

VOCOM II

Operation Instructions

VOCOM II Tough



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1 Identification

The VOCOM II communication unit is the latest diagnostic hardware tool developed by Volvo Group for maintenance of trucks, buses, engines and machines.

Three VOCOM II product variants exist for use in workshops (Tough variant), production lines (Tough and Light variant) and "on the truck" (Dongle variant). Only the Tough variant is in scope of these operation instructions.

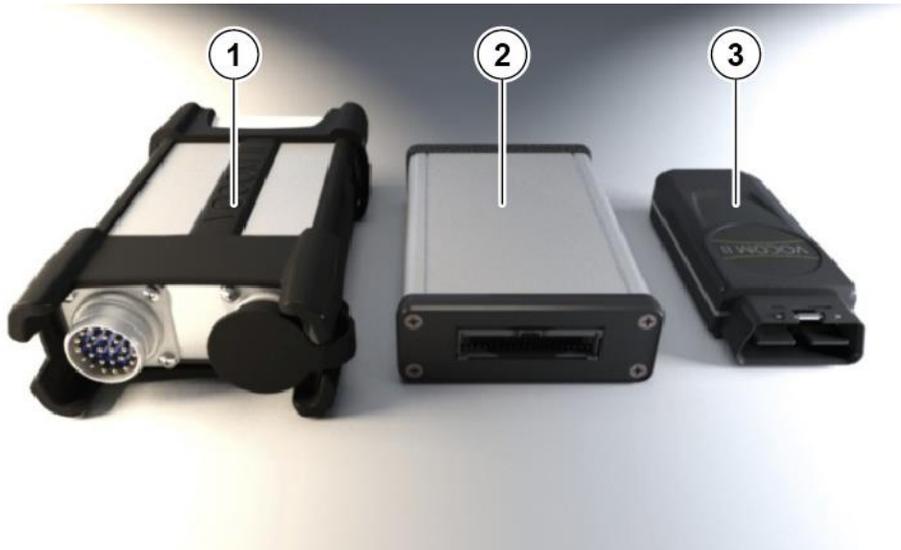


Fig. 1-1: Product variants of VOCOM II

1 Tough variant

3 Dongle variant

2 Light variant

Tab. 1–1 lists the product features of VOCOM II Tough.

Parameter	Description
Vehicle Power supply	Supports 12 V or 24 V power supply Operating voltage 6 V to 32 V
USB Power Supply	USB 2.0 High Power Device or USB 3.0 High Power Device
CPU	QUALCOMM/Atheros AR9350, 32 bit MIPS 74 Kc, 533 MHz
RAM	2x128 MB DDR
Storage	128 MB NAND FLASH 16 MB NOR FLASH
USB	USB 2.0 High Power Device
Network Interface	USB Ethernet communication via RNDIS interface
WiFi Standards and Frequency Bands	IEEE 802.11 a/b/g/n Hardware supports 2.4 and 5 GHz operation
WiFi Security	WPA (TKIP/PSK), WPA2(PSK/Enterprise), WPS
WiFi Configuration	Infrastructure (Access Point/Client) and WiFi-Direct
Vehicle Connector	ECTA / OBD
Vehicle interface	CAN, J1708, K-Line, DoIP / Ethernet, Digital I/O
Diagnostic APIs	RP1210C, J2534, J2534-1, VOCOM II Smartphone API
Operating system support	Windows 7, 8, 10 (32/64 bit)

Tab. 1–1: Product features of VOCOM II

2 About VOCOM II Tough operation instructions

2.1 Use and purpose of the operation instructions

These operation instructions are intended for the end user. These operation instructions help you:

- To setup and use the product.
- To avoid hazards.
- To prevent downtime.
- To ensure or increase the service life of this product

Instructions about hazards, safety regulations, as well as the information in these operation instructions must be observed without exception. For the proper and safe operation and performance of work on the device, it is vital that you read, understand and apply these operation instructions.

As a rule, company-specific instructions are less extensive than those in these operation instructions. The operation instructions are designed to be the basis for the instruction of the qualified personnel.

2.2 Symbols used in the operation instructions

Various markings and symbols are used in the text in these operation instructions. These are explained below.

▶ Symbol for a required act or measure

▶ Subdivided point

1 Numbered action steps

2 Numbered action steps

● Symbol for a list

1. Numbering

2. Numbering

⇒ Chap. - Reference to a chapter

⇒ Fig. - Reference to a figure

NOTE Symbol for additional information and instructions.



See Classification of the warning instructions. (⇒ Chap. 3.1.2 "Classification of the warnings")

2.3 Validity of the operation instructions

These operation instructions are valid only for the following product:

- VOCOM II Tough, hereinafter referred to as "VOCOM II" or "device".

The type of the device is specified on the type plate.

2.4 Type plate

The type plate is attached to the housing.

The following information is presented on the type plate:

- Article number: AR10009037
- Hardware revision: Rev. X, X indicates the revision index of the production instruction
- Production date: ww/jj
- Serial number (S/N): 71xxxxx, serially numbered, starting with 7100001
- S/N as C128 bar code
- MAC address of WLAN interface: nn-nn-nn-nn-nn-nn

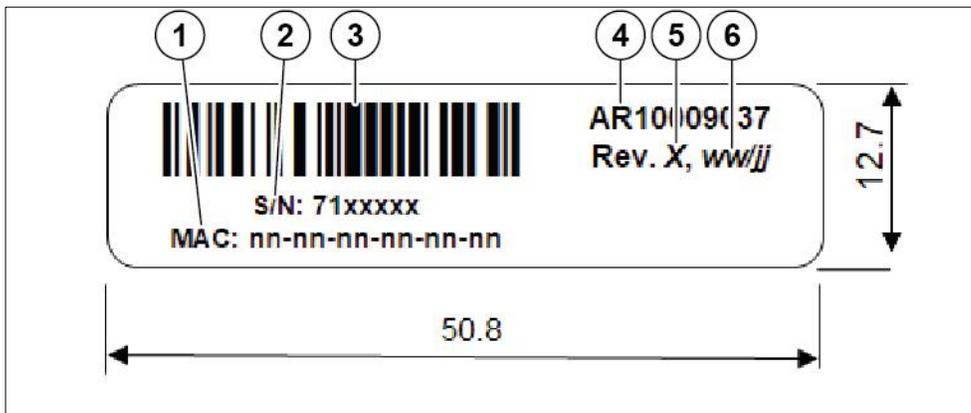


Fig. 2-1 Type plate of VOCOM II

1	MAC address	4	Article number
2	Serial number	5	Hardware revision
3	C128 bar code	6	Production date

2.5 Warranty and liability

VOCOM II comes with a 2 year warranty. Volvo Groups Spare Parts Warranty applies.

Warranty and liability claims for personal and property damage are excluded if they are due to one or more of the following causes:

- Improper use. (⇒ Chap. 3.2 "Proper and intended use")
 - Failure to follow the instructions, do's and don'ts of the operation instructions.
 - Unauthorized structural changes to VOCOM II.
- ▶ Comply with all applicable legal rules and regulations.

Changes to the device can lead to the loss of the warranty.

To avoid this, comply with the following instructions:

- ▶ Do not perform any independent modifications or tamper with the device.
- ▶ Only use proper and authorized materials.

2.6 Owner's obligations

The owner must:

- Ensure that only persons who have read the operation instructions use the device.
- Ensure that the prescribed firmware updates are done according to schedule. (⇒ Chap. 9.2.2 "Firmware Updates")

3 For your safety

These operation instructions provide instructions about safety.

- ▶ Follow all instructions to avoid personal injury, environmental damage or property damage.

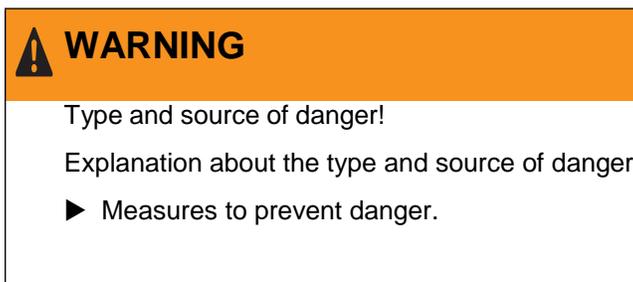
3.1 Safety instructions and warnings

The basic safety instructions contain instructions which apply fundamentally to the safe use or the maintenance of the safe state of VOCOM II.

The action-related warnings warn you about residual risks and are positioned before a hazardous action.

3.1.1 Structure of warnings

Warnings are structured as follows:



3.1.2 Classification of the warnings

Action-related warnings are marked with different signal words, symbols and colours depending on the severity of the risk. The warnings used in the text are explained in the following.



3.2 Proper and intended use

VOCOM II Tough is intended solely for maintaining trucks, buses, engines and machines made by Volvo Group. VOCOM II Tough is used for vehicle diagnostic communication in workshops, production facilities and warehouses.

VOCOM II can be used for a period of about 15 years, provided that regular maintenance and testing ensure safe operation.

Non-intended use (foreseeable misuse):

- ▶ Avoid the following listed areas of misuse:
 - Opening VOCOM II.
 - Careless handling of VOCOM II.
 - Careless handling of cables used with VOCOM II.
 - Use of defective cables.
 - Use of unauthorized cables.
 - Exceeding the permissible operating voltage of VOCOM II.
 - Use of incorrect regional settings in WLAN mode.
 - Use other than under the specified conditions and requirements laid out by the manufacturer in its technical documents, data sheets, assembly, installation and operation instructions and in other specific regulations.

3.3 Warnings

NOTICE

Possible material damage due to removal of protectors!

The device and the materials can be damaged if the front protector and WLAN protector are removed during transport.

- ▶ Keep the front protector and WLAN protector fitted on the device when preparing VOCOM II for transport.

CAUTION

Risk of slight injuries due to careless handling of cables.

There is risk of slight injuries in case of careless handling of cables used with VOCOM II.

- ▶ Do not pull the cables.
- ▶ Make sure that cables do not run across the floor.

WARNING

Serious injuries due to improper maintenance work!

Improperly performed maintenance work can impair the safety of the device and cause serious injuries.

- ▶ Only allow authorized and instructed personnel to perform maintenance work.

NOTICE

Possible material damage due to unsuitable cleaning agents!

Incompatible and aggressive cleaning agents can damage the surface or the components.

- ▶ Only use a moist cloth for cleaning the device.
- ▶ Do not use hard sponges etc.
- ▶ Only use cleaning agents which are compatible with the surfaces and the materials.
- ▶ Do not clean the interior of the device.

3.4 Limits of use

- ▶ Observe the following requirements concerning the operating environment and the infrastructure:

Operating environment / facilities	Limits of use
EX areas (Electrical equipment in hazardous areas)	Not authorized for EX areas
Humidity and temperature	Operation and Transport & storage: 75 % humidity at -40°C to +85°C (-40°F to +185°F)

Tab. 3-1: Limits of use of VOCOM II

4 Design and function

4.1 Design

VOCOM II has a ruggedized design with an aluminium enclosure and ECTA connectors for OBD interfaces (vehicle side) and USB interfaces (host side). The WLAN antennas are located under the plastic cap with the function indicators.

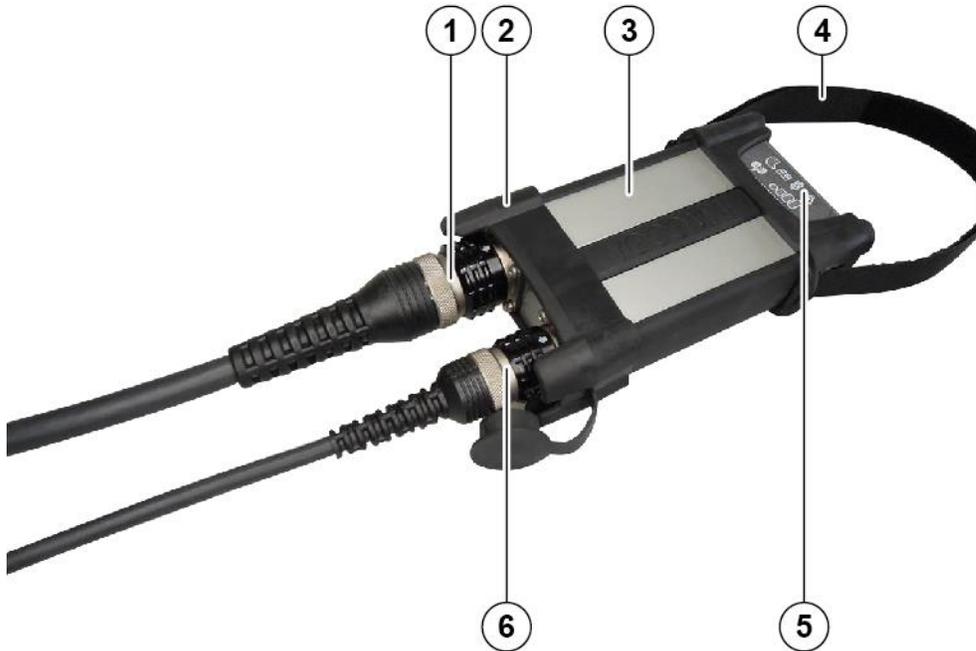


Fig. 4-1: Design of VOCOM II

1 ECTA-26 / OBD connector	4 Carry strap with Velcro fastener
2 Rubber protector	5 Plastic cap with WLAN antennas and function indicators
3 Aluminium enclosure	6 ECTA-12 / USB connector with dust cap

4.2 Communication interfaces

4.2.1 Vehicle communication interfaces

Tab. 4-1 lists the available vehicle communication interfaces for VOCOM II:

Vehicle communication	Description
CAN	2 CAN channels <ul style="list-style-type: none"> Compliant to ISO 11898-2:2015

J1708	<p>1x SAE J1708 channel</p> <ul style="list-style-type: none"> J1708 bus topology, 20 nodes @9600 bit/s J1708 high-speed 1 to 1 @14400, 19200, 38400, 57600, 115200 bit/s
ISO 9141	<p>1x K-Line, 1x L-Line</p> <ul style="list-style-type: none"> Baud rates: 600 - 115200 baud
ISO 13400	<p>1x DoIP Ethernet</p> <ul style="list-style-type: none"> Supports both vehicle pinning variants
Digital I/O	<p>3x DI</p> <ul style="list-style-type: none"> Low: 0 to 3.5 V, High: 7.2 to 32 V, TH: 4.25 V 3x DO High-side automotive switches, 200 mA
RT legacy	Via VOCOM II Smartcable

Tab. 4–1: Vehicle communication interfaces of VOCOM II

4.2.2 Host communication interfaces

VOCOM II can be used from a host PC (tester) via USB 2.0 or WLAN 802.11 a/b/g/n.

- For USB connectivity, the VOCOM ECTA-12/USB cable is required.
- The WLAN interface supports 2.4 GHz and 5 GHz operation and can be configured either for WiFi-Direct or WLAN-Infrastructure mode. VOCOM II can be also configured as WLAN Access Point.

4.2.3 Function indicators

The device has six function indicators with different colours to indicate the operating statuses and dangers of VOCOM II.

