charging status of the internal energy storage.

Color	Description
Green	Full
Yellow	Not full
Red	Error

▶ **Battery - External**

This LED indicates the charging status of the external battery.

Color	Description
Off	Not present
Green	Full
Yellow	Not full
Red	Error

▶ **Battery - Output (right arrow)**

This LED indicates an energy flow from either the internal energy storage or from EXT BAT to the PWR OUTs.

Color	Description
Off	Off
Green (pulsating)	Energy storages are supplying the PWR OUTs

► **1...5 Output - Power**

These LEDs indicate the status of the power outputs PWR OUT1 to 5.

Color	Description
Off	Deactivated
Green	Activated
Green (pulsating)	Energy flow sensed through PWR OUT
Red	PWR OUT is deactivated due to overload
Red (pulsating)	Power limit exceeded: - Power limit 1...2: 240 W - Power limit 3...5: 85 W

► **Output - Ignition**

This LED indicates the status of the emulated ignition output signal.

Color	Description
Off	IGN OUT is off
Green	IGN OUT is on

2.4.2 Back Side

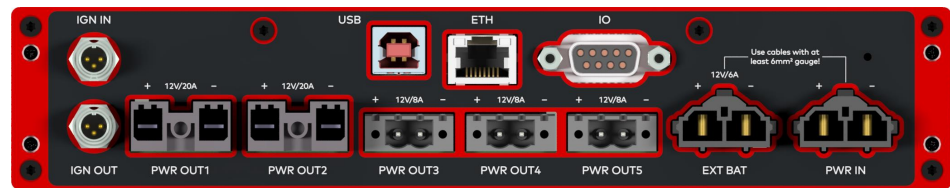


Figure 2: VP2110 back side

► IGN IN

This input is a primary control signal of the Smart UPS with impact on most transitions between the operating states.

Also, the Smart UPS only draws energy from PWR IN, while IGN IN is high (see **PWR IN** description for standby power consumption).

IGN IN is supposed to be connected to the ignition signal (KL15) of the vehicle. IGN IN is considered high if a voltage of 3 V or higher is detected.

Pin	Description
1	Ignition signal (terminal 15). This signal is referenced against GND of the PWR IN connector.
2	Not connected
3	Not connected



Note

Use only the supplied ignition cables. The cable length must not exceed 3 m for proper operation.

► IGN OUT

This is an ignition signal emulated by the Smart UPS to control ignition-sensitive loads like the Vector Smart Logger. Such loads are supposed to wake up when ignition is turned on, and to shut down when ignition is turned off. The voltage level is 10.3 V ... 14.8 V.

Pin	Description
1	Emulated ignition signal (terminal 15) for external loads. This signal is referenced against GND of the PWR OUT connectors.
2	Not connected
3	Not connected



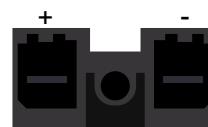
Note

Use only the supplied ignition cables. The cable length must not exceed 3 m for proper operation.

► **PWR OUT1/2**

Each of these terminals can provide up to 240 W power to external loads, with a maximum possible output power of 240 W across all PWR OUTs.

Pin	Description
+	Output voltage 10.8 VDC ... 16 VDC
-	GND



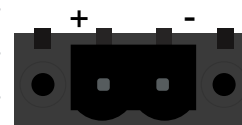
Note

Use only the power cables supplied with the attached loads or equivalent cables to ensure safety and proper function. Make sure the cable is not pinched or in contact with hot surfaces or sharp edges. Check the wiring regularly for damage.

► **PWR OUT3/4/5**

Each of these terminals can provide up to 85 W power to external loads, with a maximum possible output power of 240 W across all PWR OUTs.

Pin	Description
+	Output voltage 10.8 VDC ... 16 VDC
-	GND



Note

Use only the power cables supplied with the attached loads or equivalent cables to ensure safety and proper function. Make sure the cable is not pinched or in contact with hot surfaces or sharp edges. Check the wiring regularly for damage.

► **EXT BAT**

This terminal is used to connect an external 12 V LiFePo battery to the Smart UPS. The battery must have its own Battery Management System (BMS).

Pin	Description
+	Battery plus
-	Battery minus



Note

Use only the supplied power cables or equivalent cables with a wire gauge of at least 6 mm² to ensure safety and proper function. Longer cables result in higher voltage drops across the cable. We recommend using cables with a length of less than 1.5 m. Use a suitable fuse (40 A / slow) close to the positive pole of the battery. Do not pinch or touch hot surfaces or sharp edges. Check the wiring regularly for damage.

**WARNING!**

Never connect batteries other than those specified in this manual. Connecting unsuitable batteries, especially non-rechargeable batteries, may cause serious damage.

Always follow the battery manufacturer's specifications and recommendations. A battery must be operated within its specified temperature range for charging and discharging. This temperature range may differ from and limit the temperature range of the VP2110 Smart UPS. The maximum charge current at the EXT BAT connector can be configured to 3 A or 6 A. The maximum charge current must be taken from the data sheet of the battery used and the charge current must be set accordingly.

A battery can give off explosive gases during the charging process, ensure adequate ventilation and avoid sparking in the vicinity of the battery.

 PWR IN

Primary power input for the Smart UPS.

This terminal is supposed to be connected to the vehicle power supply.

Although power intake through PWR IN is controlled by IGN IN, the Smart UPS will draw a standby current of up to 2 mA when IGN IN is off.

Pin	Description
+	External power supply 10.8 VDC ... 32 VDC, typ. 12/24 VDC, robust against vehicle load dumps, protected against reversed polarity
-	GND

**Note**

Use only the supplied power cables or equivalent cables with a wire gauge of at least 6 mm² to ensure safety and proper function. Longer cables result in higher voltage drops across the cable. Do not pinch or touch hot surfaces or sharp edges. Check the wiring regularly for damage.

 USB

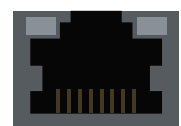
Reserved for future use.

 ETH

Ethernet port to communicate with a Vector Smart Logger, an Automotive PC running CANape, or the Smart UPS Configurator.

The port is an RJ45 socket with integrated LEDs and supports 100 Mbit/s standard Ethernet (100 BASE-TX).

LED	Description
(left) SPEED	Off: No Link Yellow: 100 Mbit/s
(right) LINK/ACT	Off: Link down Green: Link up Green blinking: Network activity



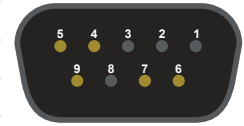
**Note**

Use only the supplied Ethernet cables. The cable length must not exceed 3 m for proper operation.

► **IO**

This connector allows the Smart UPS to be woken up by an external signal. This can be done via an electrical isolated or via a non- isolated input. A typical setup is connecting a push button (normally open) between pin 5 and pin 9 or a logical driver between pin 6 and 7 (see examples below).

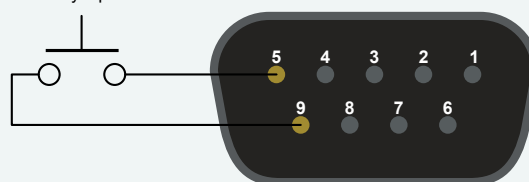
Pin	Assignment
1	Reserved
2	Reserved
3	Reserved
4	Wake-up output Low-active Reference GND pin 9 High-level: 3.3 V Output current: < 3 mA
5	Wake-up input Connect with GND/pin 9 to wake up the Smart UPS Internally pulled up against 3.3 V Output current: < 1 mA
6	Isolated wake-up input Reference isolated GND pin 7 High-level: 3 V...36 V
7	Isolated GND
8	Output: 3.3 V, < 10 mA
9	GND



Example

NO push button setup. The signal must be active for a minimum of 1 second and a maximum of 10 seconds to take effect.

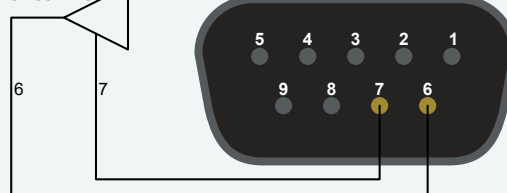
Normally Open Push Button



Example

Logic driver setup. The signal must be active for a minimum of 1 second and a maximum of 10 seconds to take effect.

Logic Driver
3...36 VDC



2.5 Internal Energy Storage

The internal energy storage of the Smart UPS consists of Super Caps. As the capacity of Super Caps degrades over time, especially at high temperatures, so does the amount of energy that can be stored. This results in a decreasing maximum backup period. To regain maximum capacity of the internal energy storage, the Smart UPS is designed so that the Super Caps can be replaced.



Note

The Smart UPS does not contain user-serviceable parts and must not be opened! To have the Super Caps replaced, please contact the Vector support for a maintenance offer and for instructions how to return the Smart UPS.

The current health of the internal energy storage of the Smart UPS can be checked using the Smart UPS Configurator. Once the health state drops below a critical threshold, the Smart UPS Configurator will recommend to have the Super Caps replaced.

2.6 Energy Flow and PWR OUT Voltage Range

The Smart UPS will only draw significant energy from PWR IN while IGN is sensed as on. Please refer to section **Technical Data** on page 44 for standby power consumption.

Energy from PWR IN is generally used to charge the energy storages and to supply the external loads attached to the PWR OUTs. Depending on the operating state of the Smart UPS, the PWR OUTs or charging may be disabled.

Bypass mode

► **For 12 V vehicle electrical networks:**

If the PWR IN voltage is within 10.8 V ... 14.8 V, it will be directly routed to the PWR OUT outputs, resulting in an output voltage of 10.8 V ... 14.8 V.

Bypassing the Smart UPS power converter like this avoids conversion losses.

► **For 24 V vehicle electrical networks:**

The VP2110 Smart UPS will not operate in bypass mode.

Conversion mode

► **For 12 V vehicle electrical networks:**

If the PWR IN voltage is within 14.8 V ... 37 V, the PWR OUTs will be supplied with a converted constant voltage of 14.8 V.

► **For 24 V vehicle electrical networks:**

If the PWR IN voltage is within 21.6 V ... 37 V, the PWR OUTs will be supplied with a converted constant voltage of 14.8 V.

Backup mode

If the PWR IN voltage is

- below 10.8 V (12 V vehicle electrical networks) or
- below 21.6 V (24 V vehicle electrical networks), or
- or above 37 V, or
- IGN IN is off while the Smart UPS is not in STANDBY mode,

the PWR OUTs will be supplied in backup mode by the internal or external energy source:

- If an external battery is attached and not empty, it will be directly routed to the PWR OUTs, passing through a voltage range of 10.8 V ... 16 V.
- If the external battery is absent or empty, the internal storage is used, supplying the PWR OUTs with a converted constant voltage of 14.8 V.

