



VP6400 Manual

Version 2.4 | English

Imprint

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Contents

1 Introduction	7
1.1 About this User Manual	8
1.1.1 Warranty	9
1.1.2 Registered Trademarks	9
1.2 Important Notes	10
2 System Description	11
2.1 Overview	12
2.2 General Setup	13
2.3 Operation in Vehicle Electrical Systems	14
3 Platforms	15
3.1 VP6440	16
3.1.1 Scope of Delivery	16
3.1.2 Introduction	16
3.1.3 Interfaces, Control Elements and Indicators	18
3.1.4 Technical Data	25
3.2 VP6441	27
3.2.1 Scope of Delivery	27
3.2.2 Introduction	27
3.2.3 Interfaces, Control Elements and Indicators	29
3.2.4 Technical Data	36
3.3 VP6450	38
3.3.1 Scope of Delivery	38
3.3.2 Introduction	38
3.3.3 Interfaces, Control Elements and Indicators	40
3.3.4 Technical Data	47
3.4 VP6451	49
3.4.1 Scope of Delivery	49
3.4.2 Introduction	49
3.4.3 Interfaces, Control Elements and Indicators	51
3.4.4 Technical Data	58
3.5 RTC Battery Replacement	60
4 Storages and Readers	61
4.1 VP6240 Storage Cartridge	62
4.1.1 Overview	62
4.1.2 Interfaces, Control Elements and Indicators	63

4.1.3 Variants	64
4.2 VP6241 Storage Cartridge	66
4.2.1 Overview	66
4.2.2 Interfaces, Control Elements and Indicators	67
4.2.3 Variants	68
4.3 VP6140 USB Reader for VP6240	70
4.3.1 Scope of Delivery	70
4.3.2 Overview	70
4.3.3 Interfaces, Control Elements and Indicators	71
4.3.4 Getting Started	73
4.3.5 Technical Data	74
4.4 VP6141 TB3 Reader for VP624x	75
4.4.1 Scope of Delivery	75
4.4.2 Overview	75
4.4.3 Interfaces, Control Elements and Indicators	76
4.4.4 Getting Started	78
4.4.5 Technical Data	80
5 Software Variants	81
5.1 Introduction	82
5.2 Smart Logger	83
5.2.1 Introduction	83
5.2.2 Getting Started	84
5.2.3 Mobile UI	93
5.2.4 Shutdown via Terminal 15	95
5.2.5 Retrieving Serial Number	97
5.3 Automotive PC	98
5.3.1 Introduction	98
5.3.2 Getting Started	99
5.3.3 Using a Remote Desktop Connection	101
5.3.4 Shutdown via Terminal 15	102
5.3.5 Retrieving Serial Number	104
6 Accessories	105
6.1 Router and Antennas	106
6.1.1 Router RV55W	106
6.1.2 2.4 & 5 GHz Antenna SMA-R Std.	107
6.1.3 2.4 & 5.2 GHz Antenna SMA-R Asia	107
6.1.4 GNSS Antenna SMA	108
6.1.5 4G LTE Antenna	108

6.2 Power	109
6.2.1 VP7110 UPS (Obsolete)	109
6.2.2 VP2110 Smart UPS	109
6.2.3 Desktop Type Power Supply	110
6.2.4 Power Supply 24V/2.5A DC Coaxial Plug	111
6.2.5 Power Supply 12V/25W With Jack Plug	112
6.3 Cables and Connectors	113
6.3.1 CAN/LIN	113
6.3.2 USB	117
6.3.3 Ethernet	123
6.3.4 Miscellaneous	126
6.4 Mounting Equipment	131
6.4.1 VSH Cable Guard 216	131
6.4.2 VSH Cable Guard 216 Clip	134
6.4.3 VSH Connection Kit 19"	135
6.4.4 VSH Connection Kit Horizontal	137
6.4.5 VSH Connection Kit Vertical	138
6.4.6 VSH Equipment Foot Kit	139
6.4.7 VSH Mounting Flange Kit	140
6.4.8 Ball Joint Mounting Brackets	141
6.5 Miscellaneous	142
6.5.1 Spectra TouchScreen 12" SR	142
6.5.2 Monitor Cable Guard for VP6400	143
7 Important Notes - Details	145
7.1 Safety Instructions and Hazard Warnings	146
7.1.1 Proper Use and Intended Purpose	146
7.1.2 Hazards	147
7.1.3 Battery Notice	147
7.1.4 Warning of Hot Surface	147
7.1.5 Electrostatically Sensitive Components (ESD)	147
7.1.6 Additional Instructions	148
7.2 Disclaimer	150
7.3 Disposal of Vector Hardware	151
8 Wichtige Hinweise	152
8.1 Sicherheits- und Gefahrenhinweise	153
8.1.1 Sach- und bestimmungsgemäßer Gebrauch	153
8.1.2 Gefahren	154
8.1.3 Hinweise zur Batterie	154

8.1.4 Warnung vor heißen Oberflächen	154
8.1.5 Elektrostatisch gefährdete Bauelemente (ESD)	155
8.1.6 Zusätzliche Anweisungen	155
8.2 Haftungsausschluss	158
8.3 Entsorgung von Vector Hardware	159

1 Introduction

In this chapter you find the following information:

1.1 About this User Manual	8
1.1.1 Warranty	9
1.1.2 Registered Trademarks	9
1.2 Important Notes	10

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 System Description

In this chapter you find the following information:

2.1 Overview	12
2.2 General Setup	13
2.3 Operation in Vehicle Electrical Systems	14

2.1 Overview

General information

The VP6400 is a powerful, compact and robust PC-based hardware platform that is especially designed for simultaneous and time-synchronous recording of automotive bus messages, video streams, radar raw data and ECU-internal measurement data.

Components

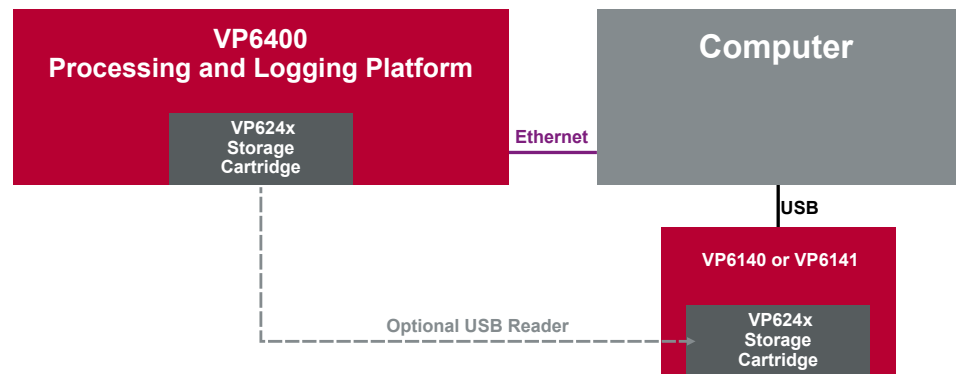
The VP6400 system consists of the following main components:

► **VP6400 Processing and Logging Platform**

The VP6400 platforms are available in a number of hardware variants depending on the requirements. Available platforms are listed in section [Platforms](#) on page 15.

► **VP624x Storage Cartridge**

Available storage cartridges are listed in section [Storages and Readers](#) on page 61.



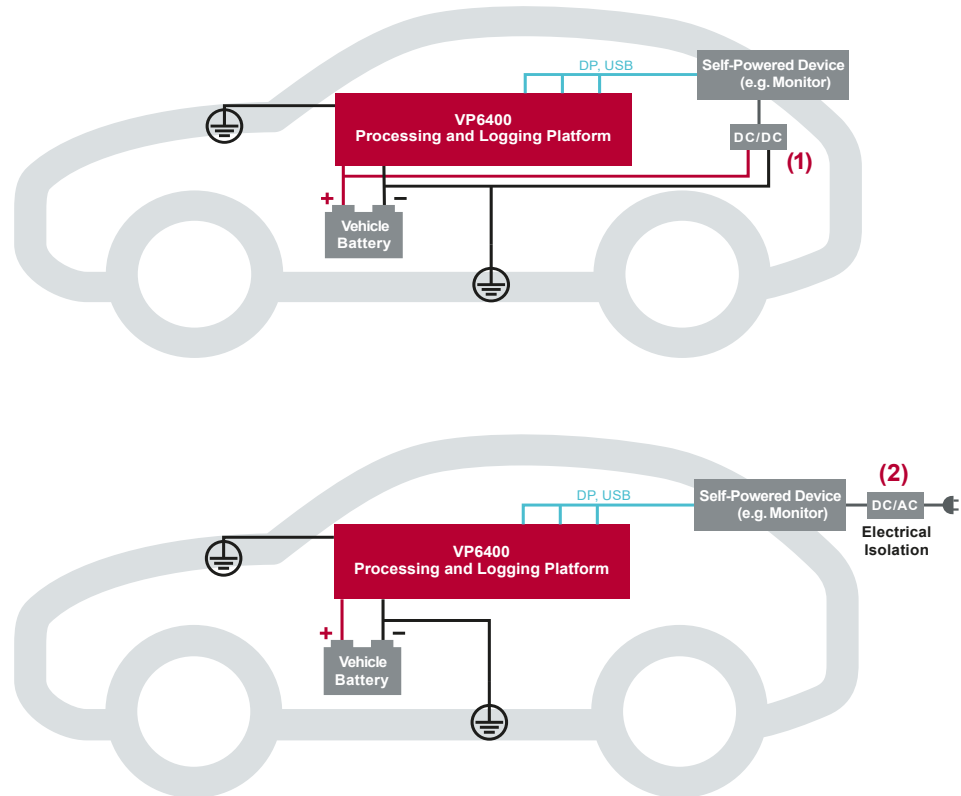
Other components and accessories are also available and listed in section [Accessories](#) on page 105.

Software variants

The VP6400 platforms are available with different software variants to suit different tasks and applications. The software variants are part of the order and cannot be changed afterwards. Please refer to section [Software Variants](#) on page 81 for more details.

2.2 General Setup

To ensure system functionality, make sure your system is set up properly. Please note that using separate power supplies with different grounds for VP6400 and connected devices may damage the devices.



2.3 Operation in Vehicle Electrical Systems

The VP6400 is designed to operate from

- ▶ 10 V DC..32 V DC (typ. 12 V DC $\pm 10\%$ or 24 V DC $\pm 10\%$) or from
- ▶ a 12 V vehicle electrical system.

Unlike DC sources, vehicle electrical systems have voltage dips and voltage spikes. The VP6400 is safe against drop down pulses (cranking) down to 6.5 V and is also protected against 12 V load dumps according to ISO 16750-2 Load Dump Test B - with centralized load dump suppression.

Since load drops that can occur in a 24 V vehicle electrical system can damage the VP6400, we recommend using one of the following protection devices in this case:

- ▶ Vector VP2110 Smart UPS (part number: 22575)
- ▶ Ifm Electronic Load-Dump-Modul EC2016

A typical setup using a VP2110 could be as follows:

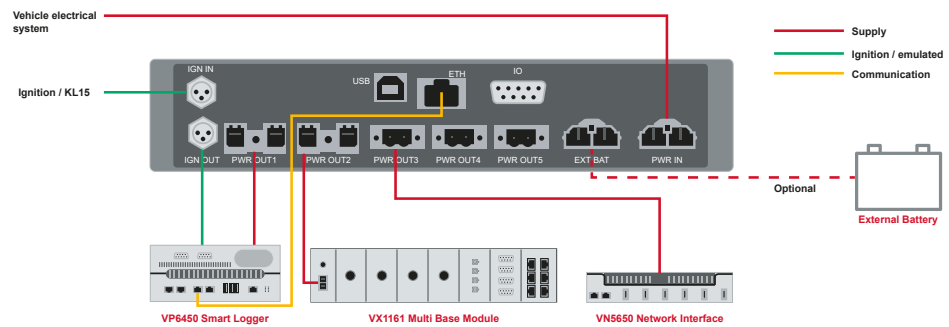


Figure 1: Setup example

The VP2110 Smart UPS protects the connected devices from undervoltage and overvoltage from the vehicle's electrical system.

A typical setup using a Ifm Electronic Load-Dump-Modul EC2016 could be as follows:

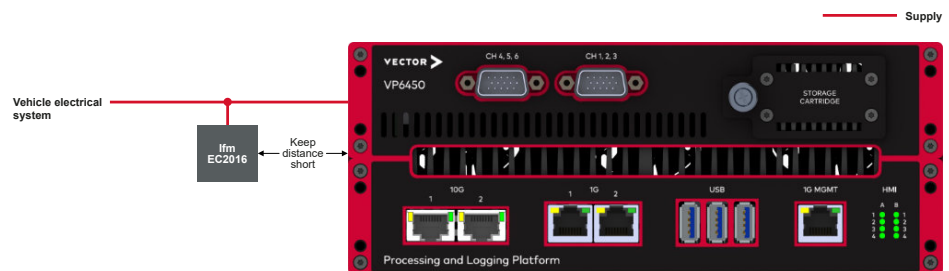


Figure 2: Setup example with Ifm EC2016

The Ifm Electronic Load-Dump-Modul EC2016 limits the voltage so that the VP6400 is not damaged.

3 Platforms

In this chapter you find the following information:

3.1 VP6440	16
3.1.1 Scope of Delivery	16
3.1.2 Introduction	16
3.1.3 Interfaces, Control Elements and Indicators	18
3.1.4 Technical Data	25
3.2 VP6441	27
3.2.1 Scope of Delivery	27
3.2.2 Introduction	27
3.2.3 Interfaces, Control Elements and Indicators	29
3.2.4 Technical Data	36
3.3 VP6450	38
3.3.1 Scope of Delivery	38
3.3.2 Introduction	38
3.3.3 Interfaces, Control Elements and Indicators	40
3.3.4 Technical Data	47
3.4 VP6451	49
3.4.1 Scope of Delivery	49
3.4.2 Introduction	49
3.4.3 Interfaces, Control Elements and Indicators	51
3.4.4 Technical Data	58
3.5 RTC Battery Replacement	60

3.1 VP6440

3.1.1 Scope of Delivery

The scope of delivery depends on the ordered system and the configuration:

- ▶ VP6440 in ordered variant and configuration (part number 180140)
- ▶ Power supply
 - Power Cable Molex Mini-Fit (part number 22515)
- ▶ Accessories
 - GNSS antenna (part number 07205)
 - Ignition cable (part number 22557)
 - VSH Foot Kit (part number 05150)
 - Ethernet Cable 10Gbps 2m (part number 30016)
 - Storage Cartridge Bay cover (when ordered without VP6240 Storage Cartridge, part number 22530)
 - Additionally for Automotive PC:
 - Monitor Cable Guard for VP6400 (part number 22598)
 - DisplayPort Adapter for VP6400 (part number 22640)
- ▶ Documentation
 - Quick Start Guide (part number 80895)

3.1.2 Introduction

The VP6440 consist of an actively-vented high-performance computer core based on x86 architecture. It supports time synchronization via PTP (IEEE1588 v2) on its 1 Gbit/s Ethernet and 10 Gbit/s Ethernet ports and has a built-in GNSS receiver as UTC reference clock.



Figure 3: VP6440

Highlights

Features of the VP6440:

- ▶ Intel Core i3 8100H (4 cores, 3.00 GHz)
- ▶ 16 Gbyte RAM
- ▶ 256 Gbyte Industrial SSD internal mass storage
- ▶ 2x 10 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 2x 1 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 1x 1 Gbit/s Ethernet (RJ45) (MGMT)
- ▶ 3x USB 3.2 Gen 1 (5 Gbit/s) host ports
- ▶ GNSS receiver
- ▶ WLAN option (EU only) for mobile UI
- ▶ LTE/UMTS option (EU only)
- ▶ AUX socket for connection of logger accessories
- ▶ Vector Hardware Sync Line socket for hardware time synchronization and power up/down control
- ▶ PTP (IEEE1588v2), with GNSS-based UTC time

3.1.3 Interfaces, Control Elements and Indicators

3.1.3.1 Front Side

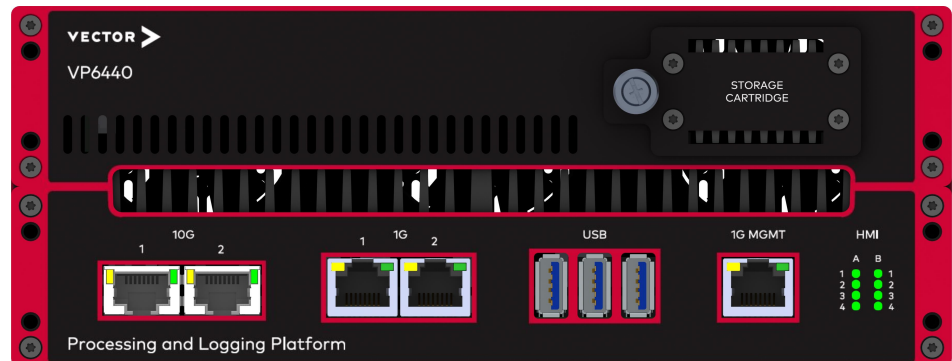


Figure 4: VP6440 front side

► Storage Cartridge Bay

A storage cartridge can be inserted into the cartridge bay and be used as a removable mass storage device, e. g. for storing measurement data. If no storage cartridge is included in the initial order of the VP6440, a removable slot cover is fitted over the storage cartridge bay.



Note

The storage cartridge is not hot plug capable. Make sure your system is shut down before you insert or remove the cartridge. Insertion or removal of the storage cartridge during operation can cause data loss.

► 10G 1/2

These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 10GBASE-T Ethernet interface according to IEEE 802.3an. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 100 Mbit/s Green: 1 Gbit/s Yellow blinking: 10 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► **1G 1/2**

These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 1000BASE-T Ethernet interface according to IEEE 802.3ab. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 1 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► **USB**

The three USB 3.2 Gen 1 host ports allow to connect external USB hardware to the VP6400, for example other Vector devices to use them as additional interfaces in the tool software.



Note

The USB 3.2 Gen 1 ports are protected against over current via a self-resetting fuse. The maximum current is 900 mA per port and 2000 mA in total.



Note

In order to achieve the data transmission rates typical for USB 3.2 Gen 1 (up to 5 Gbit/s), suitable connection cables with USB Type-A plugs have to be used. Furthermore, the connected peripheral devices have to support USB 3.2 Gen 1. Also a connection of USB 1.0/2.0 devices with USB Type-A plugs is possible. Cable length must not exceed 3 m for proper operation.



Note

If the internal WLAN module is available no second WLAN interface via USB will be supported.

► **1G MGMT**

This Ethernet port is intended to connect the VP6440 to a LAN or a configuration computer for setup or maintenance. It is not recommended for data capturing as it has no hardware time synchronization.

**Note**

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 1 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity

► **HMI**

System and user defined LEDs for status information.

User LEDs

The four LEDs A1 to A4 can show user defined status information. This feature is not yet implemented and will be available with a future software update.

When using the Automotive PC variant, the following also applies:

A4	B4	Description
Off	Green	VP6400 is in normal state
Orange	((Green))	Debounce timer running
((Red))	((Green))	Debounce timer elapsed / shutdown timer running
Red	((Green))	Shutdown timer elapsed

LED State: Green/Orange/Red: permanently on, (()): slow flashing, ((())): fast flashing

System LEDs

System status information is provided via the four system LEDs B1 to B4. Each LED can show the colors red, green or orange and have one of the following states: permanently on, fast flashing or slowly flashing. The combination of color and state is shown in the table as a combination of the two attributes.

Therefore the following LED states are possible:

B1	B2	B3	B4	Description
-	-	-	((G))	OS boot in progress
-	-	-	G	OS boot done
Off	Off	Off	((R))	OS boot failed → System halted
-	-	-	((G))	OS shutdown in progress
-	-	-	R	OS shutdown done
Off	Off	Off	((R))	OS shutdown failed → System halted
-	((G))	O	-	Ambient temperature high or low (> +69 °C or < -15 °C)

B1	B2	B3	B4	Description
-	((G))	O	-	Internal temperature high or low
-	-	(((O)))	-	Fan malfunction detected
-	-	((O))	-	Fan control failure
Off	Off	R	Off	Shutdown due to exceeded max or min temperature
-	O	-	-	Supply voltage out of range (12 V $\pm 10\%$; 24 V $\pm 10\%$)
-	((O))	-	-	RTC battery failure or empty
((O))	-	-	-	AUX interface error
R	Off	Off	Off	Internal system error → System halted
-	-	-	(((O)))	Storage Cartridge exchange requested
-	-	-	O	Storage Cartridge ready for exchange
(((G)))	-	-	-	Storage Cartridge temperature sensor failure

LED Color: G: green, O: orange, R: red, off : LED off

LED State: G/O/R: permanently on, (()): slow flashing, ((())): fast flashing , - : state not relevant

3.1.3.2 Back side

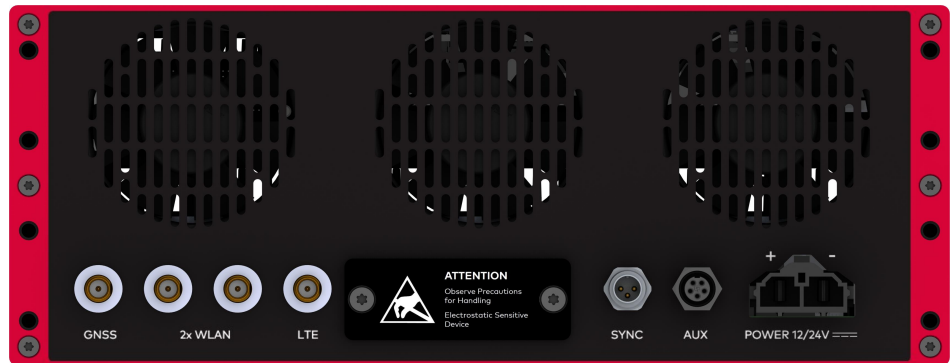


Figure 5: VP6440 back side

► GNSS

SMA female connector to attach a GNSS antenna.
Please attach the provided antenna before using this feature.



Note

Use only the supplied GNSS antenna (part number: 07205).

► 2x WLAN

RP-SMA female connectors to attach WLAN antennas.

- Left connector: main antenna
- Right connector: aux antenna

Please attach the provided antennas before using the WLAN interface.



Note

Use only the supplied WLAN antennas (part number: 07169).

► LTE

RP-SMA female connector to attach an LTE antenna.
Please attach the provided antenna before using LTE.



Note

Use only the supplied LTE antenna (part number: 22542).



Note

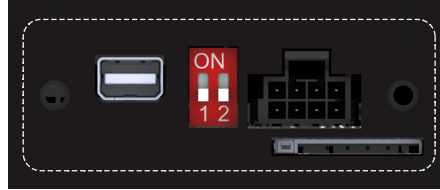
To insert a SIM card into the VP6400 the cover between the LTE and the SYNC connector has to be removed.



WARNING!

Do not change the DIP switches or connect external hardware to the pin connector behind the cover as this may change the behavior of the VP6400 or damage both devices permanently.

► **Cover plate/additional connectors**



Depending on the software version ordered, there is either a mounted cover plate or further accessible connections:

- **Mini-DP**

To use the monitor connector, the cover plate must be removed and replaced with the Monitor Cable Guard supplied. The Automotive PC software variant has the Monitor Cable Guard already mounted. The maximum supported resolution is 4K at 60 Hz.

- **DIP-Switches**

Do not use unless explicitly advised by Vector Support.

- **Debug-Connector**

Do not use unless explicitly advised by Vector Support.

- **SIM-Card Slot**

Insert the SIM card here if you are using the LTE/UMTS option.



WARNING!

Do not use the Monitor connector without the Monitor Cable Guard (part number 22598) and the DisplayPort Adapter for VP6400 (part number 22640), as this could damage the monitor connector of the VP6400. The cable length must not exceed 3 m for proper operation.



WARNING!

Do not change the DIP switches or connect external hardware to the pin connector behind the cover as this may change the behavior of the VP6400 or damage both devices permanently.

► **SYNC**

This terminal can be used for time synchronization of different Vector devices and to control the power up/down function of the device.



Note

Use only the supplied Cable Ignition <> Binder 3-pin (part number: 22557).

LED	Description
1	Power up/down control line (terminal 15)
2	Synchronization line
3	Ground sync line



WARNING!

Ground sync line (pin 3 of the SYNC connector) must not be connected to any other GND potential of the VP6400. This pin has an isolated ground potential and only provides the reference potential for the Synchronization line (pin 2 of the SYNC connector).

Power up/down control

To start-up the VP6400 a positive voltage level must be provided to the Power up/down control line (pin 1 of the SYNC connector). To properly shut down the VP6400 the positive voltage level on pin 1 must be removed.

**WARNING!**

The power up/down control line (pin 1 of the SYNC connector) uses the same reference to GND as the power supply input of the device, not pin 3 of the SYNC connector.

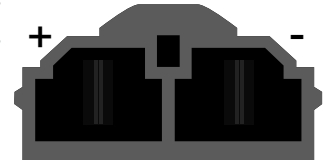
 AUX

Connector for auxiliary Vector hardware.

 Power

Power supply input for the VP6400 via Molex Mini-Fit connector to attach the supplied power cable or power adapter.

Pin	Assignment
+	VIN+ 10 V DC ... 32 V DC typ.: 12 V DC $\pm 10\%$ or 24 V DC $\pm 10\%$ (resistant to voltage drops down to 6.5 V)
-	VIN-

**Note**

Use only the supplied power cable (part number 22515) or equivalent cables with a wire gauge of at least 4 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 (30 A / slow) close to the positive pole of the power supply. Do not pinch or touch hot surfaces or sharp edges. Check the wiring regularly for damage.