The following symbols are located on the plastic cap of VOCOM II:

Symbol	Indicator name	Description
	Vehicle power	<p>Multi-colour LED</p> <p>Green: normal</p> <p>Orange: too low/high</p> <p>Red: critically low/high</p>
	PC Link	<p>Green LED</p> <p>Continuous: USB powered</p> <p>Flashing: PC Comm activity</p>

	<p>Warning</p>	<p>Multi-colour LED</p> <p>Continuous orange: warning</p> <p>Continuous red: critical error</p> <p>Blinking orange: overtemperature</p>
	<p>WLAN quality</p>	<p>Two leftmost bars (1, 2): dual-colour LEDs</p> <p>Other bars (3, 4): green LEDs</p> <p>Red bar (1): WLAN connectivity error</p> <p>Green bars (1-4): signal quality</p>
	<p>WLAN link</p>	<p>Blue LED</p> <p>Blinking 1 Hz: WLAN link / scanning, not connected</p> <p>Continuous: WLAN link / connected</p> <p>Flashing: WLAN Comm activity</p>
	<p>Smartcable Connectivity</p>	<p>Green LED</p> <p>Continuous: Smartcable connected</p>

Tab. 4-2: Function indicators of VOCOM II

4.2.4 WPS button

The WPS button for WiFi Protected Setup and Factory Reset is integrated into the front protector.

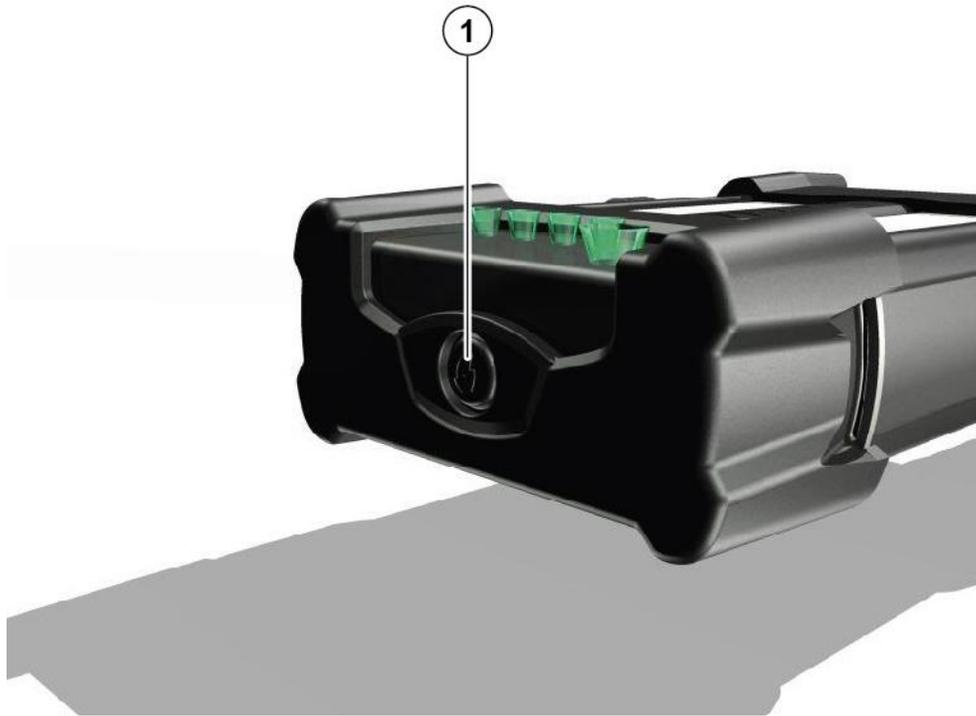


Fig. 4-2: WPS button of VOCOM II

1 WPS button

4.3 Operation modes

VOCOM II is designed and constructed for use in the following operation modes:

- WLAN operation mode
- USB operation mode

4.3.1 WLAN operation mode

NOTE In WLAN operation mode, VOCOM II is powered via OBD.

The WLAN operation status of VOCOM II is indicated by the following function indicators:

- WLAN connectivity status (blue LED, antenna symbol)
- WLAN signal strength (green LED, bar graph)
- PC communication status (green LED, laptop symbol)



Fig. 4-3: VOCOM II front label with link status indicators

1 PC communication status	3 WLAN signal strength
2 WLAN connectivity status	

- If the WLAN interface is active, the WLAN connectivity status LED will be ON.
- If the WLAN connection has been established, the WLAN status LED will be constantly ON and flashing in case of RX/TX activity and the LED bar graph will indicate the signal strength.
- If no WLAN connection has been established, the WLAN status LED will blink with a period of approximately 1 second and the LED bar graph will be OFF (signal strength is 0).
- In case of RX/TX activity, the PC communication status LED will flash.
- The vehicle battery status is indicated by the VBAT status LED.
 1. Normal battery state (12/24 V operation) is indicated by green colour.
 2. Low battery states are indicated by yellow (low) and red colour (critical).

Fig. 4-4 shows the typical function indicator state of VOCOM II in WLAN operation mode.



Fig. 4-4: VOCOM II function indicators in WLAN operation mode

1 WLAN connectivity status	4 WLAN signal strength
2 PC communication status	5 ECTA / OBD connector
3 VBAT status	

4.3.2 USB operation mode

NOTE In USB operation mode, VOCOM II is powered via OBD (primarily) or USB.

Fig. 4–5 shows the typical function indicator state of VOCOM II in USB operation mode.



Fig. 4–5: VOCOM II function indicators in USB operation mode

1 PC communication status	3 ECTA / USB connector
2 VBAT status	4 ECTA / OBD connector

The USB operation status indication is as follows:

- The PC communication status LED shines green when the device is powered via USB.
- The PC communication status LED is flashing during RX/TX activity.
- The vehicle battery status is indicated by the VBAT status LED.
 1. Normal battery state (12/24 V operation) is indicated by green colour.
 2. Low battery states are indicated by yellow (low) and red colour (critical).

4.4 Supported vehicle communication APIs

VOCOM II supports the following vehicle communication APIs:

- Smartphone API
- RP1210C API
- 2534/J2534-1 API

VOCOM II supports several vehicle communication interfaces. (⇒ chap. 4.2.1 “Vehicle communication interfaces”)

5 Installation



Fig. 5-1: VOCOM II function indicators in USB operation mode

1 PC communication status

3 ECTA / USB connector

2 VBAT status

4 ECTA / OBD connector

Connect the VOCOM II device to the USB port of the PC. The device is ready to communicate when the PC communication status LED shines green.

When connecting a new VOCOM II device for the first time the Windows device driver setup will run:



Fig. 5-2: Installing device

NOTE When connecting a VOCOM II device for the first time, the device installation could take several minutes due to the Windows specific “driver installation” feature.

The installation progress and remaining time is displayed during the installation.

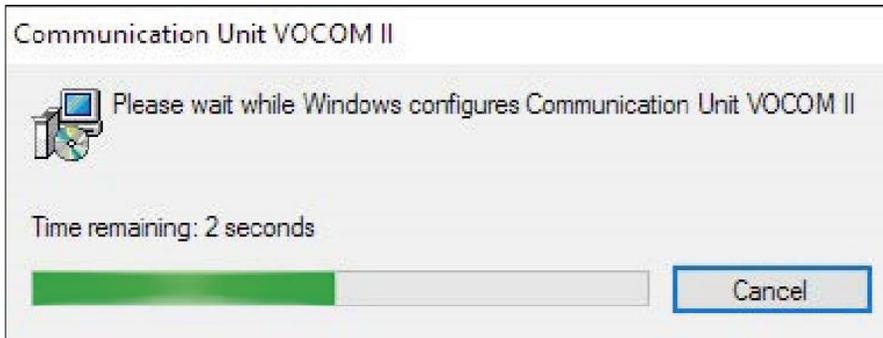


Fig. 5-3: Startup screen of the VOCOM II Windows installer

If the device driver installation has been successfully completed, a task bar notification will be shown:



Fig. 5-4: Device ready to use



Fig. 5-5: Device installed

If for some reason the device driver fails to install, try again by disconnecting VOCOM II from the USB port and connecting it to a different USB port or by restarting the computer.

5.1 Firewall rules

For proper operation of the VOCOM II hardware, the following firewall rules have to be set up. For the standard Windows firewall, the VOCOM II Windows installer will add these firewall rules automatically during the installation process.

Firewall rule	Setting
VOCOM II CAST	<ul style="list-style-type: none">● Direction: inbound● Protocol: UDP● Port: 427
VOCOM II HTTP	<ul style="list-style-type: none">● Direction: outbound● Protocol: TCP● Port: 80
VOCOM II HTTP	<ul style="list-style-type: none">● Direction: outbound● Protocol: TCP● Port: 27015
VOCOM II HTTP	<ul style="list-style-type: none">● Direction: outbound● Protocol: TCP● Port: 2534

Tab.5-1: Firewall rules

6 Configuration

The Config Application provides all features necessary to configure and update VOCOM II devices.

The VOCOM II Config Application is started from Windows Start menu: **Start > All Programs > VOCOM II Configuration Application.**

For each available VOCOM II device there is a single device list containing information regarding:

- Product Variant
- Serial Number
- Connection Type (USB: Wire symbol, WLAN: Radio symbol)
- Pairing status
- Device status
- Software Update status

Each VOCOM II device available will be listed on the Device list that is always visible at the left side of the application.

NOTE This is the default tab when opening the application or when selecting another device in the list.

NOTE The Device list is continuously updated and will update the connection type as they change or show new devices as they become available.

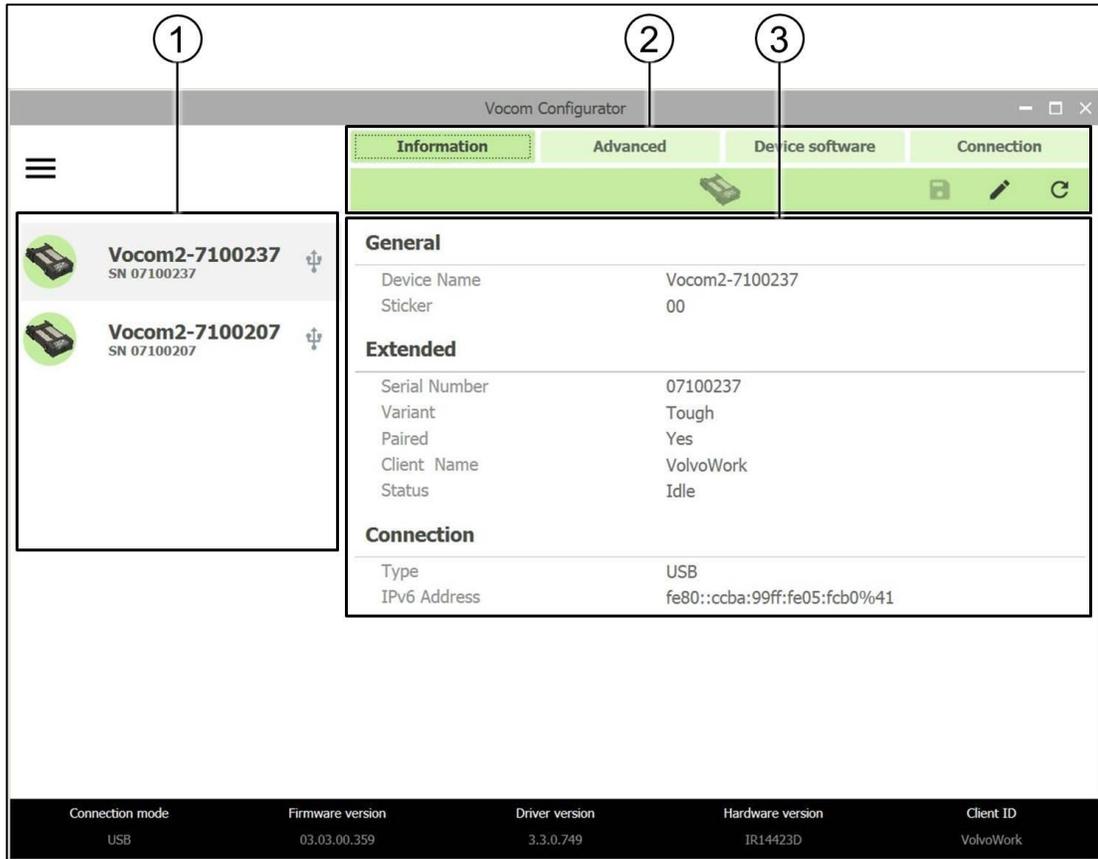


Fig. 6–1: VOCOM II Config Application main window

- | | |
|---------------|----------------------|
| 1 Device list | 3 Configuration page |
| 2 Menu bar | 4 Info bar |

The main window components are the **Device** list to the left, the **Info** bar at the bottom, the **Menu** bar at the top and the Configuration page in the middle right.

The Info bar shows information about the software version and connection mode of the selected device. The Configuration page displays content from the currently active configuration page.

The four main configuration pages are **Information**, **Advanced**, **Device Software** and **Connection**, these can be reached via their corresponding **Menu** bar tabs.

To save configuration changes and reboot the device, use the **Save** and **Reboot** buttons on the **Menu** bar.

The **Edit** button opens the configuration page for basic device setup, factory reset and device pairing.

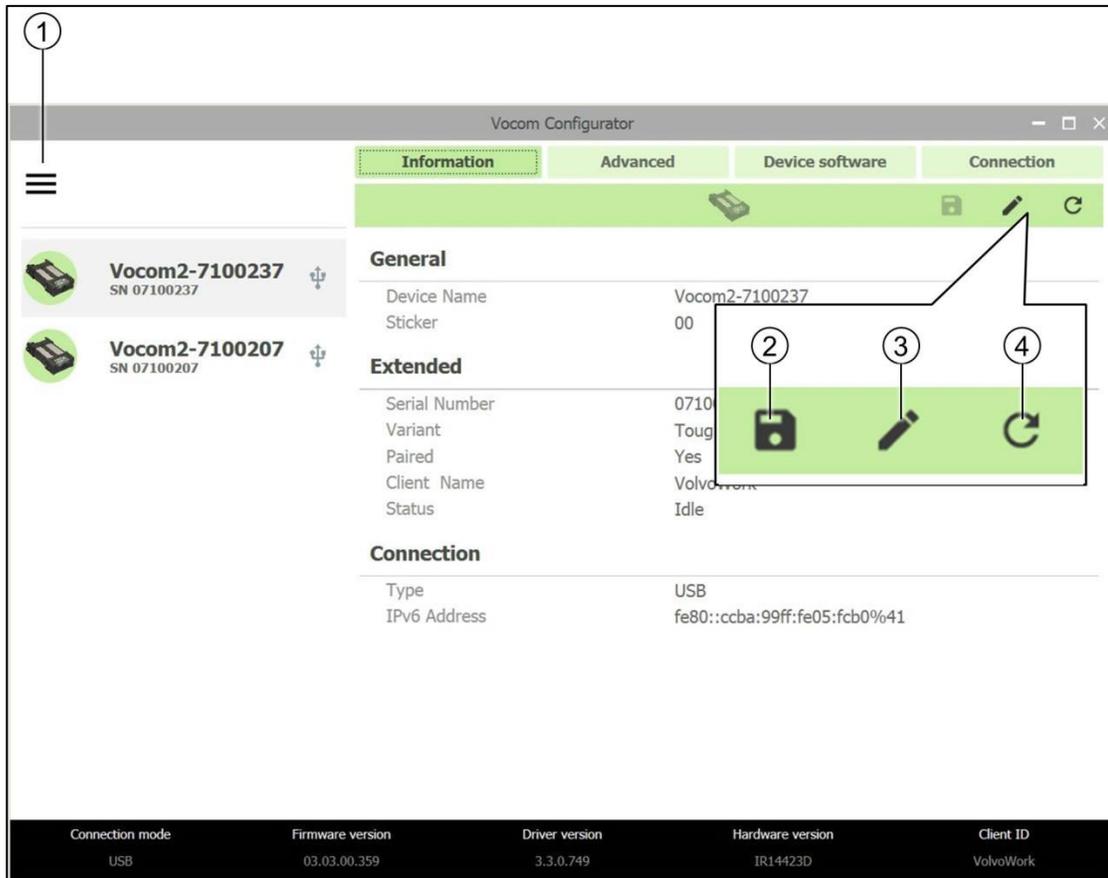


Fig. 6–2: Options menu, Save, Edit and Reboot buttons

- | | |
|----------------|-----------------|
| 1 Options menu | 3 Edit button |
| 2 Save button | 4 Reboot button |

Additional VOCOM II Config Application features can be accessed from the Options menu in the upper left corner, above the Device list. Among those features are the **Help** function, the **Language settings**, the **Logging configuration** dialog and the **Device mapping** dialog.