Charging energy storages

The energy storages of the Smart UPS are charged while IGN IN is on and PWR IN above 13.2 V for 12 V vehicle electrical systems respectively above 26.4 V for 24 V vehicle electric systems. These thresholds were introduced to avoid charging while the vehicle electrical system is already under heavy load.

PWR IN hysteresis

► **Undervoltage hysteresis for 12 V vehicle electrical networks:**

If the PWR IN voltage is below 10.8 V, the PWR OUTs will operate in backup mode (see above). To exit backup mode, the PWR IN voltage must exceed 11.8 V.

► **Undervoltage hysteresis for 24 V vehicle electrical networks:**

If the PWR IN voltage is below 21.6 V, the PWR OUTs will operate in backup mode. To exit backup mode, the PWR IN voltage must exceed 22.6 V.

- ▶ **Overvoltage hysteresis for 12 V and 24 V vehicle electrical networks:**
If the PWR IN voltage exceeds 37 V, the PWR OUTs will be supplied in backup mode. To exit backup mode, the PWR IN voltage must fall below 33 V.

2.7 Hardware Setup

2.7.1 Installation

To ensure a proper and safe fixation of the Smart UPS in a lab, on a test bench or in a car, various mounting options are available (see section [Mounting Equipment](#) on page 60).

**WARNING!**

For device safety reasons, the Smart UPS must not be used or mounted with the front side or the back side facing downwards. All other mounting orientations are permitted.

2.7.2 Typical Setup

This section shows a typical hardware setup with a VP2110 Smart UPS, and provides important notes on the connections.

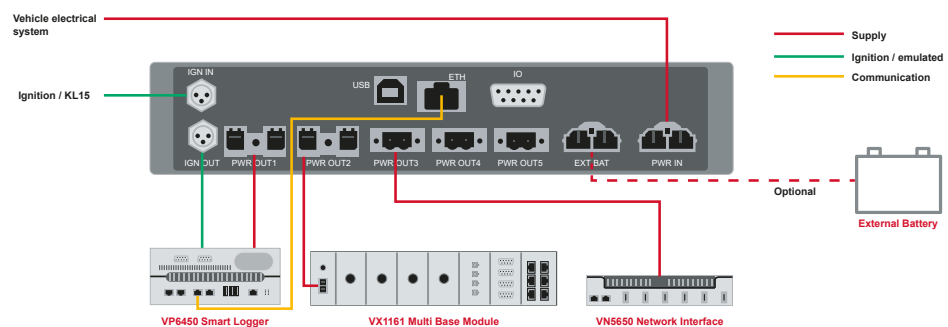


Figure 3: Setup example

Power input

The Smart UPS is connected to the vehicle power supply via the PWR IN connector. An external battery can be connected to the EXT BAT connector for additional features such as cold start measurement or longer backup times of the attached loads.

**WARNING!**

Only use allowed battery types as mentioned in section [Interface and Connectors](#). Only use the supplied power cables or equivalent cables with a wire gauge of at least 6 mm² to ensure safety and proper function.

Also refer to the information and notes in section [Interface and Connectors](#) and [Technical Data](#).

Power output

Up to five loads like Smart Loggers or VX devices can be attached to the Smart UPS. According to their maximum power consumption, they are connected to

- ▶ PWR OUT1/2 (up to 240 W per output) or
- ▶ PWR OUT3/4/5 (up to 85 W per output).

**Note**

The maximum possible power output of the Smart UPS across all PWR OUTs is 240 W.

**WARNING!**

Use only the power cables supplied with the attached loads or equivalent cables to ensure safety and proper function.

Ignition

The ignition signal of the vehicle is connected to the IGN IN connector of the Smart UPS. An emulated ignition signal is available at IGN OUT for optional control of loads.

**Note**

The ignition signals IGN IN and IGN OUT are referenced to the GND of the PWR IN and PWR OUT connectors, respectively.

Ethernet

In order for the Smart Logger to take full advantage of the Smart UPS features, both are connected via Ethernet. It is recommended to use the first 1G Ethernet port of the Smart Logger to connect to the VP2110 Smart UPS. Configuration and updates are also done via the Ethernet connection using the Smart UPS Configurator tool.

2.7.3 Wireless Remote Control

The IO interface on the back panel (see section IO on page 22) can be used to wake up the VP2110 with a wireless remote control. There are several remote-controlled relays on the market that can be used for this purpose.

To wake up the VP2110, the receiver relay must short-circuit pin 5 and pin 9 of the VP2110 IO connector for a minimum of 1 second and a maximum of 10 seconds.

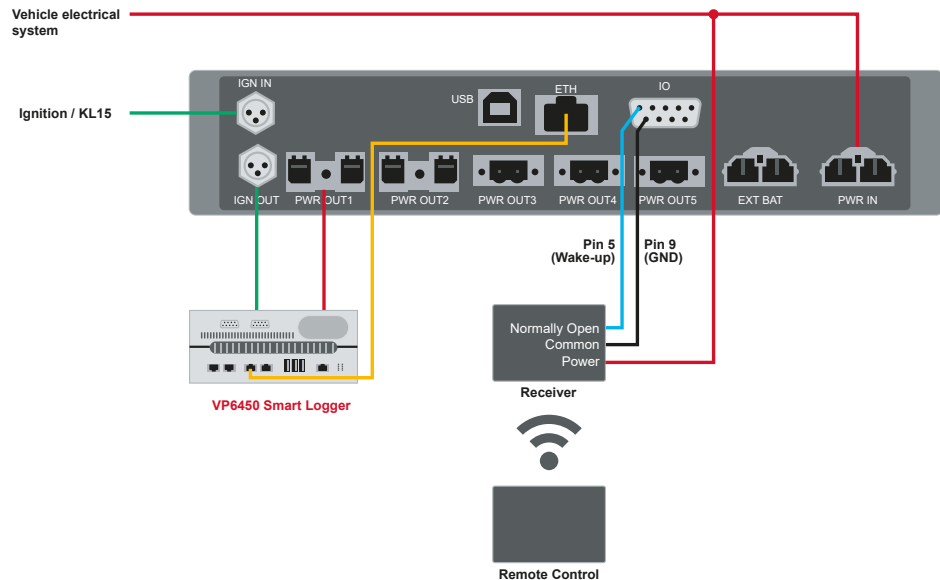


Figure 4: Setup



WARNING!

Make sure the receiver's power input is protected from voltage pulses that may occur in a vehicle's electrical system. Failure to do so may damage the receiver.

If an external battery is connected to the VP2110, the receiver can also be powered from the battery. In this case, voltage pulses from the vehicle's electrical system are avoided.



Note

The receiver has a certain standby voltage that will drain the vehicle battery over time. Please note that the vehicle battery must be recharged periodically when using a connected receiver.

2.7.4 LTE/WLAN Remote Control

2.7.4.1 Overview

The IO interface on the back panel (see section IO on page 22) can be used to wake up the VP2110 with a RV55W Router (see section Router RV55W on page 47). There are several ways to send the wake-up command to the router.

Two of them are:

- ▶ SMS over telephone network
- ▶ AT command over WLAN

A typical connection setup looks like this:

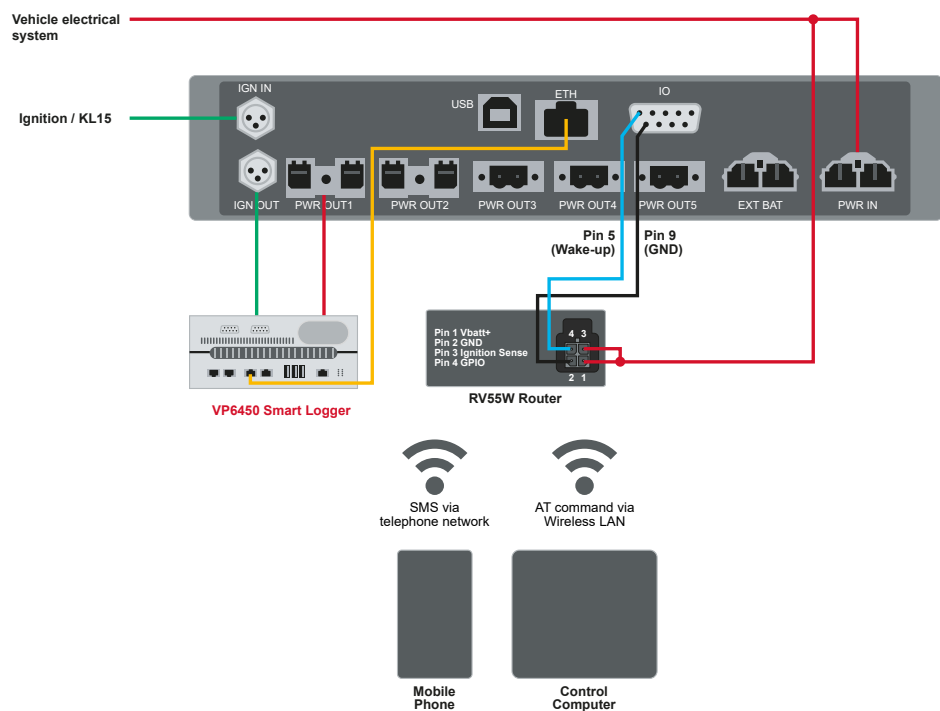


Figure 5: Setup



Note

Please note that pins 1 and 3 of the RV55W must be permanently connected to Vbatt+. Pin 2 of the RV55W must be connected to pin 9 of the VP2110 and also to the vehicle's GND. Pin 4 of the RV55W must be connected to pin 5 of the VP2110.



Note

The RV55W has a standby current of approx. 75 mA at 12 V. For example, if a 60 Ah battery is used in the vehicle, the RV55W will discharge it in approximately 30 days. Please note that the vehicle's battery must be recharged periodically when using the RV55W.

2.7.4.2 Example: Wake-up via SMS

The following example illustrates the process of configuring the RV55W to transmit a wake-up signal to the VP2110 via SMS.



Note

The SIM card used in the RV55W must have the capability to receive SMS messages. Please note that data-only SIM cards may not have this capability.



Step by Step Procedure

1. On the RV55W web interface, set up the SMS mode. Choose a command password (e. g. "1234") and a command prefix (e. g. "&&&").

For detailed setup instructions, please refer to the "ALEOS Software Configuration User Guide."

2. The SMS format is as follows:
PW<space>[Password]<space>[Prefix] [Command]<space>1<space>1.

To set the wake-up pin of the VP2110 to low, please send an SMS with the following content to the RV55W:

```
PW 1234 &&&relay 1 1
```

3. Please wait for one to ten seconds.
4. To set the wake-up pin of the VP2110 to high, please send an SMS with the following content to the RV55W:

```
PW 1234 &&&relay 1 0
```

Afterwards, the VP2110 wakes up.