3.1.4 Technical Data

Processor	Intel Core 8th Gen i3-8100H, 4x 3.0 GHz
Graphic support	Intel UHD Graphics 630
RAM	16 Gbyte, DDR4
OS-Storage	256 Gbyte M.2 SATA-III SSD
Network interfaces	3x 1 Gbit/s Ethernet (2x Intel I210 with hardware timestamp support, 1x Intel I219) 2x 10Gbit/s Ethernet (Intel X550 with hardware timestamp support)
USB interfaces	3x USB 3.2 Gen 1 (5 Gbit/s) host (max. 900 mA per port, max. 2000 mA total)
Monitor interfaces	1x DP 1.2 with a maximum resolution of: 3840 x 2160 pixels @ 60 Hz, 24 bits per pixel (bpp)
GNSS	ublox LEA-M8S
Power up/down control	1x Digital input via SYNC connector (pin 1), On: >4.75 V Off: <4.15 V ($\pm 5\%$) U _{max} : 32 V, I _{in} < 1mA
Operating system	Windows 10 IoT (64 bit)
Housing dimensions	216 x 84 x 250 mm (W x H x D)
Supply voltage	10 V DC ...32 V DC; typ.: 12 V DC $\pm 10\%$ or 24 V DC $\pm 10\%$; 12 V electrical vehicle systems are supported; safe in case of dropdown pulses (cranking) down to 6.5 V
Cooling	Active
Power consumption	Typ: 85 W @ 12 V DC Max: 155 W @ 12 V DC
Standby (OFF) current	< 20 μ A (RTC, GNSS, SMC Standby)
Weight	max. 4.9 kg (depending on variant)
Operating temperature	-20 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Air humidity	90 % non-condensing
Vibration	EN 60068-2-64:2008 (10...1000 Hz – 33.8 m/s ²); x, y and z axis, 1 h per axis
WLAN option	EU only for mobile UI
LTE/UMTS option	EU only

Dimensions

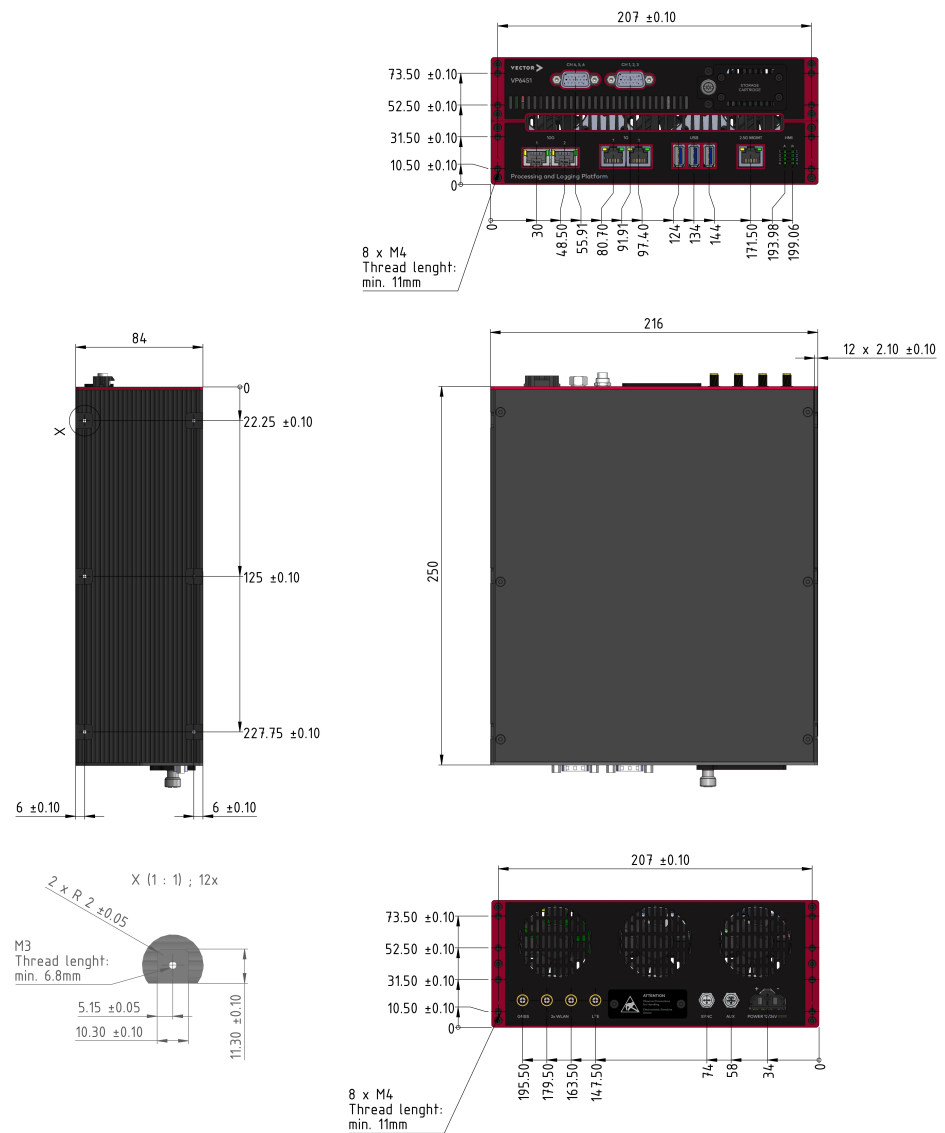


Figure 6: Mechanical drawing VP6400

3.2 VP6441

3.2.1 Scope of Delivery

The scope of delivery depends on the ordered system and the configuration:

- ▶ VP6441 in ordered variant and configuration (part number 180217)
- ▶ Power supply
 - Power Cable Molex Mini-Fit (part number 22515)
- ▶ Accessories
 - GNSS antenna (part number 07205)
 - Ignition cable (part number 22557)
 - VSH Foot Kit (part number 05150)
 - Ethernet Cable 10Gbps 2m (part number 30016)
 - Storage Cartridge Bay cover (when ordered without VP6240 Storage Cartridge, part number 22530)
 - Additionally for Automotive PC:
 - Monitor Cable Guard for VP6400 (part number 22598)
 - DisplayPort Adapter for VP6400 (part number 22640)
- ▶ Documentation
 - Quick Start Guide (part number 80895)

3.2.2 Introduction

The VP6441 consist of an actively-vented high-performance computer core based on x86 architecture. It supports time synchronization via PTP (IEEE1588 v2) on its 1 Gbit/s Ethernet and 10 Gbit/s Ethernet ports and has a built-in GNSS receiver as UTC reference clock.



Figure 7: VP6441

Highlights

Features of the VP6441:

- ▶ Intel Xeon W-11555MRE (6 cores, 2.6 GHz)
- ▶ 32 Gbyte RAM
- ▶ 512 Gbyte Industrial SSD internal mass storage
- ▶ 2x 10 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 2x 1 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 1x 2.5 Gbit/s Ethernet (RJ45) (MGMT)
- ▶ 3x USB 3.2 Gen 1 (5 Gbit/s) host ports
- ▶ GNSS receiver
- ▶ AUX socket for connection of logger accessories
- ▶ Vector Hardware Sync Line socket for hardware time synchronization and power up/down control
- ▶ PTP (IEEE1588v2), with GNSS-based UTC time

3.2.3 Interfaces, Control Elements and Indicators

3.2.3.1 Front Side

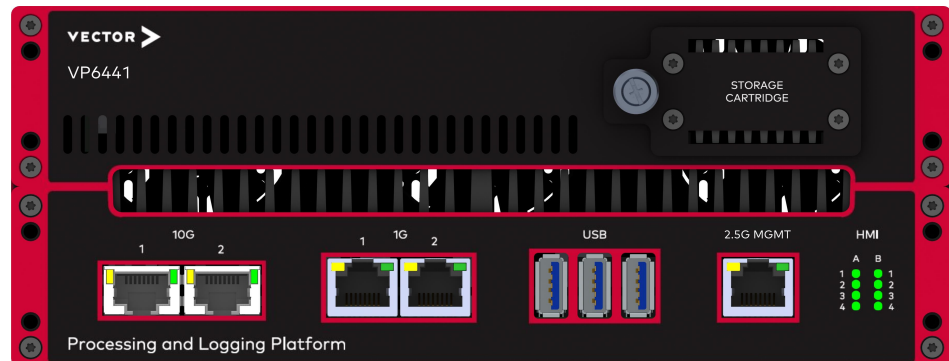


Figure 8: VP6441 front side

► Storage Cartridge Bay

A storage cartridge can be inserted into the cartridge bay and be used as a removable mass storage device, e. g. for storing measurement data. If no storage cartridge is included in the initial order of the VP6441, a removable slot cover is fitted over the storage cartridge bay.



Note

The storage cartridge is not hot plug capable. Make sure your system is shut down before you insert or remove the cartridge. Insertion or removal of the storage cartridge during operation can cause data loss.

► 10G 1/2

These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 10GBASE-T Ethernet interface according to IEEE 802.3an. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 100 Mbit/s Green: 1 Gbit/s Yellow blinking: 10 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



Note

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

► **1G 1/2**

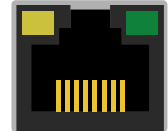
These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 1000BASE-T Ethernet interface according to IEEE 802.3ab. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 1 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► **USB**

The three USB 3.2 Gen 1 host ports allow to connect external USB hardware to the VP6400, for example other Vector devices to use them as additional interfaces in the tool software.



Note

The USB 3.2 Gen 1 ports are protected against over current via a self-resetting fuse. The maximum current is 900 mA per port and 2000 mA in total.



Note

In order to achieve the data transmission rates typical for USB 3.2 Gen 1 (up to 5 Gbit/s), suitable connection cables with USB Type-A plugs have to be used. Furthermore, the connected peripheral devices have to support USB 3.2 Gen 1. Also a connection of USB 1.0/2.0 devices with USB Type-A plugs is possible. Cable length must not exceed 3 m for proper operation.



Note

If the internal WLAN module is available no second WLAN interface via USB will be supported.

► 2.5G MGMT

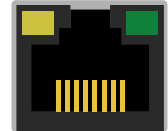
This Ethernet port is intended to connect the VP6441 to a LAN or a configuration computer for setup or maintenance. It is not recommended for data capturing as it has no hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 2.5 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► HMI

System and user defined LEDs for status information.

User LEDs

The four LEDs A1 to A4 can show user defined status information. This feature is not yet implemented and will be available with a future software update.

When using the Automotive PC variant, the following also applies:

A4	B4	Description
Off	Green	VP6400 is in normal state
Orange	((Green))	Debounce timer running
((Red))	((Green))	Debounce timer elapsed / shutdown timer running
Red	((Green))	Shutdown timer elapsed

LED State: Green/Orange/Red: permanently on, (()): slow flashing, ((())): fast flashing

System LEDs

System status information is provided via the four system LEDs B1 to B4. Each LED can show the colors red, green or orange and have one of the following states: permanently on, fast flashing or slowly flashing. The combination of color and state is shown in the table as a combination of the two attributes.

Therefore the following LED states are possible:

B1	B2	B3	B4	Description
-	-	-	((G))	OS boot in progress
-	-	-	G	OS boot done
Off	Off	Off	((R))	OS boot failed → System halted
-	-	-	((G))	OS shutdown in progress
-	-	-	R	OS shutdown done
Off	Off	Off	((R))	OS shutdown failed → System halted
-	((G))	O	-	Ambient temperature high or low (> +69 °C or < -15 °C)

B1	B2	B3	B4	Description
-	((G))	O	-	Internal temperature high or low
-	-	(((O)))	-	Fan malfunction detected
-	-	((O))	-	Fan control failure
Off	Off	R	Off	Shutdown due to exceeded max or min temperature
-	O	-	-	Supply voltage out of range (12 V $\pm 10\%$; 24 V $\pm 10\%$)
-	((O))	-	-	RTC battery failure or empty
((O))	-	-	-	AUX interface error
R	Off	Off	Off	Internal system error → System halted
-	-	-	(((O)))	Storage Cartridge exchange requested
-	-	-	O	Storage Cartridge ready for exchange
(((G)))	-	-	-	Storage Cartridge temperature sensor failure

LED Color: G: green, O: orange, R: red, off : LED off

LED State: G/O/R: permanently on, (()): slow flashing, ((())): fast flashing , - : state not relevant

3.2.3.2 Back side

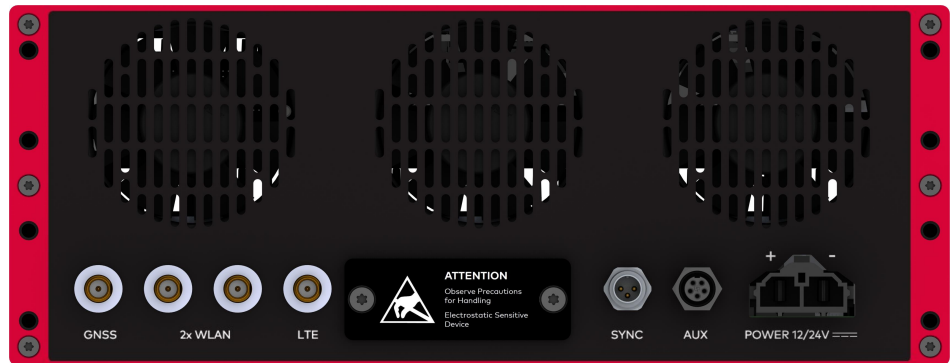


Figure 9: VP6441 back side

► GNSS

SMA female connector to attach a GNSS antenna.
Please attach the provided antenna before using this feature.



Note

Use only the supplied GNSS antenna (part number: 07205).

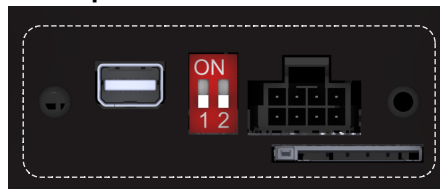
► 2x WLAN

Reserved for future use.

► LTE

Reserved for future use.

► Cover plate/additional connectors



Depending on the software version ordered, there is either a mounted cover plate or further accessible connections:

- Mini-DP

To use the monitor connector, the cover plate must be removed and replaced with the Monitor Cable Guard supplied. The Automotive PC software variant has the Monitor Cable Guard already mounted. The maximum supported resolution is 4K at 60 Hz.

- DIP-Switches

Do not use unless explicitly advised by Vector Support.

- Debug-Connector

Do not use unless explicitly advised by Vector Support.

- SIM-Card Slot

Reserved for future use.

**WARNING!**

Do not use the Monitor connector without the Monitor Cable Guard (part number 22598) and the DisplayPort Adapter for VP6400 (part number 22640), as this could damage the monitor connector of the VP6400. The cable length must not exceed 3 m for proper operation.

**WARNING!**

Do not change the DIP switches or connect external hardware to the pin connector behind the cover as this may change the behavior of the VP6400 or damage both devices permanently.

 SYNC

This terminal can be used for time synchronization of different Vector devices and to control the power up/down function of the device.

**Note**

Use only the supplied Cable Ignition <> Binder 3-pin (part number: 22557).

LED	Description
1	Power up/down control line (terminal 15)
2	Synchronization line
3	Ground sync line

**WARNING!**

Ground sync line (pin 3 of the SYNC connector) must not be connected to any other GND potential of the VP6400. This pin has an isolated ground potential and only provides the reference potential for the Synchronization line (pin 2 of the SYNC connector).

Power up/down control

To start-up the VP6400 a positive voltage level must be provided to the Power up/down control line (pin 1 of the SYNC connector). To properly shut down the VP6400 the positive voltage level on pin 1 must be removed.

**WARNING!**

The power up/down control line (pin 1 of the SYNC connector) uses the same reference to GND as the power supply input of the device, not pin 3 of the SYNC connector.

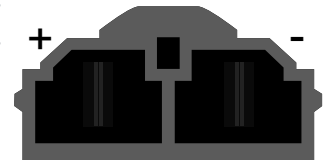
 AUX

Connector for auxiliary Vector hardware.

 Power

Power supply input for the VP6400 via Molex Mini-Fit connector to attach the supplied power cable or power adapter.

Pin	Assignment
+	VIN+ 10 V DC ... 32 V DC typ.: 12 V DC $\pm 10\%$ or 24 V DC $\pm 10\%$ (resistant to voltage drops down to 6.5 V)
-	VIN-

**Note**

Use only the supplied power cable (part number 22515) or equivalent cables with a wire gauge of at least 4 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 (30 A / slow) close to the positive pole of the power supply. Do not pinch or touch hot surfaces or sharp edges. Check the wiring regularly for damage.

3.2.4 Technical Data

Processor	Intel Xeon W-11555MRE (6x 2.6 GHz)
Graphic support	Intel UHD Graphics for 11th Gen Intel Processors
RAM	32 Gbyte, DDR4
OS-Storage	512 Gbyte M.2 SATA-III SSD
Network interfaces	3x 1 Gbit/s Ethernet (2x Intel I210 with hardware timestamp support, 1x Intel I225) 2x 10Gbit/s Ethernet (Intel X550 with hardware timestamp support)
USB interfaces	3x USB 3.2 Gen 1 (5 Gbit/s) host (max. 900 mA per port, max. 2000 mA total)
Monitor interfaces	1x DP 1.4a with a maximum resolution of: 3840 x 2160 pixels @ 60 Hz, 30 bits per pixel (bpp)
GNSS	ublox LEA-M8S
Power up/down control	1x Digital input via SYNC connector (pin 1), On: >4.75 V Off: <4.15 V (±5 %) U _{max} : 32 V, I _{in} < 1mA
Operating system	Windows 10 IoT (64 bit)
Housing dimensions	216 x 84 x 250 mm (W x H x D)
Supply voltage	10 V DC ...32 V DC; typ.: 12 V DC ±10 % or 24 V DC ±10 %; 12 V electrical vehicle systems are supported; safe in case of dropdown pulses (cranking) down to 6.5 V
Cooling	Active
Power consumption	Typ: 85 W @ 12 V DC Max: 155 W @ 12 V DC
Standby (OFF) current	< 20 µA (RTC, GNSS, SMC Standby)
Weight	max. 4.9 kg (depending on variant)
Operating temperature	-30 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Air humidity	90 % non-condensing
Vibration	EN 60068-2-64:2008 (10...1000 Hz – 33.8 m/s ²); x, y and z axis, 1 h per axis

Dimensions

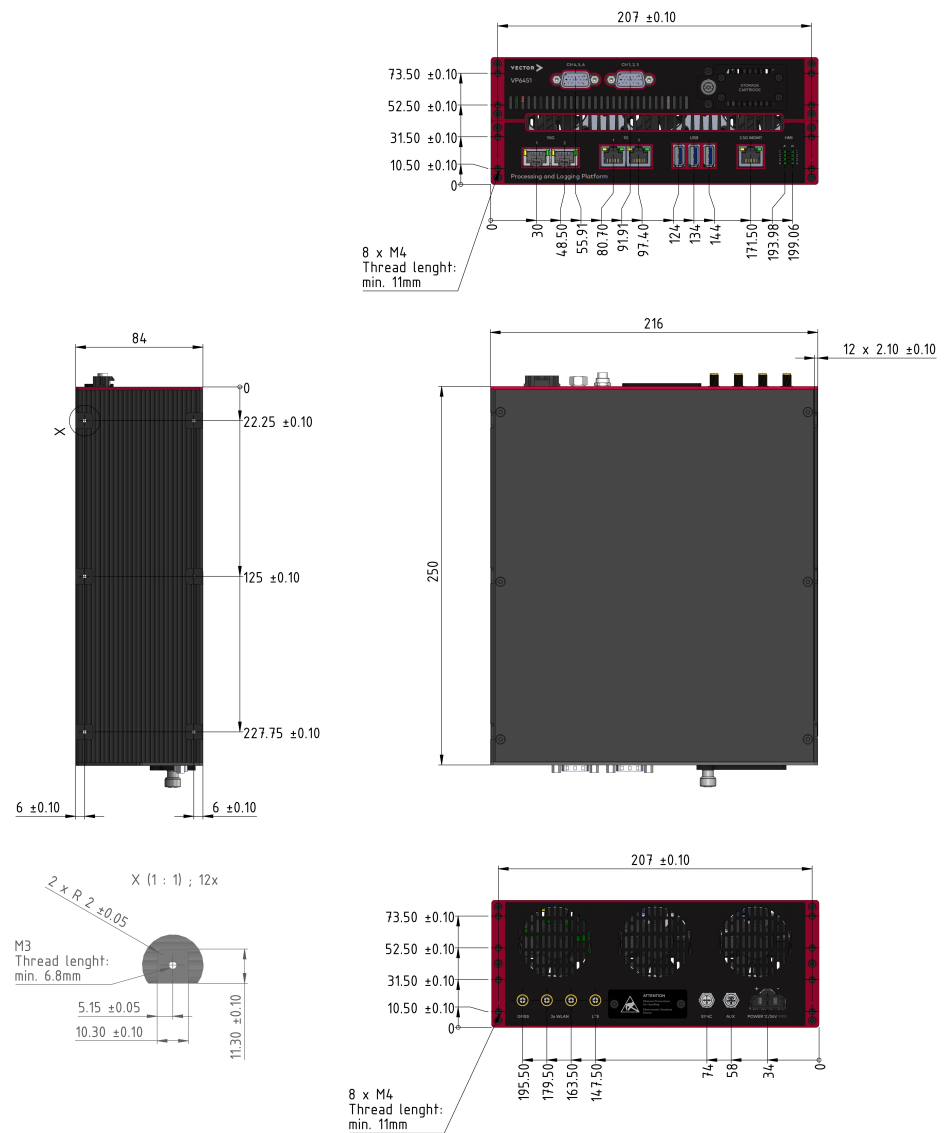


Figure 10: Mechanical drawing VP6400

3.3 VP6450

3.3.1 Scope of Delivery

The scope of delivery depends on the ordered system and the configuration:

- ▶ VP6450 in ordered variant and configuration (part number 180141)
- ▶ Power supply
 - Power Cable Molex Mini-Fit (part number 22515)
- ▶ Accessories
 - GNSS antenna (part number 07205)
 - Ignition cable (part number 22557)
 - VSH Foot Kit (part number 05150)
 - Ethernet Cable 10Gbps 2m (part number 30016)
 - Storage Cartridge Bay cover (when ordered without VP6240 Storage Cartridge, part number 22530)
 - Additionally for Automotive PC:
 - Monitor Cable Guard for VP6400 (part number 22598)
 - DisplayPort Adapter for VP6400 (part number 22640)
- ▶ Documentation
 - Quick Start Guide (part number 80895)

3.3.2 Introduction

The VP6450 consist of an actively-vented high-performance computer core based on x86 architecture. It supports time synchronization via PTP (IEEE1588 v2) on its 1 Gbit/s Ethernet and 10 Gbit/s Ethernet ports and has a built-in GNSS receiver as UTC reference clock.



Figure 11: VP6450

Highlights

Features of the VP6450:

- ▶ Intel Core i3 8100H (4 cores, 3.00 GHz)
- ▶ 16 Gbyte RAM
- ▶ 256 Gbyte Industrial SSD internal mass storage
- ▶ 2x 10 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 2x 1 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 1x 1 Gbit/s Ethernet (RJ45) (MGMT)
- ▶ 3x USB 3.2 Gen 1 (5 Gbit/s) host ports
- ▶ GNSS receiver
- ▶ WLAN option (EU only) for mobile UI
- ▶ LTE/UMTS option (EU only)
- ▶ AUX socket for connection of logger accessories
- ▶ Vector Hardware Sync Line socket for hardware time synchronization and power up/down control
- ▶ PTP (IEEE1588v2), with GNSS-based UTC time

3.3.3 Interfaces, Control Elements and Indicators

3.3.3.1 Front Side

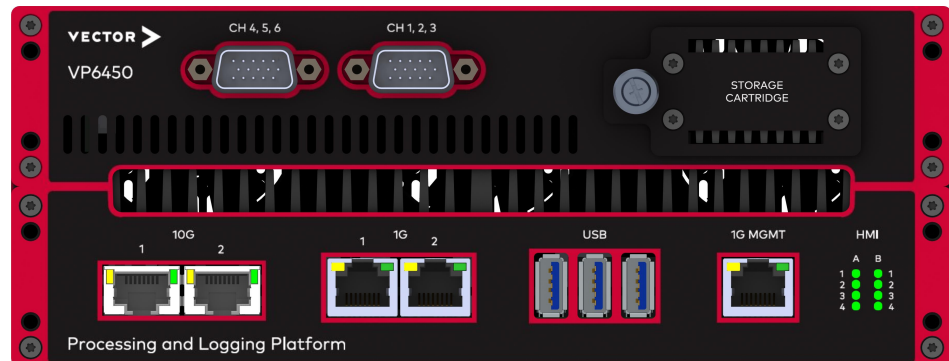


Figure 12: VP6450 front side

► CH 4, 5, 6 / CH 1, 2, 3

The VP6450 provides its network interface channels via two D-SUB15 connectors. The following table shows the available configuration options and the corresponding channel assignments.

Configuration	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6
4x CAN	CAN	CAN	-	CAN	CAN	-
6x CAN	CAN	CAN	CAN	CAN	CAN	CAN
4x CAN / 2x LIN	CAN	CAN	LIN	CAN	CAN	LIN

► Storage Cartridge Bay

A storage cartridge can be inserted into the cartridge bay and be used as a removable mass storage device, e. g. for storing measurement data. If no storage cartridge is included in the initial order of the VP6450, a removable slot cover is fitted over the storage cartridge bay.



Note

The storage cartridge is not hot plug capable. Make sure your system is shut down before you insert or remove the cartridge. Insertion or removal of the storage cartridge during operation can cause data loss.

► **10G 1/2**

These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 10GBASE-T Ethernet interface according to IEEE 802.3an. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 100 Mbit/s Green: 1 Gbit/s Yellow blinking: 10 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► **1G 1/2**

These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 1000BASE-T Ethernet interface according to IEEE 802.3ab. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 1 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► **USB**

The three USB 3.2 Gen 1 host ports allow to connect external USB hardware to the VP6400, for example other Vector devices to use them as additional interfaces in the tool software.



Note

The USB 3.2 Gen 1 ports are protected against over current via a self-resetting fuse. The maximum current is 900 mA per port and 2000 mA in total.



Note

In order to achieve the data transmission rates typical for USB 3.2 Gen 1 (up to 5 Gbit/s), suitable connection cables with USB Type-A plugs have to be used. Furthermore, the connected peripheral devices have to support USB 3.2 Gen 1. Also a connection of USB 1.0/2.0 devices with USB Type-A plugs is possible. Cable length must not exceed 3 m for proper operation.

**Note**

If the internal WLAN module is available no second WLAN interface via USB will be supported.

► **1G MGMT**

This Ethernet port is intended to connect the VP6450 to a LAN or a configuration computer for setup or maintenance. It is not recommended for data capturing as it has no hardware time synchronization.

**Note**

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 1 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity

► **HMI**

System and user defined LEDs for status information.

User LEDs

The four LEDs A1 to A4 can show user defined status information.

This feature is not yet implemented and will be available with a future software update.

When using the Automotive PC variant, the following also applies:

A4	B4	Description
Off	Green	VP6400 is in normal state
Orange	((Green))	Debounce timer running
((Red))	((Green))	Debounce timer elapsed / shutdown timer running
Red	((Green))	Shutdown timer elapsed

LED State: Green/Orange/Red: permanently on, (()): slow flashing, ((())): fast flashing

System LEDs

System status information is provided via the four system LEDs B1 to B4. Each LED can show the colors red, green or orange and have one of the following states: permanently on, fast flashing or slowly flashing. The combination of color and state is shown in the table as a combination of the two attributes.

Therefore the following LED states are possible:

B1	B2	B3	B4	Description
-	-	-	((G))	OS boot in progress
-	-	-	G	OS boot done
Off	Off	Off	((R))	OS boot failed → System halted
-	-	-	((G))	OS shutdown in progress

B1	B2	B3	B4	Description
-	-	-	R	OS shutdown done
Off	Off	Off	((R))	OS shutdown failed → System halted
-	(((G)))	O	-	Ambient temperature high or low (> +69 °C or < -15 °C)
-	((G))	O	-	Internal temperature high or low
-	-	(((O)))	-	Fan malfunction detected
-	-	((O))	-	Fan control failure
Off	Off	R	Off	Shutdown due to exceeded max or min temperature
-	O	-	-	Supply voltage out of range (12 V ±10 %; 24 V ±10 %)
-	((O))	-	-	RTC battery failure or empty
((O))	-	-	-	AUX interface error
R	Off	Off	Off	Internal system error → System halted
-	-	-	(((O)))	Storage Cartridge exchange requested
-	-	-	O	Storage Cartridge ready for exchange
(((G)))	-	-	-	Storage Cartridge temperature sensor failure

LED Color: G: green, O: orange, R: red, off : LED off

LED State: G/O/R: permanently on, (()): slow flashing, ((())): fast flashing , - : state not relevant

3.3.3.2 Back side

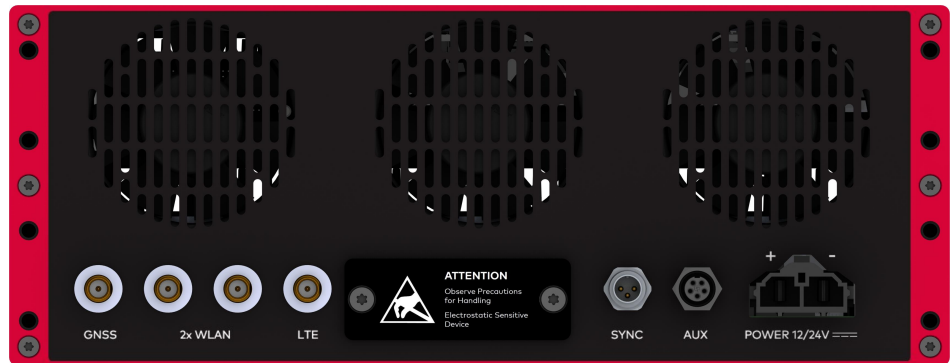


Figure 13: VP6450 back side

► GNSS

SMA female connector to attach a GNSS antenna.
Please attach the provided antenna before using this feature.