(⇒ Chap. 6.4 "Options menu functions")

6.1 Device list

The Device list of the VOCOM II Config Application contains the currently connected VOCOM II device(s).

A single mouse click on a Device list entry will change the device context of the Info bar and the Configuration page view.

A double mouse click on a Device list entry will select this device instance as default device.

The currently selected default device is indicated by a green check mark.

Fig. 6–3 shows examples of Device list entries for different device variants and states.



Fig. 6–3: Device list entries

1	Tough variant, Idle status	5	Name and serial number
2	Light variant, Idle status	6	USB connection
3	Tough variant, Idle status	7	WLAN connection
4	Selected default device		

6.2 Perform basic device setup

Click **Edit** from the **Menu** bar to open the VOCOM II Config Application and perform the basic device setup. In the basic VOCOM II device setup you can do the following:

- Change the **Device Name** and **Sticker** number.
- Pair the device with the local PC.
- Reset the device configuration to factory settings.
- Perform a firmware update. (⇒ Chap. 6.2.46.2.4 “Perform Firmware Update”).

6.2.1 Change Device Name and Sticker number

You can change the **Device Name** and **Sticker** number of your VOCOM II device in the basic device setup configuration page.

To change the **Device Name** and **Sticker** number of your VOCOM II device, perform the following steps:

- 1 Click **Edit** from the **Menu** bar.
- 2 Change the **Device Name** and / or **Sticker** number.
- 3 Click **Save**.

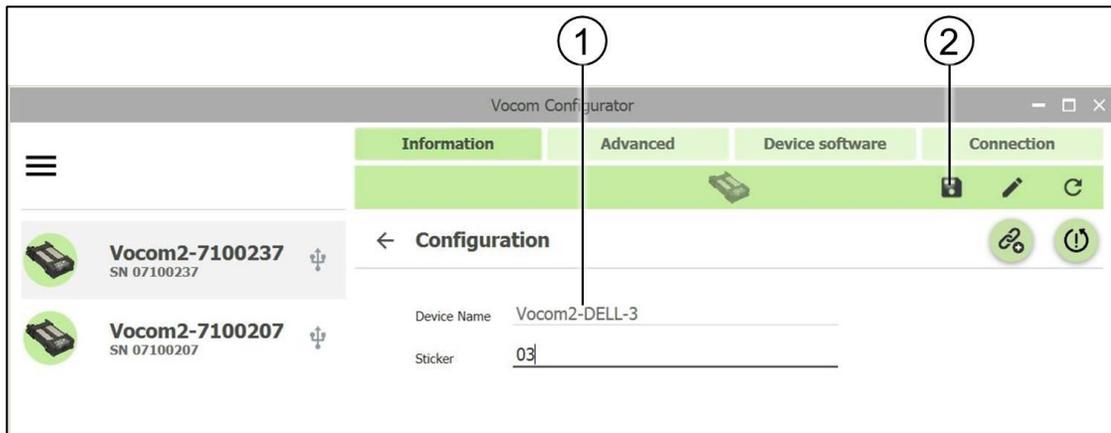


Fig. 6-4: Changing the Device Name and Sticker number

1 Device Name and Sticker number

2 Save button

- 4 Click **Reboot**.

The new **Device Name** and / or **Sticker** number are updated in the corresponding Device list entry and **Information** page.



Fig. 6-5: Changing the Device Name and Sticker number

6.2.2 Pair with local PC

Pairing is a prerequisite for WLAN usage.

The following tasks can only be performed if the VOCOM II device is paired:

- Diagnostic communication via WLAN
- Firmware update via WLAN
- Changing the device settings via WLAN

NOTE After a factory reset the pairing is lost.

NOTE In order to pair a VOCOM II device, you have to connect it to the client PC via USB.

To pair a VOCOM II device, perform the following steps:

Click on the **Edit** button in the **Menu** bar.

2 In the Configuration page, click on the **Pair** button.

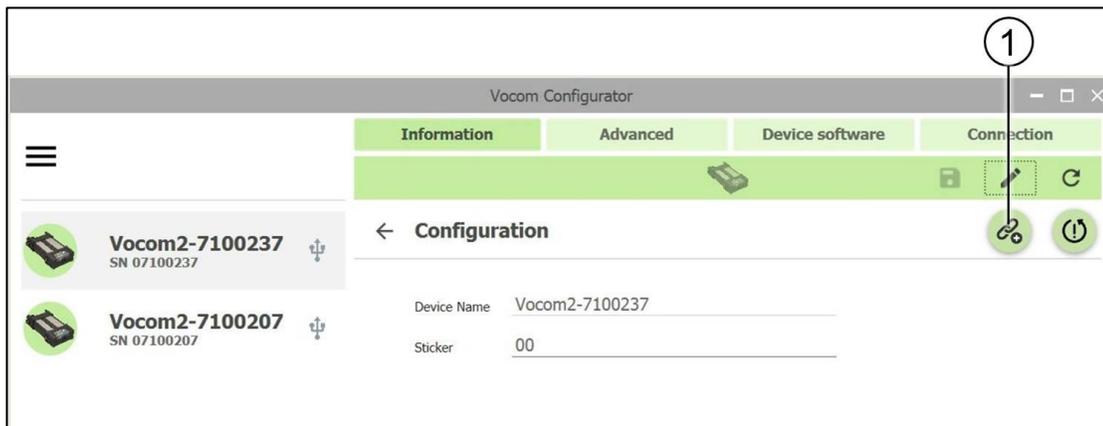


Fig. 6-6: Pairing a VOCOM II device with a client PC

1 Pair button



Fig. 6-7: Pairing a VOCOM II device with a client PC

1 Client Name

2 Pair button

3 In the **Pairing** dialog, enter a name (**Client Name**) to be displayed in the **Info** bar.

4 In the **Pairing** dialog, click on the **Pair** button.

NOTE The current paired computer is always displayed in the **Info** bar in the **Client ID** field.

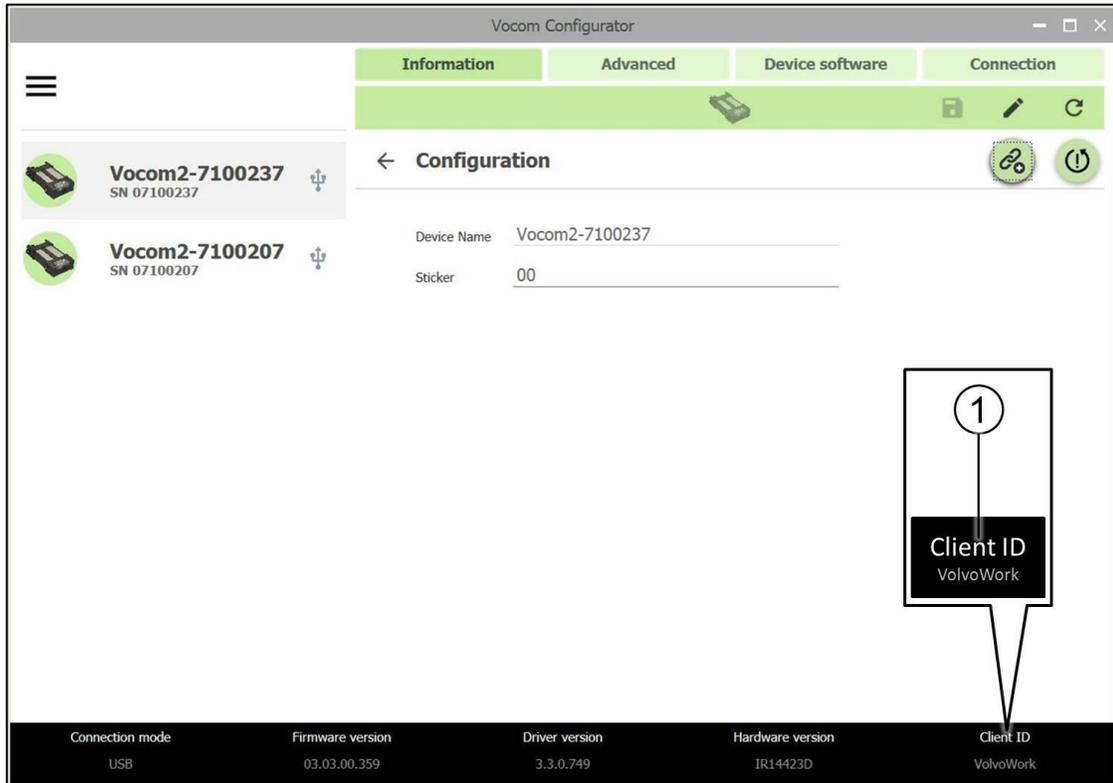


Fig. 6–8: Pairing a VOCOM II device with a client PC

1 Client ID

6.2.3 Perform a factory reset

A factory reset will revert the VOCOM II device configuration to its original state and restore the factory default settings.

NOTE A factory reset can only be performed when the VOCOM II is connected via USB.

To perform a factory reset, perform the following steps:

- 1 Click Edit from the **Menu** bar.
- 2 In the Configuration page, click Factory Reset.
- 3 Confirm the factory reset.
- 4 Reboot the device.

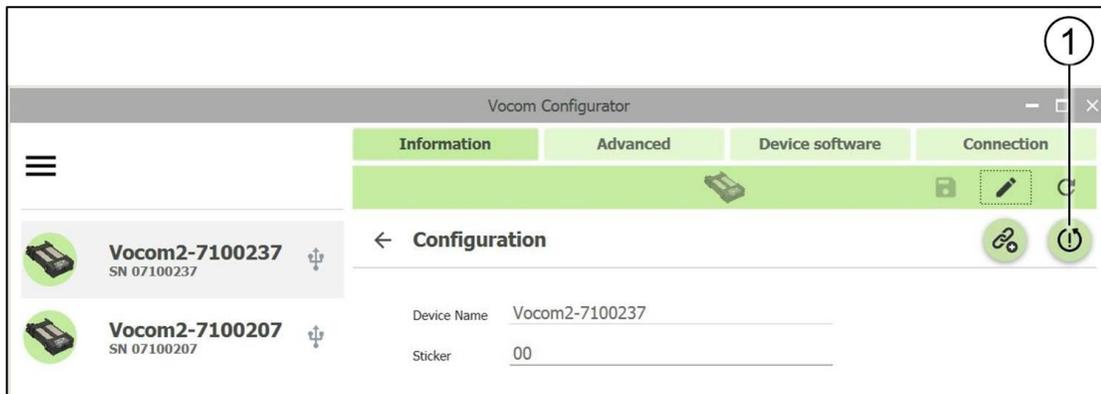


Fig. 6–9: Performing a factory reset

1 Factory Reset button

6.2.4 Perform Firmware Update

The firmware package of a particular VOCOM II release is part of the Windows installer.

Firmware updates can only be performed on USB-connected devices or on paired WLAN devices. Follow these steps in order to update the VOCOM II software:

- 1 Select a device from the Device list.
- 2 Select **Device software** tab.

The Software Update page will be shown with information about the firmware currently installed in the selected device.

The latest compatible firmware is already selected.

- 3 Click the **Update device** button.
- 4 The firmware update will start.
- 5 During a firmware update the progress bar displays the completion status in per cent. You can cancel the firmware download at any time by clicking the Close button.

After the firmware update has been completed the device restarts automatically to switch to the new device firmware version. Wait until restart is completed.

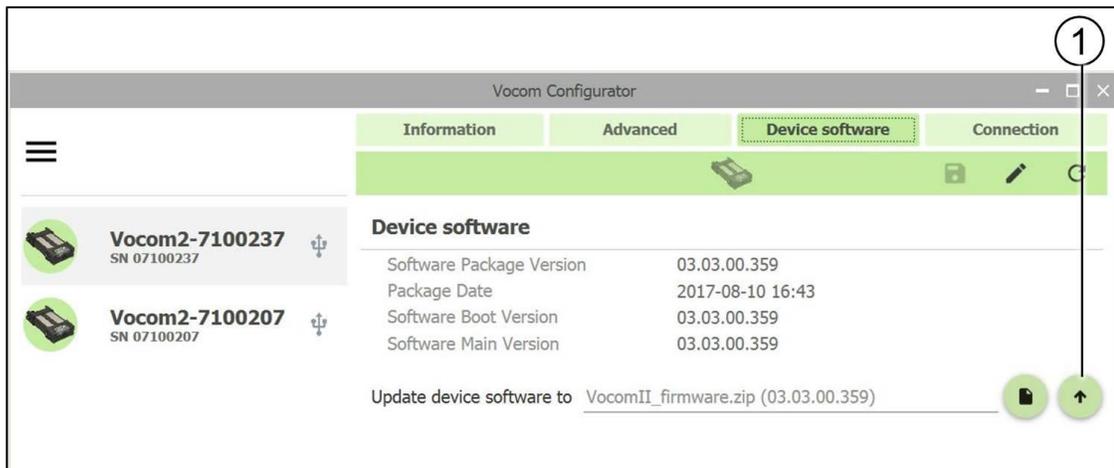


Fig. 6–10: Performing VOCOM II firmware updates

1 Update device button

NOTE If the new firmware version includes an FPGA update, the firmware update may continue after device reboot.

NOTE Updating the internal FPGA on VOCOM II may take several minutes.

6.3 WLAN configuration

NOTE Please make sure that the VOCOM II is connected via USB and is ready to operate.

Open the VOCOM II Config Application and perform the WLAN configuration. To open the WLAN configuration page of a particular device you have to perform the following steps:

- 1 From the Device list, select the VOCOM II device you want to configure for WLAN operation.
- 2 Click Connection in the **Menu** bar.
- 3 The WLAN Configuration page will be shown:
 1. The WLAN Infrastructure Mode is normally used in a workshop environment where there is already an existing infrastructure network.
 2. The WLAN Direct mode is used when the laptop needs to be directly connected to a VOCOM II device via WLAN, e.g. when using it in the field without the existence of an infrastructure network.

NOTE WiFi-Direct is a feature for other client platforms (e.g. Android) and should not be used on Windows platforms since it is not properly supported yet.

NOTE WLAN configuration changes will only take place after rebooting the device.

After configuring the VOCOM II WLAN interface and rebooting the device, unplug the USB cable. Make sure the VOCOM II is powered from ECTA/OBD connector.

- The VBAT indicator (battery symbol) should shine green.
- The WLAN indicator (antenna symbol) should shine blue.
- The WLAN signal strength indicators (LED bar) should be lit.

When the WLAN connection has been successfully established, then the WLAN signal strength is indicated by the 4 LED bars.

WLAN RX/TX activity is indicated by flashing WLAN- and PC-Comm status indicators in case of Vehicle traffic is on-going.