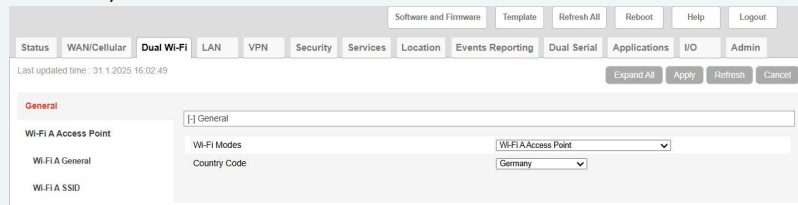
2.7.4.3 Example: Wake-up via AT Command

The following example illustrates the process of configuring the RV55W to transmit a wake-up signal to the VP2110 via an AT command.



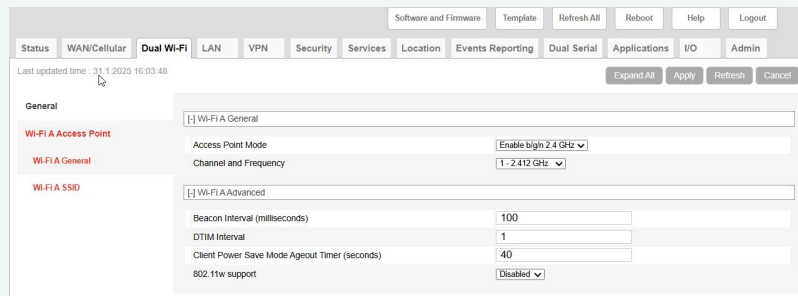
Step by Step Procedure

1. On the RV55W web interface, enable the WLAN access point (**Dual Wi-Fi | General**).

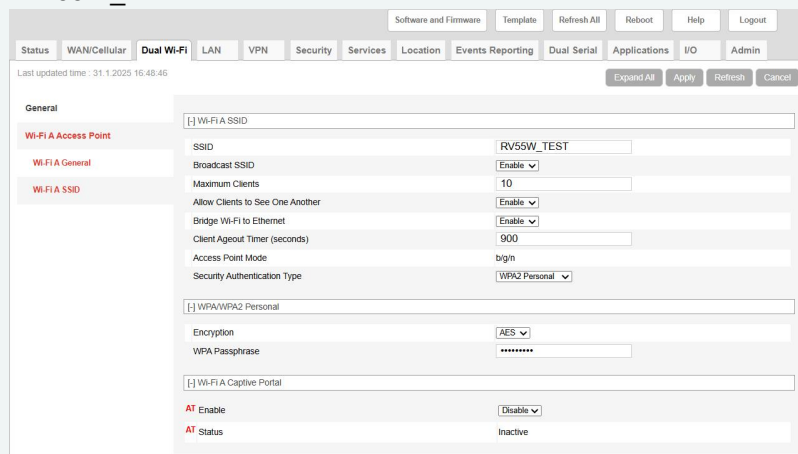


For detailed setup instructions, please refer to the "ALEOS Software Configuration User Guide."

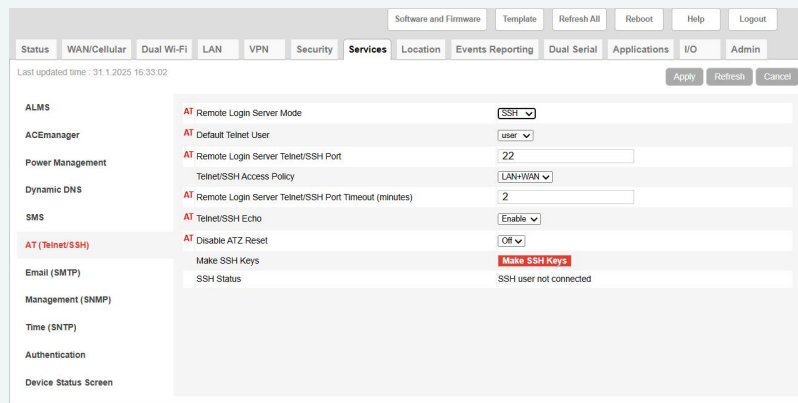
2. Please set the **Access Point Mode (Dual WiFi | Wi-Fi A General)**, e. g. 2.4 GHz.



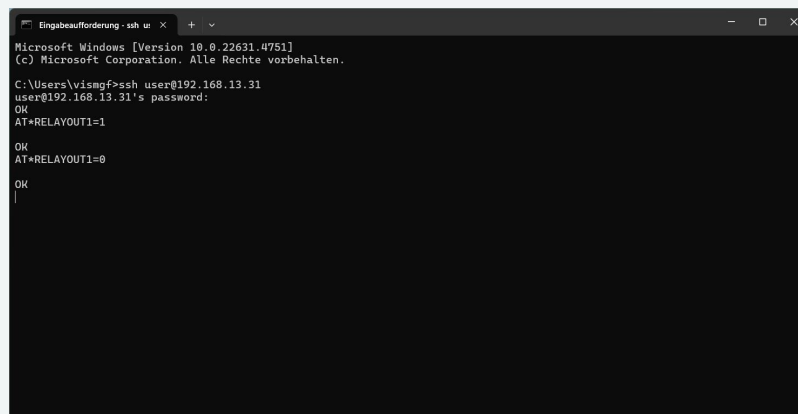
3. Set the **SSID** and the **WPA Passphrase (Dual WiFi | Wi-Fi A SSID)**, e. g. "RV55W_TEST".



4. Enable SSH (**Services | AT (Telnet/SSH)**) and set the port number. e. g. 22.



5. Use your computer to connect to the RV55W access point via WLAN.
6. Use SSH to connect to the RV55W. In the example below, the standard IP address 192.168.13.31 and the standard username "user" are used.
7. To set the wake-up pin of the VP2110 to low, please send the command to the RV55W:
`AT*RELAYOUT1=1`
8. Please wait for one to ten seconds.
9. To set the wake-up pin of the VP2110 to high, please send the command to the RV55W:
`AT*RELAYOUT1=0`



```
Microsoft Windows [Version 10.0.22631.4751]
(c) Microsoft Corporation. Alle Rechte vorbehalten.

C:\Users\vismgf>ssh user@192.168.13.31
user@192.168.13.31's password:
OK
AT*RELAYOUT1=1
OK
AT*RELAYOUT1=0
OK
```

Afterwards, the VP2110 wakes up.

2.7.5 Reed Switch Remote Control

The IO interface on the back panel (see section IO on page 22) can be used to wake up the VP2110 with a reed switch. There are several reed switch on the market that can be used for this purpose.

To wake up the VP2110, the reed switch must short-circuit pin 5 and pin 9 of the VP2110 IO connector for a minimum of 1 second and a maximum of 10 seconds. A LED between pin 8 (anode) and pin 4 (cathode) of the IO connector can be used as visual feedback. When the VP2110 wakes up, the LED will light up for about 3 seconds. Please make sure to use a low current LED (2 mA).

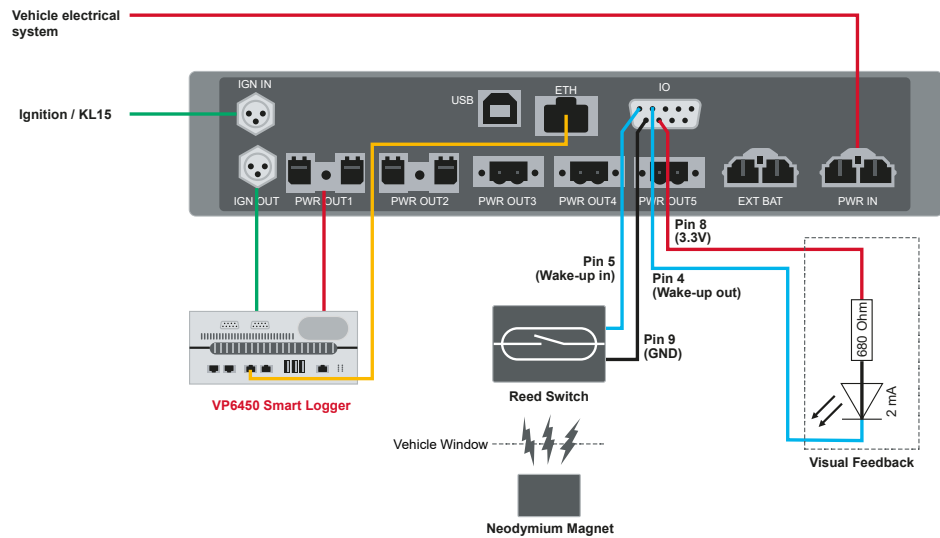


Figure 6: Setup

2.7.6 Master/Slave Configuration

The VP2110 Smart UPS supports a Master/Slave configuration for setups where two devices with high power requirements are used.

In this example setup, two VP2110 are used. With the master/slave cabling shown below, wake-up events that occur on the master unit will automatically wake up the slave unit.

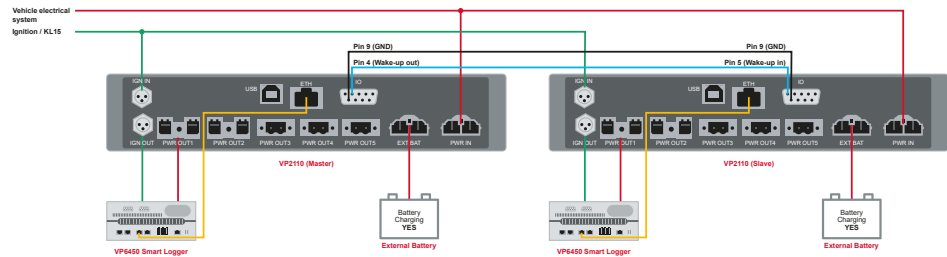


Figure 7: Setup 1

The wake-up events include:

- ▶ Wake-up via front button (see section Push button on page 15)
- ▶ Wake-up via internal timer (see Smart UPS Configurator help)
- ▶ Wake-up via remote control (see section IO on page 22)
- ▶ Wake-up via isolated input (see section IO on page 22)

If an external battery is required, each VP2110 can use its own battery (Setup 1), or a single battery can be shared by both VP2110s (Setup 2).

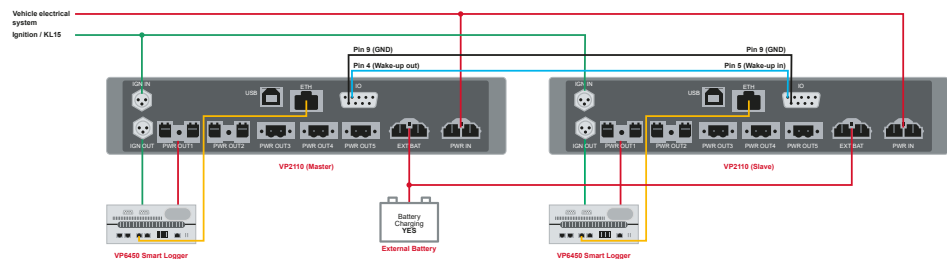


Figure 8: Setup 2



WARNING!