Note

Use only the supplied GNSS antenna (part number: 07205).

► 2x WLAN

RP-SMA female connectors to attach WLAN antennas.

- Left connector: main antenna
- Right connector: aux antenna

Please attach the provided antennas before using the WLAN interface.



Note

Use only the supplied WLAN antennas (part number: 07169).

► LTE

RP-SMA female connector to attach an LTE antenna.
Please attach the provided antenna before using LTE.



Note

Use only the supplied LTE antenna (part number: 22542).



Note

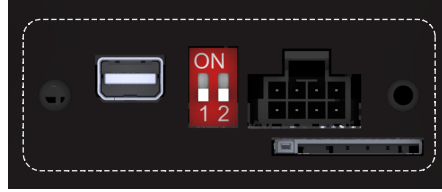
To insert a SIM card into the VP6400 the cover between the LTE and the SYNC connector has to be removed.



WARNING!

Do not change the DIP switches or connect external hardware to the pin connector behind the cover as this may change the behavior of the VP6400 or damage both devices permanently.

► **Cover plate/additional connectors**



Depending on the software version ordered, there is either a mounted cover plate or further accessible connections:

- **Mini-DP**

To use the monitor connector, the cover plate must be removed and replaced with the Monitor Cable Guard supplied. The Automotive PC software variant has the Monitor Cable Guard already mounted. The maximum supported resolution is 4K at 60 Hz.

- **DIP-Switches**

Do not use unless explicitly advised by Vector Support.

- **Debug-Connector**

Do not use unless explicitly advised by Vector Support.

- **SIM-Card Slot**

Insert the SIM card here if you are using the LTE/UMTS option.



WARNING!

Do not use the Monitor connector without the Monitor Cable Guard (part number 22598) and the DisplayPort Adapter for VP6400 (part number 22640), as this could damage the monitor connector of the VP6400. The cable length must not exceed 3 m for proper operation.



WARNING!

Do not change the DIP switches or connect external hardware to the pin connector behind the cover as this may change the behavior of the VP6400 or damage both devices permanently.

► **SYNC**

This terminal can be used for time synchronization of different Vector devices and to control the power up/down function of the device.



Note

Use only the supplied Cable Ignition <> Binder 3-pin (part number: 22557).

LED	Description
1	Power up/down control line (terminal 15)
2	Synchronization line
3	Ground sync line



WARNING!

Ground sync line (pin 3 of the SYNC connector) must not be connected to any other GND potential of the VP6400. This pin has an isolated ground potential and only provides the reference potential for the Synchronization line (pin 2 of the SYNC connector).

Power up/down control

To start-up the VP6400 a positiv voltage level must be provided to the Power up/down control line (pin 1 of the SYNC connector). To properly shut down the VP6400 the positive voltage level on pin 1 must be removed.



WARNING!

The power up/down control line (pin 1 of the SYNC connector) uses the same reference to GND as the power supply input of the device, not pin 3 of the SYNC connector.

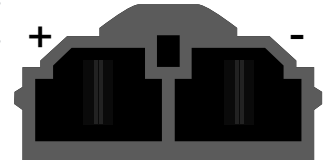
▶ AUX

Connector for auxiliary Vector hardware.

▶ Power

Power supply input for the VP6400 via Molex Mini-Fit connector to attach the supplied power cable or power adapter.

Pin	Assignment
+	VIN+ 10 V DC ... 32 V DC typ.: 12 V DC $\pm 10\%$ or 24 V DC $\pm 10\%$ (resistant to voltage drops down to 6.5 V)
-	VIN-



Note

Use only the supplied power cable (part number 22515) or equivalent cables with a wire gauge of at least 4 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 (30 A / slow) close to the positive pole of the power supply. Do not pinch or touch hot surfaces or sharp edges. Check the wiring regularly for damage.

3.3.4 Technical Data

Processor	Intel Core 8th Gen i3-8100H, 4x 3.0 GHz
Graphic support	Intel UHD Graphics 630
RAM	16 Gbyte, DDR4
OS-Storage	256 Gbyte M.2 SATA-III SSD
Network interfaces	3x 1 Gbit/s Ethernet (2x Intel I210 with hardware timestamp support, 1x Intel I219) 2x 10Gbit/s Ethernet (Intel X550 with hardware timestamp support)
USB interfaces	3x USB 3.2 Gen 1 (5 Gbit/s) host (max. 900 mA per port, max. 2000 mA total)
Monitor interfaces	1x DP 1.2 with a maximum resolution of: 3840 x 2160 pixels @ 60 Hz, 24 bits per pixel (bpp)
GNSS	ublox LEA-M8S
Power up/down control	1x Digital input via SYNC connector (pin 1), On: >4.75 V Off: <4.15 V (±5 %) U _{max} : 32 V, I _{in} < 1mA
Operating system	Windows 10 IoT (64 bit)
Housing dimensions	216 x 84 x 250 mm (W x H x D)
Supply voltage	10 V DC ... 32 V DC; typ.: 12 V DC ±10 % or 24 V DC ±10 %; 12 V electrical vehicle systems are supported; safe in case of dropdown pulses (cranking) down to 6.5 V
Cooling	Active
Power consumption	Typ: 85 W @ 12 V DC Max: 155 W @ 12 V DC
Standby (OFF) current	< 20 µA (RTC, GNSS, SMC Standby)
Weight	max. 4.9 kg (depending on variant)
Operating temperature	-20 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Air humidity	90 % non-condensing
Vibration	EN 60068-2-64:2008 (10...1000 Hz – 33.8 m/s ²); x, y and z axis, 1 h per axis
WLAN option	EU only for mobile UI
LTE/UMTS option	EU only

Dimensions

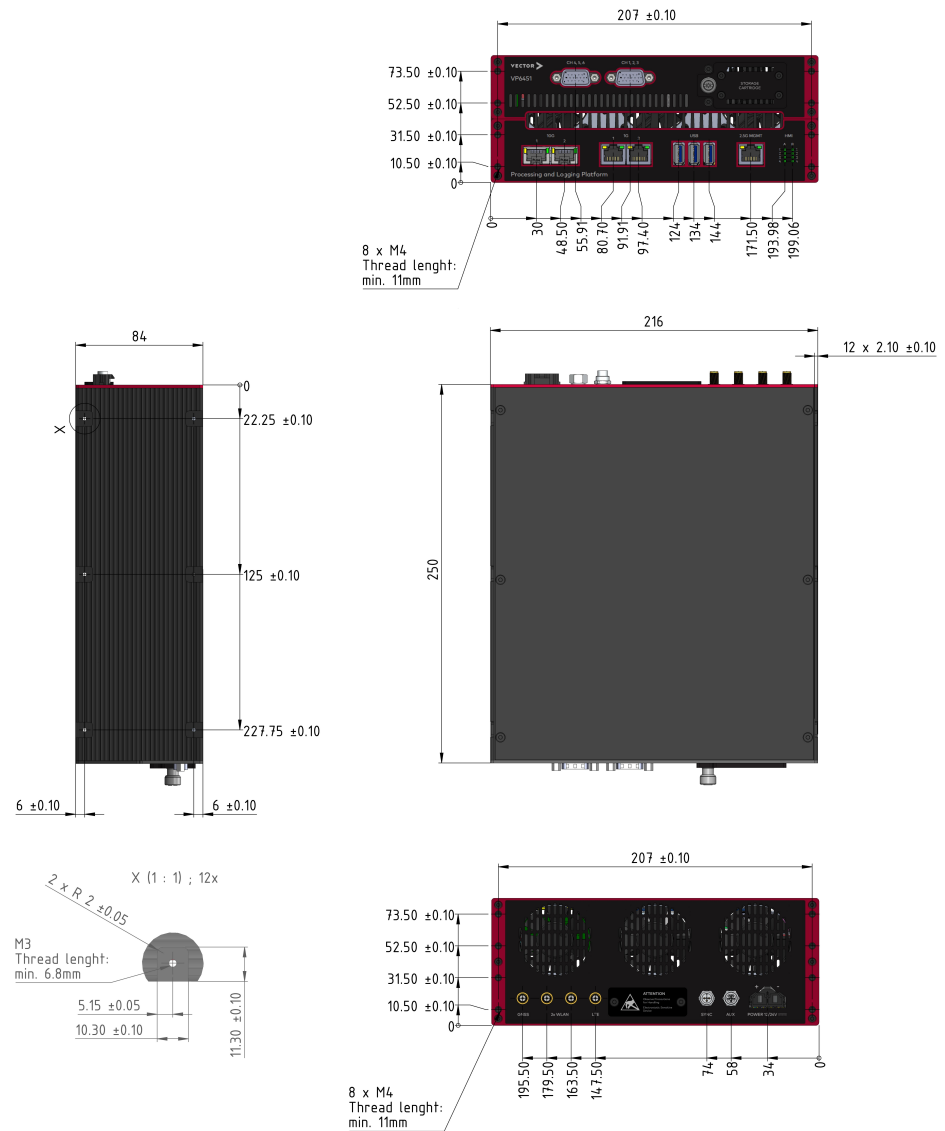


Figure 14: Mechanical drawing VP6400

3.4 VP6451

3.4.1 Scope of Delivery

The scope of delivery depends on the ordered system and the configuration:

- ▶ VP6451 in ordered variant and configuration (part number 180218)
- ▶ Power supply
 - Power Cable Molex Mini-Fit (part number 22515)
- ▶ Accessories
 - GNSS antenna (part number 07205)
 - Ignition cable (part number 22557)
 - VSH Foot Kit (part number 05150)
 - Ethernet Cable 10Gbps 2m (part number 30016)
 - Storage Cartridge Bay cover (when ordered without VP6240 Storage Cartridge, part number 22530)
 - Additionally for Automotive PC:
 - Monitor Cable Guard for VP6400 (part number 22598)
 - DisplayPort Adapter for VP6400 (part number 22640)
- ▶ Documentation
 - Quick Start Guide (part number 80895)

3.4.2 Introduction

The VP6451 consist of an actively-vented high-performance computer core based on x86 architecture. It supports time synchronization via PTP (IEEE1588 v2) on its 1 Gbit/s Ethernet and 10 Gbit/s Ethernet ports and has a built-in GNSS receiver as UTC reference clock.



Figure 15: VP6451

Highlights

Features of the VP6451:

- ▶ Intel Xeon W-11555MRE (6 cores, 2.6 GHz)
- ▶ 32 Gbyte RAM
- ▶ 512 Gbyte Industrial SSD internal mass storage
- ▶ 2x 10 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 2x 1 Gbit/s Ethernet (RJ45), with hardware timestamps
- ▶ 1x 2.5 Gbit/s Ethernet (RJ45) (MGMT)
- ▶ 3x USB 3.2 Gen 1 (5 Gbit/s) host ports
- ▶ GNSS receiver
- ▶ AUX socket for connection of logger accessories
- ▶ Vector Hardware Sync Line socket for hardware time synchronization and power up/down control
- ▶ PTP (IEEE1588v2), with GNSS-based UTC time

3.4.3 Interfaces, Control Elements and Indicators

3.4.3.1 Front Side



Figure 16: VP6451 front side

► CH 4, 5, 6 / CH 1, 2, 3

The VP6450 provides its network interface channels via two D-SUB15 connectors. The following table shows the available configuration options and the corresponding channel assignments.

Configuration	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6
4x CAN	CAN	CAN	-	CAN	CAN	-
6x CAN	CAN	CAN	CAN	CAN	CAN	CAN
4x CAN / 2x LIN	CAN	CAN	LIN	CAN	CAN	LIN

► Storage Cartridge Bay

A storage cartridge can be inserted into the cartridge bay and be used as a removable mass storage device, e. g. for storing measurement data. If no storage cartridge is included in the initial order of the VP6451, a removable slot cover is fitted over the storage cartridge bay.



Note

The storage cartridge is not hot plug capable. Make sure your system is shut down before you insert or remove the cartridge. Insertion or removal of the storage cartridge during operation can cause data loss.

► **10G 1/2**

These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 10GBASE-T Ethernet interface according to IEEE 802.3an. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 100 Mbit/s Green: 1 Gbit/s Yellow blinking: 10 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► **1G 1/2**

These connectors are designed as RJ45 sockets with integrated LEDs and correspond to a 1000BASE-T Ethernet interface according to IEEE 802.3ab. Both ports support hardware time synchronization.



Note

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 1 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity



► **USB**

The three USB 3.2 Gen 1 host ports allow to connect external USB hardware to the VP6400, for example other Vector devices to use them as additional interfaces in the tool software.



Note

The USB 3.2 Gen 1 ports are protected against over current via a self-resetting fuse. The maximum current is 900 mA per port and 2000 mA in total.



Note

In order to achieve the data transmission rates typical for USB 3.2 Gen 1 (up to 5 Gbit/s), suitable connection cables with USB Type-A plugs have to be used. Furthermore, the connected peripheral devices have to support USB 3.2 Gen 1. Also a connection of USB 1.0/2.0 devices with USB Type-A plugs is possible. Cable length must not exceed 3 m for proper operation.

**Note**

If the internal WLAN module is available no second WLAN interface via USB will be supported.

► **2.5G MGMT**

This Ethernet port is intended to connect the VP6451 to a LAN or a configuration computer for setup or maintenance. It is not recommended for data capturing as it has no hardware time synchronization.

**Note**

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

LED	Description
SPEED (left LED)	Off: 10 Mbit/s Yellow: 100 Mbit/s Green: 2.5 Gbit/s
LINK/ACT (right LED)	Off: No Link Green: Link Green blinking: Activity

► **HMI**

System and user defined LEDs for status information.

User LEDs

The four LEDs A1 to A4 can show user defined status information.

This feature is not yet implemented and will be available with a future software update.

When using the Automotive PC variant, the following also applies:

A4	B4	Description
Off	Green	VP6400 is in normal state
Orange	((Green))	Debounce timer running
((Red))	((Green))	Debounce timer elapsed / shutdown timer running
Red	((Green))	Shutdown timer elapsed

LED State: Green/Orange/Red: permanently on, (()): slow flashing, ((())): fast flashing

System LEDs

System status information is provided via the four system LEDs B1 to B4. Each LED can show the colors red, green or orange and have one of the following states: permanently on, fast flashing or slowly flashing. The combination of color and state is shown in the table as a combination of the two attributes.

Therefore the following LED states are possible:

B1	B2	B3	B4	Description
-	-	-	((G))	OS boot in progress
-	-	-	G	OS boot done
Off	Off	Off	((R))	OS boot failed → System halted
-	-	-	((G))	OS shutdown in progress

B1	B2	B3	B4	Description
-	-	-	R	OS shutdown done
Off	Off	Off	((R))	OS shutdown failed → System halted
-	(((G)))	O	-	Ambient temperature high or low (> +69 °C or < -15 °C)
-	((G))	O	-	Internal temperature high or low
-	-	(((O)))	-	Fan malfunction detected
-	-	((O))	-	Fan control failure
Off	Off	R	Off	Shutdown due to exceeded max or min temperature
-	O	-	-	Supply voltage out of range (12 V ±10 %; 24 V ±10 %)
-	((O))	-	-	RTC battery failure or empty
((O))	-	-	-	AUX interface error
R	Off	Off	Off	Internal system error → System halted
-	-	-	(((O)))	Storage Cartridge exchange requested
-	-	-	O	Storage Cartridge ready for exchange
(((G)))	-	-	-	Storage Cartridge temperature sensor failure

LED Color: G: green, O: orange, R: red, off : LED off

LED State: G/O/R: permanently on, (()): slow flashing, ((())): fast flashing , - : state not relevant

3.4.3.2 Back side

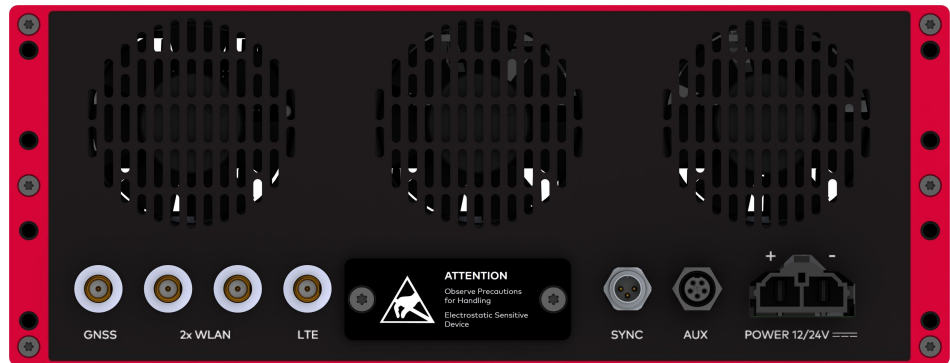


Figure 17: VP6451 back side

► GNSS

SMA female connector to attach a GNSS antenna.
Please attach the provided antenna before using this feature.



Note

Use only the supplied GNSS antenna (part number: 07205).

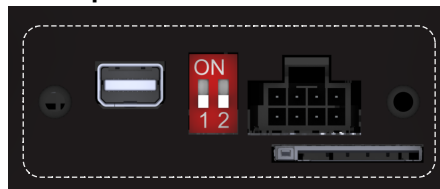
► 2x WLAN

Reserved for future use.

► LTE

Reserved for future use.

► Cover plate/additional connectors



Depending on the software version ordered, there is either a mounted cover plate or further accessible connections:

- Mini-DP

To use the monitor connector, the cover plate must be removed and replaced with the **Monitor Cable Guard** supplied. The Automotive PC software variant has the Monitor Cable Guard already mounted. The maximum supported resolution is 4K at 60 Hz.

- DIP-Switches

Do not use unless explicitly advised by Vector Support.

- Debug-Connector

Do not use unless explicitly advised by Vector Support.

- SIM-Card Slot

Reserved for future use.

**WARNING!**

Do not use the Monitor connector without the Monitor Cable Guard (part number 22598) and the DisplayPort Adapter for VP6400 (part number 22640), as this could damage the monitor connector of the VP6400. The cable length must not exceed 3 m for proper operation.

**WARNING!**

Do not change the DIP switches or connect external hardware to the pin connector behind the cover as this may change the behavior of the VP6400 or damage both devices permanently.

 SYNC

This terminal can be used for time synchronization of different Vector devices and to control the power up/down function of the device.

**Note**

Use only the supplied Cable Ignition <> Binder 3-pin (part number: 22557).

LED	Description
1	Power up/down control line (terminal 15)
2	Synchronization line
3	Ground sync line

**WARNING!**

Ground sync line (pin 3 of the SYNC connector) must not be connected to any other GND potential of the VP6400. This pin has an isolated ground potential and only provides the reference potential for the Synchronization line (pin 2 of the SYNC connector).

Power up/down control

To start-up the VP6400 a positive voltage level must be provided to the Power up/down control line (pin 1 of the SYNC connector). To properly shut down the VP6400 the positive voltage level on pin 1 must be removed.

**WARNING!**

The power up/down control line (pin 1 of the SYNC connector) uses the same reference to GND as the power supply input of the device, not pin 3 of the SYNC connector.

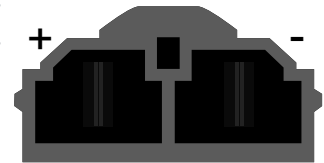
 AUX

Connector for auxiliary Vector hardware.

 Power

Power supply input for the VP6400 via Molex Mini-Fit connector to attach the supplied power cable or power adapter.

Pin	Assignment
+	VIN+ 10 V DC ... 32 V DC typ.: 12 V DC $\pm 10\%$ or 24 V DC $\pm 10\%$ (resistant to voltage drops down to 6.5 V)
-	VIN-

**Note**

Use only the supplied power cable (part number 22515) or equivalent cables with a wire gauge of at least 4 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 (30 A / slow) close to the positive pole of the power supply. Do not pinch or touch hot surfaces or sharp edges. Check the wiring regularly for damage.

3.4.4 Technical Data

Processor	Intel Xeon W-11555MRE (6x 2.6 GHz)
Graphic support	Intel UHD Graphics for 11th Gen Intel Processors
RAM	32 Gbyte, DDR4
OS-Storage	512 Gbyte M.2 SATA-III SSD
Network interfaces	3x 1 Gbit/s Ethernet (2x Intel I210 with hardware timestamp support, 1x Intel I225) 2x 10Gbit/s Ethernet (Intel X550 with hardware timestamp support)
USB interfaces	3x USB 3.2 Gen 1 (5 Gbit/s) host (max. 900 mA per port, max. 2000 mA total)
Monitor interfaces	1x DP 1.4a with a maximum resolution of: 3840 x 2160 pixels @ 60 Hz, 30 bits per pixel (bpp)
GNSS	ublox LEA-M8S
Power up/down control	1x Digital input via SYNC connector (pin 1), On: >4.75 V Off: <4.15 V ($\pm 5\%$) U _{max} : 32 V, I _{in} < 1mA
Operating system	Windows 10 IoT (64 bit)
Housing dimensions	216 x 84 x 250 mm (W x H x D)
Supply voltage	10 V DC ... 32 V DC; typ.: 12 V DC $\pm 10\%$ or 24 V DC $\pm 10\%$; 12 V electrical vehicle systems are supported; safe in case of dropdown pulses (cranking) down to 6.5 V
Cooling	Active
Power consumption	Typ: 85 W @ 12 V DC Max: 155 W @ 12 V DC
Standby (OFF) current	< 20 μ A (RTC, GNSS, SMC Standby)
Weight	max. 4.9 kg (depending on variant)
Operating temperature	-30 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Air humidity	90 % non-condensing
Vibration	EN 60068-2-64:2008 (10...1000 Hz – 33.8 m/s ²); x, y and z axis, 1 h per axis

Dimensions

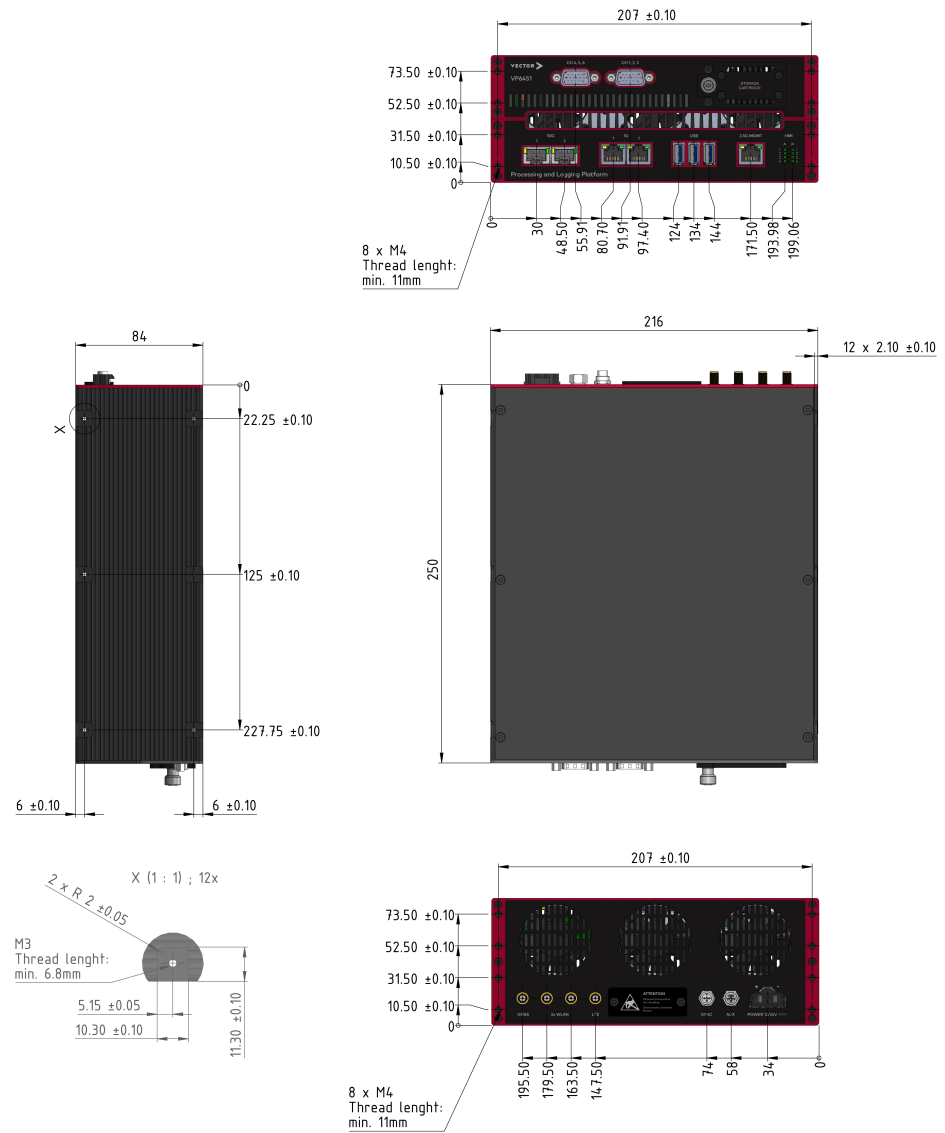


Figure 18: Mechanical drawing VP6400

3.5 RTC Battery Replacement

If the system status LED B2 flashes orange, the RTC battery should be replaced.

You will need:

- ▶ T10 screwdriver
- ▶ ESD safe workplace
- ▶ RTC battery (please use Renata CR2450N)
- ▶ Kapton tape

Follow the step-by-step procedure below to replace the RTC battery in your VP6400.



Step by Step Procedure

1. Remove the 6x T10 screws at the bottom.
2. Remove the cover.
3. Remove Kapton tape from battery holder.



4. Remove self-locking spacer.
5. Replace the RTC battery, paying attention to the position of the positive and negative poles.
6. Replace the self-retaining spacer.
7. Place the Kapton tape over the battery holder to ensure that the battery is isolated from the bottom cover.
8. Put the cover back on and secure it with 6x T10 screws (0.5 Nm).

4 Storages and Readers

In this chapter you find the following information:

4.1 VP6240 Storage Cartridge	62
4.1.1 Overview	62
4.1.2 Interfaces, Control Elements and Indicators	63
4.1.3 Variants	64
4.2 VP6241 Storage Cartridge	66
4.2.1 Overview	66
4.2.2 Interfaces, Control Elements and Indicators	67
4.2.3 Variants	68
4.3 VP6140 USB Reader for VP6240	70
4.3.1 Scope of Delivery	70
4.3.2 Overview	70
4.3.3 Interfaces, Control Elements and Indicators	71
4.3.4 Getting Started	73
4.3.5 Technical Data	74
4.4 VP6141 TB3 Reader for VP624x	75
4.4.1 Scope of Delivery	75
4.4.2 Overview	75
4.4.3 Interfaces, Control Elements and Indicators	76
4.4.4 Getting Started	78
4.4.5 Technical Data	80

4.1 VP6240 Storage Cartridge

4.1.1 Overview

General information

The VP6240 Storage Cartridge is a mass storage device, that offers continuous write data rates of up to 750 Mbyte/s (see section [Variants](#) on page 64 for more details). It can be inserted into the storage bay of the VP6400 Processing and Logging Platform.