6.3.1 WLAN-Direct Mode

NOTE Before using the VOCOM II device in WLAN-Direct mode, make sure that it is paired with your PC. (⇒ Chap. 6.2.2 "Pair with local PC")

WLAN-Direct is the default VOCOM II WLAN mode. WLAN-Direct mode only supports operation in 2.4 GHz band. The default WLAN-Direct settings are as follows:

WLAN mode / connection	Access Point
Network name / SSID	Vocom2T_[serial number] Example: Vocom2T_7100133
Broadcast SSID	Yes
Password	v2t[serial number] Example: v2t7100133
Encryption	WPA + WPA2
Channel	3
IPv4 address	192.168.51.1/24
Activate DHCP server	Yes
IPv4 address range	192.168.51.101 - 192.168.51.149

Tab. 6–3: WLAN-Direct default settings

Fig. 6–11 shows the WLAN-Direct configuration page with default settings.

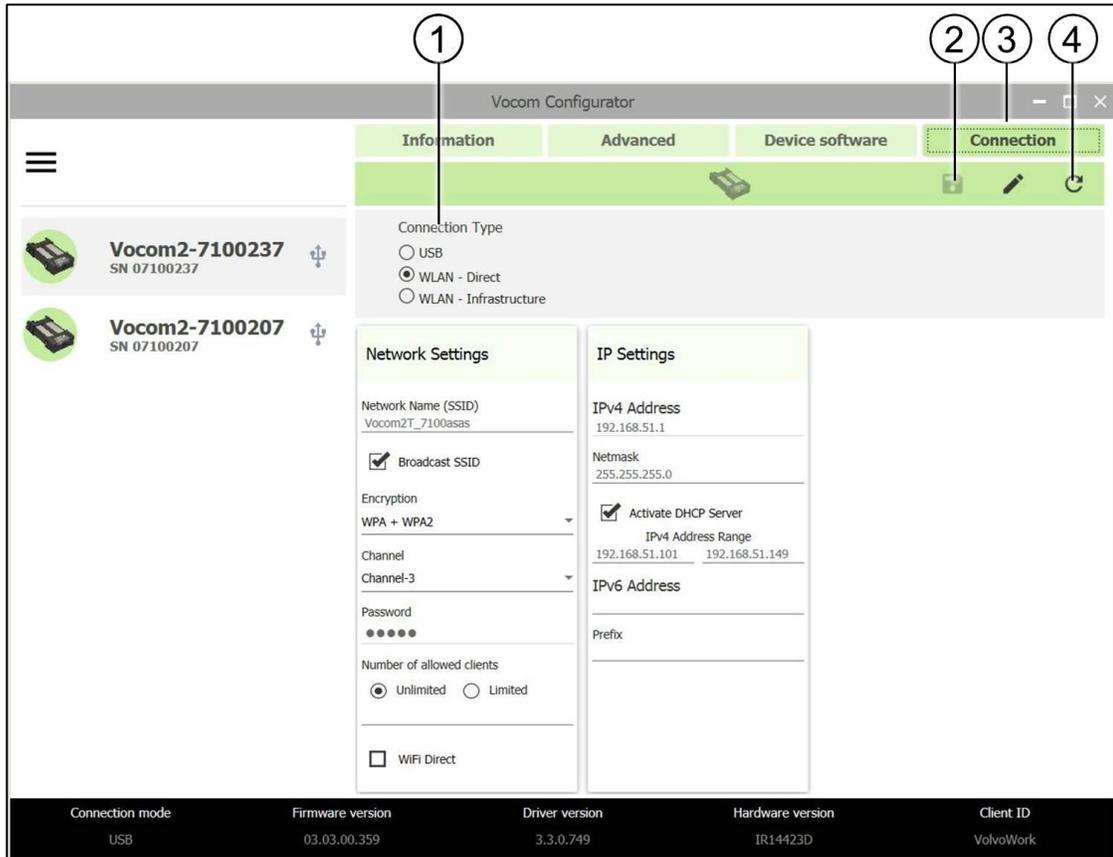


Fig. 6–11: WLAN-Direct configuration page

- | | | | |
|---|-----------------------|---|----------------|
| 1 | Connection Type panel | 3 | Connection tab |
| 2 | Save button | 4 | Reboot button |

To change the WLAN-Direct configuration, perform the following steps:

NOTE When changing the IPv4 settings, make sure that the following conditions are met:

- IPv4 Address and Netmask are consistent.
- If Activate DHCP Server is enabled, the DHCP IPv4 address range must belong to the same network as the chosen IPv4 address.

- 1 Click **Connection** from the **Menu** bar.
- 2 Select **WLAN-Direct** in the Connection Type panel.
- 3 Change the VOCOM II Access Point settings according to your needs
- 4 Click **Save**.
- 5 Click **Reboot**.

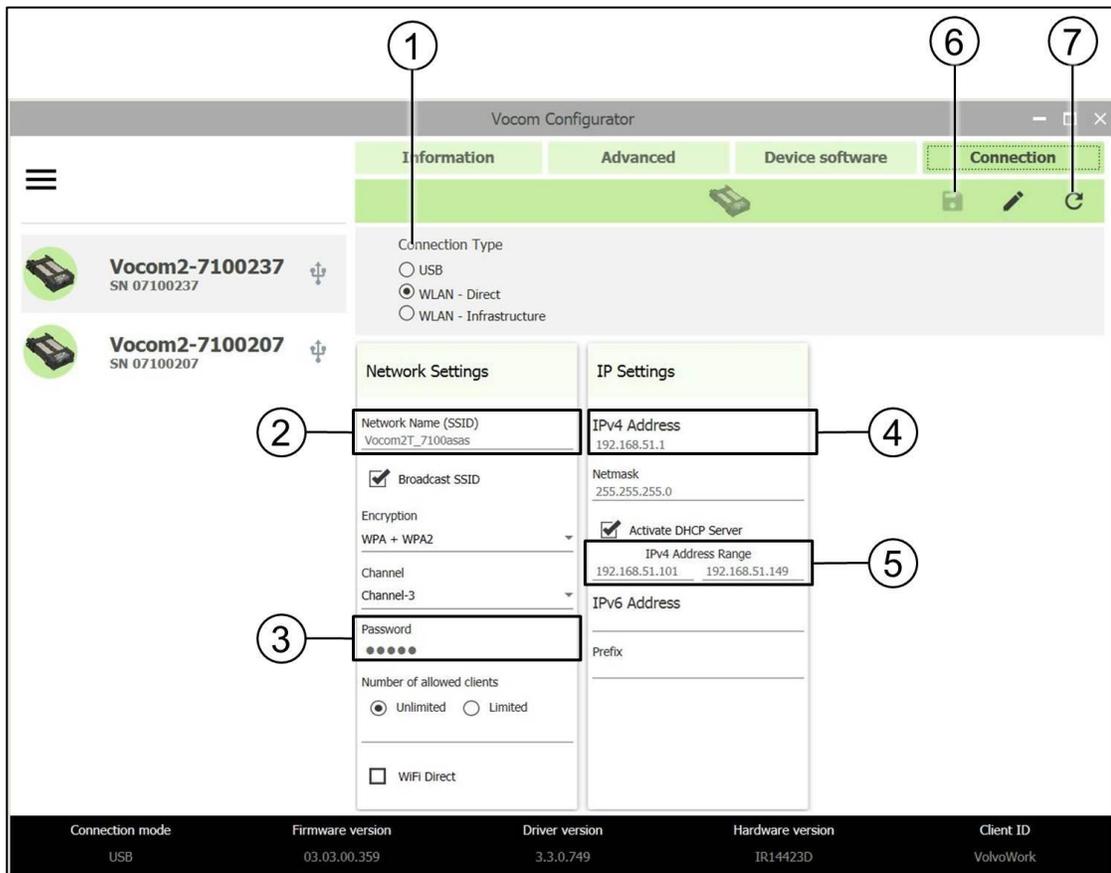


Fig. 6–12: Changing the WLAN-Direct configuration

1	Connection Type panel	5	IPv4 Address Range
2	Network Name (SSID)	6	Save button
3	Password	7	Reboot button
4	IPv4 Address		

6.3.2 WLAN Infrastructure Mode

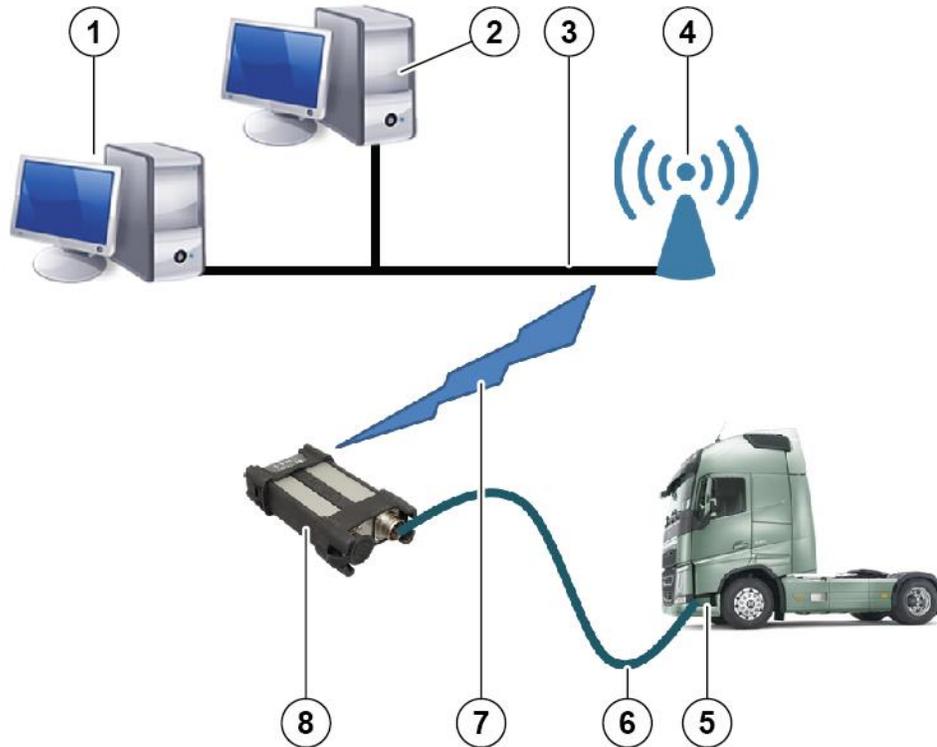


Fig. 6 –13 WLAN Infrastructure Mode description

1	PC in LAN using VOCOM II	5	Vehicle connected to VOCOM II
2	PC in LAN not using VOCOM II	6	Vehicle cable
3	(Local Area Network) LAN	7	VOCOM II connected to Enterprise Wi-Fi Router
4	Enterprise Wi-Fi router in the LAN	8	VOCOM II

In VOCOM II Config Application’s WLAN Configuration page select **WLAN-Infrastructure** in the **Connection Type** panel.

NOTE Selecting **Use my computer’s WLAN configuration** pre-sets the network SSID, authentication type, encryption method, IP address settings and country from the active network setting of the wireless NIC of the client.

- 1 Enter the name of your WLAN network (i.e. the SSID of the existing network) into the Network Name / SSID field of the WLAN Infrastructure Configuration panel.
- 2 From Encryption and Authentication menus select a combination of Encryption-methods and WLAN-Authentication methods which is supported by your network.
- 3 Click **Save**.
- 4 Click **Reboot**.

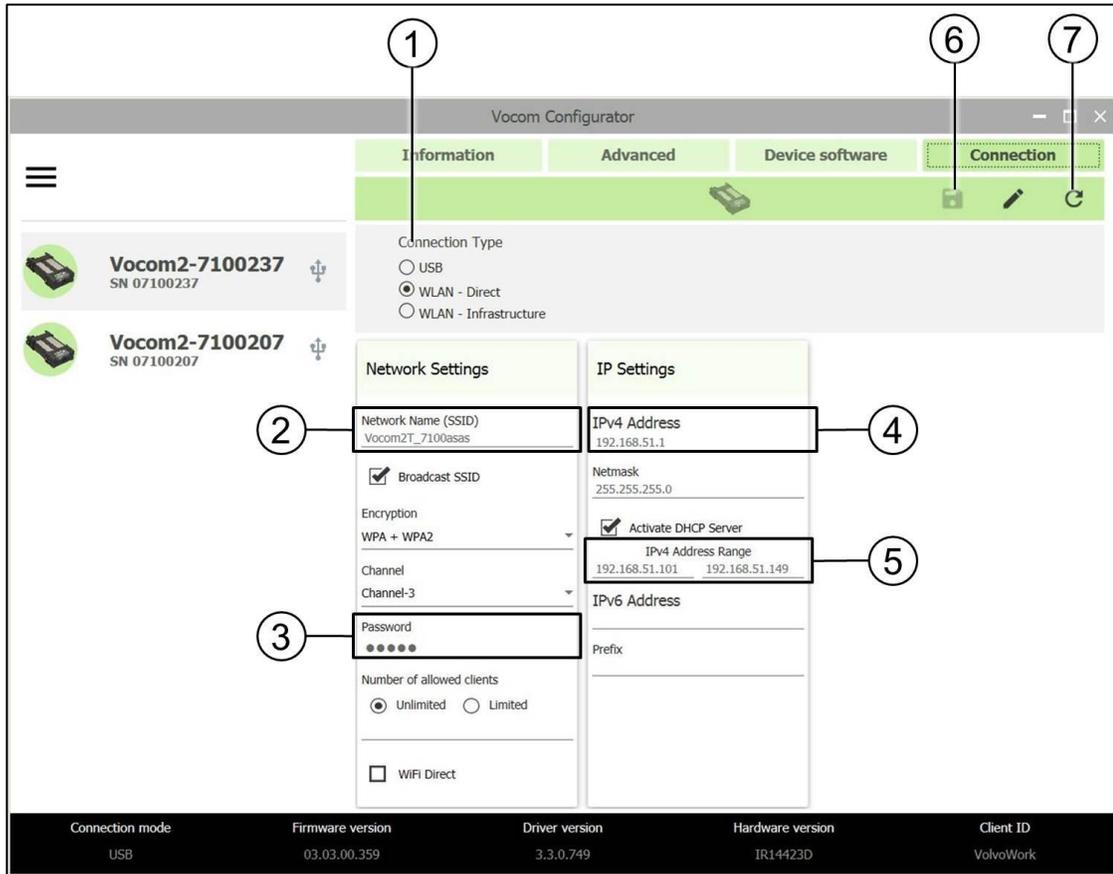


Fig. 6-14: WLAN-Infrastructure

- | | |
|----------------------------|------------------|
| 1 Connection Type | 5 Authentication |
| 2 WLAN Configuration panel | 6 User Name |
| 3 Network name / SSID | 7 Password |
| 4 Encryption | |

The default setting is WPA+WPA2 / WPA-PSK for password based authentication and encryption, which is normally used for small “personal” wireless networks. This WLAN Infrastructure Mode is commonly called “WPA-Personal”.

Other available/configurable authentication/encryption methods for WLAN Infrastructure Mode are EAP-TLS and EAP-PEAP, providing certificate based authentication through central servers, which is normally the case for larger company networks. These infrastructure modes are commonly called “WPA Enterprise”.

6.3.2.1 Network Settings for WPA-PSK

For WPA-Personal mode the following network parameter have to be set.

Parameter	Description
Network name / SSID	The name (SSID) of the network

Encryption	Should be set to WPA + WPA2
Authentication	Must be set to WPA-PSK
Password	The network password (pre-shared key)

Tab. 6-1 WPA-Personal mode parameters.

NOTE The WPA-PSK password length must be ≥ 8 .

6.3.2.2 Network Settings for EAP-TLS / EAP-PEAP

For WPA-Enterprise mode the following network parameter have to be set.

Parameter	Description
Network name / SSID	The name (SSID) of the network
Encryption	Should be set to WPA + WPA2
Authentication	Must be set to either EAP-TLS or EAP-PEAP. If necessary, ask your network administrator which authentication type is supported by your network
Certificate file	Encrypted client certificate in PKCS12 format
Certificate password	Password for decrypting the client certificate, if certificate password is required
User name	User / identity for which the certificate has been issued

Tab. 6-2 WPA-Enterprise mode parameters.