If two VP2110 share one battery, only one VP2110 (e. g. the master unit) should charge the external battery. Please enable/disable the settings for the master and the slave in the Smart UPS Configurator in **Energy | External Battery** accordingly.

2.8 Software Configuration

2.8.1 Smart UPS Configurator

The VP2110 Smart UPS is configured with the Smart UPS Configurator. It can be opened in CANape 23 or higher (**Devices | Smart UPS Configurator**) or is provided by Vector as a standalone tool.

Further details can be found in the separate help file provided with the Smart UPS Configurator.



Reference

The Smart UPS Configurator can be downloaded from:
www.vector.com/vp-tools



Note

The default IP address of the VP2110 is **192.168.1.101**.

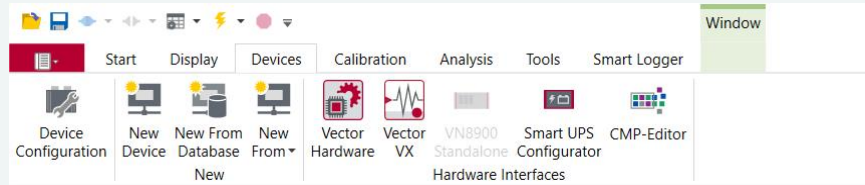
2.8.2 CANape Integration



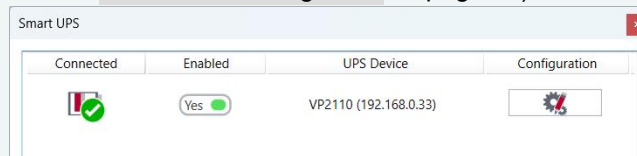
Step by Step Procedure

The VP2110 Smart UPS can be configured in CANape.

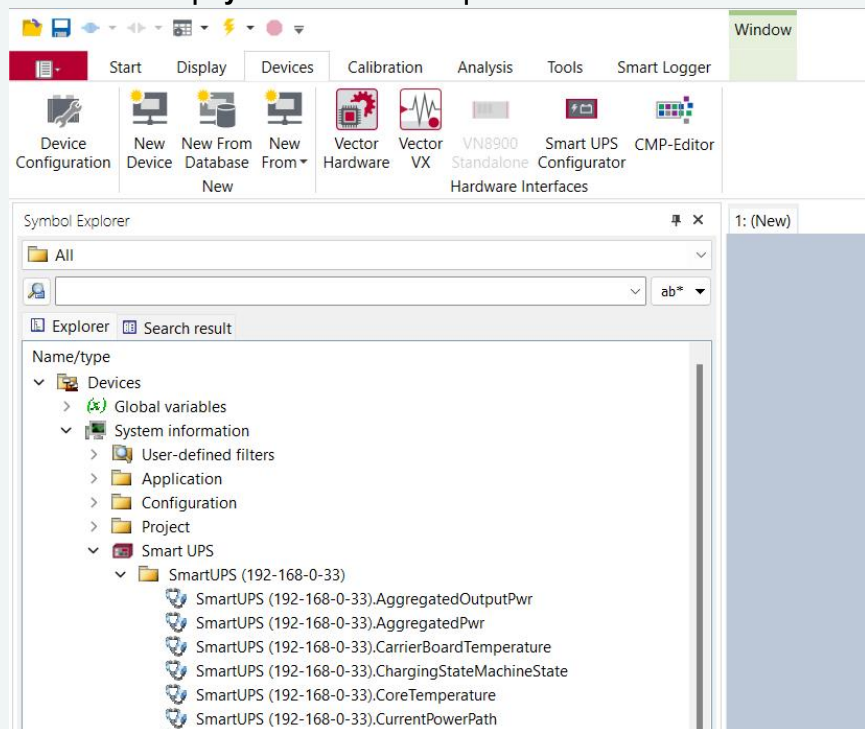
1. Click on **Devices | Smart UPS Configurator**.



2. In order to measure signals of the VP2110 Smart UPS in CANape, enable it. Click on the configuration button to configure the VP2110 Smart UPS (see section **Smart UPS Configurator** on page 35).



3. The enabled VP2110 Smart UPS appears in the CANape **Symbol Explorer** under **Devices | System information | Smart UPS**.



2.8.2.1 Signals

Signal	Description	Unit
AggregatedOutputPwr	Aggregated power of the VP2110 Smart UPS distributed to the outputs.	mW
AggregatedPwr	Aggregated input and output power of the VP2110 Smart UPS.	mW
CarrierBoardTemperature	Temperature of the carrier board.	°C
ChargingStateMachineState	State of the charging state machine: - Idle No charging in progress. - Charge internal battery Charging of internal Super Caps. - Hold Charge Trickle charging for the internal Super Caps. - Charge external battery Charging of externally connected battery.	-
CoreTemperature	Temperature of the system management controller.	°C
CurrentPowerPath	Active power path of the VP2110 Smart UPS: - External power Power is provided by the vehicle electrical system. - External battery Power is provided by the externally connected battery. - Internal Power is provided by the internal Super Caps.	-
CurrentState	Current state of the VP2110 Smart UPS state machine: - PRECHARGE Pre-charge of internal Super Caps in progress. - INIT Pre-run mode is active. - NORMAL Normal operation mode. - DEINIT IGN IN Off response timer is counting. - SHUTDOWN Shutdown of the VP2110 Smart UPS in progress. - FATAL ERROR Fatal error occurred.	-
DCLink	Bus voltage.	V
IExtBatIn	External battery input current.	mA
IgnitionOffResponseTimerElapsed	Not implemented.	-
IPwrIn	Vehicle electrical network input current.	mA
IPwrOut0	Output current to PWR OUT1.	mA
IPwrOut1	Output current to PWR OUT2.	mA
IPwrOut2	Output current to PWR OUT3.	mA
IPwrOut3	Output current to PWR OUT4.	mA
IPwrOut4	Output current to PWR OUT5.	mA
MainBoardTemperature	Temperature of the mainboard.	°C
PExtBatIn	External battery input power.	mW
PPwrIn	Vehicle electrical network input power .	mW

Signal	Description	Unit
PPwrOut0	Output power to PWR OUT1.	mW
PPwrOut1	Output power to PWR OUT2.	mW
PPwrOut2	Output power to PWR OUT3.	mW
PPwrOut3	Output power to PWR OUT4.	mW
PPwrOut4	Output power to PWR OUT5.	mW
RtcTime	Date and time of the real time clock.	DD.MM.YYYY HH:mm:ss
RuntimeSinceResetOrStartup	Runtime since the last start of the VP2110 Smart UPS.	100 ms
SoCSuperCaps	State of the super cap energy storage: - Full Super Caps fully loaded. - Almost Full Super Caps almost fully loaded. - Half Super Caps half loaded. - Almost Empty Super Caps almost empty. - Empty Super Caps empty.	-
SoCSuperCapsWs	Energy of the Super Cap energy storage.	Ws
StatePwrOut0	State of output PWR OUT1: - 0 Output disabled. - 1 Output enabled.	-
StatePwrOut1	State of output PWR OUT2: - 0 Output disabled. - 1 Output enabled.	-
StatePwrOut2	State of output PWR OUT3: - 0 Output disabled. - 1 Output enabled.	-
StatePwrOut3	State of output PWR OUT4: - 0 Output disabled. - 1 Output enabled.	-
StatePwrOut4	State of output PWR OUT5: - 0 Output disabled. - 1 Output enabled.	-
SuperCapCapacity	Capacity of the Super Cap energy storage in percent of initial capacity.	%
SuperCapCapacityF	Capacity of the Super Cap energy storage in Farad.	F
SuperCapChargingCurrent	Charging current of the Super Caps.	mA
SuperCapDischargingCurrent	Discharging current of the Super Caps.	mA
VExtBatIn	External battery input voltage.	V
VPwrIn	Vehicle electrical network input voltage.	V
VPwrOut0	Output power of PWR OUT1.	V
VPwrOut1	Output power of PWR OUT2.	V
VPwrOut2	Output power of PWR OUT3.	V
VPwrOut3	Output power of PWR OUT4.	V

Signal	Description	Unit
VPwrOut4	Output power of PWR OUT5.	V

2.8.3 REST API

2.8.3.1 Retrieving Data

In addition to CANape, you can retrieve data from the VP2110 Smart UPS via a REST API. The data is provided in JSON format. The available REST API endpoints (based on the default IP address) are:

Endpoint	Description																										
http://192.168.1.101/api/version	Displays the REST API version.																										
http://192.168.1.101/api/device/name	Displays the product name of the device.																										
http://192.168.1.101/api/device/leds	Displays the status of all device LEDs: <table><tr><th>Value</th><th>Color</th></tr><tr><td>1</td><td>Off</td></tr><tr><td>2</td><td>Red</td></tr><tr><td>3</td><td>Green</td></tr><tr><td>4</td><td>Yellow</td></tr><tr><td>5</td><td>Red (fast flashing)</td></tr><tr><td>6</td><td>Green (fast flashing)</td></tr><tr><td>7</td><td>Red (slow flashing)</td></tr><tr><td>8</td><td>Green (slow flashing)</td></tr><tr><td>9</td><td>Red (pulsating)</td></tr><tr><td>10</td><td>Green (pulsating)</td></tr><tr><td>11</td><td>Red (short pulses)</td></tr><tr><td>12</td><td>Blue</td></tr></table>	Value	Color	1	Off	2	Red	3	Green	4	Yellow	5	Red (fast flashing)	6	Green (fast flashing)	7	Red (slow flashing)	8	Green (slow flashing)	9	Red (pulsating)	10	Green (pulsating)	11	Red (short pulses)	12	Blue
Value	Color																										
1	Off																										
2	Red																										
3	Green																										
4	Yellow																										
5	Red (fast flashing)																										
6	Green (fast flashing)																										
7	Red (slow flashing)																										
8	Green (slow flashing)																										
9	Red (pulsating)																										
10	Green (pulsating)																										
11	Red (short pulses)																										
12	Blue																										
http://192.168.1.101/api/device/versions	Displays the firmware version.																										
http://192.168.1.101/api/device/hardware	Displays the device identification.																										
http://192.168.1.101/api/system-description	Displays the signal description of the available measurement signals.																										
http://192.168.1.101/api/measurements/status	Displays the values of available measurement signals.																										



Example

The tool **cURL** can be used to retrieve data from the VP2110 Smart UPS via the REST API and is available for several operating systems.