Figure 19: VP6240 Storage Cartridge



Note

To keep the Storage Cartridges' writing performance high, you should format them after each logging session and wait 5 minutes. This allows the cartridge to complete internal processes that improve performance.



Note

The available memory of the VP6240 Storage Cartridges shown in the operating system is typically smaller than the storage size in the article name.

This is due to the following reasons:

- ▶ The memory size of the Storage Cartridges is specified in TB = Terabyte = 10^{12} bytes. Operating systems typically show the memory size in TiB = Tebibyte = 2^{40} bytes.
- ▶ Part of the memory is reserved as a spare area to ensure optimum write speed. See section [Variants](#) on page 64 for available sizes.

4.1.2 Interfaces, Control Elements and Indicators

Device description

▶ VP6240 Exchange

To remove the exchangeable VP6240 Storage Cartridge loosen the knurled screw and then gently pull on it. After inserting the VP6240, be sure to tighten the knurled screw before booting the VP6400.



Note

The VP6240 Storage Cartridge is not hot plug capable. Make sure the VP6400 is shut down before you insert or remove the cartridge. Insertion or removal of the VP6240 Storage Cartridge during operation can cause data loss.

To properly shut down the VP6400, the power up/down control line (pin 1 of the SYNC connector) must be used.

4.1.3 Variants

4.1.3.1 VP6240-rs Storage Cartridges

The VP6240-rs Storage Cartridges are available in the following storage size configurations:

► **VP6240-2rs Storage Cartridge 2TB**

Available storage size: 1.8 Tbyte
Part number: 180058

► **VP6240-4rs Storage Cartridge 4TB**

Available storage size: 3.6 Tbyte
Part number: 180061

► **VP6240-8rs Storage Cartridge 8TB**

Available storage size: 7.2 Tbyte
Part number: 180234

Technical data

Operating temperature	0 °C ... 50 °C
Write data rate	Max. 750 Mbyte/s
Housing dimensions	178 x 30 x 60 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.

4.1.3.2 VP6240-fs Storage Cartridges

The VP6240-fs Storage Cartridges are available in the following storage size configurations:

► **VP6240-2fs Storage Cartridge 2TB**

Available storage size: 1.8 Tbyte
Part number: 180060

► **VP6240-4fs Storage Cartridge 4TB**

Available storage size: 3.6 Tbyte
Part number: 180059

► **VP6240-8fs Storage Cartridge 8TB**

Available storage size: 7.2 Tbyte
Part number: 180235

Technical data

Operating temperature	-20 °C ... 70 °C
Write data rate	Max. 750 Mbyte/s
Housing dimensions	178 x 30 x 60 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.

4.1.3.3 VP6240-r Storage Cartridges (Obsolete)

**WARNING!**

Do not use the VP6140 with the obsolete storage cartridge (part number: 180185, 180186, 180142, 180143). There is a risk that these obsolete storage cartridges may be damaged when used with the VP6140 USB Reader!

The VP6240-r Storage Cartridges are available in the following storage size configurations:

► **VP6240-4r Storage Cartridge 4TB (Obsolete)**

Available storage size: 3.6 Tbyte

Part number: 180142

► **VP6240-8r Storage Cartridge 8TB (Obsolete)**

Available storage size: 7.2 Tbyte

Part number: 180143

Technical data

Operating temperature	0 °C ... 50 °C
Write data rate	Max. 750 Mbyte/s
Housing dimensions	178 x 30 x 60 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.

4.1.3.4 VP6240-f Storage Cartridges (Obsolete)

**WARNING!**

Do not use the VP6140 with the obsolete storage cartridge (part number: 180185, 180186, 180142, 180143). There is a risk that these obsolete storage cartridges may be damaged when used with the VP6140 USB Reader!

The VP6240-f Storage Cartridges are available in the following storage size configurations:

► **VP6240-4f Storage Cartridge 4TB (Obsolete)**

Available storage size: 3.6 Tbyte

Part number: 180185

► **VP6240-8f Storage Cartridge 8TB (Obsolete)**

Available storage size: 7.2 Tbyte

Part number: 180186

Technical data

Operating temperature	-20 °C ... 70 °C
Write data rate	Max. 750 Mbyte/s
Housing dimensions	178 x 30 x 60 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.

4.2 VP6241 Storage Cartridge

4.2.1 Overview

General information

The VP6241 Storage Cartridge is a mass storage device, that offers continuous write data rates of up to 2 Gbyte/s (see section [Variants](#) on page 68 for more details). It can be inserted into the storage bay of the VP6400 Processing and Logging Platform.



Figure 20: VP6241 Storage Cartridge



Note

To keep the Storage Cartridges' writing performance high, you should format them after each logging session and wait 5 minutes. This allows the cartridge to complete internal processes that improve performance.



Note

The available memory of the VP6241 Storage Cartridges shown in the operating system is typically smaller than the storage size in the article name.

This is due to the following reasons:

- ▶ The memory size of the Storage Cartridges is specified in TB = Terabyte = 10^{12} bytes. Operating systems typically show the memory size in TiB = Tebibyte = 2^{40} bytes.
- ▶ Part of the memory is reserved as a spare area to ensure optimum write speed. See section [Variants](#) on page 68 for available sizes.

4.2.2 Interfaces, Control Elements and Indicators

Device description

▶ VP6241 Exchange

To remove the exchangeable VP6241 Storage Cartridge loosen the knurled screw and then gently pull on it. After inserting the VP6241, be sure to tighten the knurled screw before booting the VP6400.



Note

The VP6241 Storage Cartridge is not hot plug capable. Make sure the VP6400 is shut down before you insert or remove the cartridge. Insertion or removal of the VP6241 Storage Cartridge during operation can cause data loss.

To properly shut down the VP6400, the power up/down control line (pin 1 of the SYNC connector) must be used.

4.2.3 Variants

4.2.3.1 VP6241-r Storage Cartridges

The VP6241-r Storage Cartridges are available in the following storage size configurations:

► **VP6241-16r Storage Cartridge 16TB**

Available storage size: 14.4 Tbyte

Part number: 180215

Technical data

Operating temperature	0 °C ... 50 °C
Write data rate	Max. 2 Gbyte/s: ► VP6441 ► VP6451 Max. 750 Mbyte/s: ► VP6440 ► VP6450
Encryption	Hardware encryption ready according to TCG Opal 2.01
Endurance (JESD219 enterprise)	Total Bytes Written (TBW): 16000 Tbyte Drive Writes Per Day (DWPD): 1 @ 3 years
Housing dimensions	178 x 30 x 60 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.

► **VP6241-32r Storage Cartridge 32TB**

Available storage size: 28.8 Tbyte

Part number: 180214

Technical data

Operating temperature	0 °C ... 50 °C
Write data rate	Max. 2 Gbyte/s: ► VP6441 ► VP6451 Max. 750 Mbyte/s: ► VP6440 ► VP6450
Encryption	Hardware encryption ready according to TCG Opal 2.01
Endurance (JESD219 enterprise)	Total Bytes Written (TBW): 33280 Tbyte Drive Writes Per Day (DWPD): 1 @ 3 years
Housing dimensions	178 x 30 x 60 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.

4.2.3.2 VP6241-f Storage Cartridges

The VP6241-f Storage Cartridges are available in the following storage size configurations:

► **VP6241-16f Storage Cartridges 16TB**

Available storage size: 14.4 Tbyte

Part number: 180212

Technical data

Operating temperature	-30 °C ... 70 °C
Write data rate	Max. 2 Gbyte/s: ► VP6441 ► VP6451 Max. 750 Mbyte/s: ► VP6440 ► VP6450
Encryption	Hardware encryption ready according to TCG Opal 2.01
Endurance (JESD219 enterprise)	Total Bytes Written (TBW): 9600 Tbyte Drive Writes Per Day (DWPD): 0.6 @ 3 years
Housing dimensions	178 x 30 x 60 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.

4.3 VP6140 USB Reader for VP6240

4.3.1 Scope of Delivery

- ▶ VP6140 USB Reader for VP6240 (part number 22561)
- ▶ Power supply
 - 1x External power supply unit (Type: GST25B12-P1J)
 - 1x Power cord EU/UK/USA/JP (depending on the region of delivery)
- ▶ USB cables
 - 1x USB 3.2 Gen 2 cable Type A-C
 - 1x USB 3.2 Gen 2 cable Type C-C
- ▶ Documentation
 - Quick Start Guide

4.3.2 Overview

General information

The VP6140 USB Reader for VP6240 is a stand alone read out device for storage cartridges. It is connected to the host computer via its USB Type-C port and allows data transfer speeds of up to 1 Gbyte/s.



Figure 21: VP6140 USB Reader for VP6240



WARNING!

Do not use the VP6140 with the obsolete storage cartridge (part number: 180185, 180186, 180142, 180143). There is a risk that these obsolete storage cartridges may be damaged when used with the VP6140 USB Reader!

4.3.3 Interfaces, Control Elements and Indicators

4.3.3.1 Front Side

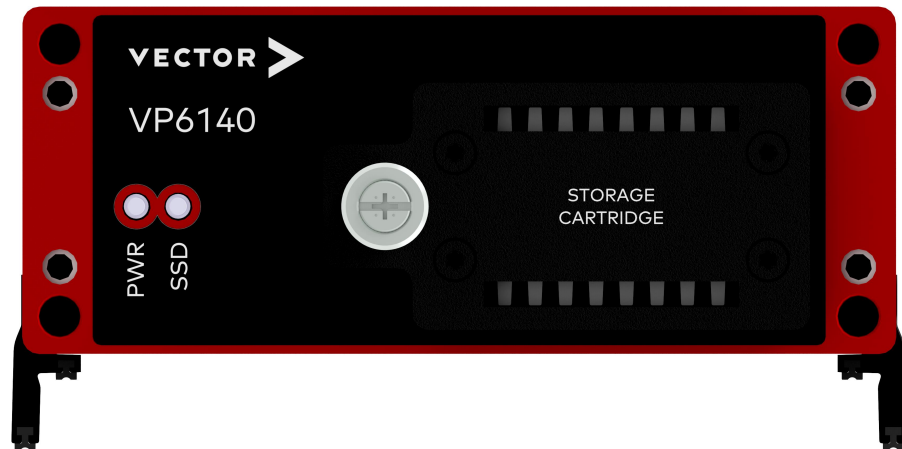


Figure 22: VP6140 front side incl. VP6240 Storage Cartridge

► LEDs

The VP6140 provides two green LEDs to show the state of the device itself as well as of the inserted VP6240 Storage Cartridge.

- **PWR**

The PWR LED is lit as long as the VP6140 is powered up.

- **SSD**

The SSD LED shows the status of the inserted VP6240 Storage Cartridge.

- **SSD LED = off**

No VP6240 connected or detected.

- **SSD LED = on**

VP6240 detected and ready.

- **SSD LED = flashing**

Data transfer from/to the VP6240.

► Storage Cartridge Bay

A storage cartridge can be inserted into the cartridge bay and connected to a host computer via USB, making the cartridge available as a USB mass storage device in Windows.



Note

After inserting a storage cartridge, the knurled screw must be tightened to supply power to the storage cartridge. To remove the storage cartridge, ensure that all operations on the VP6240 Storage Cartridge have finished. Then, loosen the knurled screw and carefully pull it out.



WARNING!

Do not loosen the knurled screw on the storage cartridge during data transfer as this will interrupt the power supply to the storage cartridge, resulting in data loss or corruption.

4.3.3.2 Back Side

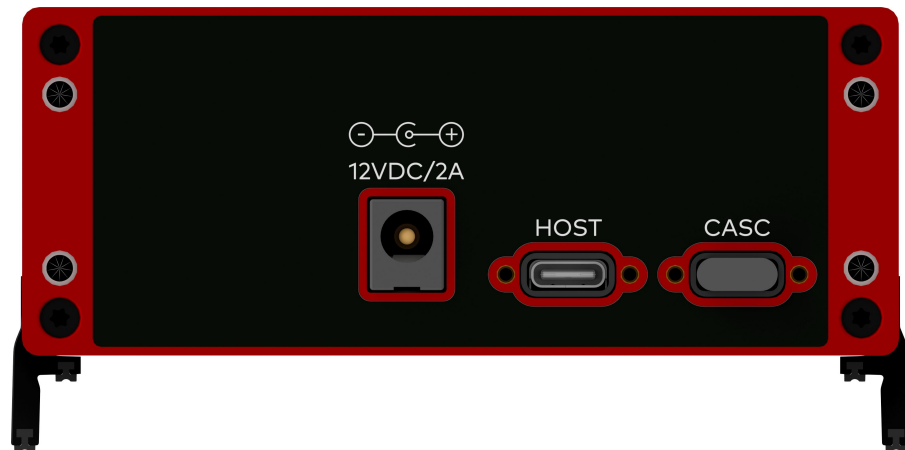


Figure 23: VP6140 back side

► **Power Supply**

Power Supply connector for the power adapter included in the scope of delivery.



WARNING!

Do not connect any power adapter other than the GST25B12-P1J (12V / 25W) included in the scope of delivery. Otherwise the VP6140 and/or connected devices may be damaged.

► **HOST**

This USB Type-C connector supports USB 3.2 Gen 2 and allows you to connect to a host computer to read an inserted storage cartridge.



Note

Please use the cables included in the scope of delivery to ensure full transfer performance.

► **CASC**

This USB Type-C connector supports USB 3.2 Gen 2 and allows the cascading of a second VP6140. Therefore the second VP6140 is connected via its HOST port to the CASC port of the first VP6140.



Note

There is no limitation for the number of cascaded devices, but the overall transfer rate is limited by the host link to the PC of up to 1 Gbyte/s.



Note

Please use the cables included in the scope of delivery to ensure full transfer performance.

4.3.4 Getting Started

4.3.4.1 Initial Operation



Step by Step Procedure

1. Turn on your host system and boot up the operating system.
2. Connect the external power supply unit to the PWR port on the back of the VP6140. The PWR LED on the front of the VP6140 will turn solid green.
3. Connect the USB Type A-C or USB Type C-C cable to the HOST port on the back of the VP6140. Then, connect the other end to a USB port on your host system.
4. Fully insert the VP6240 Storage Cartridge into the VP6140.
5. Tighten the knurled screw on the VP6240 Storage Cartridge. The SSD LED on the front of the VP6140 will turn solid green.
6. The VP6240 will appear as "VP_Storage" volume in the operating system and will be accessible.

4.3.4.2 Hot-Swapping VP6240



Step by Step Procedure

1. Ensure that all operations of the VP6240 Storage Cartridge have finished.
2. Loosen the knurled screw and carefully pull the VP6240 Storage Cartridge out of the VP6140.
3. Fully insert the next VP6240 Storage Cartridge into the VP6140.
4. Tighten the knurled screw on the storage cartridge. The SSD LED on the front of the VP6140 will turn solid green.
5. The VP6240 will appear as "VP_Storage" volume in the operating system and will be accessible.

4.3.5 Technical Data

USB interfaces (HOST, CASC)	USB 3.2 Gen2 (up to 10 Gbit/s), USB Type-C connector
Read / write speed (HOST)	up to 1 Gbyte/s
Power supply	12 V / 2.08 A (25 W)
Operating temperature	0 °C ... +50 °C (ambient temperature)
Housing dimensions	251 x 42 x 106 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.
Cooling	fanless design
Weight	950 g (without VP6240 Storage Cartridge)
Supported operating system	Windows 10 (x64, 64 bit) Windows 11 (x64, 64 bit) Ubuntu 24.04 LTS

Dimensions

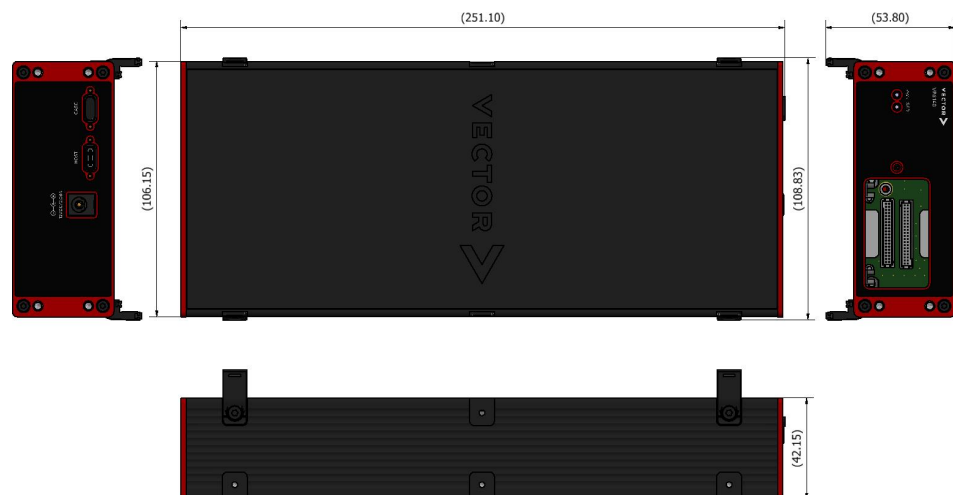


Figure 24: Mechanical drawing VP6140

4.4 VP6141 TB3 Reader for VP624x

4.4.1 Scope of Delivery

- ▶ VP6141 TB3 Reader for VP624x (part number 22629)
- ▶ Power supply
 - 1x External power supply unit (Type: GST25B12-P1J)
 - 1x Power cord EU/UK/USA/JP (depending on the region of delivery)
- ▶ Cable
 - 1x Thunderbolt 4 Cable
- ▶ Documentation
 - Quick Start Guide

4.4.2 Overview

General information

The VP6141 TB3 Reader for VP624x is a standalone readout device for storage cartridges. Connected to the host computer via its Thunderbolt 3 (TB3) interface, it allows data transfer speeds of up to 3 Gbyte/s.



Figure 25: VP6141 TB3 Reader for VP624x

4.4.3 Interfaces, Control Elements and Indicators

4.4.3.1 Front Side



Figure 26: VP6141 front side

► LEDs

The VP6141 provides two green LEDs to show the state of the device itself as well as of the inserted VP624x Storage Cartridge.

- **PWR**

The PWR LED is lit as long as the VP6141 is powered up.

- **SSD**

The SSD LED shows the status of the inserted VP624x Storage Cartridge.

- **SSD LED = off**

No VP624x connected or detected.

- **SSD LED = on**

VP624x detected and ready.

► Storage Cartridge Bay

A storage cartridge can be inserted into the cartridge bay and connected to a host computer via Thunderbolt.



Note

After inserting a storage cartridge, the knurled screw must be tightened to supply power to the storage cartridge. To remove the storage cartridge, eject the disk in VP Storage Manager, loosen the knurled screw and then carefully pull on it.



WARNING!

Do not loosen the knurled screw on the storage cartridge during data transfer as this will interrupt the power supply to the storage cartridge, resulting in data loss or corruption.

4.4.3.2 Back Side

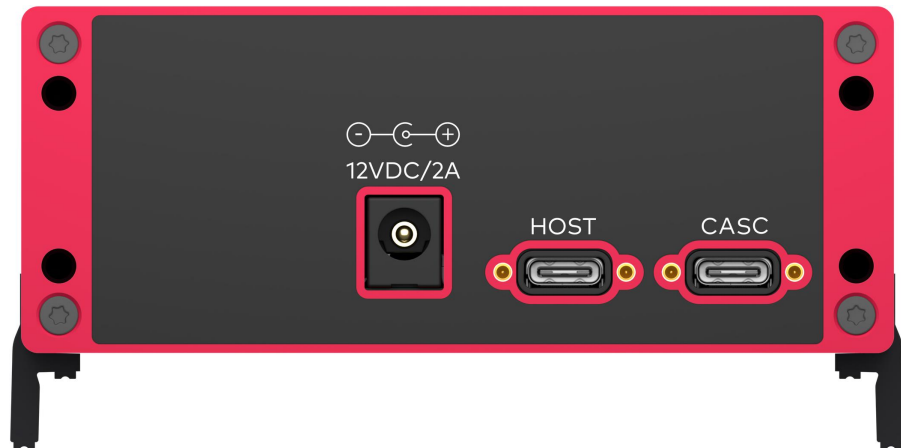


Figure 27: VP6141 back side

► Power Supply

Power Supply connector for the power adapter included in the scope of delivery.



WARNING!

Do not connect any power adapter other than the GST25B12-P1J (12V / 25W) included in the scope of delivery. Otherwise the VP6141 and/or connected devices may be damaged.

► HOST

This USB Type-C connector supports Thunderbolt 3 and allows you to connect to a host computer to read an inserted storage cartridge.



Note

Please use the cables included in the scope of delivery to ensure full transfer performance.

► CASC

This USB Type-C connector supports Thunderbolt 3 and allows the cascading of a second VP6141. Therefore the second VP6141 is connected via its HOST port to the CASC port of the first VP6141.



Note

Up to six devices can be connected in a cascade, but the host computer's link to the devices is limited to a transfer rate of up to 3 Gbyte/s.



Note

Please use the cables included in the scope of delivery to ensure full transfer performance.

4.4.4 Getting Started

4.4.4.1 Initial Operation



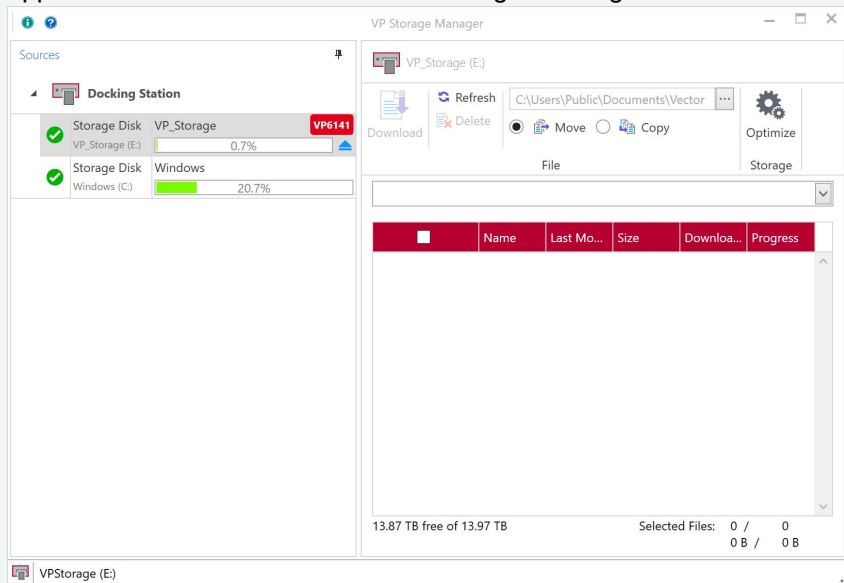
Note

Admin access is required for the initial setup and installation of the software.



Step by Step Procedure

1. Turn on your host system and boot up the operating system.
2. Download and install the VP Storage Manager from www.vector.com/vp-tools on your host system.
3. Connect the external power supply unit to the PWR port on the back of the VP6141. The PWR LED on the front of the VP6141 will turn solid green.
4. Connect the Thunderbolt cable to the HOST port on the back of the VP6141. Then, connect the other end to a Thunderbolt port on your host system.
5. Fully insert the VP624x Storage Cartridge into the VP6141.
6. Tighten the knurled screw on the VP624x Storage Cartridge. The SSD LED on the front of the VP6141 will turn solid green.
7. Open the VP Storage Manager on your host system. The storage disk will appear on the left side. The VP624x Storage Cartridge is now accessible.

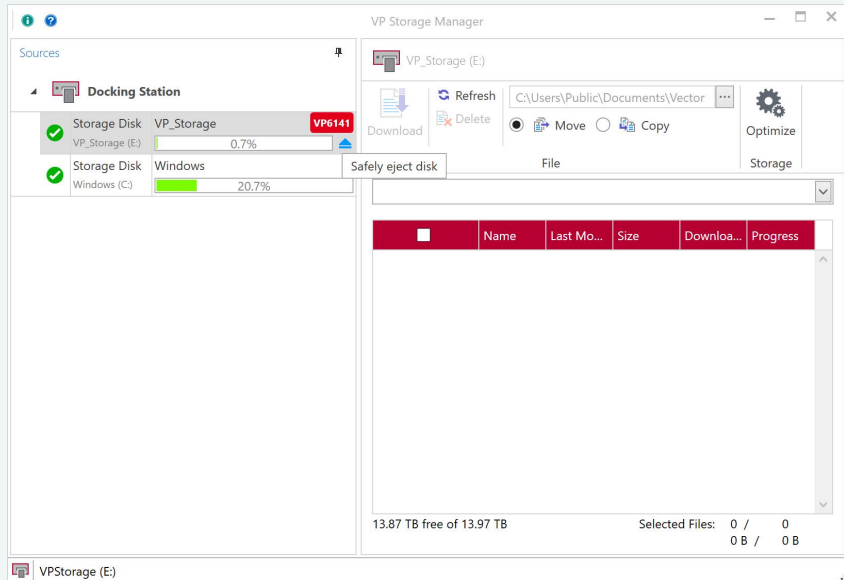


4.4.4.2 Hot-Swapping VP624x

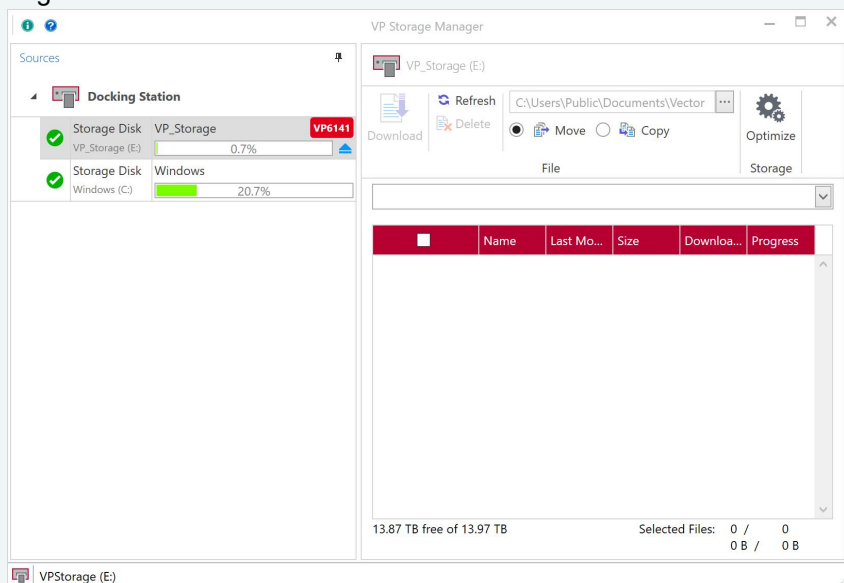


Step by Step Procedure

1. To remove the VP624x Storage Cartridge, open the VP storage manager.
2. Locate the VP624x Storage Cartridge on the left and click the blue eject button.



3. Confirm the ejection in the pop-up window.
4. Wait for the VP624x Storage Cartridge to disappear in the VP storage manager.
5. Loosen the knurled screw, then carefully pull out the VP624x Storage Cartridge.
6. Insert the new VP6141 Storage Cartridge.
7. Tighten the knurled screw to supply power to the cartridge.
8. Wait for the storage disk to appear on the left side. The VP624x Storage Cartridge is now accessible.