NOTE For EAP-TLS configuration, the Password field of the Network Settings page must be empty.

In order to upload and install the selected client certificate on the VOCOM II (which needs this certificate for later authentication on the network's Radius server), click Certificate/Install button.

After successful upload and installation of a certificate on the VOCOM II, the currently installed client certificate will be listed in the Network Settings panel.

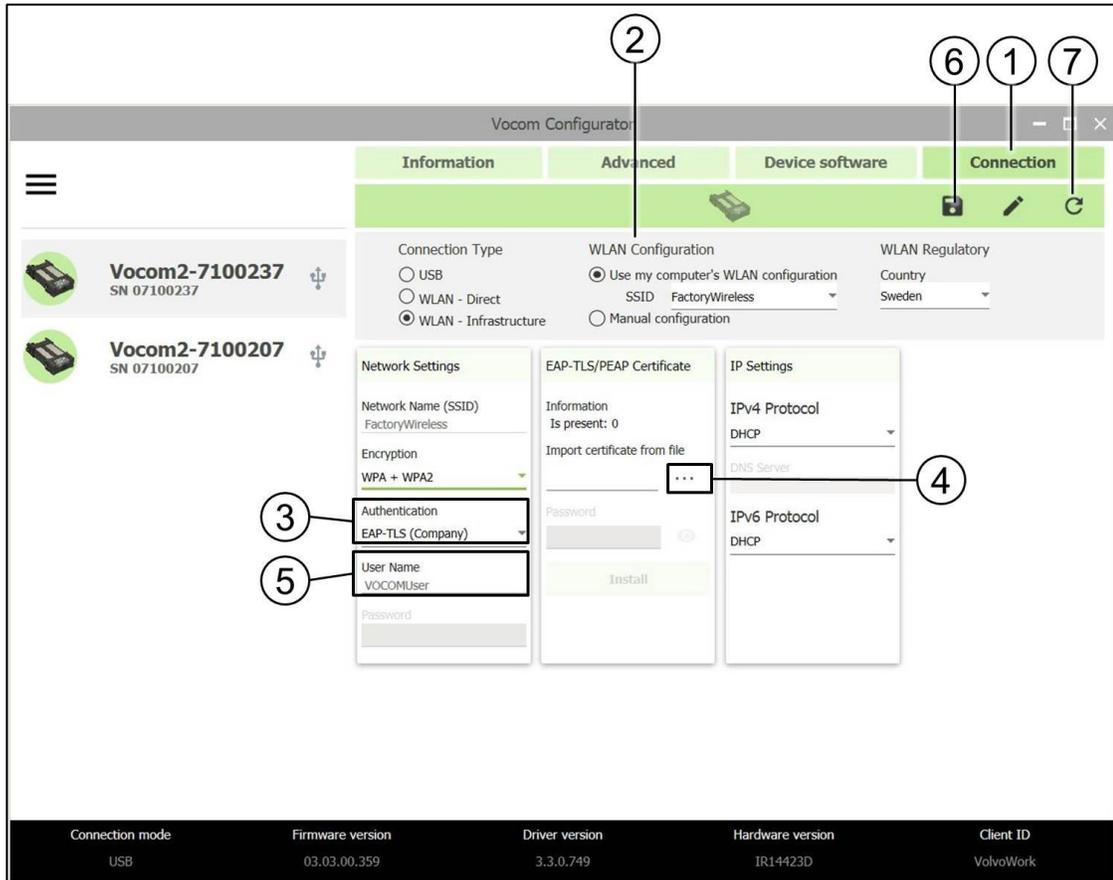


Fig. 6-15: WLAN-Infrastructure EAP-TLS configuration

- | | |
|--------------------------------|-----------------|
| 1 Connection tab | 5 User Name |
| 2 WLAN Configuration panel | 6 Save button |
| 3 Authentication | 7 Reboot button |
| 4 Certificate / Install button | |

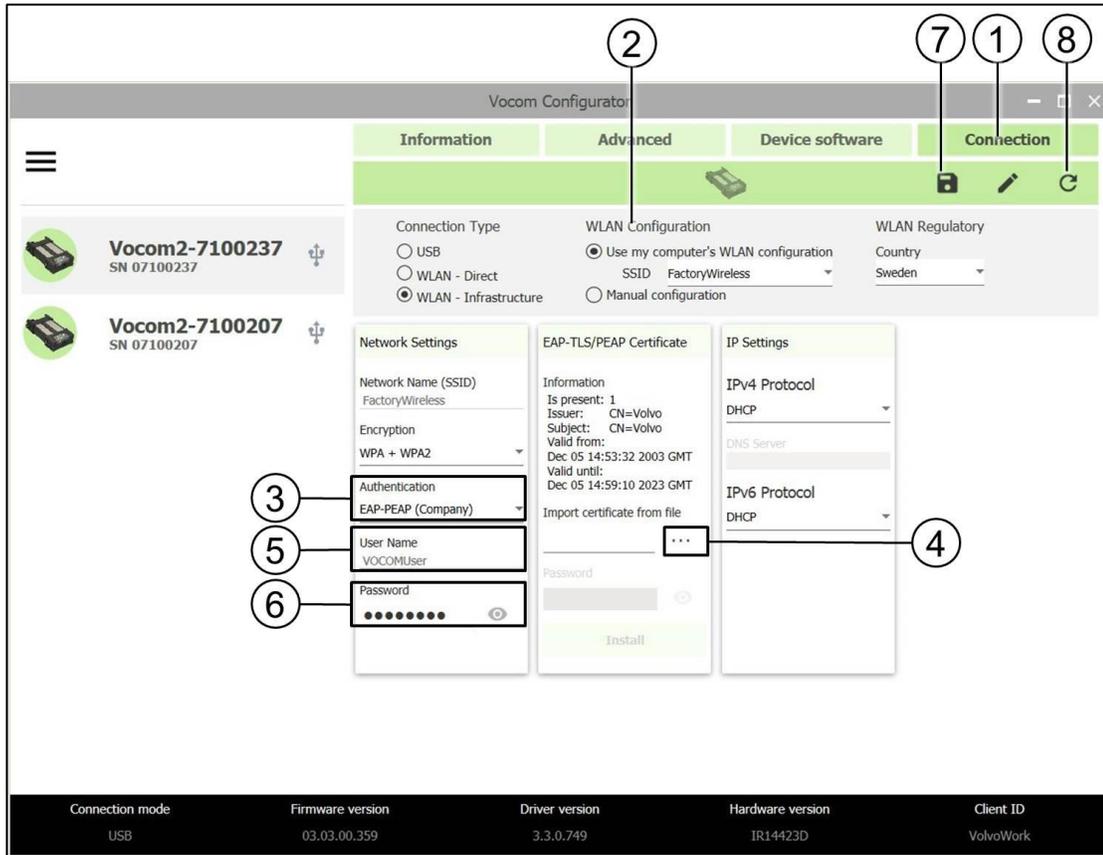


Fig. 6-16: WLAN-Infrastructure EAP-PEAP configuration

- | | |
|--------------------------------|-----------------|
| 1 Connection tab | 5 User Name |
| 2 WLAN Configuration panel | 6 Password |
| 3 Authentication | 7 Save button |
| 4 Certificate / Install button | 8 Reboot button |

6.3.2.3 Country settings

The use of radio channels for 2.4 GHz and 5 GHz is regulated and differs among countries with respect to the set of allowed radio channels and maximum transmission power.

NOTE The VOCOM II factory default configuration uses a "golden set" of 2.4 GHz and 5 GHz radio channels which can be used worldwide.

The VOCOM II Config Application will automatically set the WLAN regulatory country code based on the locale settings of the client PC.

For the country-specific WLAN radio settings implemented in VOCOM II firmware. (⇒ Chap. 12.1. "WLAN country settings".)

These radio settings cannot be changed by the user.

6.3.2.4 Advanced / Manual setup

The VOCOM II Config Application allows Windows users with Administrator profile to manually adjust the standard WLAN-Infrastructure configurations.

The following WLAN-Infrastructure settings can be manually adjusted:

- IPv4 and IPv6 address assignment
- WLAN roaming threshold
- Frequency band selection
- Setup of VOCOM II for Volvo Factory wireless operation

To show the manual WLAN-Infrastructure settings, perform the following steps:

- 1 Open the **WLAN-Infrastructure** configuration page.
- 2 Select **Manual configuration** in the **WLAN Configuration** panel.

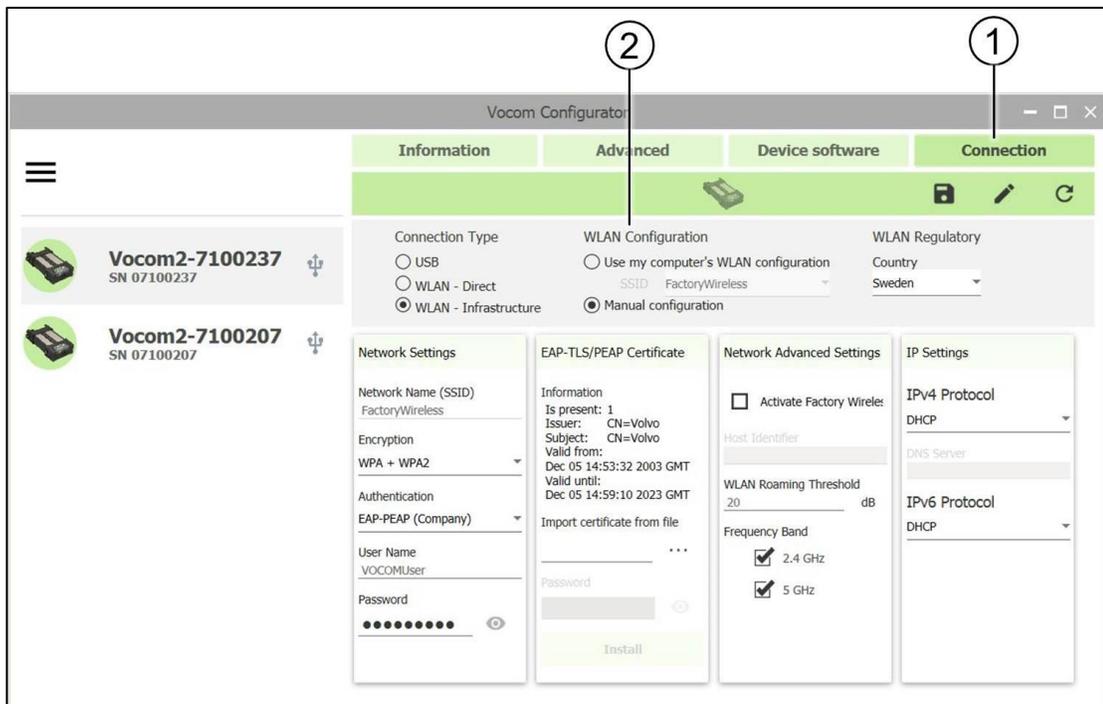


Fig. 6–17: WLAN-Infrastructure – manual configuration

1 Connection tab

2 WLAN Configuration panel

6.3.2.5 IPv4 and IPv6 address assignment

The VOCOM II WLAN interface configuration supports the following IPv4 and IPv6 address assignment methods.

Assignment method	Description
DHCP	Use a dynamically assigned IP address from the network's DHCP server.
Use IP address	Manually set a static IPv4 and / or IPv6 address.
APIPA	Obtain a unique, link-local IP address using a Zeroconf algorithm.

Tab. 6-4: IPv4 and IPv6 address assignment methods

To use a static IPv4 address assignment for the VOCOM II WLAN interface, perform the following steps:

- 1 Open the **WLAN-Infrastructure** configuration page.
- 2 Select Manual configuration in the WLAN Configuration panel.
- 3 Change the IPv4 and IPv6 address assignment according to your needs.
- 4 Click **Save**.
- 5 Click **Reboot**.

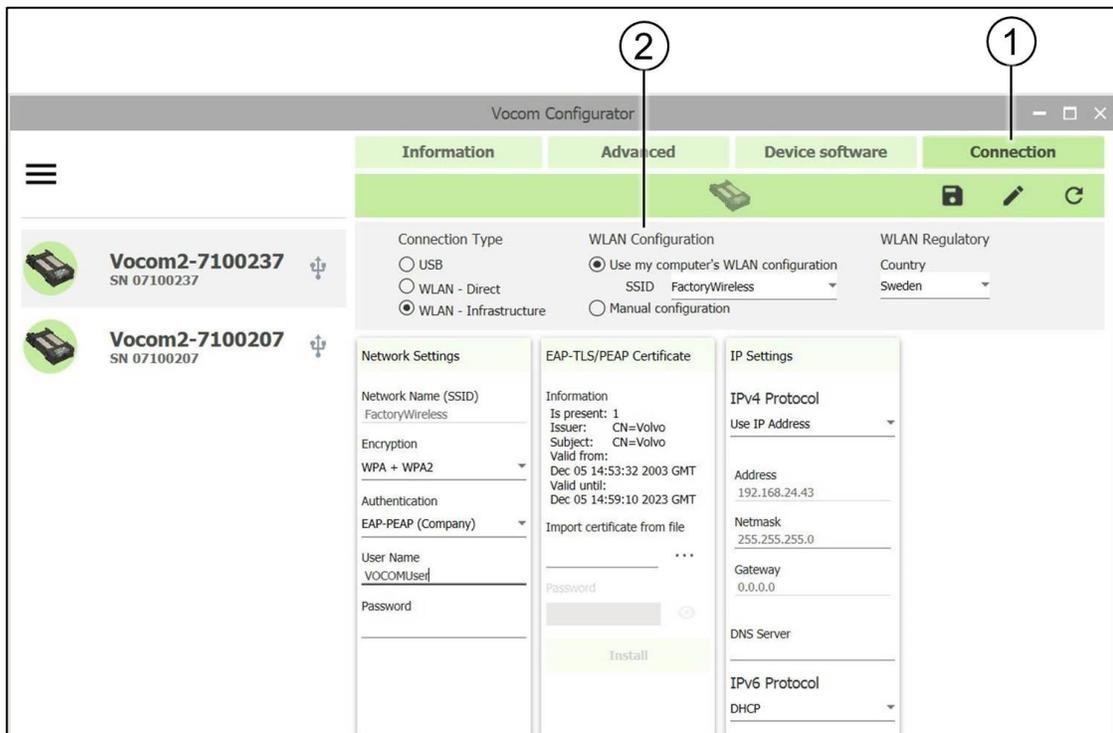


Fig. 6-18: WLAN-Infrastructure configuration – static IPv4 address assignment

1 Connection tab

2 WLAN Configuration panel

NOTE The **Gateway** field has to be either set to the IP address of the wireless network gateway, or can be left empty if the client PC is located in the same network.

NOTE Assigning a static IPv4 address is necessary if the Access Point of the wireless network does not support DHCP and there is no DHCP server behind the Access Point.

6.3.2.6 WLAN roaming threshold

The WLAN roaming threshold parameter defines the Signal-to-Noise ratio (SNR) in dB. This is used to set the background scanning interval for roaming.

If the SNR of the current Access Point is above the threshold (indicating a good signal), the background scanning frequency is decreased. If the SNR of the current Access Point is below the threshold (indicating a low signal), the background scanning frequency will be increased.

NOTE If an Access Point with higher signal strength is found during background scanning, VOCOM II will try to roam to the new Access Point.

NOTE You should only change the WLAN roaming threshold if you have connectivity problems due to too frequent or too slow roaming. The default threshold value of 20 dB should work well for most WLAN infrastructures.