On Windows, the following cURL command can be used to fetch and save measurement data from the VP2110 Smart UPS into the file `measurement_values.json`.

```
curl.exe -X GET http://192.168.1.101/api/measurements/status -o measurement_values.json
```

2.8.3.2 Output Control

The REST API can be used to control the VP2110 Smart UPS's individual outputs. The available REST API endpoints (based on the default IP address) are:

Endpoint	Description
http://192.168.1.101/api/outputs/1	PWR OUT1
http://192.168.1.101/api/outputs/2	PWR OUT2
http://192.168.1.101/api/outputs/3	PWR OUT3
http://192.168.1.101/api/outputs/4	PWR OUT4
http://192.168.1.101/api/outputs/5	PWR OUT5



Example

On Windows, the following cURL command can be used to disable output PWR OUT1:

```
curl.exe -X PATCH -d '{"enable":false}'  
http://192.168.0.33/api/outputs/1
```

To enable the output PWR OUT1, the following command can be used:

```
curl.exe -X PATCH -d '{"enable":true}'  
http://192.168.0.33/api/outputs/1
```

2.8.3.3 Changing IP Address

You can use the REST API to change the IP address of the VP2110 Smart UPS.



Example

To change the IP address from

- 192.168.1.101 to
- 192.168.1.102,

use the command:

```
curl.exe -X PUT -d '{"ip": "192.168.1.102"}'  
http://192.168.1.101/api/network/ipv4
```

2.8.3.4 Identifying Device

You can use the REST API to identify the VP2110 Smart UPS by causing the power LED to blink for a few seconds.



Example

Use the command:

```
curl.exe -X PUT http://192.168.1.101/api/device/identify
```

2.9 Use Cases

2.9.1 Reliable Power Supply

When ignition is switched on, the Smart UPS ensures to reliably supply a Smart Logger and additional VX and VN interface hardware. Both overvoltages and voltage dips in the vehicle electrical system are backed up by the Smart UPS. If the ignition is switched off, the Smart Logger and interface hardware can continue to be supplied for a configurable follow-up time. The Smart UPS also ensures that the Smart Logger always has enough time to stop a running measurement and shut down cleanly. To this end, the Smart UPS also forces an orderly shutdown of the Smart Logger if a continuous supply of all loads is no longer possible. Data loss due to abrupt loss of power for the Smart Logger can thus be avoided.

2.9.2 Cold Start Measurement

In order to be able to measure an on-board electrical system and its control units from the start, the Smart Logger and interface hardware must be powered up before the ignition is switched on or before the on-board electrical system is woken up. For this purpose, a Smart UPS can be woken up remotely from standby. It then switches into pre-run mode, in which it supplies the loads from its energy storages until the Smart UPS can access the vehicle electrical system once ignition is switched on.

2.9.3 Bridging Ignition Switch-off Times

There are applications where a measurement should continue for some time after the ignition is turned off.

Examples of such applications are:

- ▶ measurement of vehicle cool-down phases
- ▶ measurement of ignition on/off cycles
- ▶ bridging of short driving breaks
- ▶ bridging of driver changes

To make this possible, the **IGN IN Off Response Time** parameter can be configured. Each time IGN IN is turned off, this parameter allows a grace period for IGN IN to turn on again, in which case the Smart UPS remains in the NORMAL state.

2.9.4 Follow-up Time After Ignition Off

The FOLLOW-UP state can be used when a Smart Logger is connected to the VP2110 Smart UPS. When entering this state, IGN OUT and all configured PWR OUTs are enabled. The Smart Logger controls the outputs of the VP2110 Smart UPS and the duration of this state.

This state can be used to measure cool down phases with the connected measuring devices. A Smart Logger can also use this phase to upload files to the cloud or check the cloud for a new configuration.

When all tasks are completed, the Smart Logger initiates a state change to SHUTDOWN.

2.10 Technical Data

Power supply input (PWR IN)	10.8 V DC ... 32.0 V DC (typ. 12 V DC or 24 V DC) Operation: max. 30 A Standby: typ. 2 mA @ 12 V DC
Power supply output (PWR OUT1/2)	10.8 V DC ... 16.0 V DC Max. 240 W
Power supply output (PWR OUT3/4/5)	10.8 V DC ... 16.0 V DC Max. 85 W
Total power budget (PWR OUT1...5)	Max. 240 W
Internal energy storage	30 s backup time at 240 W output power 60 s backup time at 120 W output power
External energy storage	Suitable batteries: 12 V LiFePo with BMS (Battery Management System) Charging Current: 3.125 A or 6.25 A (configurable)
Ignition input (IGN IN)	On: > 3.0 V Off: < 2.9 V U_{max} : 32.0 V I_{in_max} : < 1 mA
Ignition output (IGN OUT)	On: min: 10.3 V nom: 12 V max: 14.8 V R_i = 310 Ohm I_{out_max} : < 45 mA
Management interface (ETH)	Ethernet 100BASE-TX
Wake-up interface (IO)	Pin 4: - wake-up output - low-active with reference to pin 9 - high-level: 3.3 V - output current: < 3 mA Pin 5: - Wake-up input - low-active with reference to pin 9 - high-level: 3.3 V - input current: < 1 mA Pin 6: - Isolated Wake-up input - high-active with reference to pin 7 - high-level: 3.0 V DC ... 36 V DC Pin 1, 2, 3 and 8: do not connect
Cooling	Passive
Temperature Range	Operating: -40 °C ... +65 °C (external batteries may have different specifications) Storage: -40 °C ... +65 °C
Air humidity	90 % non-condensing

Dimensions (W x H x D)	216 x 42 x 250 mm
Weight	2.8 kg
Vibration	ISO 16750-3:2023-7 x-, y- and z-axis; 4 h per axis

3 Accessories

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3.1 Router and Antennas

3.1.1 Router RV55W

Technical data

Description	LTE router and WLAN access point. - Wireless transmission of logging telemetry data from vehicles, for example to use the Mobile UI - Connecting the Smart Logger to the Logger Cloud - Updating the Smart Logger configuration via mobile radio - Support for universal SIM cards (SIM card not included)
Scope of delivery	- 1x LTE Router RV55W - 2x Antenna for 3G/4G Router 2.0 (part number 28134) - 2x 2.4 & 5 GHz Antenna SMA-R std. (part number 07169) - 1x Ethernet Cable 10Gbps 2m (part number 30016)
Temperature range	Operation: -30 °C ... +70 °C Storage: -40 °C ... +85 °C
IP - class	IP64
Areas of application	Global
Dimensions (WxHxD)	119 mm x 33 mm x 85 mm (102 mm including WLAN connectors)
Weight	320 g
Part number	28154



3.1.2 2.4 & 5 GHz Antenna SMA-R Std.

Technical data

Description	Standard antenna for EU, USA and other non-Asian countries. Suitable for 2.4 GHz and 5 GHz applications.
Part number	07169



Reference

A suitable antenna for Asian countries can be found section 2.4 & 5.2 GHz Antenna SMA-R Asia on page 48.

3.1.3 2.4 & 5.2 GHz Antenna SMA-R Asia

Technical data

Description	Standard antenna for Asia. Suitable for 2.4 GHz and 5.2 GHz applications.
Part number	07170



Reference

A suitable antenna for EU, USA and other non-Asia countries can be found section 2.4 & 5 GHz Antenna SMA-R Std. on page 48.

3.1.4 4G LTE Antenna

Technical data

Description	4G LTE antenna for suction cup mounting on car windows
Length	2 m
Connectors	1x SMA-plug 1x window antenna (including 3x suction cups)
Part number	22542



3.2 Cables and Connectors

3.2.1 Power Cable Molex Mini-Fit 6mm²

Description	Red/black 6 mm ² power cable
Length	1.5 m
Connectors	1x Molex Mini-Fit connector 1x open ends
Part number	22583



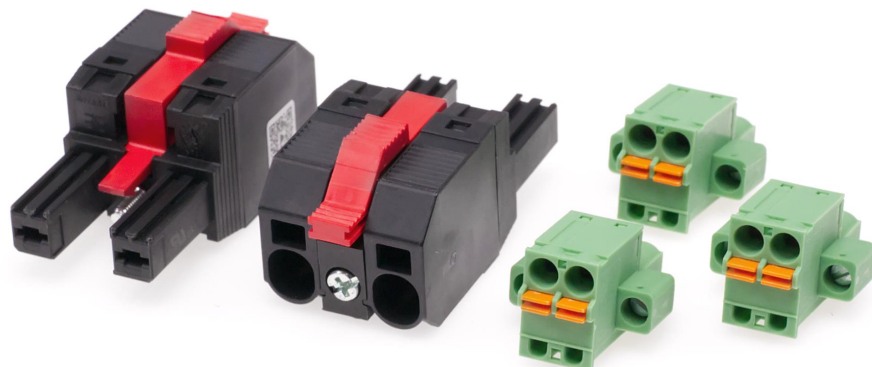
3.2.2 Power Adapter Molex Mini-Fit

Description	Adapter for Molex Mini-Fit power cables with taps for VCC and GND potentials via banana sockets.
Length	0.25 m
Connectors	1x Molex Mini-Fit connector 1x Molex Mini-Fit socket 2x banana sockets
Part number	22556



3.2.3 Connector Set Power Out for VP2110

Description	Plug housings to connect consumers to the VP2110.
Contains	▶ PWR OUT1/2 Counter Parts - 2x Weidmüller part no.: 1060630000 ▶ PWR OUT3/4/5 Counter Parts - 3x Phoenix part no.: 1902301
Part number	22597



3.2.4 Cable Ignition <> Binder 3-pin

Technical data

Description	Cable to connect Vector devices with Binder 3-pin connector with ignition
Length	Approx. 1.5 m
Connectors	1x Binder 3-pin 1x Banana plug
Part number	22557



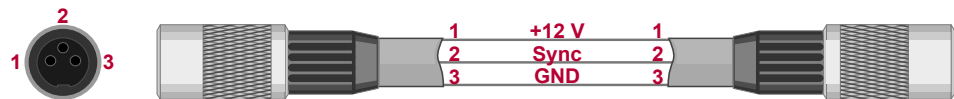
3.2.5 Vector SYNCcableXL

Synchronization cable

Description	Connection cable for time synchronization of Vector devices
Length	2 m
Connectors	2x female 3-pin Binder connectors (type 711)
Temp. range	Fixed installation: -30 °C ...+80 °C Flexible use: -5 °C ...+70 °C
Min. bending radius	Fixed installation: 16 mm Flexible use: 40 mm
Part number	05018



Setup



3.2.6 Cable Ignition Binder 3-pin <> 5x Binder

Description	Cable for connecting the ignition output of the VP2110 to up to five ignition inputs of connected devices.
Length	2 m
Connectors	6x female 3-pin Binder connector (type 711)
Temp. range	Fixed installation: -30 °C ... +80 °C Flexible use: -5 °C ... +70 °C
Min. bending radius	Fixed installation: 16 mm Flexible use: 40 mm
Part number	22679