4.4.5 Technical Data

Thunderbolt interfaces (HOST, CASC)	Thunderbolt 3 (up to 40 Gbit/s), USB Type-C connector
Read / write speed (HOST)	up to 3 Gbyte/s
Power supply	12 V / 2.08 A (25 W)
Operating temperature	0 °C ... +45 °C (ambient temperature)
Housing dimensions	251 x 42 x 106 mm (L x H x W)
Housing material and Surface	Solid aluminum housing with black anodized surface. Please note: Due to the anodizing process minimal differences in color are possible.
Cooling	fanless design
Weight	950 g (without VP624x Storage Cartridge)
Supported operating system	Windows 10 (x64, 64 bit) Windows 11 (x64, 64 bit) Ubuntu 24.04 LTS

Dimensions

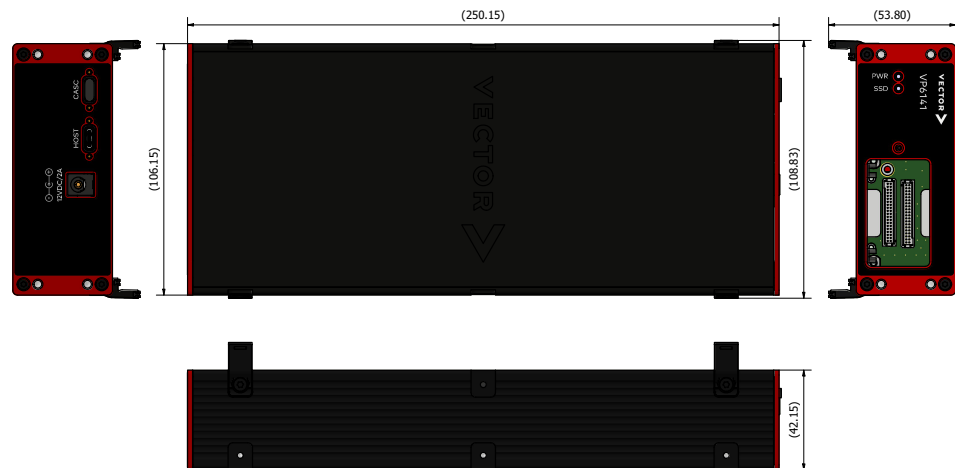


Figure 28: Mechanical drawing VP6141

5 Software Variants

In this chapter you find the following information:

5.1 Introduction	82
5.2 Smart Logger	83
5.2.1 Introduction	83
5.2.2 Getting Started	84
5.2.3 Mobile UI	93
5.2.4 Shutdown via Terminal 15	95
5.2.5 Retrieving Serial Number	97
5.3 Automotive PC	98
5.3.1 Introduction	98
5.3.2 Getting Started	99
5.3.3 Using a Remote Desktop Connection	101
5.3.4 Shutdown via Terminal 15	102
5.3.5 Retrieving Serial Number	104

5.1 Introduction

Each platform of the VP6400 family differs in the technical (hardware) properties. In addition, they differ in the software used. The right software variant for you depends on the intended use.

The following software variants are available:

► **Smart Logger**

Use this software variant if you want to perform logging tasks in conjunction with CANape log or vMeasure log. Use dedicated Vector tools for configuration, measurement and logging. This software variant is the perfect choice for field applications where a given configuration must be used (e. g. vehicle fleet).

► **Automotive PC**

Use this software version as a dedicated computer to run a full version of CANape. You can access the Automotive PC like any other computer by connecting a keyboard, mouse and display. This variant is particularly suitable for trained CANape personnel who place a high value on configuration and flexibility.



Note

The software variants are part of the order and cannot be changed afterwards.

5.2 Smart Logger

5.2.1 Introduction

The Smart Logger software variant is the perfect choice for field applications where a given configuration must be used (e. g. vehicle fleet) and if you want to perform logging tasks in conjunction with CANape log or vMeasure log. With CANape log or vMeasure log, the VP6400 platform becomes a powerful stand-alone Smart Logger.

Use dedicated Vector tools for configuration, measurement, and logging. Configuration is performed on a computer with CANape or vMeasure installed. Existing CANape projects can be downloaded to the VP6400 platform quickly and easily.

The configuration computer is no longer needed for logging while a browser-based mobile user interface is available for monitoring measurements. Individual measurement signals and status information, such as remaining memory capacity, can also be displayed.

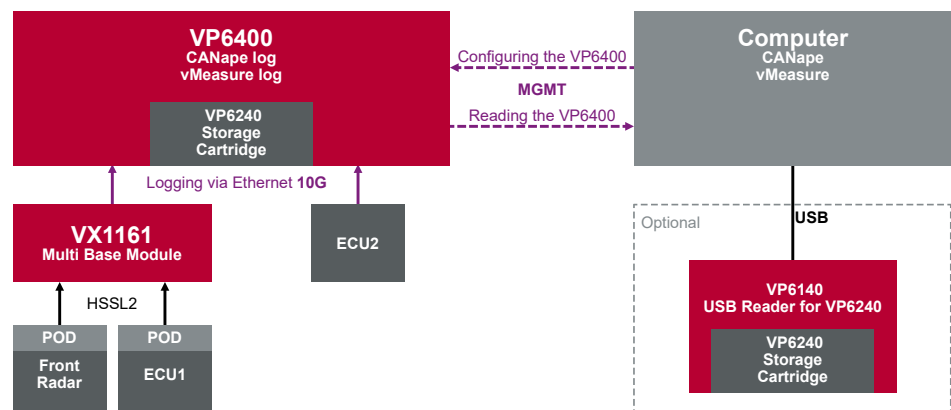


Figure 29: Setup example



Note

The Smart Logger software variant is supported on the following platforms:

- ▶ VP6440
- ▶ VP6441
- ▶ VP6450
- ▶ VP6451

5.2.2 Getting Started

5.2.2.1 Step 1: Power Supply

Smart Loggers are designed to start-up when terminal 15 of the vehicle becomes active. The following sections describe the required wiring.



Step by Step Procedure

1. Connect the open cable ends of the supplied power cable (part number 22515) to the permanent power supply of the vehicle (terminal 30/GND).
2. Connect the Molex Mini-Fit connector at the other end of the power cable to the **Power 12/24V DC** connector of the VP6400.
3. Connect the supplied ignition cable (part number 22557) to terminal 15 of the vehicle.
4. Connect the Binder connector at the other end of the cable to the **SYNC** connector of the VP6400.



Figure 30: Connecting VP6400 to power supply



Note

Power supply and terminal 15 line must have the same GND reference for proper functionality.

5.2.2.2 Step 2: Computer Connection

To configure and control the Smart Logger, an Ethernet connection between the Smart Logger and a configuration computer is required. Connect the configuration computer to the Ethernet port labeled **MGMT**.



Figure 31: Connecting VP6400 to configuration computer

5.2.2.3 Step 3: IP Address Configuration

To establish an Ethernet connection between the Smart Logger and the configuration computer both devices must be configured to use the same IP address subnet. Please ensure this or change the settings if required.



Edit

The default IP settings of the Smart Loggers for the **MGMT** port are:

- IP Address: 192.168.0.10
- Subnet mask: 255.255.255.0

The following sections describe how to change the IP settings for the configuration computer and the Smart Logger.

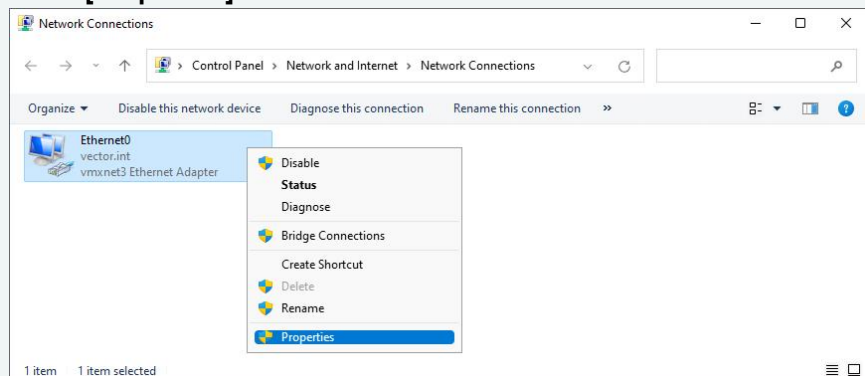
Adapt Configuration Computer IP Settings

Step by step guide to change the adapter settings on your configuration computer under Windows 11:

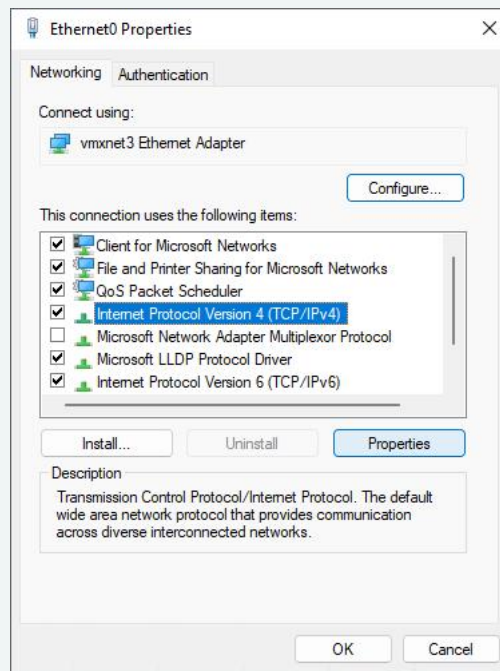


Step by Step Procedure

1. Open the Windows start menu and search for **Network connections**.
2. Right click on the Ethernet adapter the Smart Logger is connected to and select **[Properties]**.

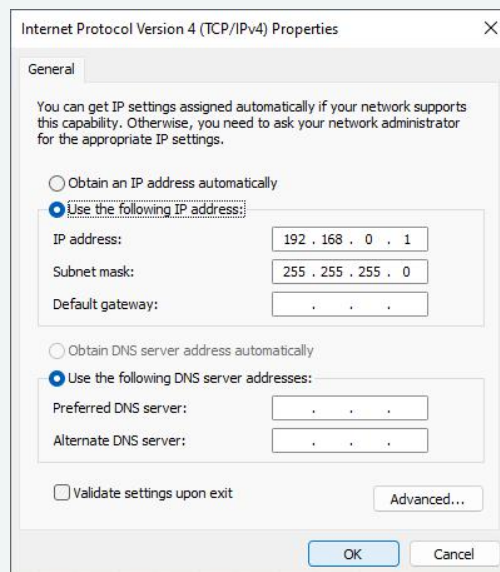


3. Select **Internet Protocol Version 4 (TCP/IPv4)** and click on **[Properties]**.



4. Set the IP address and the subnet mask to match the Smart Logger settings, e. g.:

- IP Address: 192.168.0.1
- Subnet mask: 255.255.255.0



5. Turn off the firewall to establish a connection between configuration computer and Smart Logger.

5.2.2.4 Step 4: Adapting Smart Logger IP Settings

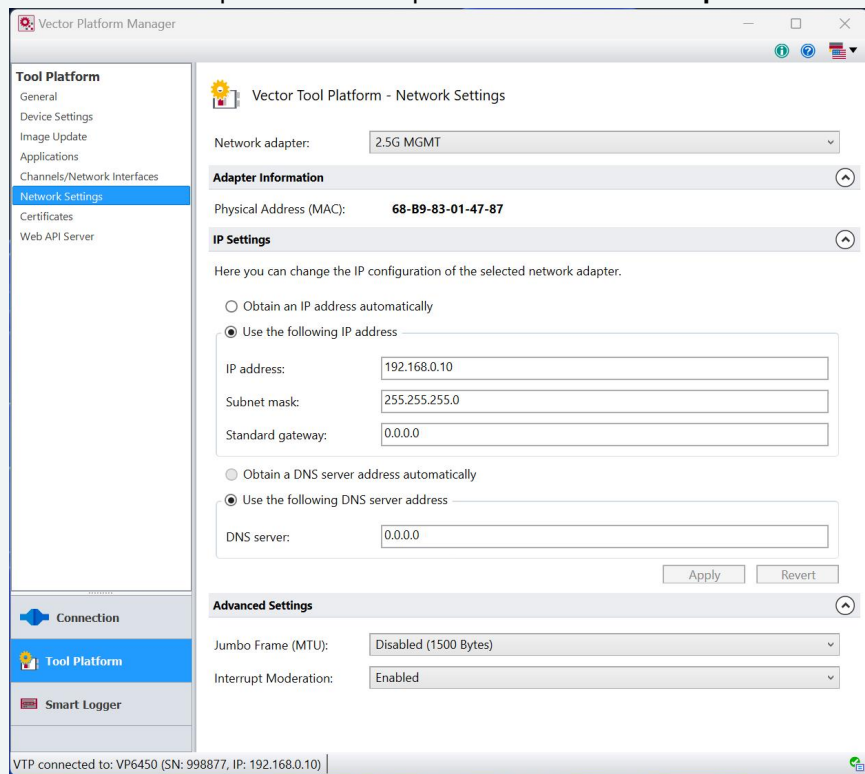
Upon delivery, all Smart Loggers are configured with the IP setting described in section [Step 2: Computer Connection](#) on page 85. To change these settings, you will have to connect at least once using matching settings on the configuration computer.

Once the adapter settings of the configuration computer are set, and the firewall is turned off follow these steps to adapt the IP settings of the Smart Logger:



Step by Step Procedure

1. Start the **Vector Platform Manager**.
2. Choose the Smart Logger from the drop-down list **Selected devices**.
3. After the connection between the Vector Platform Manager and the Smart Logger is established, switch to the tab **Tool Platform** and then to the sub-tab **Network Settings**.
4. Select the **MGMT** port from the drop-down list **Network adapter**.



5. Change the adapter setting in the section **IP Settings**.



Note

The adapter settings must be set static.

6. Click the button **[Apply]**.

**Note**

After clicking the button **[Apply]**, the connection to the Smart Logger will be lost. You will then have to adapt the network adapter settings of the configuration computer to match the new IP settings of the Smart Logger before reconnecting.

5.2.2.5 Step 5: Smart Logger Configuration

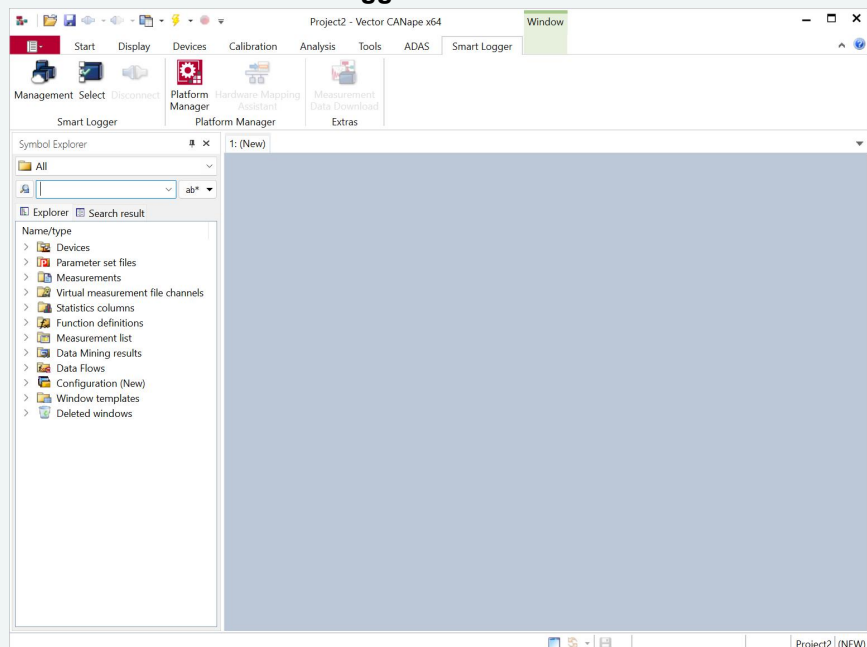
Vector Smart Loggers are available in two version, as vMeasure log and CANape log. The configuration tools for these two versions are vMeasure and CANape, respectively. In terms of configuring a Smart Logger, both versions are alike.

Connecting the Configuration Tool



Step by Step Procedure

1. After setting up the hardware and configuring the Ethernet interfaces, as described in section **Getting Started** on page 84, boot the Smart Logger. Ensure that the firewall of the configuration computer is turned off.
2. Start the configuration tool.
3. Create a new project in vMeasure or a new container project in CANape.
4. Switch to the ribbon **Smart Logger**.



5. Click on **[Select Logger]** to open the Smart Logger selection dialog.
6. Select your Smart Logger and confirm the dialog (update the logger if necessary).



Note

The red frame around the configuration tool GUI depicts, that you are now connected with the Smart Logger. Any modification done in the configuration tool is executed on the Smart Logger. The configuration of interfaces connected to or built-in the Smart Logger is done from the ribbon **Smart Logger**.

Transferring Existing Project



Step by Step Procedure

1. Follow the steps described in section **Connecting the Configuration Tool** on page 90. However, instead of creating a new project in step 3, load your existing project to the configuration tool.
2. With step 6, the existing project is deployed to the Smart Logger.
3. Connect all devices to the Smart Logger.
4. Check on the ribbon **Smart Logger** that the channel mapping of the Smart Logger matches the project.



Note

Existing project might need to be adapted to the logging use-case. The Smart Logger use-case dictates an autonomous operation.

Starting a Measurement

With the configuration tool, a measurement is started by clicking on the lightning icon **Start** on the ribbon **Start** or in the quick access toolbar.

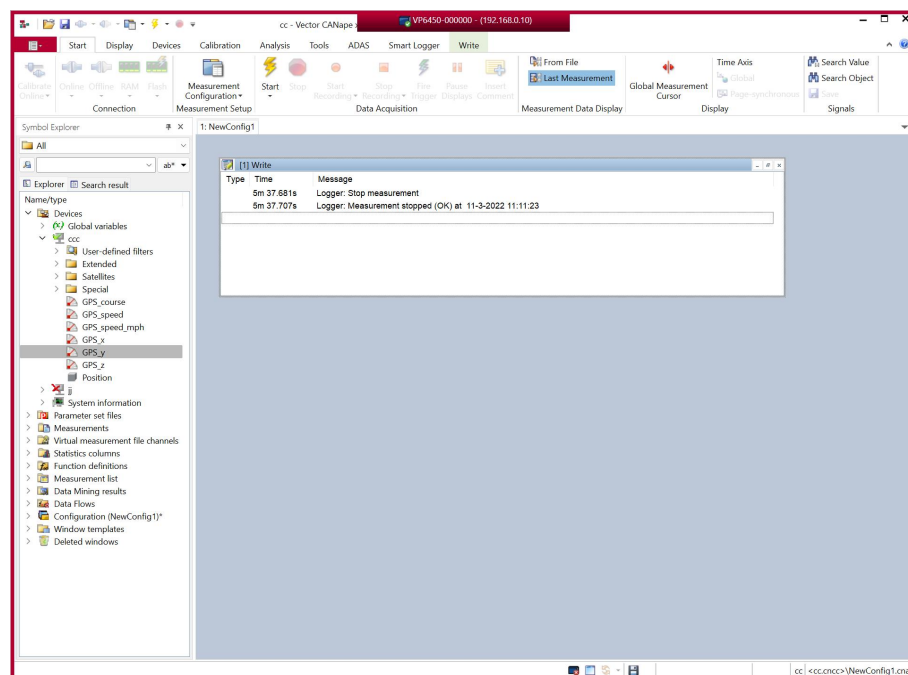


Figure 32: Starting a measurement in CANape

Every reboot of the Smart Logger starts a new measurement.

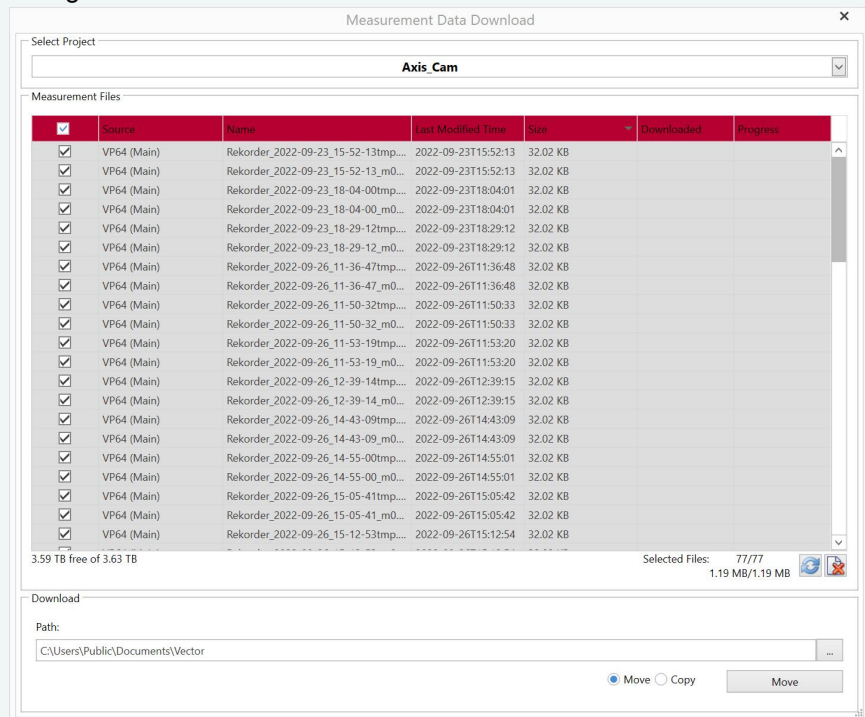
The recording of measurement data can be configured separately. Check the recorder configuration within the **Measurement Configuration** on the ribbon **Start**.

Downloading Recorded Data



Step by Step Procedure

1. Click on **Measurement Data Download** on the ribbon **Smart Logger**.
2. All measurement files recorded with the currently active project are listed in the section Measurement Files. To download data from previously used project, scroll through the drop-down menu. Select **Project** at the very top of the dialog.



3. Select individual files or all files to be downloaded from the Smart Logger.
4. State the directory the measurement data shall be downloaded to and if you want the data to be moved or just copied.
5. Click the button **[Move/Copy]** to start the download.



Note

In addition to the **Measurement Data Download** dialog integrated into the tool, the stand-alone tool **Vector Measurement Data Explorer** is also available for downloading the recorded data. The **Vector Measurement Data Explorer** can be downloaded from the Vector website.

5.2.3 Mobile UI

The Mobile UI is a web-based user interface that allows you to pause and resume recordings, fire trigger, monitor vital Smart Logger properties and display currently recorded signals. The mobile UI can be accessed with any browser from any WLAN connected device.



Note

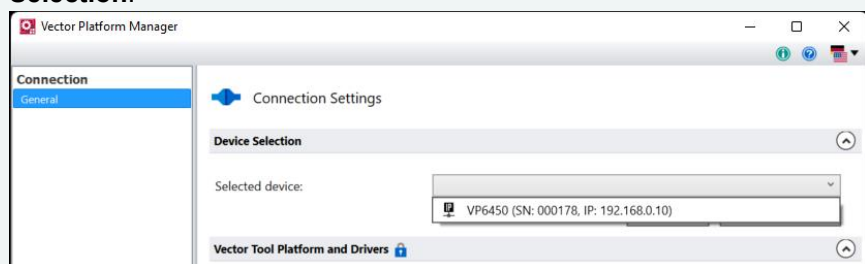
Some VP6400 variants are available with in-built WLAN adapters in the EU only (see corresponding technical data). For all other countries and variants please use the RV55W or an external WLAN adapter from LM Technologies. Driver sets for the WLAN adapter LM007 and LM808 are included in the Smart Logger OS.

5.2.3.1 Connecting Via WLAN

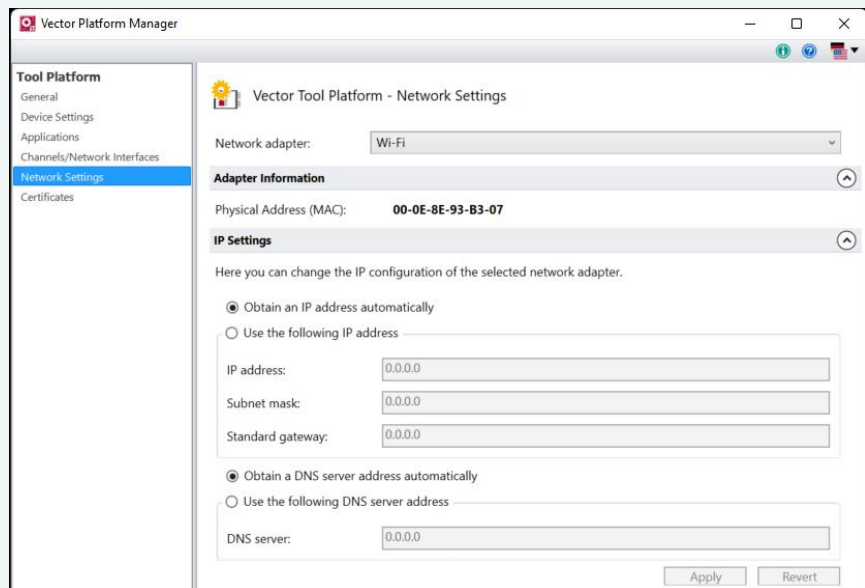


Step by Step Procedure

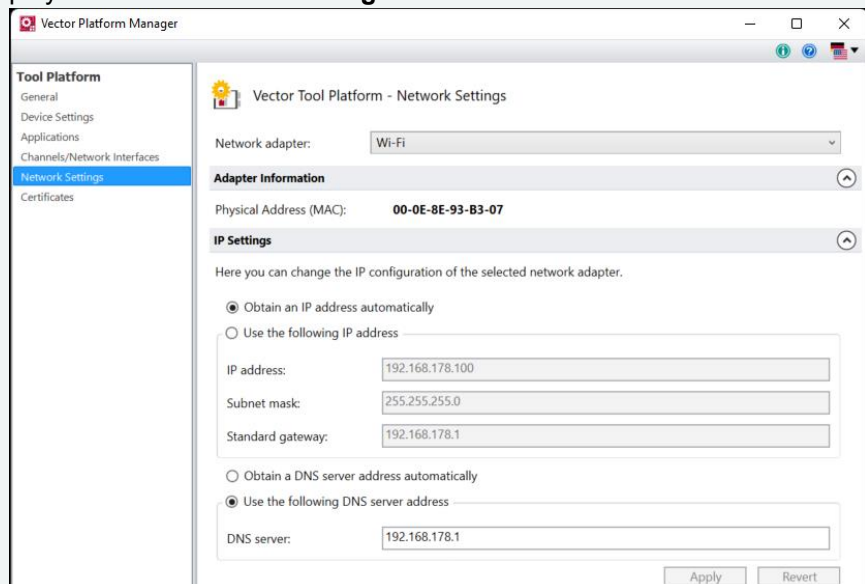
1. Set up a hotspot with the device you want to display the mobile UI with. For details on how to set it up please have a look in the manual of your device.
2. Connect an external WLAN adapter to the Smart Logger (skip this step if your VP6400 has an in-built WLAN adapter).
3. Disable the firewall on your computer.
4. Start the configuration tool.
5. Switch to the ribbon **Smart Logger**.
6. Click on the button **Platform Manager** to open the **Vector Platform Manager**.
7. Select your Smart Logger from the drop-down list in the section **Device Selection**.



8. Switch to the ribbon **Tool Platform** and there to the sub-ribbon **Network Settings**.
9. Select the **WLAN Adapter** from the drop-down list **Network adapter**.
10. In section **WLAN Settings**, switch the mode to **Infrastructure**. All available WLAN networks in range are listed in the table **Infrastructure**.
11. Select the network referring to your hotspot and connect to it.



12. After connection is established refresh the display page, e.g. by switching the sub-ribbon back and forth. The IP address of your Smart Logger is displayed in the section **IP Settings**.



13. Type in the IP address the browser of the device you want to display the Mobil UI in. Your browser will be automatically redirected to the Mobile UI.

5.2.4 Shutdown via Terminal 15

5.2.4.1 Overview

The VP6400 Smart Logger has a shutdown function. The Vector Tool Platform monitors terminal 15 of the Smart Logger. This monitoring is used to shut down running software and the VP6400 as soon as the power supply via terminal 15 is interrupted.