6.3.2.7 Frequency band selection

The frequency band selection check boxes from **WLAN-Infrastructure Advanced Network Settings** allow users with Administrator profile to restrict WLAN channel scanning to either 2.4 GHz or 5 GHz channels.

By default VOCOM II performs scans for Access Points of a wireless network on both frequency bands.

NOTE Restricting the WLAN frequency band to either 2.4 GHz or 5 GHz will reduce the number of WLAN channels to be considered in background scanning.

6.3.2.8 Factory wireless Mode

The term "Factory wireless" shows the following wireless infrastructure. This configuration is used when IP multicasting is not supported in the network. Factory wireless enables to connect to wireless network using unicasting.

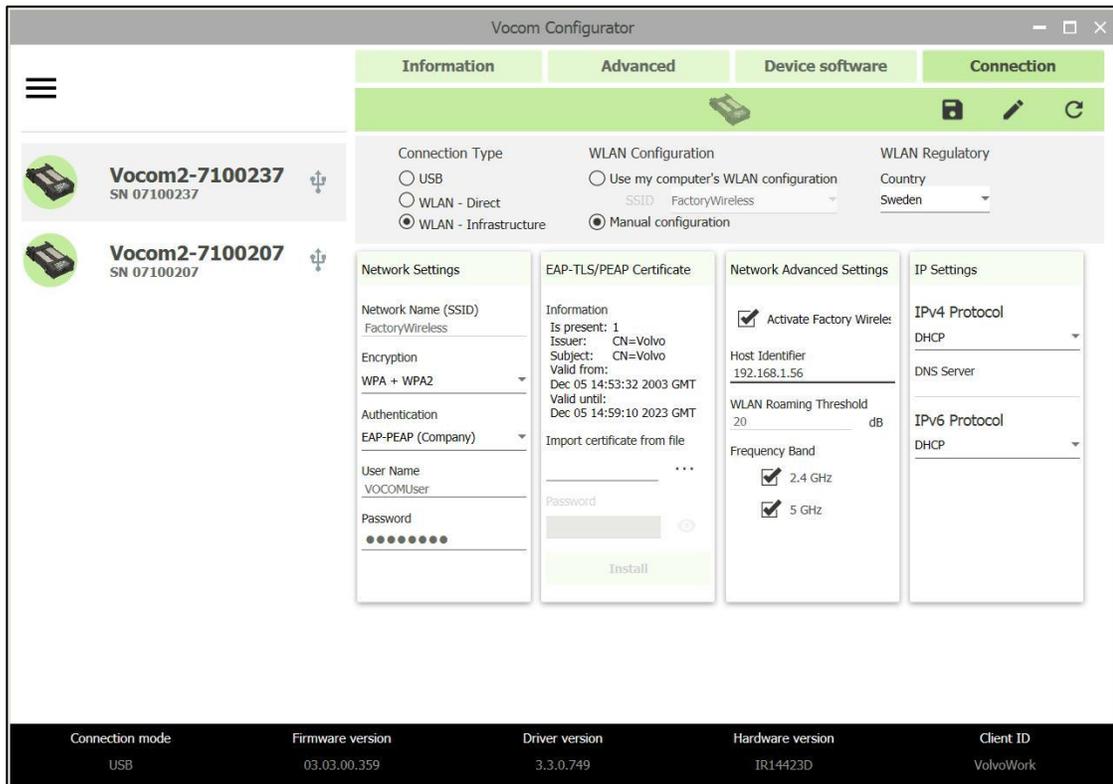


Fig. 6–19: Factory Wireless setting where Host Identifier is an IP address

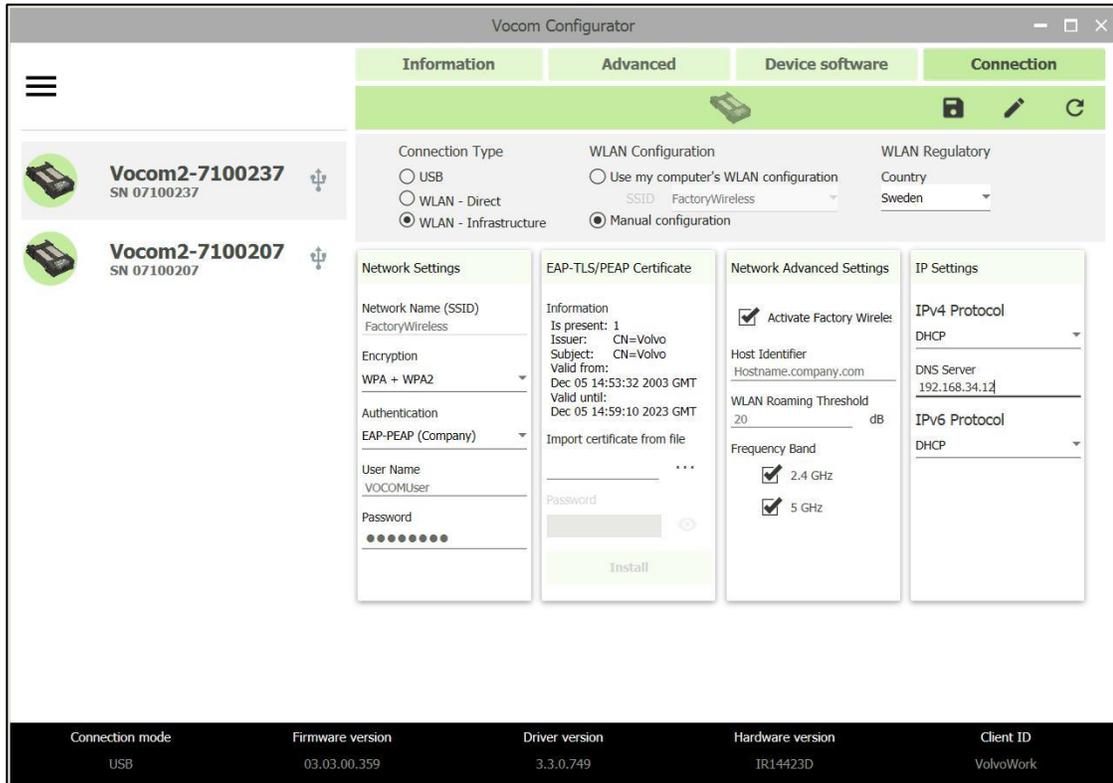


Fig. 6-20: Factory Wireless where host Identifier is Computer name and need DNS Server IP

If the host identifier is a DNS name, the factory wireless infrastructure configuration will also require the provision of the DNS server IP address.

NOTE If the host identifier is a DNS name, it has to be a full qualified DNS name including the DNS suffix.

For more information about Factory Wireless infrastructure setup contact help desk.

6.4 Options menu functions

The Options menu is located in the top left corner of the Config Application window. It provides preferences for client-specific settings like display language, RP1210 and J2534 device mappings, log levels and help links.

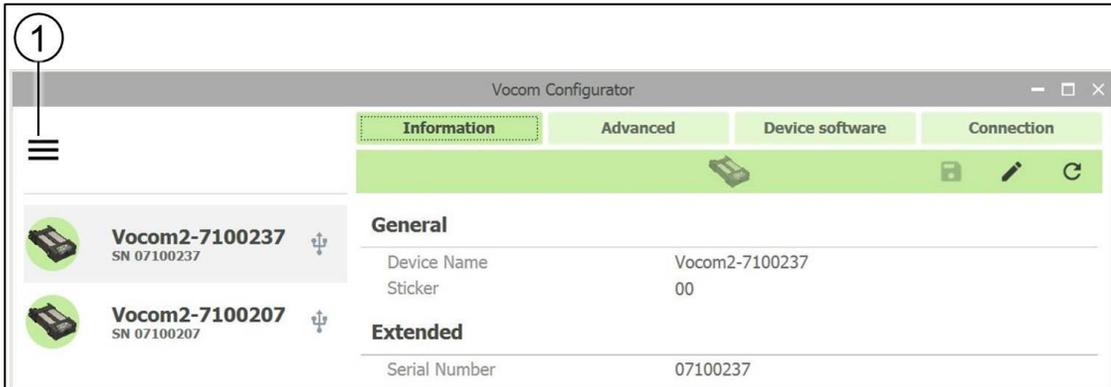


Fig. 6–21: Options menu location in VOCOM II Config Application

1 Options menu button

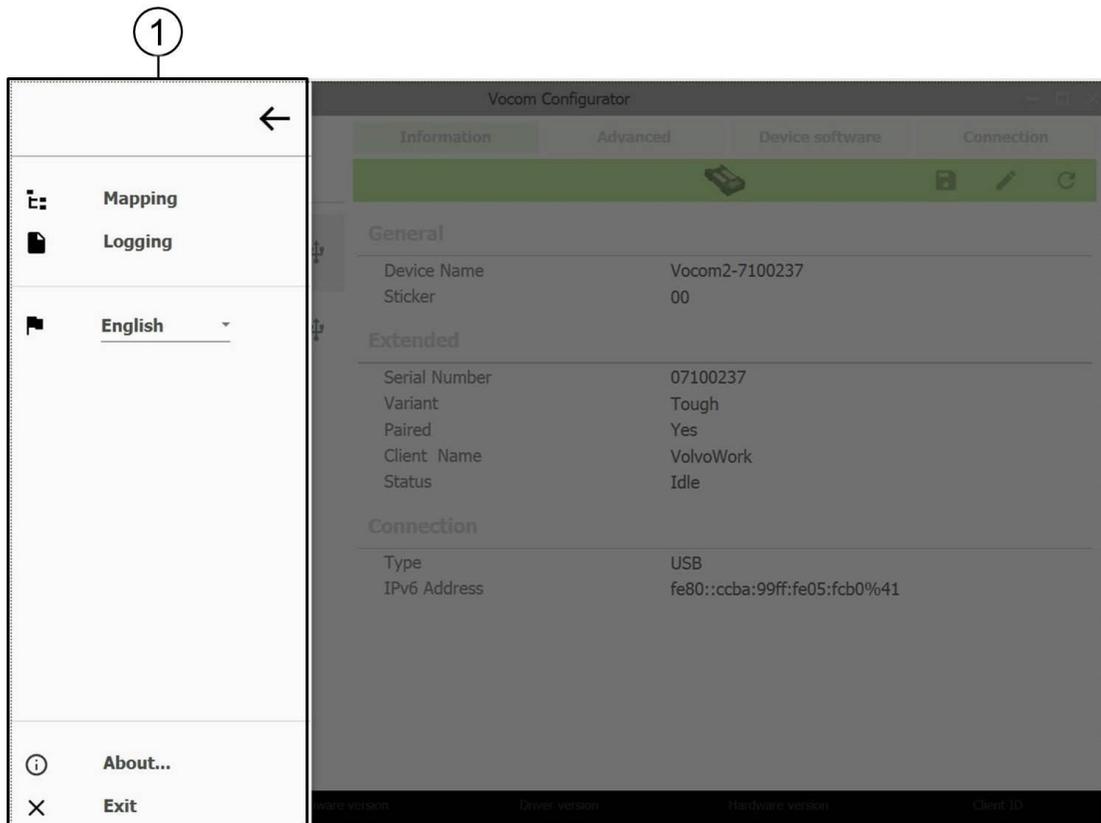


Fig. 6–22: Options menu

1 Options menu

6.4.1 Language settings

The VOCOM II Config Application has built-in multi-language support. English is the default display language.

To change the display language, perform the following steps:

- 1 Use the language drop down menu under the Options menu to select another display language.
- 2 Restart the VOCOM II Config Application.

6.4.2 Logging configuration

Log levels can be changed per logging module.

The available VOCOM II logging modules are as follows:

Logging module	Description	Scope
J2534	J2534 API logging	Windows logs and device traces
J2534-1	J2534-1 API logging	Windows logs and device traces
RP1210	RP1210C API logging	Windows logs and device traces
VocomConfiguration	VOCOM II Config API logging	Windows logs
VocomLocate	VOCOM II Locate API logging	Windows logs
VocomService	VOCOM II Service logging	Windows logs

Tab. 6-5: VOCOM II logging modules

To change the log level of a particular module, perform the following steps:

Open the **Logging** configuration page by clicking **Logging** in the Options menu.

- 1 Change the Log level of one or more Logging modules.
- 2 Click **Save**.

NOTE Log level changes will immediately take effect after step 3 No reboot is necessary.

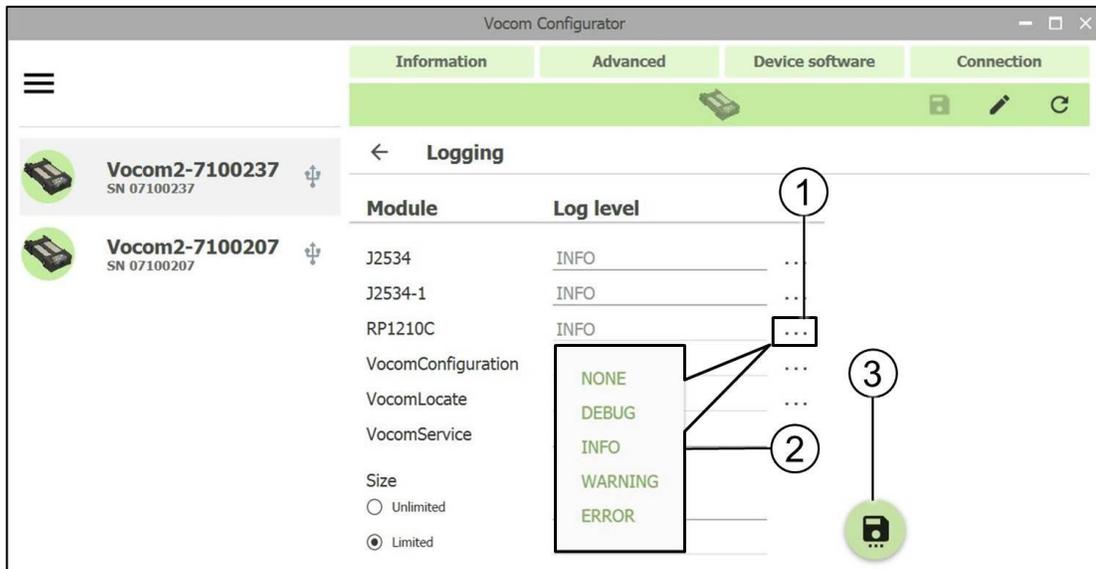


Fig. 6–23: Logging configuration page

- | | |
|-------------------------|---------------|
| 1 Log level menu button | 3 Save button |
| 2 Log levels menu | |

Changing the log level for components with scope "Windows logs and device traces" will affect both the log level on device side and on PC side. This is the case for the VOCOM II diagnostic APIs, i.e. RP1210C API and J2534/J2534-1 API.

Downloading device traces can be accomplished through the VOCOM II Config Application. (⇒ Chap. 6.5.1 "Download page")

VOCOM II Windows logs can be found under:
C:\ProgramData\ACTIA I+ME GmbH\VOCOM II\Log.

NOTE Logging levels will be reset to their default values by an installer update.

6.4.3 RP1210 device mapping

To change the mapping of logical RP1210 Device IDs to VOCOM II devices, perform the following steps:

- Go to the **Mapping** configuration page found under the Options menu.
- 2 Assign one or more Device IDs to VOCOM II serial numbers.

- ▶ In the **Mode** column, select the connection mode to be used for a particular Device ID.
- ▶ In the **Device** column, select the VOCOM II serial number to be assigned to a particular Device ID.