3.2.7 Cable VP7 Ignition <> Binder 3-pin

Description	Cable to connect a VP7000 with ignition on the VP2110.
Length	1.5 m
Connectors	1x Binder 3-pin connector 1x Ultra-Fit 4-pin connector
Part number	22632



3.2.8 Ethernet Cable 10Gbps 0.5m

Connection cable

Description	Cable for Ethernet network interfaces. Designed for vehicle interiors.
Length	approx. 0.5 m
Connectors	2x RJ45 (LxWxH: 41.9 x 12.1 x 15.6 mm)
Category	Cat 6A
Temp. range	Fixed installation: -20 °C ...+60 °C
Min. bending radius	Fixed installation: 87 mm
Outer diameter	6.2 mm
Part number	30017



3.2.9 Ethernet Cable 10Gbps 2m

Connection cable

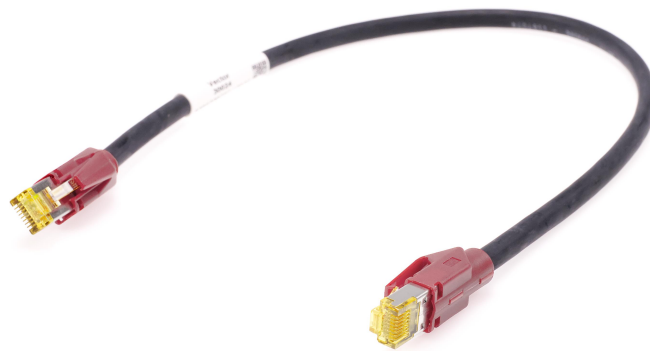
Description	Cable for Ethernet network interfaces. Designed for vehicle interiors.
Length	approx. 2 m
Connectors	2x RJ45 (LxWxH: 41.9 x 12.1 x 15.6 mm)
Category	Cat 6A
Rated voltage	250 V
Temp. range	Fixed installation: -20 °C ...+60 °C
Min. bending radius	Fixed installation: 87 mm
Outer diameter	6.2 mm
Part number	30016



3.2.10 Ethernet Cable Robust 10Gbps 0.5m

Connection cable

Description	Robust cable for Ethernet network interfaces. Designed for vehicle interiors during demanding long-term vehicle testing, with extended temperature range and higher cable robustness against oil, fuel and ozone.
Length	approx. 0.5 m
Connectors	2x RJ45 (LxWxH: 44.7 x 13.4 x 16.1 mm)
Temp. range	-40 °C ...+80 °C
Category	Cat 6A
Min. bending radius	Fixed installation: 40 mm
Outer diameter	6.6 mm
Part number	30024



3.2.11 Ethernet Cable Robust 10Gbps 2.0m

Connection cable

Description	Robust cable for Ethernet network interfaces. Designed for vehicle interiors during demanding long-term vehicle testing, with extended temperature range and higher cable robustness against oil, fuel and ozone.
Length	approx. 2 m
Connectors	2x RJ45 (LxWxH: 44.7 x 13.4 x 16.1 mm)
Temp. range	-40 °C ... +80 °C
Category	Cat 6A
Min. bending radius	Fixed installation: 40 mm
Outer diameter	6.6 mm
Part number	30025

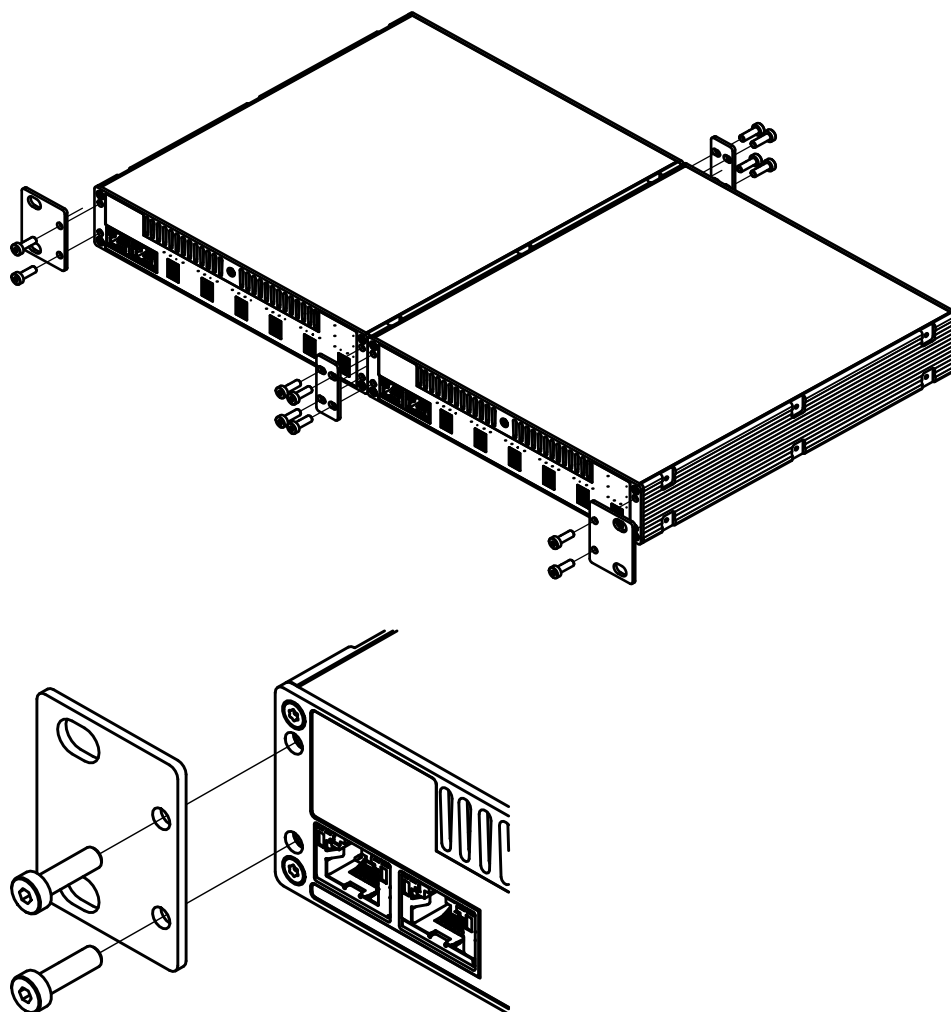


3.3 Mounting Equipment

3.3.1 VSH Connection Kit 19"

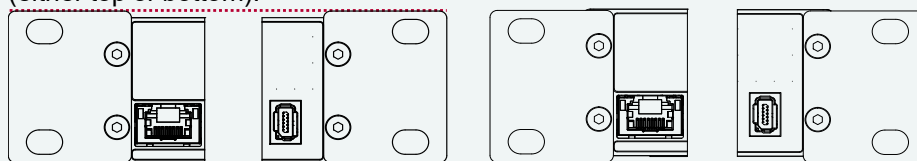
Technical data

Description	Brackets for 19" rack mounting (front and back mounting plates required, see VSH Connection Kit Horizontal on page 62).
Part number	05151



WARNING!

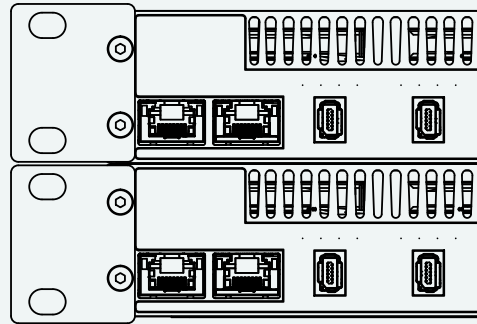
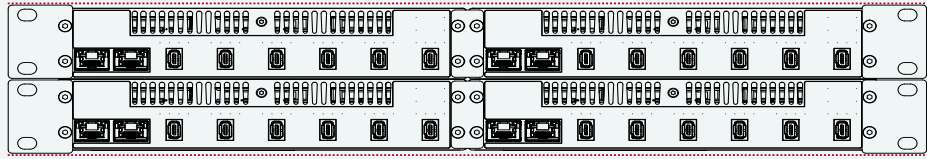
To avoid mechanical damage to the accessories, the unit or the installation, make sure that the two mounting brackets are always mounted in alignment (either top or bottom):





Note

For mounting two devices on top of each other, the rack brackets must be aligned accordingly. The rack brackets must not overlap between the devices!



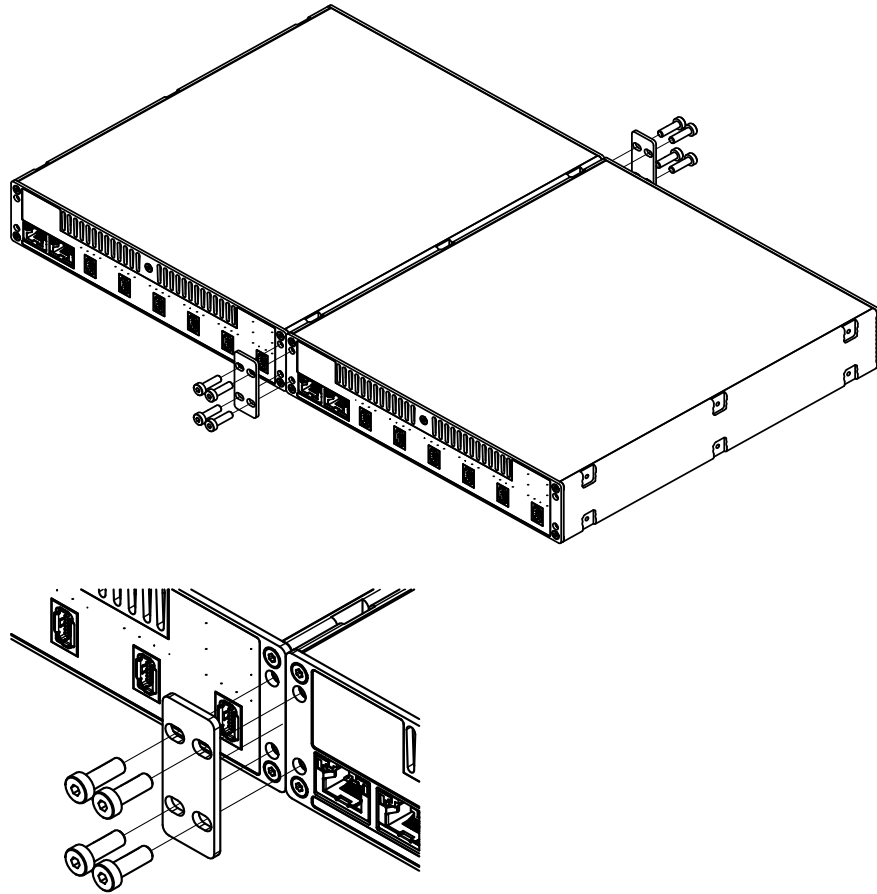
Note

- ▶ Elements may only be used for Vector devices in the Vector System Housing form factor.
- ▶ Always use both supplied elements and associated screws for mounting.
- ▶ For systems up to max. 20 kg.
- ▶ For mounting on a 19" rack, suitable screws must be selected to ensure permanent fixing according to the expected load (not included in the scope of delivery).
- ▶ In case of uncertainty and questions, please contact qualified personnel.
- ▶ Tightening torque: hexagon socket 3 mm, 1.7 Nm.