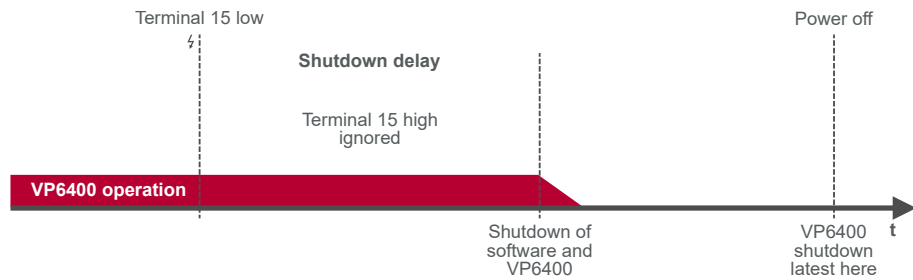


Figure 33: Shutdown phases

► **Shutdown delay**

Terminal 15 high has no effect anymore. After the shutdown delay time has elapsed, the current measurement is stopped and the software, e. g. CANape, is closed. The VP6400 will also shut down.

► **Power off**

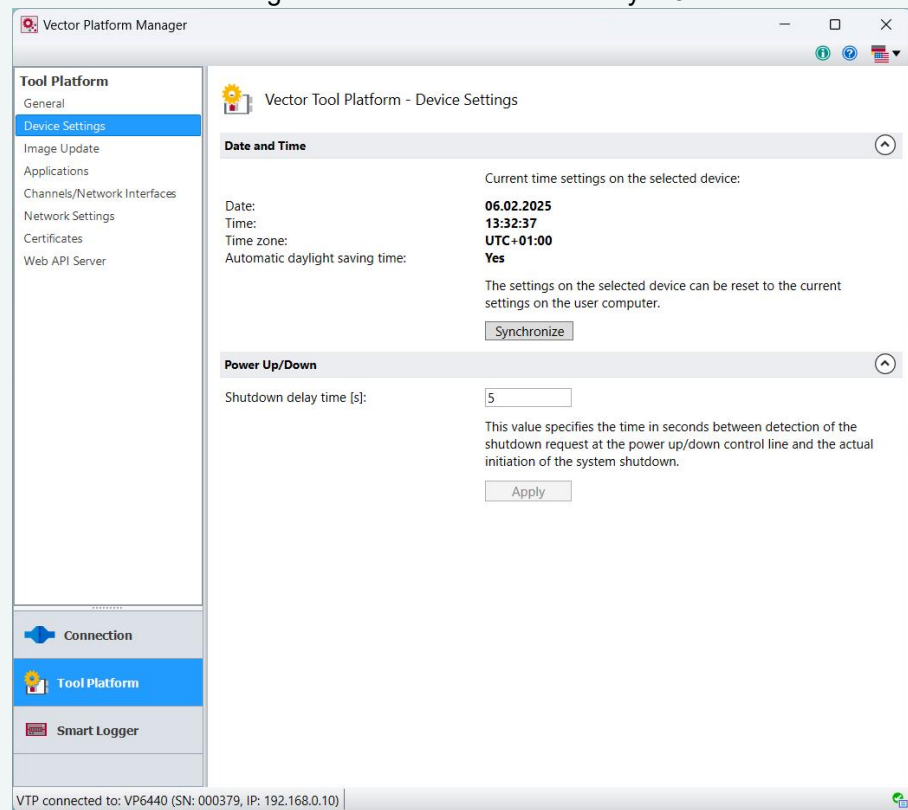
Under certain circumstances, the VP6400 may have a delayed shutdown. In this case, a hard shutdown (power off) occurs at the latest 180 seconds after terminal 15 went low.

5.2.4.2 Timeout Configuration



Edit

The shutdown delay for the VP6400 Smart Logger can be configured in the Vector Platform Manager. The default shutdown delay is 5 seconds.



Vector Platform Manager

Vector Tool Platform - Device Settings

Tool Platform

- General
- Device Settings**
- Image Update
- Applications
- Channels/Network Interfaces
- Network Settings
- Certificates
- Web API Server

Date and Time

Current time settings on the selected device:

Date: **06.02.2025**
 Time: **13:32:37**
 Time zone: **UTC+01:00**
 Automatic daylight saving time: **Yes**

The settings on the selected device can be reset to the current settings on the user computer.

Power Up/Down

Shutdown delay time [s]:

This value specifies the time in seconds between detection of the shutdown request at the power up/down control line and the actual initiation of the system shutdown.

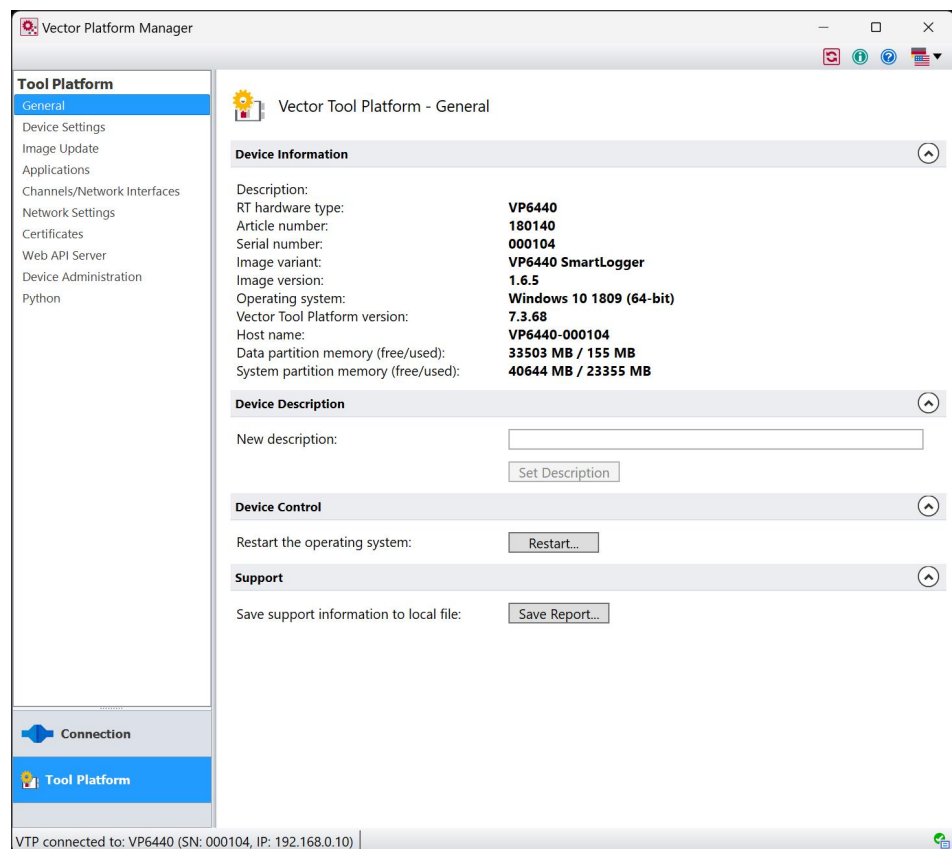
VTP connected to: VP6440 (SN: 000379, IP: 192.168.0.10)

5.2.5 Retrieving Serial Number

The device's serial number can be found on the label attached to the bottom of the housing.



If the device is permanently installed and the label is unreadable, you can retrieve the device's serial number via the Vector Platform Manager. Open the Vector Platform Manager on the host system and connect to the Smart Logger. The Smart Logger's serial number can be found under **Tool Platform | General | Device Information | Serial Number**.



5.3 Automotive PC

5.3.1 Introduction

The Automotive PC software version is a dedicated, standalone computer running Windows 10 IoT Enterprise. It is the perfect choice if you want to run a full version of CANape and other applications for deep configuration and flexibility.

To access the Automotive PC, simply connect a keyboard and mouse to the front panel, and a display to the back panel.

Pre-installed Vector drivers provide easy support for other Vector hardware products. Optionally, the system can be ordered with pre-installed Vector tools such as CANape.

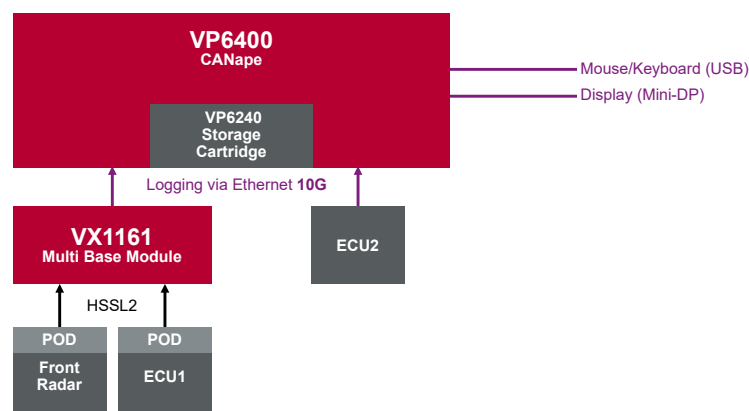


Figure 34: Setup example



Note

The Automotive PC software variant is supported on the following platforms:

- ▶ VP6440
- ▶ VP6441
- ▶ VP6450
- ▶ VP6451

5.3.2 Getting Started

5.3.2.1 Step 1: Power Supply

The VP6400 Automotive PC will start when terminal 15 of the vehicle becomes active. The following sections describe the wiring.



Step by Step Procedure

1. Connect the open cable ends of the supplied power cable (part number 22515) to the permanent power supply of the vehicle (terminal 30/GND).
2. Connect the Molex Mini-Fit connector at the other end of the power cable to the **Power 12/24V DC** connector of the VP6400.
3. Connect the supplied ignition cable (part number 22557) to terminal 15 of the vehicle.
4. Connect the Binder connector at the other end of the cable to the **SYNC** connector of the VP6400.



Figure 35: Connecting VP6400 to power supply

5.3.2.2 Step 2: Connection of Periphery

External periphery can be easily connected by using the ports on the front and back side of the Automotive PC.



Figure 36: Connecting keyboard and mouse



Figure 37: Connecting monitor (Mini-DP connector behind cover)



WARNING!

Do not use the Monitor connector without the Monitor Cable Guard (part number 22598) and the DisplayPort Adapter for VP6400 (part number 22640), as this could damage the monitor connector of the VP6400. The cable length must not exceed 3 m for proper operation.

5.3.3 Using a Remote Desktop Connection

You can also control the Automotive PC using a remote desktop connection.

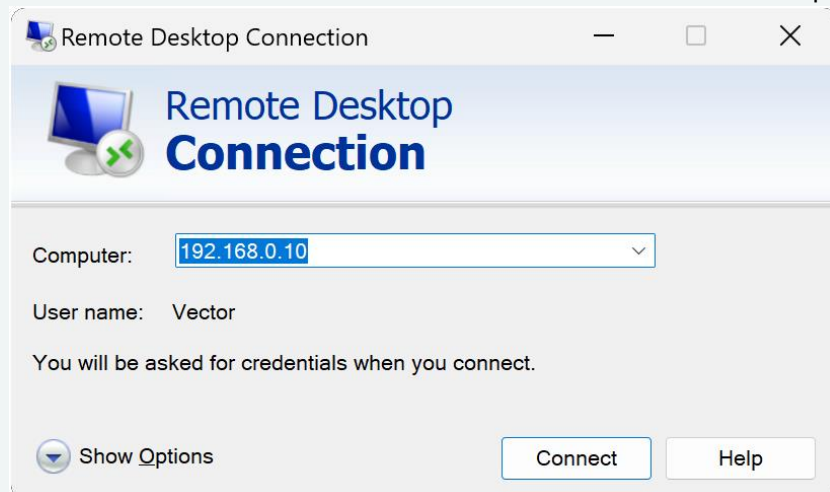


Figure 38: MGMT port connected to client



Step by Step Procedure

1. Connected to the MGMT port of the VP device to the client computer (Windows).
2. In Windows, open the Remote Desktop Connection.
3. Connect to 192.168.0.10. This is the default IP address of the MGMT port.



5.3.4 Shutdown via Terminal 15

5.3.4.1 Overview

The VP6400 Automotive PC internally runs the Vector Shutdown Service, which monitors the status of terminal 15 (Vbatt+ from ignition switch).

This service is used to shut down running software and the VP6400 in several phases as soon as the power supply via terminal 15 is interrupted. The duration of each phase is also configurable.

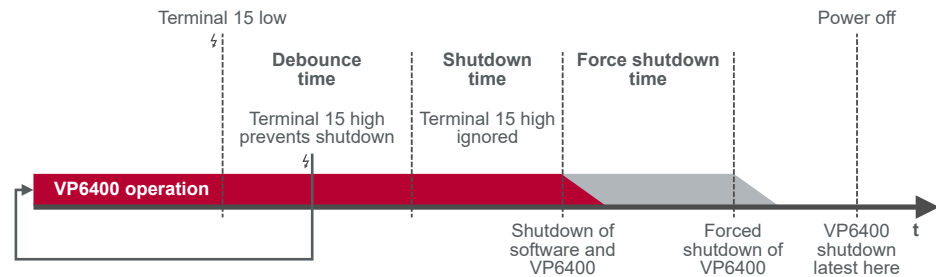


Figure 39: Shutdown phases

► Debounce time

During this time, the VP6400 is set to debounce state to prepare for shutdown. But as long as the time has not expired and terminal 15 is high again, the shutdown process is interrupted and the VP6400 returns to its normal state. The status is indicated by the user LEDs B4 and A4 (see the corresponding user LED description). Default timeout: 5 seconds.

► Shutdown time

The VP6400 is set to shutdown state. Terminal 15 high has no effect anymore. After the shutdown time has elapsed, the current measurement is stopped and the software, e. g. CANape, is closed. The VP6400 is also shut down. The status is indicated by the user LEDs B4 and A4 (see the corresponding user LED description). Default timeout: 0 seconds.

► Force shutdown time

Under certain circumstances, the shutdown of the VP6400 may be delayed. In this case, a forced shutdown process is initiated. Data that has not been saved by that time may be lost. The status is indicated by the user LEDs B4 and A4 (see the corresponding user LED description). Default timeout: 30 seconds.

► Power off

A hard shutdown occurs at the latest 180 seconds after terminal 15 goes low.

5.3.4.2 Timeout Configuration

**Edit**

The timeouts can be edited in the file:

C:\ProgramData\Vector\VectorPlatformShutdownService\
config.file

- ▶ Make sure that the sum of all three timeouts does not exceed 180 seconds.
- ▶ Also note that the VP6400 must be restarted after editing the timeouts.

5.3.5 Retrieving Serial Number

The device's serial number can be found on the label attached to the bottom of the housing.