3 Click **Save**.

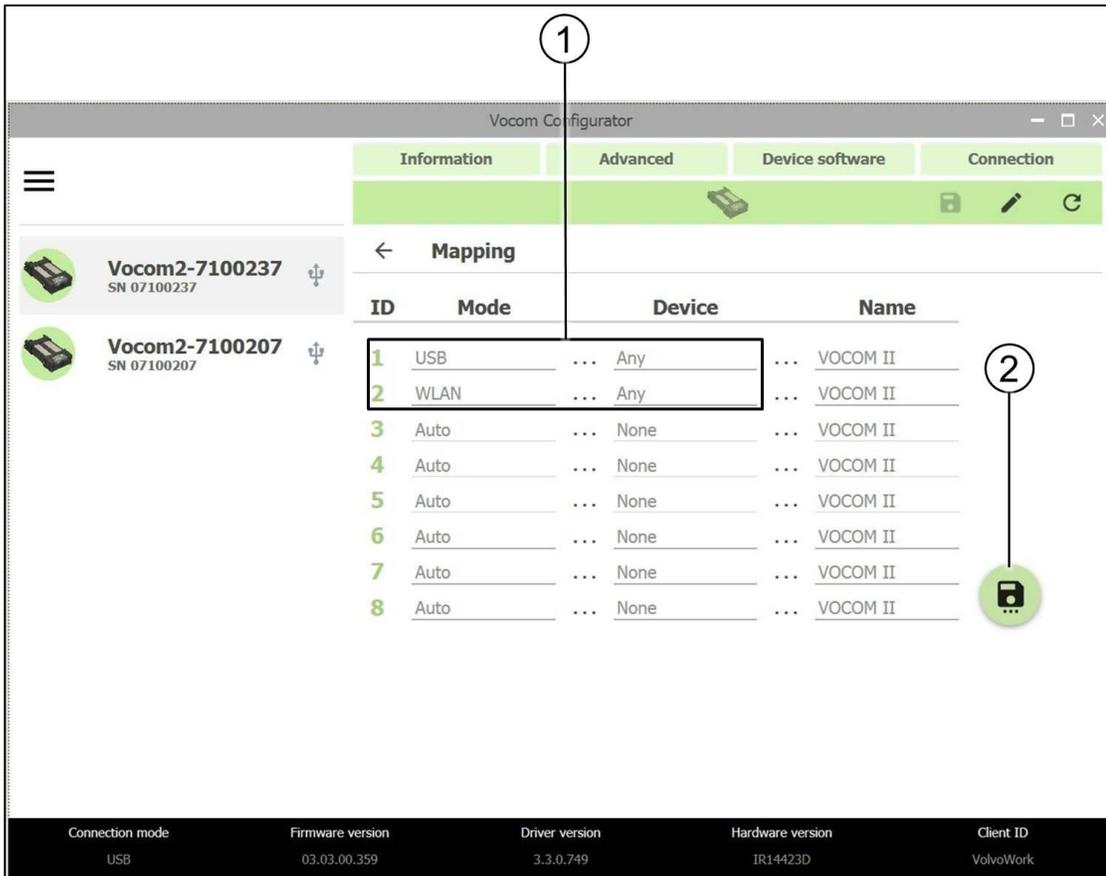


Fig. 6–24: Mapping configuration page (defaults)

1 Mapping columns

2 Save button

NOTE The RP1210 Device ID mapping will be reset by an installer update.

The default RP1210 Device ID mapping is as follows:

Device ID	Mapping
RP1210 Device ID 1	Map to first USB-connected VOCOM II from Device list.
RP1210 Device ID 2	Map to first WLAN-connected VOCOM II from Device list.
RP1210 Device IDs 3 to 8	Not mapped by default.

Tab. 6–6: Default RP1210 Device ID mapping

In case of two WLAN-connected VOCOM II operated from a client PC, perform the following steps to change the RP1210 device mapping on that PC:

- 1 Go to the **Mapping** configuration page found under the Options menu.
- 2 Perform the Device ID assignment for each of the two WLAN-connected devices.
- 3 Click **Save**.

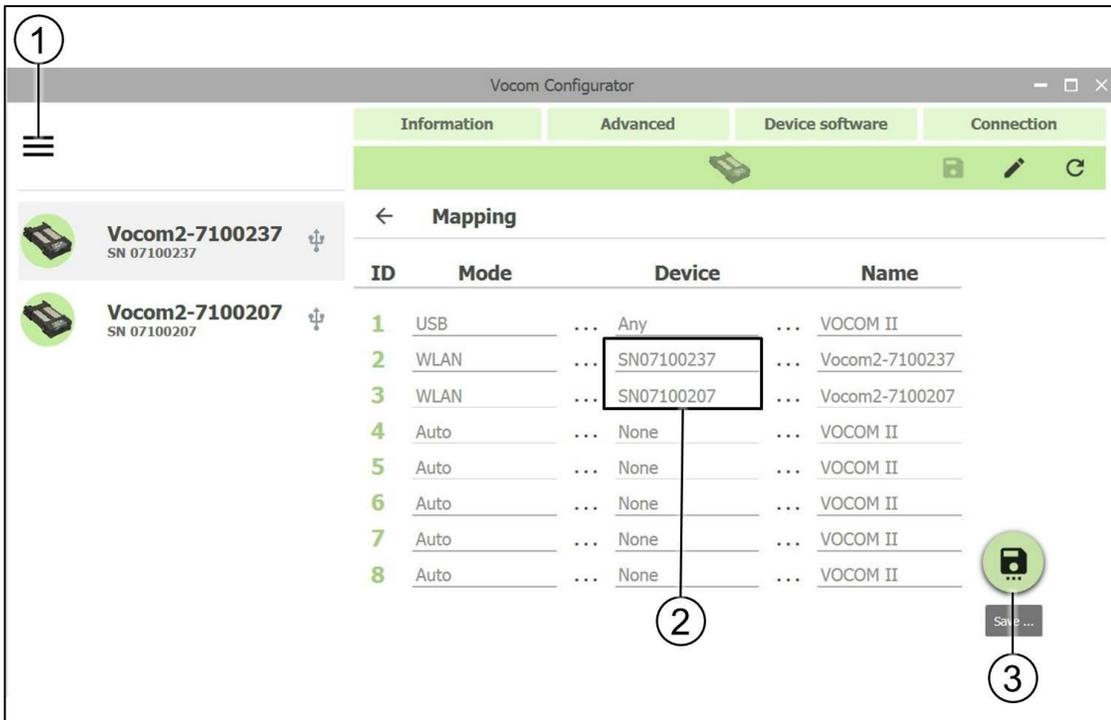


Fig. 6–25: RP1210 Device ID mapping example for two WLAN-connected VOCOM II devices

- | | |
|-------------------|---------------|
| 1 Options menu | 3 Save button |
| 2 Mapping columns | |

6.4.4 PassThru Configurator

To select the active J2534/J2534-1 PassThru device, perform the following steps:

- 1 Go to the VOCOM II PassThru Configurator tool found under the Options menu in the VOCOM II Config Application.
- 2 In the **PassThru Configurator** dialog, enter the serial number of the VOCOM II device that will be used as PassThru device on the client PC.
- 3 Click **OK**.

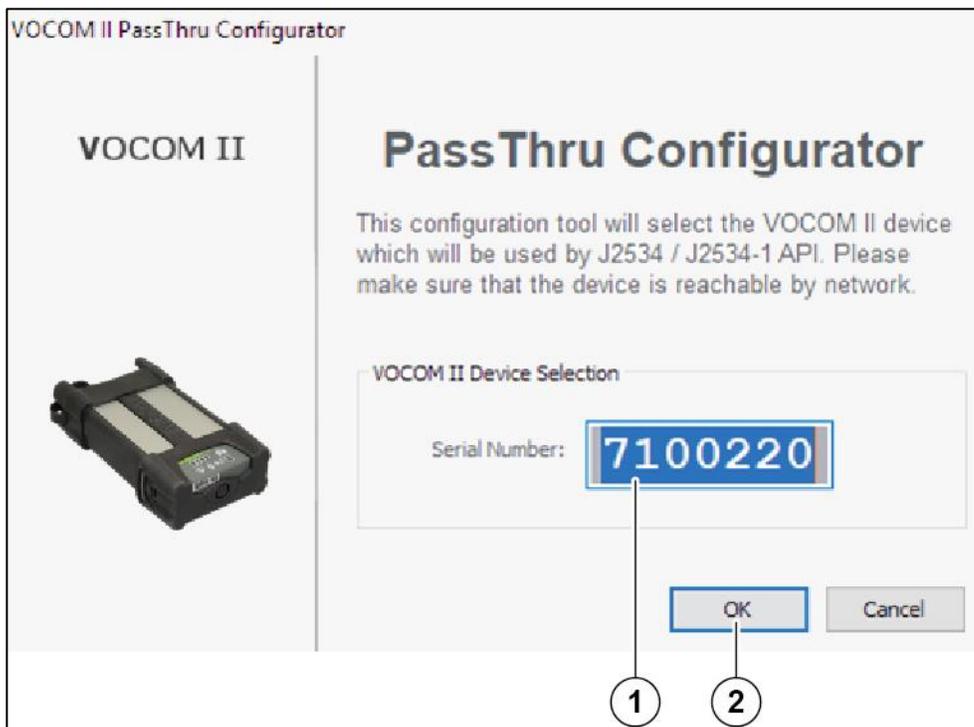


Fig. 6–26: VOCOM II J2534 PassThru Configurator

1 Serial Number

2 OK button

NOTE The VOCOM II serial number is a 7-digit string of the form "7xxxxxx", e.g. 7100200.

NOTE The VOCOM II PassThru device settings are reset by an installer update.

6.4.5 Help and About menus

At the bottom of the Options menu you will find the **Help** and **About** items.

Clicking on the **Help** item will open and display the VOCOM II Tough Operation Instructions (this document).

Clicking on the **About** item displays version information for VOCOM II Config Application

6.5 Advanced menu functions

The Advanced menu offers the following three options:

Option	Description
Download	Download VOCOM II service logs and protocol traces.
Self Test	Perform VOCOM II Self Test (external Self Test adapter is necessary).
Error Memory	Display / clear contents of VOCOM II Error Memory.

Tab. 6–7: Advanced menu options

You can navigate to the respective page by clicking on the corresponding section.

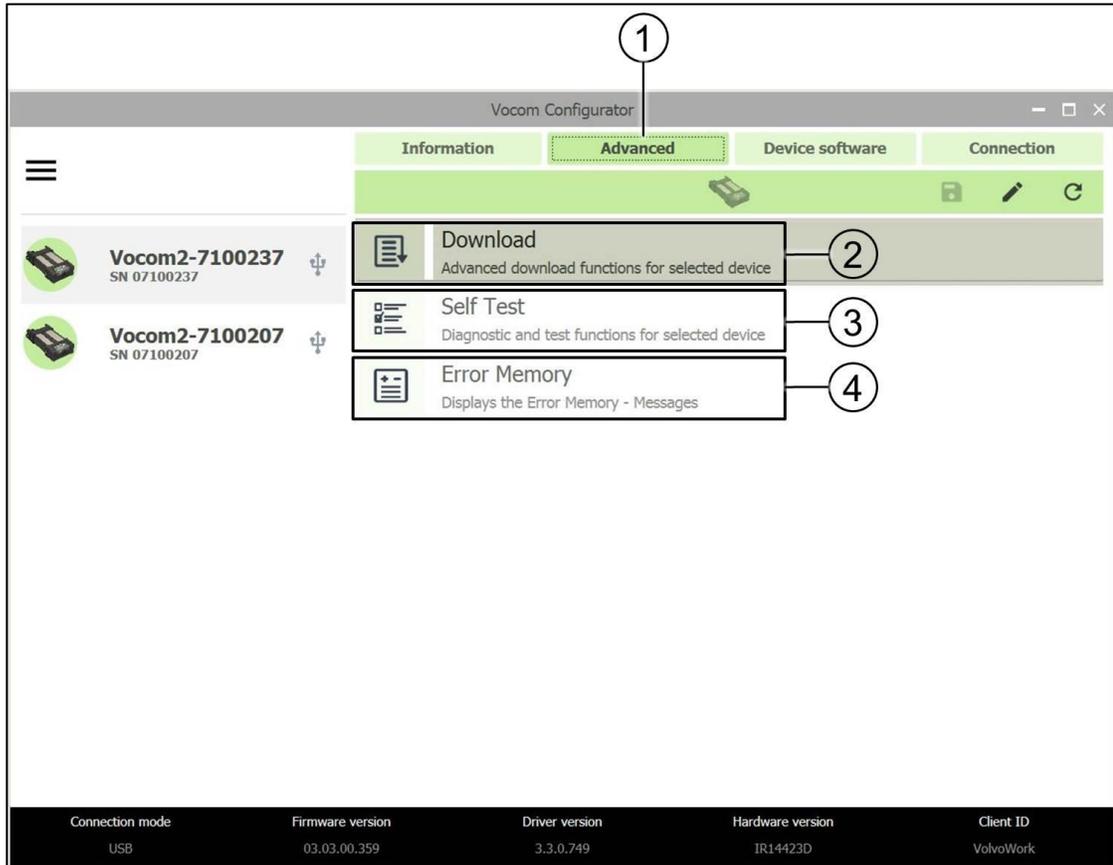


Fig. 6–27: Advanced menu

- | | |
|----------------|----------------|
| 1 Advanced tab | 3 Self Test |
| 2 Download | 4 Error Memory |

6.5.1 Download page

The Download page offers the possibility to get log files from VOCOM II. This information is typically needed for debugging purposes and support cases (i.e. the user help desk may request this data from you).

The following two sources of logging data are available:

Source	Description
Message tracing	Protocol traces from VOCOM II RP1210 and J2534 servers
Service data	Complete device logs needed for support cases

Tab. 6–8: Logging data sources

NOTE Logging data will be provided as zip-archive for each source.

To download VOCOM II log files, perform the following steps:

- 1 Choose the source of logging data you want to download.
- 2 Select the target folder for the download.
- 3 Change the name of the file to be stored (optional).
- 4 Click Downloads device logs to specified location to download.

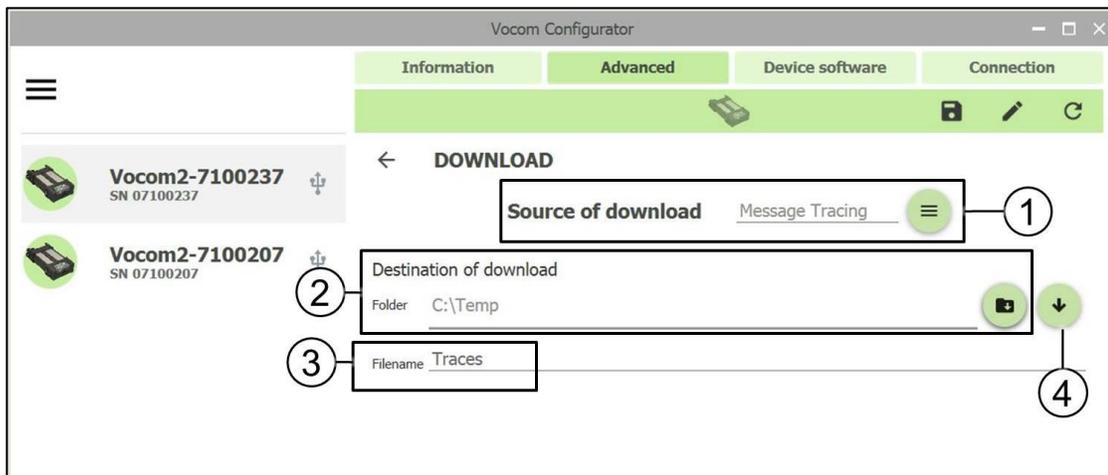


Fig. 6–28: Download traces from VOCOM II

- | | |
|---------------------------|-------------------|
| 1 Source of download | 3 Filename |
| 2 Destination of download | 4 Download button |

6.5.2 Self Test page

VOCOM II Self Test tests the proper functioning of internal and external hardware interfaces, in particular the vehicle communication interfaces such as CAN, J1708, KLINE as well as the relays of the internal OBD Mux and Pull-up resistors.