3.3.2 VSH Connection Kit Horizontal

Technical data

Description	Mounting plates for connecting two devices side by side (horizontally). The mounting is done on the front and back side of the devices.
Part number	05153



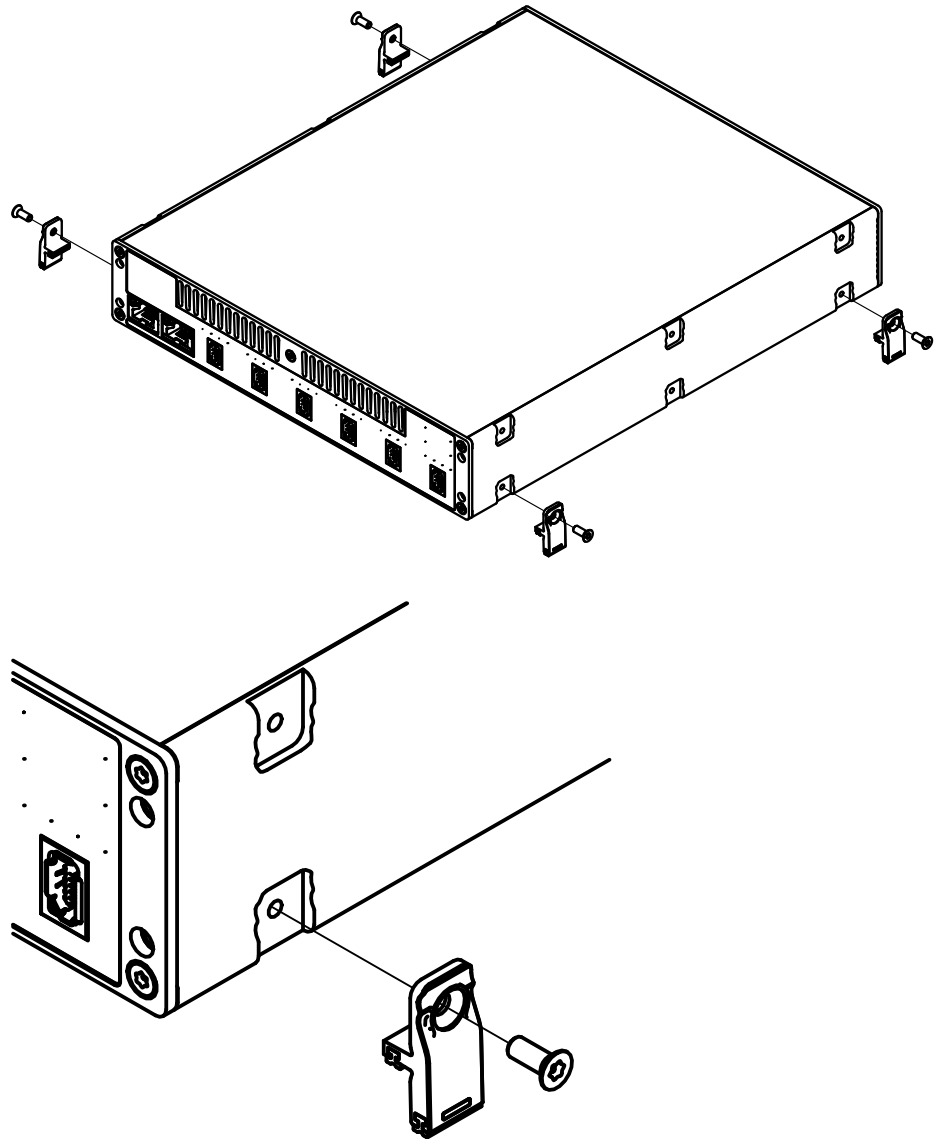
Note

- ▶ Elements may only be used for Vector devices in the Vector System Housing form factor.
- ▶ Always use both supplied elements and associated screws for mounting.
- ▶ For systems up to max. 20 kg.
- ▶ In case of uncertainty and questions, please contact qualified personnel.
- ▶ Tightening torque: hexagon socket 3 mm, 1.7 Nm.

3.3.3 VSH Equipment Foot Kit

Technical data

Description	Four spare mounting feet.
Part number	05150



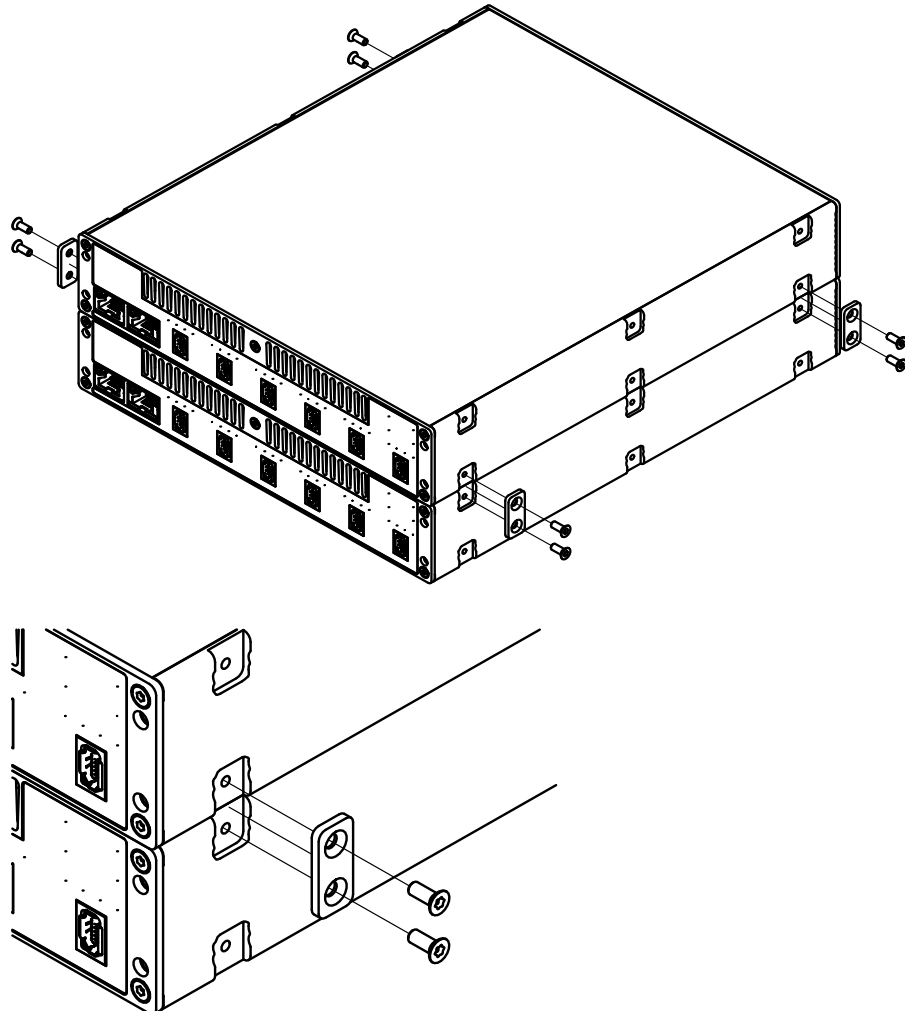
Note

- ▶ Elements may only be used for Vector devices in the Vector System Housing form factor.
- ▶ Always use all supplied elements and associated screws for mounting.
- ▶ For systems up to max. 20 kg.
- ▶ In case of uncertainty and questions, please contact qualified personnel.
- ▶ Tightening torque: Torx T10, 0.5...0.9 Nm.

3.3.4 VSH Connection Kit Vertical

Technical data

Description	Four small mounting plates for connecting two devices on top of each other (vertically). Mounting is done on the left and right side of the housing.
Part number	05152



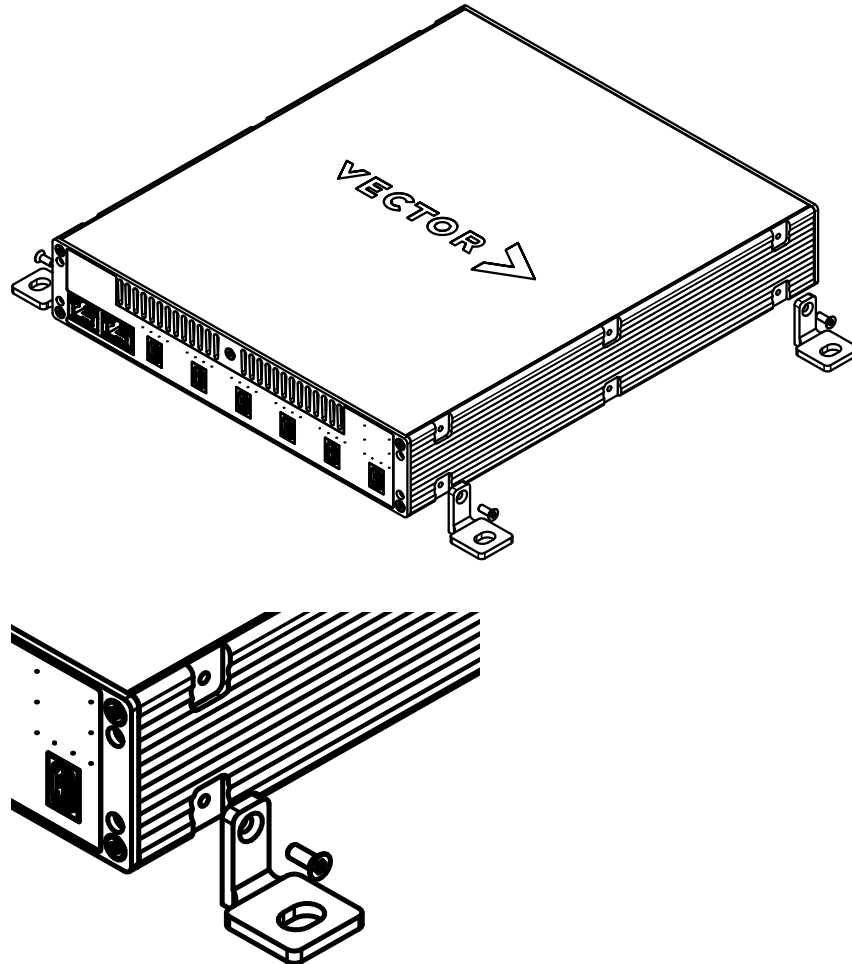
Note

- ▶ Elements may only be used for Vector devices in the Vector System Housing form factor.
- ▶ Always use all supplied elements and associated screws for mounting.
- ▶ For systems up to max. 20 kg.
- ▶ In case of uncertainty and questions, please contact qualified personnel.
- ▶ Tightening torque: Torx T10, 1.2 Nm.