If the device is permanently installed and the label is unreadable, you can retrieve the device's serial number in the command line using the "hostname" command.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.3469]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Vector>hostname
VP6440-104
```

6 Accessories

In this chapter you find the following information:

6.1 Router and Antennas	106
6.1.1 Router RV55W	106
6.1.2 2.4 & 5 GHz Antenna SMA-R Std.	107
6.1.3 2.4 & 5.2 GHz Antenna SMA-R Asia	107
6.1.4 GNSS Antenna SMA	108
6.1.5 4G LTE Antenna	108
6.2 Power	109
6.2.1 VP7110 UPS (Obsolete)	109
6.2.2 VP2110 Smart UPS	109
6.2.3 Desktop Type Power Supply	110
6.2.4 Power Supply 24V/2.5A DC Coaxial Plug	111
6.2.5 Power Supply 12V/25W With Jack Plug	112
6.3 Cables and Connectors	113
6.3.1 CAN/LIN	113
6.3.2 USB	117
6.3.3 Ethernet	123
6.3.4 Miscellaneous	126
6.4 Mounting Equipment	131
6.4.1 VSH Cable Guard 216	131
6.4.2 VSH Cable Guard 216 Clip	134
6.4.3 VSH Connection Kit 19"	135
6.4.4 VSH Connection Kit Horizontal	137
6.4.5 VSH Connection Kit Vertical	138
6.4.6 VSH Equipment Foot Kit	139
6.4.7 VSH Mounting Flange Kit	140
6.4.8 Ball Joint Mounting Brackets	141
6.5 Miscellaneous	142
6.5.1 Spectra TouchScreen 12" SR	142
6.5.2 Monitor Cable Guard for VP6400	143

6.1 Router and Antennas

6.1.1 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



6.1.2 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 107.

6.1.3 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 107.

6.1.4 GNSS Antenna SMA

Technical data

Description	Low profile magnet mounted GPS-GLONASS-GALILEO positioning antenna
Length	3 m (RG174 Coax cable)
Part number	07205



6.1.5 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



6.2 Power

6.2.1 VP7110 UPS (Obsolete)

Technical data

Description	200 Watt managed Li-ion UPS with 160 Wh
Part number	22514

6.2.2 VP2110 Smart UPS

Technical data

Description	240 Watt SuperCap Smart UPS with external energy storage connection
Features	▶ 5x output: - 2x max. 240 W - 3x max. 85 W ▶ External energy storage: - LiFePO4 batteries ▶ LAN interface for device management ▶ Terminal 15 input and output to activate/run down the measurement system ▶ Digital IO interface for wake-up (wired or remote control)
Temperature range	-40 °C ... +65 °C
Part number	22575



Reference

Refer to the separate VP2110 manual for details.

6.2.3 Desktop Type Power Supply

Technical data

Description	Power supply - AC 110...240 V - 50/60 Hz - 220 W - 24 V - 9.5 A - incl. power cord EURO CEE7/7
Part number	05116



Connection cable Europe

Description	Connection cable for power supply unit
Connectors	Connector for Europe
Part number	05244

Connection cable USA/Japan

Description	Connection cable for power supply unit
Connectors	Connector for USA/Japan
Part number	05115

Connection cable UK

Description	Connection cable for power supply unit
Connectors	Connector for UK
Part number	05125

Connection cable China

Description	Connection cable for power supply unit
Connectors	Connector for China
Part number	05114

6.2.4 Power Supply 24V/2.5A DC Coaxial Plug

Technical data

Description	Power supply unit with 24 V and 2.5 A for use with USB 3.2 Gen2x1 hub (part no. 05225). Country specific AC connection cable included.
Connectors	1x Country specific AC connection cable (see below) 1x DC coaxial plug 5.5 mm x 2.1 mm
Part number	05233



Connection cable Europe

Description	Connection cable for power supply unit
Connectors	Connector for Europe
Part number	05244

Connection cable USA/Japan

Description	Connection cable for power supply unit
Connectors	Connector for USA/Japan
Part number	05115

Connection cable UK

Description	Connection cable for power supply unit
Connectors	Connector for UK
Part number	05125

Connection cable China

Description	Connection cable for power supply unit
Connectors	Connector for China
Part number	05114

6.2.5 Power Supply 12V/25W With Jack Plug

Technical data

Description	Power supply unit with 12 V and 2.08 A for use with VP6140 USB Reader for VP6240 (part no. 22561) and VP6141 TB3 Reader for VP624x (part no. 22629).
Connectors	1x Country specific AC connection cable (see below) 1x DC Jack plug
Part number	05143



Connection cable Europe

Description	Connection cable for power supply unit
Connectors	Connector for Europe
Part number	05144

Connection cable USA/Japan

Description	Connection cable for power supply unit
Connectors	Connector for USA/Japan
Part number	05071

Connection cable UK

Description	Connection cable for power supply unit
Connectors	Connector for UK
Part number	05070

Connection cable China

Description	Connection cable for power supply unit
Connectors	Connector for China
Part number	05249

6.3 Cables and Connectors

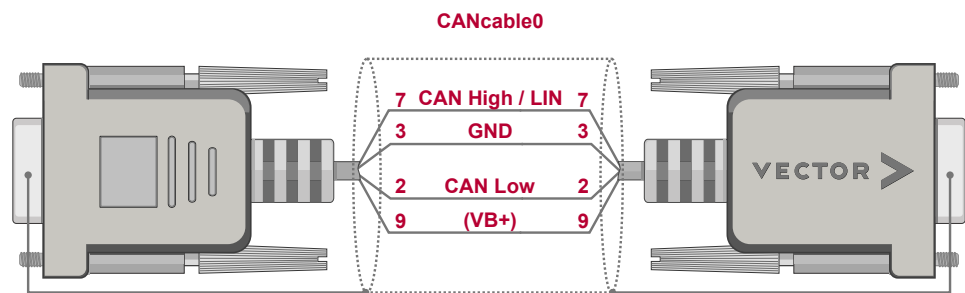
6.3.1 CAN/LIN

6.3.1.1 CANcable0

Low-speed cable

Description	CAN/LIN connection cable Note: When using with devices that have a primary and a secondary D-SUB9 pin assignment, only the primary channel is accessible.
Length	0.3 m
Connectors	2x female D-SUB9 connectors
Temp. range	Fixed installation: -30 °C ...+80 °C Flexible use: -10 °C ...+80 °C
Min. bending radius	Fixed installation: 21 mm Flexible use: 42 mm
Properties	Without terminating resistors
Part number	05002

Setup

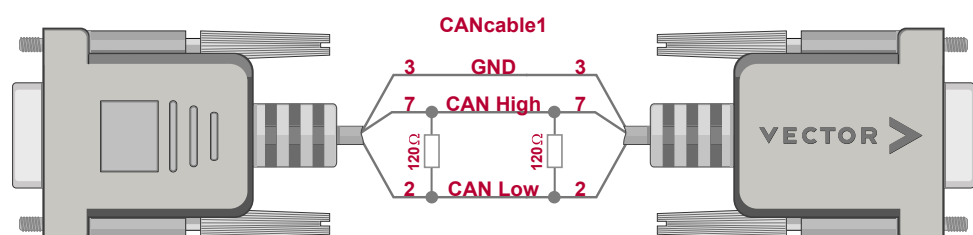


6.3.1.2 CANcable1

High-speed cable

Description	CAN connection cable Note: When using with devices that have a primary and a secondary D-SUB9 pin assignment, only the primary channel is accessible.
Length	0.3 m
Connectors	2x female D-SUB9 connectors
Temp. range	Fixed installation: -30 °C ...+80 °C Flexible use: -10 °C ...+80 °C
Min. bending radius	Fixed installation: 21 mm Flexible use: 42 mm
Properties	Two parallel 120 ohm terminating resistors
Part number	05001

Setup

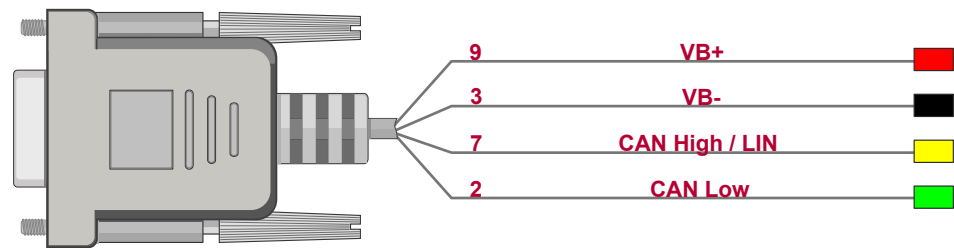


6.3.1.3 CANcableA

All-purpose cable

Description	CAN/LIN connection cable
Length	0.5 m
Connectors	1x female D-SUB9 connector 4x stripped wires
Temp. range	Fixed installation: -30 °C ...+80 °C Flexible use: -10 °C ...+80 °C
Min. bending radius	Fixed installation: 21 mm Flexible use: 42 mm
Part number	Included in CANcable Set Pro (part number 05060)

Setup

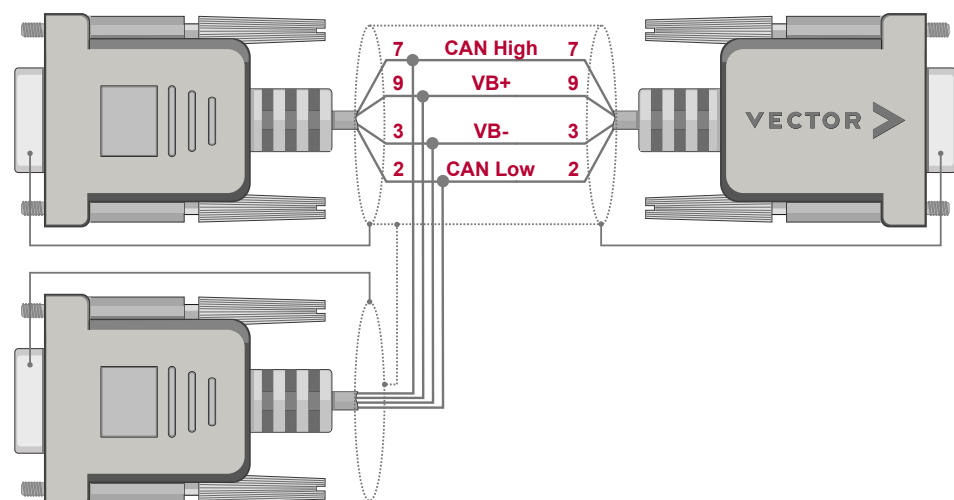


6.3.1.4 CANcableY

Extension cable

Description	Y extension cable for CAN or LIN
Length	2 m (overall length)
Connectors	3x female D-SUB9 connectors
Temp. range	Fixed installation: -30 °C ...+80 °C Flexible use: -10 °C ...+80 °C
Min. bending radius	Fixed installation: 21 mm Flexible use: 42 mm
Properties	Including gender changer
Part number	Included in CANcable Set Pro (part number 05060)

Setup

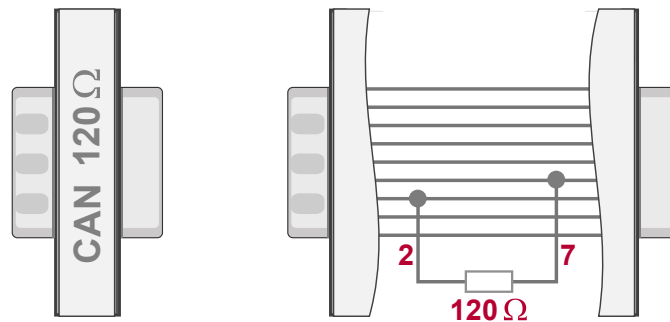


6.3.1.5 CANterm 120

Terminating resistor

Description	CAN adapter for high-speed CAN buses Note: When using with devices that have a primary and a secondary D-SUB9 pin assignment, only the primary channel is accessible.
Rated voltage	300 V
Operating temp.	-25 °C ... +105 °C
Connectors	1x female D-SUB9 connector 1x male D-SUB9 connector
Properties	One 120 ohm terminating resistor
Part number	05004

Setup



6.3.1.6 CANcable Set Pro

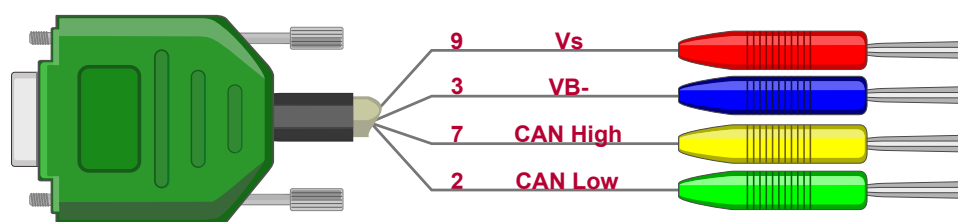
Description	Cable set for CAN/LIN incl.: ▶ 1x CANcable0 ▶ 1x CANcableY ▶ 2x CANcableA ▶ 2x CANterm 120 ▶ 2x Gender changer male/male ▶ 1x Gender changer female/female
Temp. range	Fixed installation: -30 °C ... +80 °C Flexible use: -10 °C ... +80 °C
Min. bending radius	Fixed installation: 21 mm Flexible use: 42 mm
Part number	05060

6.3.1.7 CANcable TnT (D-SUB9 to Bunch Plugs)

Misc. CAN

Description	Connection for: - CAN 2.0, CAN FD, CAN SIC - Truck & Trailer CAN (ISO 11992)
Length	1.5 m
Connectors	1x female D-SUB9 connector 4x bunch plug
Temp. range	Fixed installation: -25 °C ...+70 °C Flexible use: -5 °C ...+70 °C
Min. bending radius	Fixed installation: 22.4 mm Flexible use: 56.0 mm
Properties	Without terminating resistor
Part number	05016

Setup

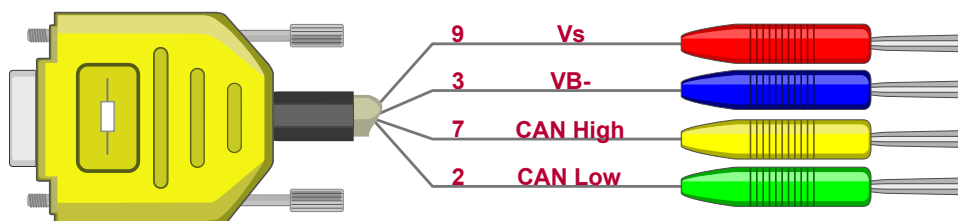


6.3.1.8 CANcable TnT Term

Truck & Trailer CAN

Description	Connection cable for Truck & Trailer (ISO 11992)
Length	1.5 m
Connectors	1x female D-SUB9 connector 4x bunch plugs
Temp. range	Fixed installation: -25 °C ...+70 °C Flexible use: -5 °C ...+70 °C
Min. bending radius	Fixed installation: 22.4 mm Flexible use: 56.0 mm
Properties	With terminating resistors
Part number	05015

Setup



6.3.2 USB

6.3.2.1 Cable USB 2.0 for Spectra Touch

Technical data

Description	USB 2.0 Cable, Type A-A for Spectra TouchScreen.
Length	4.5 m
Connectors	2x USB 2.0 Type-A
Part number	22447



6.3.2.2 USB Cable 3.2 Gen. 2 Type A-C

Technical data

Description	USB 3.2 cable. This cable is intended primarily for use with the VP6140 USB reader for the VP6240.
Length	approx. 1.0 m
Connectors	1x connector Type-A 1x connector Type-C
Max. data rate	10 Gbit/s
Part number	05205



6.3.2.3 USB Cable 3.2 Gen. 2 Type C-C

Technical data

Description	USB 3.2 cable. This cable is intended primarily for use with the VP6140 USB reader for the VP6240.
Length	approx. 1.0 m
Connectors	1x connector Type-C 1x connector Type-C
Max. data rate	10 Gbit/s
Part number	05206



6.3.2.4 USB Cable 3.1 Type A-C (Dual Screw Lock)

Technical data

Description	USB 3.1 cable
Length	approx. 1.8 m
Rated voltage	30 V
Min. bending radius	27.0 mm
Max. operating temp.	80 °C
Connectors	1x connector Type-A 1x connector Type-C with screws
Max. data rate	5 Gbit/s
Part number	05140



6.3.2.5 USBcable 3.2 Gen 2 C-C SDSL

Technical data

Description	USB 3.2 cable. This cable is primarily intended for use with the USB hub. SDSL: Single-sided Dual Screw Lock
Length	approx. 1.5 m
Rated voltage	30 V
Min. bending radius	28.8 mm
Max. operating temp.	80 °C
Connectors	1x connector Type-C 1x connector Type-C with screws
Max. data rate	10 Gbit/s
Part number	05227



6.3.2.6 USBcable 3.2 Gen 2 C-C DDSL

Technical data

Description	USB 3.2 cable. This cable is primarily intended for use with the USB hub. DDSL: Double-sided Dual Screw Lock
Length	approx. 1.5 m
Rated voltage	30 V
Min. bending radius	28.8 mm
Max. operating temp.	80 °C
Connectors	2x connector Type-C with screws
Max. data rate	10 Gbit/s
Part number	05226



6.3.2.7 USBcable 3.2 Gen 2 C-B DDSL

Technical data

Description	USB 3.2 cable. This cable is primarily intended for use with the USB hub. DDSL: Double-sided Dual Screw Lock
Length	approx. 1.5 m
Rated voltage	30 V
Min. bending radius	27.0 mm
Max. operating temp.	80 °C
Connectors	1x connector Type-B 1x connector Type-C with screws
Max. data rate	10 Gbit/s
Part number	05228



6.3.2.8 USBadapter 3.2 Gen 1 C-A SDSL

Technical data

Description	USB 3.2 adapter SDSL: Single-sided Dual Screw Lock
Length	approx. 0.1 m
Rated voltage	30 V
Min. bending radius	27.0 mm
Max. operating temp.	80 °C
Connectors	1x connector Type-A (female) 1x connector Type-C with screws
Max. data rate	10 Gbit/s
Part number	05229



6.3.2.9 USB 3.2 Gen2x1 Hub

Technical data

Description	USB 3.2 Gen2x1 hub with one USB Type-A and three USB Type-C downstream ports for secure data transfer at high speeds of up to 10 Gbit/s. With metal housing and mounting equipment. User manual included in delivery.
Ports	3x USB Type-C port with up to 3 A @ 5 V - cable fixation according to USB Type-C Locking Connector Specification 1x USB Type-A port with up to 1.5 A @ 5 V - cable fixation according to USB3 Vision standard One USB Type-C upstream port supporting up to 10 Gbit/s.
Power supply	1x DC coaxial connector 5.5 mm x 2.1 mm 9...24 V - Recommended: part no. 05233 (see section Power Supply 24V/2.5A DC Coaxial Plug on page 111) 1x Terminal block 9...24 V, up to 60 W
Part number	05225



Terminal block

Connector	Description
V+	Power supply plus (9...24 V, up to 60 W)
V-	Power supply minus (no PE/FG!)
G	System ground



WARNING!

To avoid damage to your devices and equipment, please note that **V-** must not be connected to AC Protective Earth (PE) or Functional Ground (FG)!



WARNING!

When using the USB 3.2 Gen2x1 Hub in a vehicle, an electrically isolated power supply must be used!

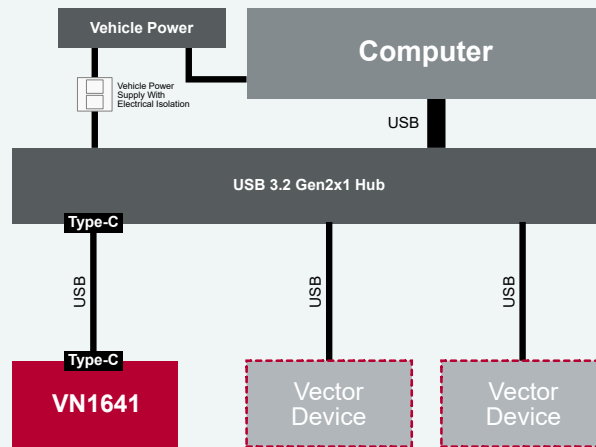


Figure 40: Example with VN1641



Note

The USB 3.2 Gen2x1 hub is a self-powered hub.

To avoid draining the battery (e. g. of a car or laptop), the hub is completely shut down by unplugging the USB host connection cable or the power adapter. This is different from typical consumer (bus-powered) hubs.

6.3.3 Ethernet

6.3.3.1 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



6.3.3.2 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



6.3.3.3 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



6.3.3.4 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

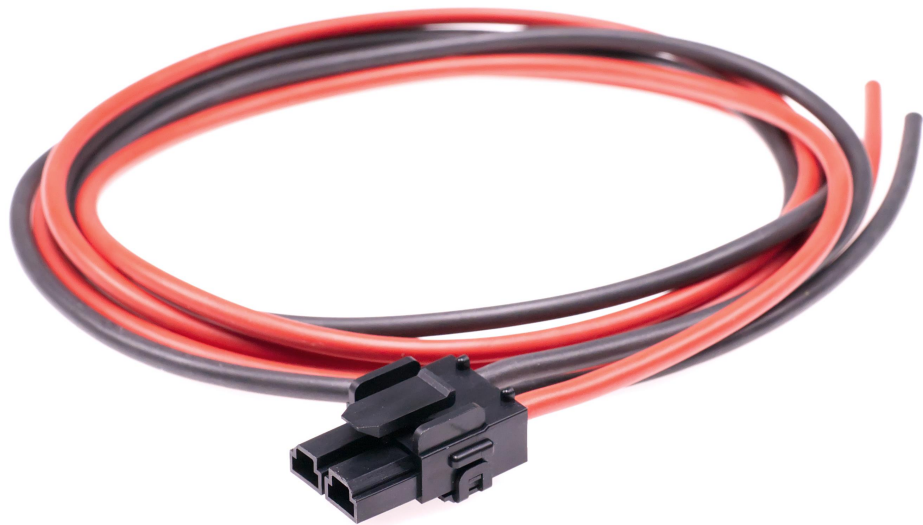


6.3.4 Miscellaneous

6.3.4.1 Power Cable Molex Mini-Fit 4mm²

Technical data

Description	Red/black 4 mm ² power cable for Vector devices with Molex Mini-Fit connector.
Length	1.5 m
Connectors	1x Molex Mini-Fit connector 2x open end
Part number	22515



6.3.4.2 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



6.3.4.3 Cable DP-DVI for Spectra Touch

Technical data

Description	DisplayPort Cable, DP-DVI (24+1), M/M for Spectra TouchScreen.
Length	5 m
Connectors	1x DisplayPort 1x DVI-D 24+1, Dual-Link
Part number	22448



6.3.4.4 DisplayPort Adapter for VP6400

Technical data

Description	Adapter for Monitor Cable Guard for VP6400 with a maximum resolution of 3840 x 2160 pixels @ 60 Hz.
Length	0.15 m
Connectors	1x Mini DisplayPort plug 1x DisplayPort socket
Part number	22640



6.3.4.5 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



6.3.4.6 VNcable 3Y

Y cable

Description	Y cable for Vector FlexRay/CAN/LIN interfaces with D-SUB15HD triple assignment. Splits a D-SUB15HD connector into three separate D-SUB9 connectors (CH A, CH B, CH C). Example: ► VN1530 - CH1/2/3 → Channel 1 (CH A), 2 (CH B) and 3 (CH C) - CH4/5/6 → Channel 4 (CH A), 5 (CH B) and 6 (CH C) The pin assignments of the D-SUB9 connectors CH A, CH B and CH C depend on the used bus transceivers inside the interface.
Length	0.3 m
Rated voltage	30 V
Min. bending radius	37.8 mm
Max. operating temp.	80 °C
Connectors	1x female D-SUB15HD connector 3x male D-SUB9 connector
Part number	05122



Channel	Pin D-SUB9	Pin D-SUB15HD
A	2	14
	3	10
	7	15
	9	5
B	2	3
	3	9
	7	4
	9	13

Channel	Pin D-SUB9	Pin D-SUB15HD
C	1	2
	2	1
	3	7
	4	11
	7	6
	8	12
	9	8

**WARNING!**

This cable **cannot** be used for:

- ▶ VN1614
- ▶ VN1615

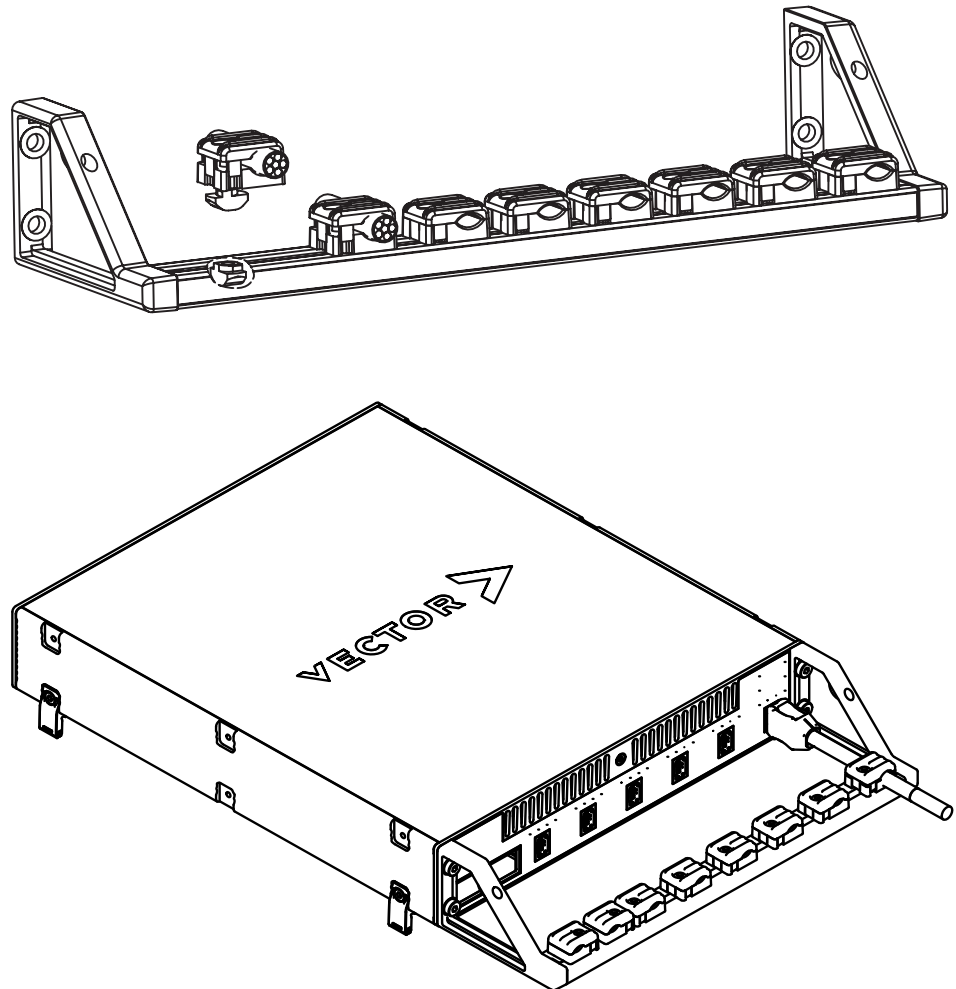
Instead, please use the VNcable 4Y.

6.4 Mounting Equipment

6.4.1 VSH Cable Guard 216

Technical data

Description	Cable support system including eight clips for clamping single cables. For cable diameters (clamping range) from Ø 3.8 mm to Ø 6.8 mm.
Part number	05149



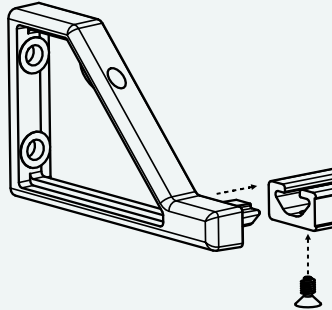
Note

The VSH Cable Guard 216 and the clips are not designed for use with VNcable 3Y.

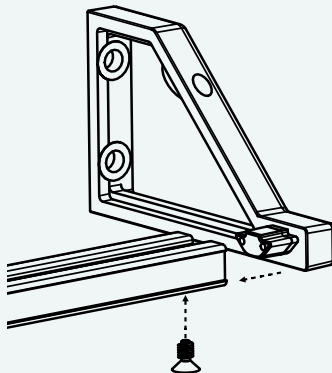
**Step by Step Procedure**

The following steps describe the mounting of the VSH Cable Guard 216:

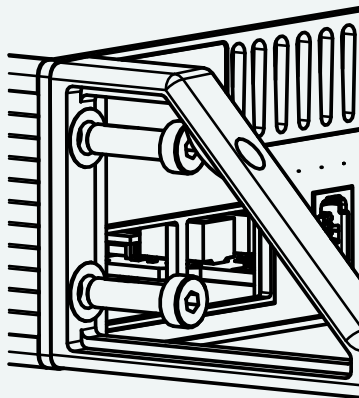
1. Insert the left frame into the cable rail and tighten the screw (Torx 8) with a torque of 1.4 Nm.



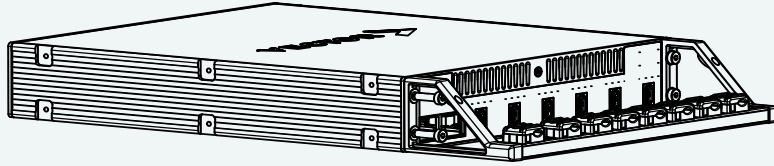
2. Repeat the steps above with the right frame.



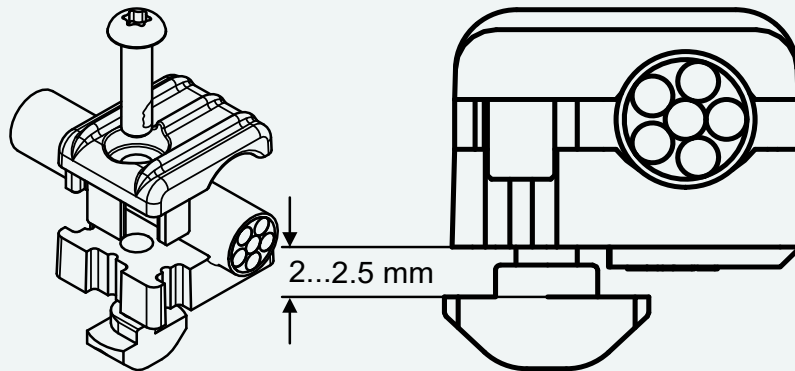
3. Attach the complete Cable Guard to the VN device and tighten it with the enclosed hexagonal screws (3 mm) and with a torque of 1.7 Nm.



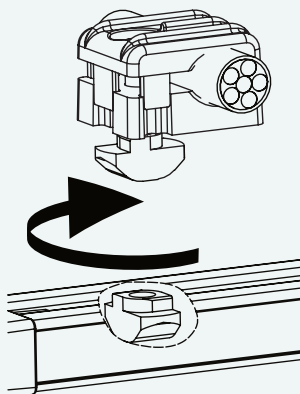
4. Repeat the steps on the other side.



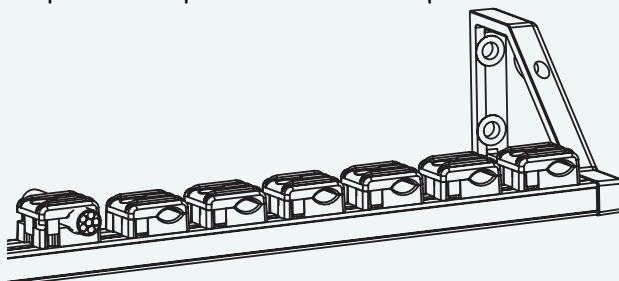
5. Lead the individual cables through the clamps and tighten the individual clamps depending on the cable (Torx 10). Tighten the screw only enough to leave a gap of 2 to 2.5 mm between the slot nut and the cable clamp.



6. Now insert the individual clamps into the Cable Guard and tighten the screw completely. The slot nut will rotate 90° inside the rail and thus fix the entire clamp.



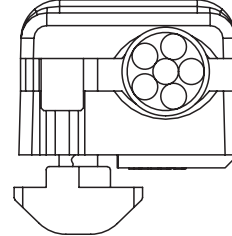
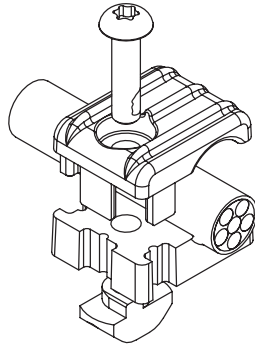
7. Repeat the steps with all other clamps.



6.4.2 VSH Cable Guard 216 Clip

Technical data

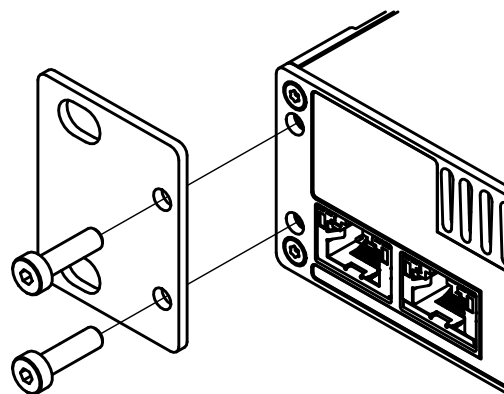
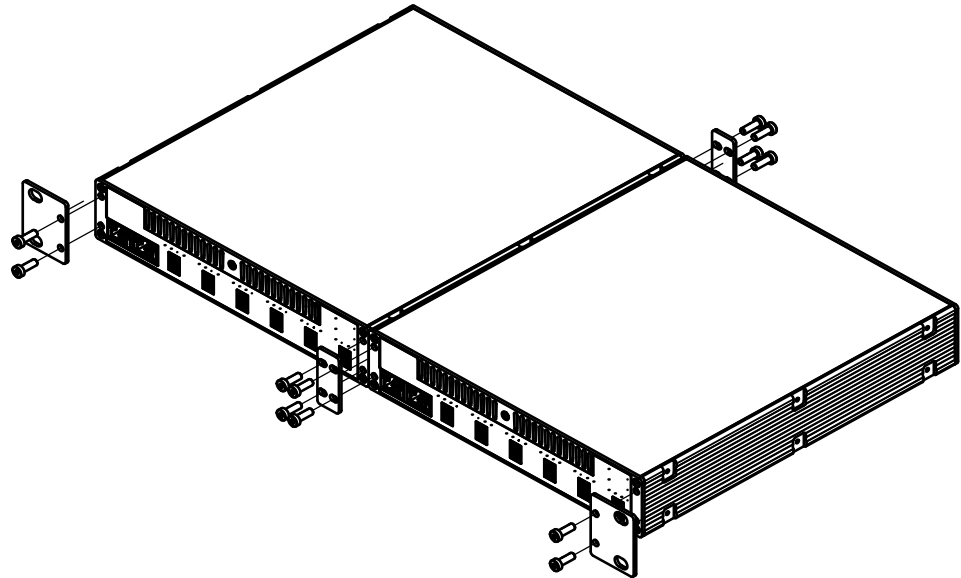
Description	Set of four single clips for VSH Cable Guard 216 (see section VSH Cable Guard 216 on page 131). For single cables.
Part number	05148



6.4.3 VSH Connection Kit 19"

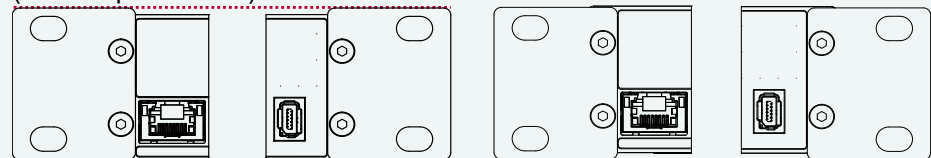
Technical data

Description	Brackets for 19" rack mounting (front and back mounting plates required, see VSH Connection Kit Horizontal on page 137).
Part number	05151