3.3.5 VSH Mounting Flange Kit

Technical data

Description	Four mounting brackets. Allows fixing the device to a suitable surface.
Part number	05147



Note

- ▶ Mounting brackets may only be used for Vector devices in the Vector System Housing form factor.
- ▶ Always use all 4 brackets incl. screws for mounting.
- ▶ For systems up to max. 20 kg.
- ▶ For fixing the mounting brackets to the floor, wall or ceiling, suitable screws must be selected to ensure permanent fixing according to the expected load (not included in the scope of delivery).
- ▶ In case of uncertainty and questions, please contact qualified personnel.
- ▶ Tightening torque: Torx T10, 1.2 Nm.

4 Important Notes - Details

In this chapter you find the following information:

4.1 Safety Instructions and Hazard Warnings	67
4.1.1 Proper Use and Intended Purpose	67
4.1.2 Hazards	68
4.1.3 Warning of Hot Surface	68
4.2 Disclaimer	69
4.3 Disposal of Vector Hardware	70

4.1 Safety Instructions and Hazard Warnings

**WARNING!**

In order to avoid personal injuries and damage to property, you have to read and understand the following safety instructions and hazard warnings prior to installation and use of this hardware. Keep this documentation (manual) always near the hardware.

4.1.1 Proper Use and Intended Purpose

**WARNING!**

The hardware may only be operated (i) according to the instructions and descriptions of this manual; (ii) with the electric power supply designed for the hardware, e.g. USB-powered power supply; and (iii) with accessories manufactured or approved by Vector.

The hardware is exclusively designed for use by skilled personnel as its operation may result in serious personal injuries and damage to property. Therefore, only those persons may operate the hardware who (i) have understood the possible effects of the actions which may be caused by the hardware; (ii) are specifically trained in the handling with the hardware, bus systems and the system intended to be influenced; and (iii) have sufficient experience in using the hardware safely.

The knowledge necessary for the operation of the hardware can be acquired in work-shops and internal or external seminars offered by Vector. Additional and hardware specific information, such as „Known Issues“, are available in the „Vector KnowledgeBase“ on Vector’s website at www.vector.com. Please consult the „Vector KnowledgeBase“ for updated information prior to the operation of the hardware.

4.1.2 Hazards

**WARNING!**

The hardware may control and/or otherwise influence the behavior of control systems and electronic control units. Serious hazards for life, body and property may arise, in particular, without limitation, by interventions in safety relevant systems (e.g. by deactivating or otherwise manipulating the engine management, steering, airbag and/or braking system) and/or if the hardware is operated in public areas (e.g. public traffic, airspace). Therefore, you must always ensure that the hardware is used in a safe manner. This includes, inter alia, the ability to put the system in which the hardware is used into a safe state at any time (e.g. by „emergency shutdown“), in particular, without limitation, in the event of errors or hazards.

Comply with all safety standards and public regulations which are relevant for the operation of the system. Before you operate the system in public areas, it should be tested on a site which is not accessible to the public and specifically prepared for performing test drives in order to reduce hazards.

4.1.3 Warning of Hot Surface

**WARNING!**

There is danger of burning! The device can become very hot during operation and should not be touched without appropriate precautions.

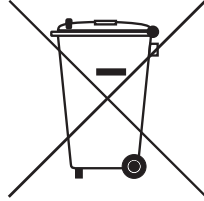
4.2 Disclaimer

**WARNING!**

Claims based on defects and liability claims against Vector are excluded to the extent damages or errors are caused by improper use of the hardware or use not according to its intended purpose. The same applies to damages or errors arising from insufficient training or lack of experience of personnel using the hardware.

4.3 Disposal of Vector Hardware

Please handle old devices responsibly and observe the environmental laws applicable in your country. Please dispose of the Vector hardware only at the designated places and not with the household waste.



Within the European Community, the Directive on Waste Electrical and Electronic Equipment (WEEE Directive) and the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS Directive) apply.

For Germany and other EU countries, we offer free take-back of old Vector hardware.

Please carefully check the Vector hardware to be disposed of before shipping. Please remove all items that are not part of the original scope of delivery, e.g. storage media. The Vector hardware must also be free of licenses and must no longer contain any personal data. Vector does not perform any checks in this regard. Once the hardware has been shipped, it cannot be returned to you. By shipping the hardware to us, you have relinquished your rights to the hardware. Before shipping, please register your old device via:

<https://www.vector.com/int/en/support-downloads/return-registration-for-the-disposal-of-vector-hardware/>

5 Wichtige Hinweise

In diesem Kapitel finden Sie die folgenden Informationen:

5.1 Sicherheits- und Gefahrenhinweise	72
5.1.1 Sach- und bestimmungsgemäßer Gebrauch	72
5.1.2 Gefahren	73
5.1.3 Warnung vor heißen Oberflächen	73
5.2 Haftungsausschluss	74
5.3 Entsorgung von Vector Hardware	75

5.1 Sicherheits- und Gefahrenhinweise

**WARNING!**

Um Personen- und Sachschäden zu vermeiden, müssen Sie vor der Installation und dem Einsatz dieser Hardware die nachfolgenden Sicherheits- und Gefahrenhinweise lesen und verstehen. Bewahren Sie diese Dokumentation (Handbuch) stets in der Nähe dieser Hardware auf.

5.1.1 Sach- und bestimmungsgemäßer Gebrauch

**WARNING!**

Diese Hardware ist entsprechend den Anweisungen und Beschreibungen dieses Handbuchs einzusetzen. Dabei darf nur die dafür vorgesehene Stromversorgung, wie z. B. USB-powered, Netzteil, und das Originalzubehör von Vector bzw. das von Vector freigegebene Zubehör verwendet werden.

Diese Hardware ist ausschließlich für den Einsatz durch geeignetes Personal bestimmt, da der Gebrauch dieser Hardware zu erheblichen Personen- und Sachschäden führen kann. Deshalb dürfen nur solche Personen diese Hardware einsetzen, welche die möglichen Konsequenzen der Aktionen mit dieser Hardware verstanden haben, speziell für den Umgang mit dieser Hardware, den Bussystemen und dem zu beeinflussenden System geschult worden sind und ausreichende Erfahrung im sicheren Umgang mit dieser Hardware erlangt haben.

Die notwendigen Kenntnisse zum Einsatz dieser Hardware können bei Vector über interne oder externe Seminare und Workshops erworben werden. Darüber hinausgehende und Hardware-spezifische Informationen wie z. B. „Known Issues“ sind auf der Vector Webseite unter www.vector.com in der „Vector KnowledgeBase“ verfügbar. Bitte informieren Sie sich dort vor dem Betrieb der Hardware über aktualisierte Hinweise.

5.1.2 Gefahren

**WARNUNG!**

Die Hardware kann das Verhalten von Regelsystemen und Steuergeräten steuern und in anderweitiger Weise beeinflussen. Insbesondere durch Eingriffe in sicherheitsrelevante Bereiche (z. B. durch Deaktivierung oder sonstige Manipulation der Motorsteuerung, des Lenk-, Airbag-, oder Bremssystems) und/oder der Einsatz der Hardware in öffentlichen Räumen (z. B. Straßenverkehr, Luftraum) können erhebliche Gefahren für Leib, Leben und Eigentum entstehen. Stellen Sie daher in jedem Fall eine gefahrfreie Verwendung sicher. Hierzu gehört unter anderem auch, dass das System, in dem die Hardware eingesetzt wird, jederzeit, insbesondere bei Auftreten von Fehlern oder Gefahren, in einen sicheren Zustand geführt werden kann (z. B. durch Not-Abschaltung).

Beachten Sie alle sicherheitstechnischen Richtlinien und öffentlich-rechtlichen Vorschriften, die für den Einsatz des Systems relevant sind. Zur Verminderung von Gefahren sollte das System vor dem Einsatz in öffentlichen Räumen auf einem nicht-öffentlich zugänglichen und für Testfahrten bestimmten Gelände erprobt werden.

5.1.3 Warnung vor heißen Oberflächen

**WARNUNG!**

Es besteht Verbrennungsgefahr! Das Gerät kann während des Betriebs sehr heiß werden und sollte ohne entsprechende Vorsichtsmaßnahmen nicht berührt werden.

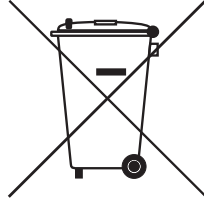
5.2 Haftungsausschluss

**WARNUNG!**

Soweit die Hardware nicht sach- oder bestimmungsgemäß eingesetzt wird, übernimmt Vector keine Gewährleistung oder Haftung für dadurch verursachte Schäden oder Fehler. Das Gleiche gilt für Schäden oder Fehler, die auf einer mangelnden Schulung oder Erfahrung derjenigen Personen beruhen, die die Hardware einsetzen.

5.3 Entsorgung von Vector Hardware

Bitte gehen Sie verantwortungsvoll mit Altgeräten um und beachten Sie die in Ihrem Land geltenden Umweltgesetze. Entsorgen Sie die Vector Hardware bitte nur bei den dafür vorgesehenen Stellen und nicht über den Hausmüll.



Innerhalb der Europäischen Gemeinschaft gelten die Richtlinie über Elektro- und Elektronik-Altgeräte (WEEE-Richtlinie) und die Richtlinie zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS-Richtlinie).

Für Deutschland und andere EU-Länder bieten wir Ihnen eine kostenlose Rücknahme der alten Vector Hardware an.

Bitte überprüfen Sie die zu entsorgende Vector Hardware vor dem Versand sorgfältig. Bitte entfernen Sie alle Gegenstände, die nicht zum ursprünglichen Lieferumfang gehören, z. B. Speichermedien. Die Vector Hardware muss außerdem frei von Lizenzen sein und darf keine personenbezogenen Daten mehr enthalten. Vector führt keine Kontrollen diesbezüglich durch. Sobald die Hardware versandt wurde, kann sie nicht mehr an Sie zurück geliefert werden. Mit dem Versand der Hardware an uns haben Sie Ihre Rechte an der Hardware abgetreten. Bitte melden Sie vor dem Versand Ihr Altgerät an über:

<https://www.vector.com/de/de/support-downloads/return-registration-for-the-disposal-of-vector-hardware/>



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