WARNING!

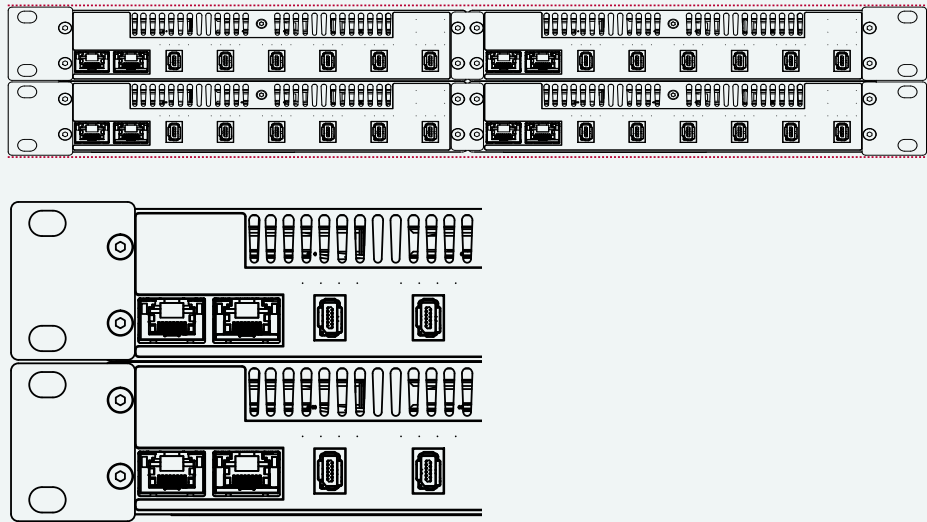
To avoid mechanical damage to the accessories, the unit or the installation, make sure that the two mounting brackets are always mounted in alignment (either top or bottom):





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!



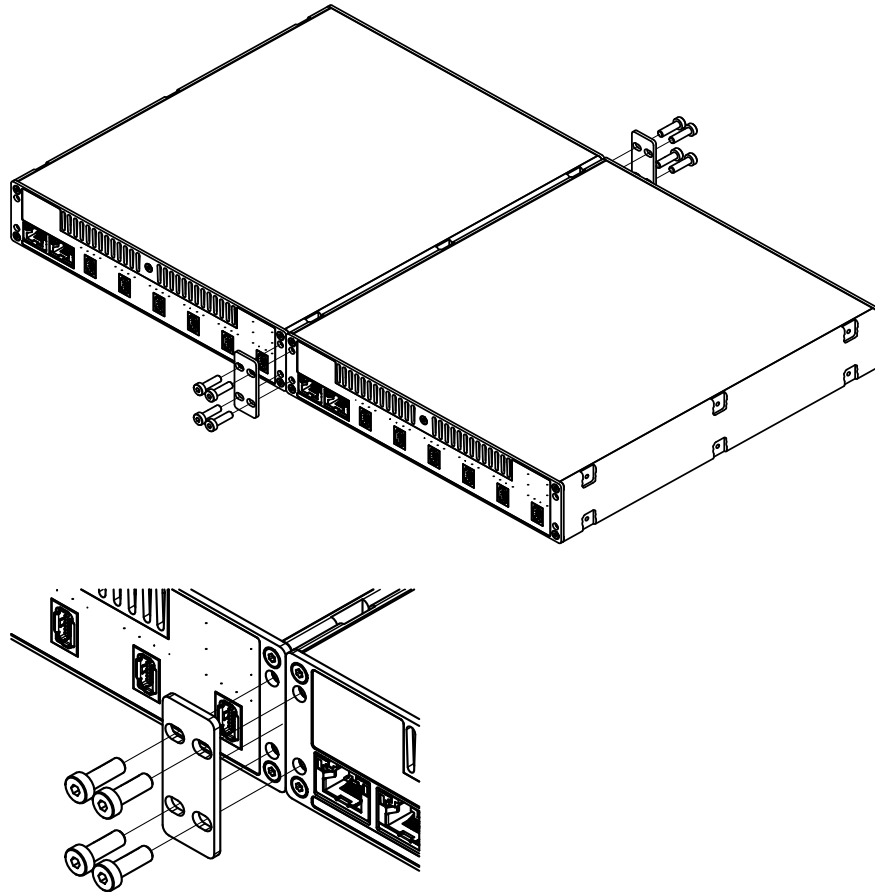
Note

- ▶ 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.

6.4.4 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



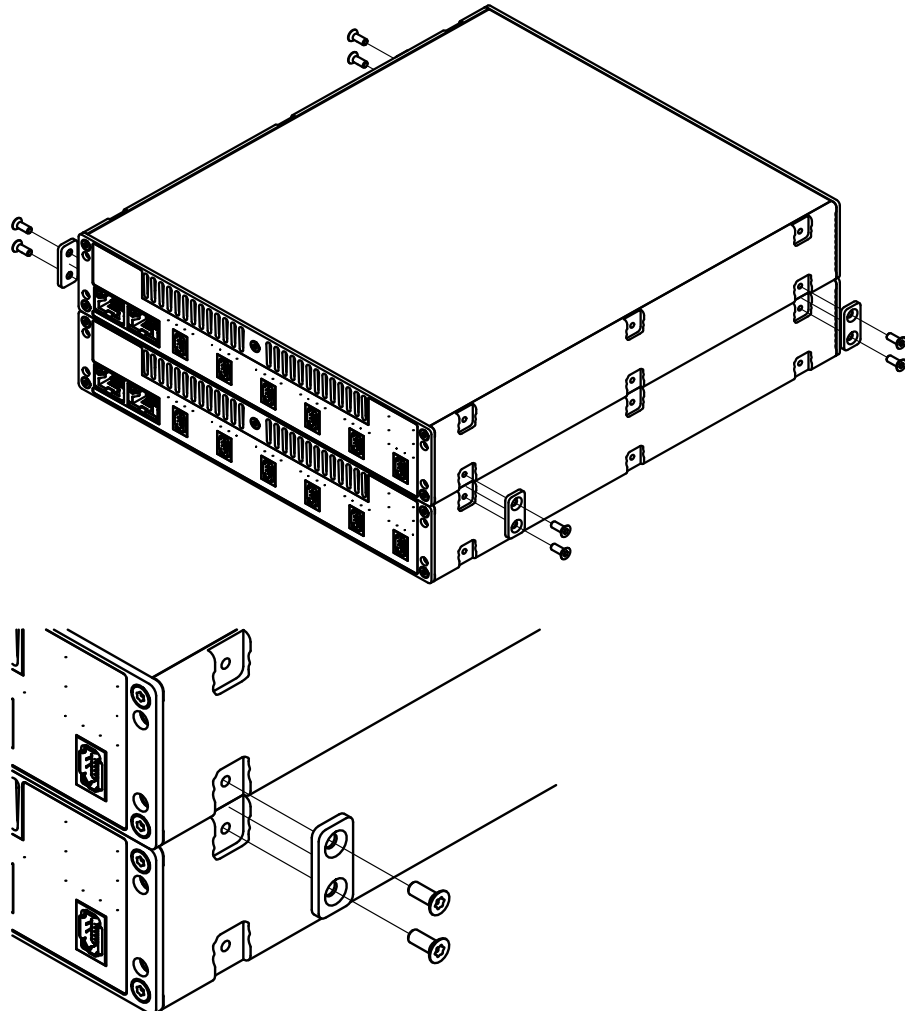
Note

- ▶ 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.

6.4.5 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



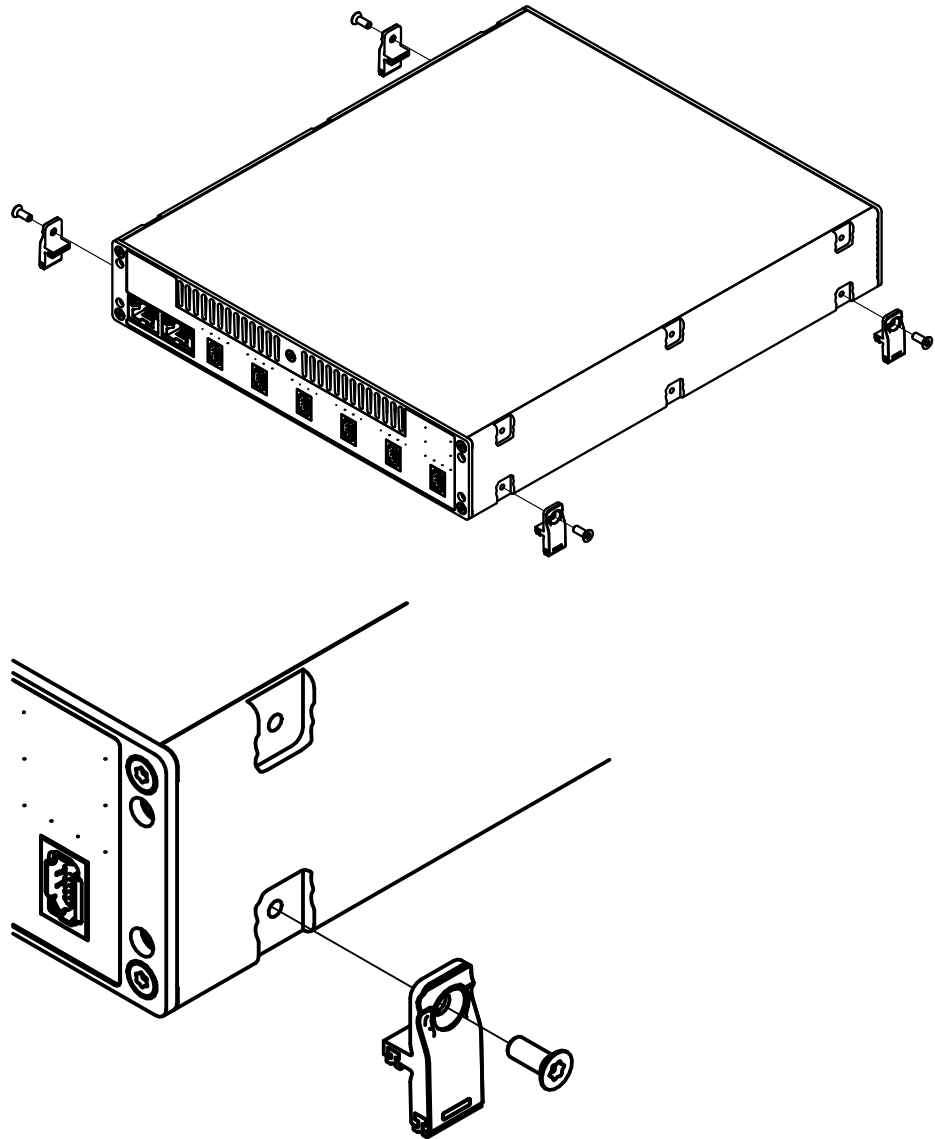
Note

- ▶ 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.

6.4.6 VSH Equipment Foot Kit

Technical data

Description	Four spare mounting feet.
Part number	05150



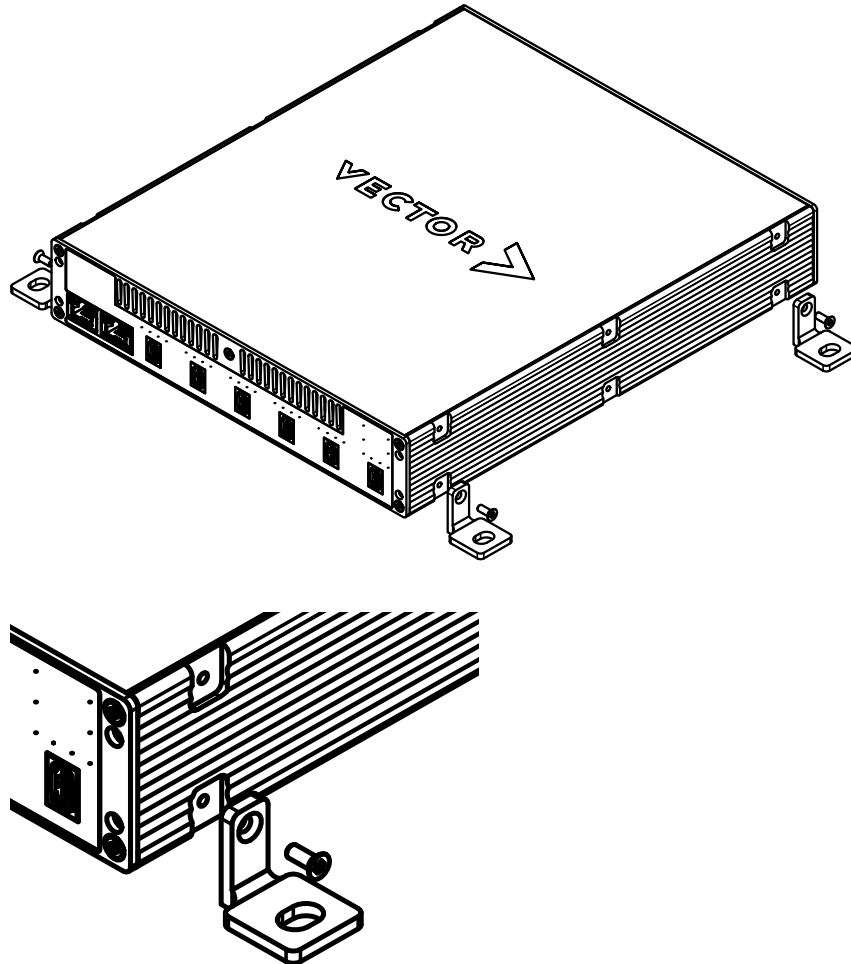
Note

- ▶ 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.

6.4.7 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.

6.4.8 Ball Joint Mounting Brackets

Technical data

Description	Ball joint mounting brackets for Spectra TouchScreen. G40 45 ° with VESA plate 75 black
Part number	22446



6.5 Miscellaneous

6.5.1 Spectra TouchScreen 12" SR

Technical data

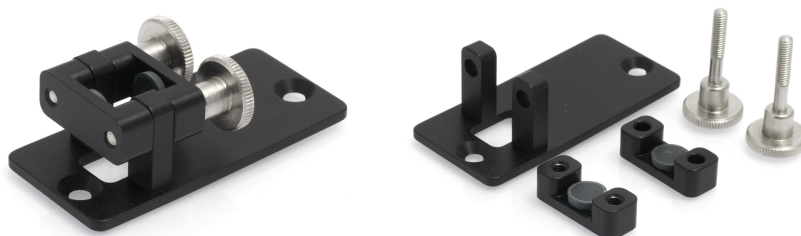
Description	12.1" Panel Monitor - 4:3 - cap-touch - 9...48 V - sunlight readable - contains a touch display and a monitor unit.
Accessories	- Cable DP-DVI for Spectra Touch (part number 22448) - Cable USB 2.0 for Spectra Touch (part number 22447) - Ball joint mounting brackets (part number 22446)
Part number	22582



6.5.2 Monitor Cable Guard for VP6400

Technical data

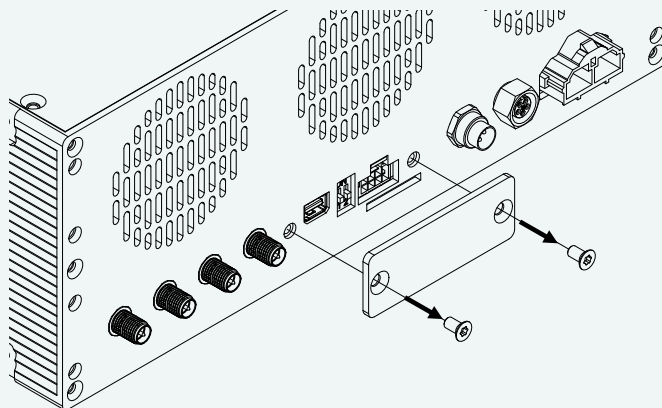
Description	Cable guard to secure the DisplayPort adapter at the VP6400.
Part number	22598



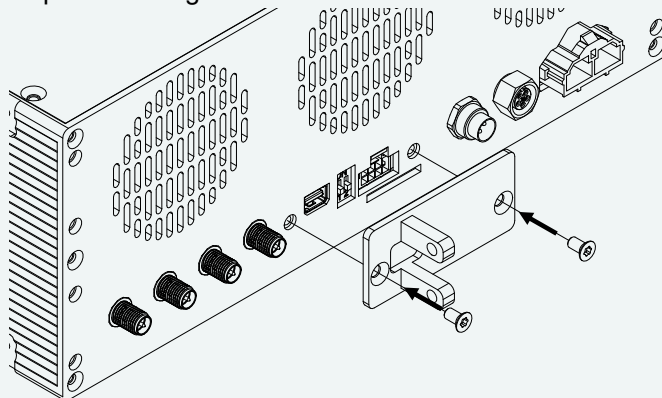
Step by Step Procedure

The following steps describe the mounting of the Monitor Cable Guard:

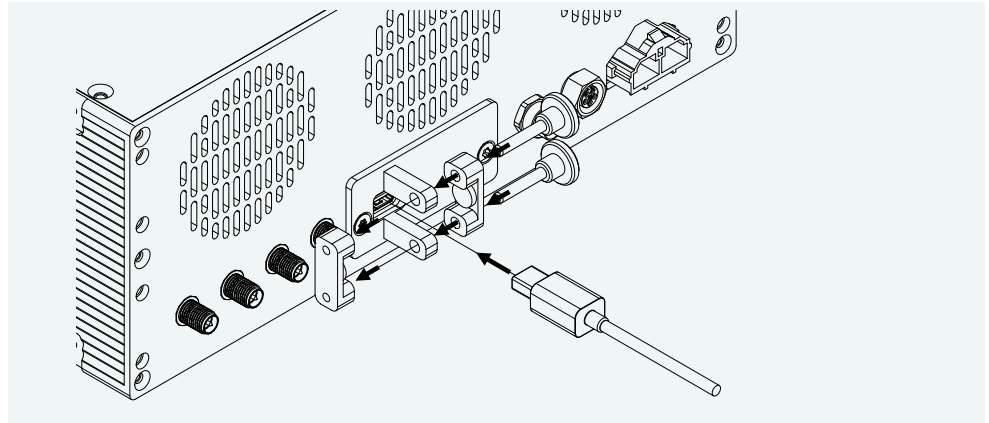
1. Remove the cover from the back side.



2. Replace the original cover with the Monitor Cable Guard.



3. Insert the knurled screws and do not tighten them fully. Then connect the monitor cable and secure the connector by tightening the knurled screws.



7 Important Notes - Details

In this chapter you find the following information:

7.1 Safety Instructions and Hazard Warnings	146
7.1.1 Proper Use and Intended Purpose	146
7.1.2 Hazards	147
7.1.3 Battery Notice	147
7.1.4 Warning of Hot Surface	147
7.1.5 Electrostatically Sensitive Components (ESD)	147
7.1.6 Additional Instructions	148
7.2 Disclaimer	150
7.3 Disposal of Vector Hardware	151

7.1 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.

7.1.1 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.

7.1.2 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.

7.1.3 Battery Notice

**WARNING!**

There is a risk of explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. Please also see the battery supplementary sheet! Valid only for devices containing a battery.

7.1.4 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.

7.1.5 Electrostatically Sensitive Components (ESD)

**WARNING!**

A sudden electrostatic discharge could destroy sensitive components. Therefore, proper packaging and grounding prescriptions must be observed. Please always observe the following safety advices:

1. Plug-in cards always have to be transported in electrostatically safe containers or bags.
2. Please leave electrostatically sensitive components in their containers until they have reached the electrostatically safe assembly site.
3. Take care that you are correctly grounded if you touch electrostatically sensitive components.
4. Make sure that electrostatically sensitive components are stored in protective packages or on antistatic mats.

**Example**

By observing the following measures, electrostatic damage to the device can be avoided:

1. Lay out antistatic mats at the work place. Wear a grounding strap which is connected to the work place and the working tools.
2. Use antistatic foot mats, foot grounding equipment or air ionizers to provide additional safety.
3. Only touch sensitive components, plug-in cards and units on the housing or at the outer edges of the plug-in cards.
4. Avoid contact with pins, wires and conductor tracks.
5. Make sure that all voltage and signal sources are switched off before establishing or disconnecting electric connections or connecting testing devices.
6. Avoid non-conductive materials such as usual mounting accessories made of plastics or polystyrene at the work place.
7. Use conductive tools (e.g. ESD screwdrivers) when working on electrostatically sensitive units and components.
8. Always put plug-in cards and drives on the antistatic mat with the component side downwards.

7.1.6 Additional Instructions

General information

Prior to use of the unit it is essential to comply with the following instructions. As stipulated by law, we are providing important safety information and advice how you can avoid damage to the device and other fittings.

- ▶ Connection to the power supply must be carried out with correct polarity. Polarity reversal could cause irreparable damages.
- ▶ The correct supply voltage is 12 V DC or 24 V DC
- ▶ Operation of the device is allowed only in circuits with safety low voltage within the admissible voltage limits (SELV standard EN60950). This applies to all connections to the unit.
- ▶ The use of a power supply outside the voltage limits defined above could cause damage or even destruction of the device.
- ▶ It is forbidden to directly connect the unit to the 230 V mains voltage.
- ▶ Please avoid mechanical stress when the device is installed.
- ▶ The unit has undergone a comprehensive final check to guarantee that it has left the facility in a perfect condition. Prior to initial operation, the unit has to be examined for damage caused by transport or inappropriate storage. If there is any damage to the unit it must not be taken into service.
- ▶ The unit must not be operated with defective safety equipment or with incorrectly mounted or inoperable safety/protection devices.
- ▶ Prior to initial operation, please check the suitability of the unit for the specific application. Please take special note of the admissible environmental and operating conditions specified in the data sheet.
- ▶ Any removal of identification numbers, repair work by yourself or modification of the unit is forbidden.
- ▶ Prior to initial operation carefully read this user manual containing notes and warnings in order to ensure safe operation.

- ▶ Unless specified differently, all technical data apply to an environmental temperature of 25 °C. The specified values are subject to the usual fluctuations.
- ▶ Stress due to extreme environmental conditions (like intense heat or cold) over a longer period of time may influence reliability. Even under normal conditions of use within the admissible limits, service life may be reduced by permanent operation at the limits. Tolerance of the operating limits is subject to the usual fluctuations.

**WARNING!**

For positioning and installation or removal of the VP system, please observe the relevant instructions given in this user manual.

The device must only be positioned and installed by maintenance personnel that is familiar with the associated risks.

The device can be operated in all positions except standing on its front or rear side.

In case of installation in a housing like a control cabinet: The housing must provide enough space for the VP system, air circulation and cable connections. Moreover, the housing must have sufficient, ideally active, ventilation to avoid overheating.

The cooling fins and the air inlets and outlets must not be blocked or covered.

Installation and removal of additional plug-in cards must be performed by a qualified and trained employee in accordance with the instructions of this manual.

Before removing the device cover please make sure that your system is switched off and disconnected from the power supply.

**Note**

Please observe the safety instructions regarding electrostatically sensitive components (ESC). Failure to observe this warning may cause damage to the device or components of the device.

**Note**

The VP system might get hot during operation and should not be touched without adequate precautions. There is danger of burning.

In order to avoid injuries and damage caused by direct or indirect contact with hot surfaces the following instructions must be observed:

VP device must be positioned and installed in a maintenance area or in an operating facility of limited access.

The users having permission to enter the maintenance area or the operating facility must have received adequate instructions regarding the risks.

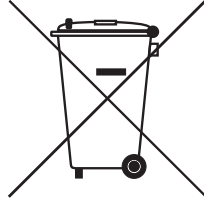
7.2 Disclaimer

**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.

7.3 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/>

8 Wichtige Hinweise

In diesem Kapitel finden Sie die folgenden Informationen:

8.1 Sicherheits- und Gefahrenhinweise	153
8.1.1 Sach- und bestimmungsgemäßer Gebrauch	153
8.1.2 Gefahren	154
8.1.3 Hinweise zur Batterie	154
8.1.4 Warnung vor heißen Oberflächen	154
8.1.5 Elektrostatisch gefährdete Bauelemente (ESD)	155
8.1.6 Zusätzliche Anweisungen	155
8.2 Haftungsausschluss	158
8.3 Entsorgung von Vector Hardware	159

8.1 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.

8.1.1 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.

8.1.2 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.

8.1.3 Hinweise zur Batterie

**WARNUNG!**

Bei unsachgemäßem Austausch der Batterie besteht Explosionsgefahr. Nur durch den gleichen oder gleichwertigen Typ ersetzen, der vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien gemäß den Anweisungen des Herstellers. Bitte beachten Sie auch das Batterie-Begleitblatt! Gilt nur für Geräte, die eine Batterie enthalten.

8.1.4 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.

8.1.5 Elektrostatisch gefährdete Bauelemente (ESD)



WARNUNG!

Eine plötzliche elektrostatische Entladung kann empfindliche Bauteile zerstören. Daher sind die Vorschriften für Verpackung und Erdung zu beachten. Bitte beachten Sie immer die folgenden Sicherheitshinweise:

1. Steckkarten müssen immer in elektrostatisch sicheren Behältern oder Taschen transportiert werden.
2. Bitte lassen Sie elektrostatisch gefährdete Bauelemente in ihren Behältern, bis sie die elektrostatisch sichere Montagestelle erreicht haben.
3. Achten Sie auf die richtige Erdung, wenn Sie elektrostatisch gefährdete Bauelemente berühren.
4. Achten Sie darauf, dass elektrostatisch gefährdete Bauelemente in Schutzverpackungen oder auf antistatischen Matten gelagert werden.



Beispiel

Durch die Beachtung der folgenden Maßnahmen können elektrostatische Schäden am Gerät vermieden werden:

1. Antistatikmatten am Arbeitsplatz auslegen. Tragen Sie ein Erdungsband, das mit dem Arbeitsplatz und den Arbeitsgeräten verbunden ist.
2. Verwenden Sie antistatische Fußmatten, Fußerdungsgeräte oder Luftionisatoren, um zusätzliche Sicherheit zu gewährleisten.
3. Berühren Sie empfindliche Komponenten, Steckkarten und Geräte nur am Gehäuse oder an den Außenkanten der Steckkarten.
4. Vermeiden Sie den Kontakt mit den Pins, Drähten und Leiterbahnen.
5. Stellen Sie sicher, dass alle Spannungs- und Signalquellen ausgeschaltet sind, bevor Sie elektrische Verbindungen herstellen oder trennen oder Prüfgeräte anschließen.
6. Vermeiden Sie nicht leitfähige Materialien wie z. B. übliches Montagezubehör aus Kunststoff oder Polystyrol am Arbeitsplatz.
7. Verwenden Sie leitfähige Werkzeuge (z. B. ESD-Schraubendreher) bei Arbeiten an elektrostatisch empfindlichen Geräten und Komponenten.
8. Stecken Sie Steckkarten und Laufwerke immer mit der Bauteilseite nach unten auf die Antistatikmatte.

8.1.6 Zusätzliche Anweisungen

Allgemeine Informationen

Vor der Benutzung des Geräts sind die folgenden Hinweise unbedingt zu beachten. Wie vom Gesetzgeber vorgeschrieben, geben wir Ihnen wichtige Sicherheitshinweise und Ratschläge, wie Sie Schäden am Gerät und an anderen Einrichtungen vermeiden können.

- ▶ Der Anschluss an das Stromnetz muss mit der richtigen Polarität erfolgen. Eine Verpolung kann zu irreparablen Schäden führen.
- ▶ Die richtige Versorgungsspannung beträgt 12 V DC oder 24 V DC
- ▶ Der Betrieb des Gerätes ist nur in Stromkreisen mit Schutzkleinspannung innerhalb der zulässigen Spannungsgrenzen (SELV-Norm EN60950) zulässig. Dies gilt für alle Verbindungen zum Gerät.

- ▶ Die Verwendung eines Netzteils außerhalb der oben definierten Spannungsgrenzen kann zur Beschädigung oder gar Zerstörung des Gerätes führen.
- ▶ Es ist verboten, das Gerät direkt an die 230 V Netzspannung anzuschließen.
- ▶ Bitte vermeiden Sie mechanische Belastungen bei der Installation des Geräts.
- ▶ Das Gerät wurde einer umfassenden Endkontrolle unterzogen, um zu gewährleisten, dass es die Einrichtung in einem einwandfreien Zustand verlassen hat. Vor der ersten Inbetriebnahme ist das Gerät auf Transportschäden oder unsachgemäße Lagerung zu untersuchen. Wenn das Gerät beschädigt ist, darf es nicht in Betrieb genommen werden.
- ▶ Das Gerät darf nicht mit defekten Sicherheitseinrichtungen oder mit falsch montierten oder nicht funktionsfähigen Sicherheits-/Schutzeinrichtungen betrieben werden.
- ▶ Bitte prüfen Sie vor der ersten Inbetriebnahme die Eignung des Gerätes für den jeweiligen Anwendungsfall. Bitte beachten Sie insbesondere die im Datenblatt angegebenen zulässigen Umgebungs- und Betriebsbedingungen.
- ▶ Jegliche Entfernung von Identifikationsnummern, eigene Reparaturen oder Veränderungen am Gerät sind untersagt.
- ▶ Lesen Sie vor der ersten Inbetriebnahme diese Bedienungsanleitung mit den Hinweisen und Warnungen sorgfältig durch, um einen sicheren Betrieb zu gewährleisten.
- ▶ Wenn nicht anders angegeben, gelten alle technischen Daten für eine Umgebungstemperatur von 25 °C. Die angegebenen Werte unterliegen den üblichen Schwankungen.
- ▶ Belastungen durch extreme Umweltbedingungen (wie starke Hitze oder Kälte) über einen längeren Zeitraum können die Zuverlässigkeit beeinflussen. Auch bei normalem Gebrauch innerhalb der zulässigen Grenzen kann sich die Lebensdauer durch Dauerbetrieb an den Grenzwerten verringern. Die Toleranz der Betriebsgrenzen unterliegt den üblichen Schwankungen.

**WARNUNG!**

Für die Positionierung und den Ein- oder Ausbau des VP-Systems beachten Sie bitte die entsprechenden Hinweise in dieser Bedienungsanleitung.

Das Gerät darf nur von Wartungspersonal, das mit den damit verbundenen Risiken vertraut ist, aufgestellt und installiert werden.

Das Gerät kann in allen Positionen betrieben werden, außer stehend auf seiner Vorder- oder Rückseite.

Bei Einbau in ein Gehäuse wie einen Schaltschrank: Das Gehäuse muss genügend Platz für das VP-System, die Luftzirkulation und die Kabelanschlüsse bieten. Außerdem muss das Gehäuse über eine ausreichende, idealerweise aktive, Belüftung verfügen, um eine Überhitzung zu vermeiden. Die Kühlrippen und die Luftein- und -auslässe dürfen nicht blockiert oder abgedeckt werden.

Der Ein- und Ausbau zusätzlicher Steckkarten muss von einem qualifizierten und geschulten Mitarbeiter gemäß den Anweisungen dieses Handbuchs durchgeführt werden.

Bevor Sie die Geräteabdeckung abnehmen, vergewissern Sie sich bitte, dass Ihr System ausgeschaltet und von der Stromversorgung getrennt ist.

**Hinweis**

Bitte beachten Sie die Sicherheitshinweise für elektrostatisch gefährdete Bauelemente (ESC). Die Nichtbeachtung dieser Warnung kann zu Schäden am Gerät oder an Komponenten des Geräts führen.

**Hinweis**

Das VP-System kann während des Betriebs heiß werden und sollte nicht ohne entsprechende Vorsichtsmaßnahmen berührt werden. Es besteht die Gefahr von Verbrennungen.

Um Verletzungen und Schäden durch direkten oder indirekten Kontakt mit heißen Oberflächen zu vermeiden, müssen die folgenden Hinweise beachtet werden:

Das VP-Gerät muss in einem Wartungsbereich oder in einer Betriebsstätte mit begrenztem Zugang aufgestellt und installiert werden.

Die Benutzer, die die Erlaubnis haben, den Instandhaltungsbereich oder die Betriebsanlage zu betreten, müssen eine angemessene Unterweisung über die Risiken erhalten haben.

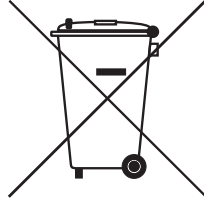
8.2 Haftungsausschluss

**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.

8.3 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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