NOTE A special VOCOM II Self Test adapter is needed to perform a complete Self Test. The Self Test adapter has to be plugged into the ECTA / OBD connector. Without a connected Self Test adapter some of the tests will fail.

Fig. 6–29 - Fig. 6–30 show how to run the Self Test.

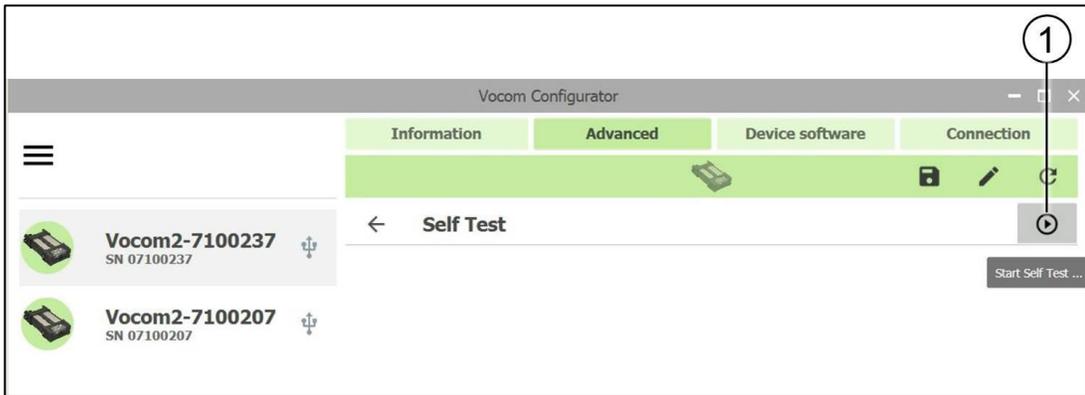


Fig. 6–29: Execute VOCOM II Self Test

1 Self Test execute button

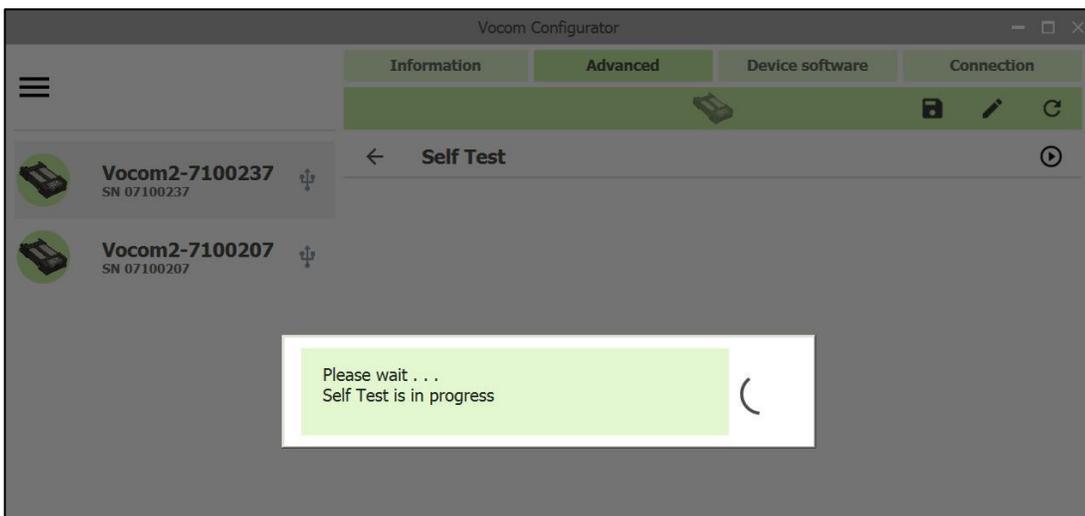


Fig. 6–30: Self Test in progress window

Fig. 6-31 shows the Self Test result page. The shown test result is failed due to missing test adapter.

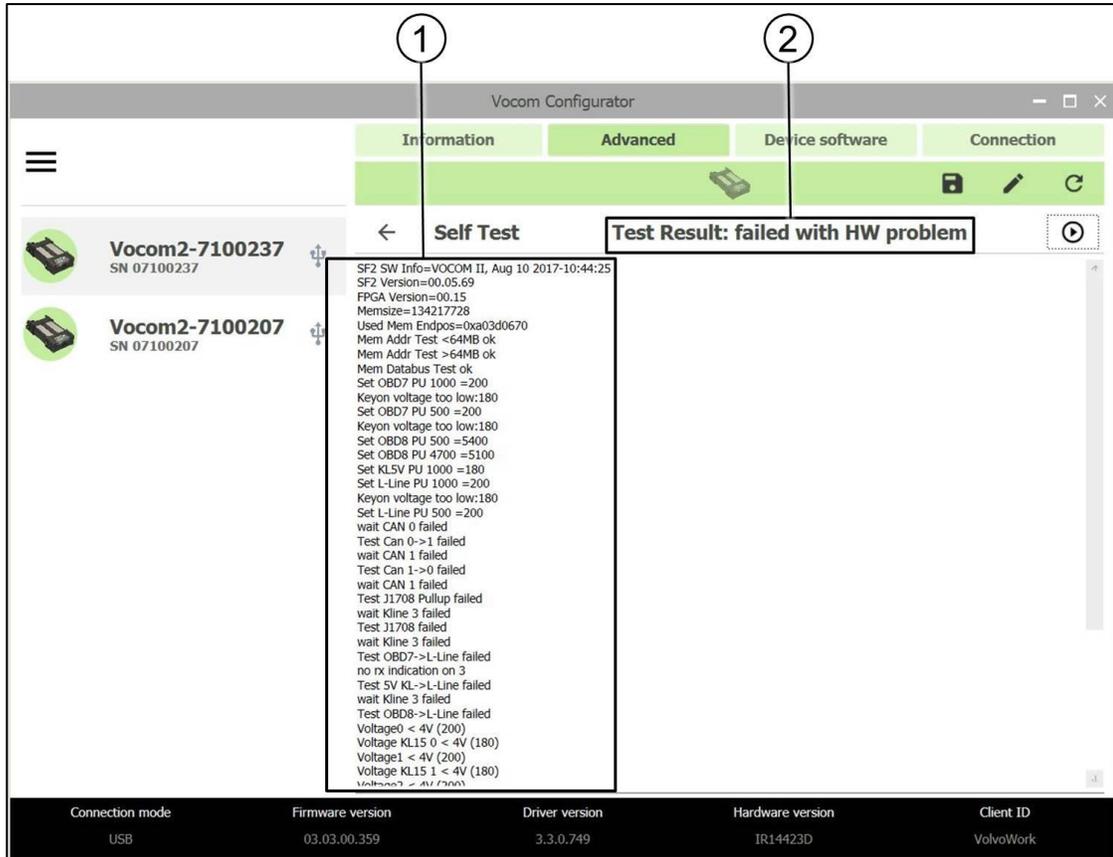


Fig. 6-31: Self Test result page

1 Self Test information

2 Test Result messages

6.5.3 Error Memory page

VOCOM II logs critical events and errors in an internal **Error Memory**.

The contents of the internal **Error Memory** can be displayed, filtered and reset through the Error Memory page of the VOCOM II Config Application.

- To load the **Error Memory** and to display present events, click the **Refresh** button.
- To reset the **Error Memory**, click the Delete button.

NOTE Clearing the **Error Memory** will also reset the state of the warning LEDs.

- To display only specific error types, click on the Filter button.

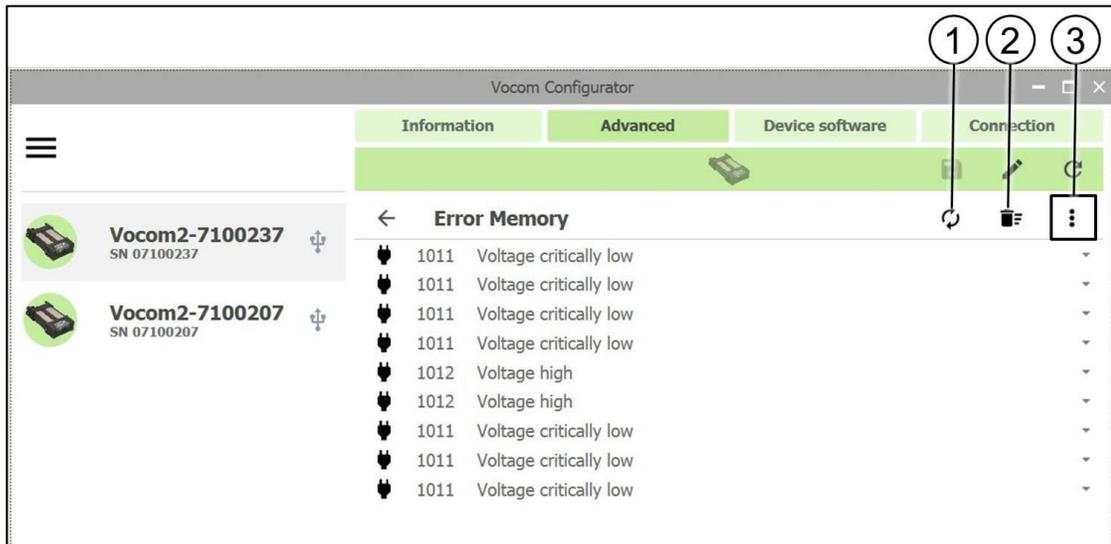


Fig. 6–32: Error Memory page

1 Refresh button
2 Delete button

3 Filter button

To display the extended description of an event, click on one of the down-arrows of an **Error Memory** entry.

7 Operation

7.1 WLAN mode operation

7.1.1 Prerequisites

- ▶ Make sure the VOCOM II Windows software has been installed on the client PC.
- ▶ Configure the WLAN interface for operation in one of the WLAN modes. (⇒ Chap. 6.3. "WLAN configuration")

To use the WLAN interface, perform the following steps:

- 1 Unplug the device from the USB port of the PC.
- 2 Connect the ECTA / OBD cable to the vehicle / platform.
- 3 Power the device from vehicle side.

7.1.2 WLAN-Direct mode

NOTE WLAN-Direct is the default WLAN operation mode of VOCOM II. In this mode, VOCOM II operates as an Access Point to which you can directly connect from your PC.

To connect to VOCOM II from your PC via WLAN-Direct, perform the following steps:

NOTE For details regarding default settings for SSIDs and passwords (⇒ Chap. 6.3.2 "WLAN Infrastructure Mode")

- 1 Disconnect VOCOM II from USB port and power on from vehicle side.
- 2 Open the **Wireless Networks** dialog on your PC.
- 3 Find the SSID corresponding to your VOCOM II device.
- 4 Connect to the SSID and enter the password.

If connected, the WLAN signal strength indicators of VOCOM II will be ON.

Function indicators for WLAN operation (⇒ Chap. 4.3.1 "WLAN operation mode").

7.1.3 WLAN device access in RP1210 API

The RP1210 Device ID mapping can be controlled through the VOCOM II Config Application. (⇒ Chap. 6.4.3 "RP1210 device mapping")

The default RP1210 Device ID for WLAN connected devices is Device ID 2. By using Device ID 2 in RP1210_ClientConnect, you connect to the first VOCOM II WLAN device found in the Device list.

For workshops and applications with several wireless VOCOM II units, you have to manually setup the RP1210 device mapping in VOCOM II Config Application.

7.2 USB mode operation

7.2.1 Prerequisite

- ▶ Make sure that the VOCOM II Windows software has been installed on the PC. (⇒ Chap. 5 "Installation".)

7.2.2 USB mode

- ▶ To connect the VOCOM II device to the USB port of the PC, use the 12-pin ECTA / USB cable.
- ▶ To connect the VOCOM II device to the vehicle / platform, use the 26-pin ECTA / OBD cable.

When connected via USB, the VOCOM II device is represented in the Windows Device Manager as network adapter named "VOCOM II Tough".

Function indicators for USB operation (⇒ Chap. 4.3.2 "USB operation mode")

8 Troubleshooting

8.1 General procedure

To carry out troubleshooting, perform the following steps:

- 1 Make sure that the product is keyed on.
- 2 Check the instrument cluster and make sure that the battery voltage is correct.
- 3 Make sure that the vehicle cable is not damaged and none of the PINs are bent.
- 4 Make sure that the LED status is as described. (⇒ Chap. 4.3.2 "USB operation mode")
- 5 Narrow down the problem.
 - ▶ Try with a different working vehicle cable.
 - ▶ Try with a different working USB cable and USB slot on the PC.
 - ▶ Try with another working communication unit (VOCOM II).
 - ▶ Try with another working PC.
- 6 If using WLAN, check that the WLAN is working properly. Consult your local IT support for advanced checking of WLAN.

NOTE If none of the above solves the problem, contact Support with the logs for support cases. (⇒ Chap. 6.5.1 "Download page")

8.2 VOCOM II error codes

VOCOM II logs critical events and errors in an internal **Error Memory**. (⇒ Chap. 6.5.3 "Error Memory page")

The following overview will help you to determine possible faults and their causes and to carry out troubleshooting procedures.

The function indicators help you to detect possible faults.

If you cannot rectify a fault, please contact an authorized specialist or the Customer Service organization.

Error code	Fault	Cause	Solution
0001	Wrong PSK	WLAN password does not match the password on the Access Point.	Reenter password and make sure it matches password on Access Point.
0003	Login credentials error	User name and / or password for authentication were rejected by authentication server.	Make sure user name / identity and / or password match those on the authentication server.

0004	Certificate invalid	Client certificate was rejected.	Upload a valid client certificate to the device.
0005	Certificate expired	Client certificate has expired.	Upload a valid client certificate to the device.
0006	Certificate not yet valid	Client certificate is not yet valid.	Upload a valid client certificate to the device.
0007	Wrong server certificate	Certificate sent by authentication server could not be validated with installed root certificate.	Make sure the root certificate on the device is the same used by the network you wish to connect to.
0008	IEEE 802.1X authentication failed	Login credentials were rejected by authentication server.	Make sure to use a valid certificate or user name and password.
0100	Client connect with wrong PSK	A client tried to connect with an invalid password.	Make sure the password is correct. Check for unauthorized WLAN users.
1001	Temperature high	Temperature is very high, warning state entered.	Switch on A/C or find another means of cooling the device; alternatively, stop using it until ambient temperature is low enough.
1002	Temperature critical	Temperature has reached or exceeded critical value, system will be powered down.	Device has powered down; wait until ambient temperature is low enough.
1010	Voltage low	The voltage is lower than it should be.	Check the vehicle battery.

1011	Voltage critically low	The voltage is critically low, proper operation can no longer be guaranteed.	Check the vehicle battery.
1012	Voltage high	The voltage is higher than it should be.	Check the vehicle battery or charger.
1013	Voltage critically high	The voltage is critically high, proper operation can no longer be guaranteed.	Check the vehicle battery or charger.
1100	Update failed due to failed checksum check	The image contents as written to the flash memory were found to be corrupted.	Try the update again later.
1101	Update failed, image did not boot	The image failed to boot properly, for instance due to power loss during update.	Try the update again later.
1102	Update failed, image had invalid format	The file used for update was not a valid VOCOM II update image file.	Use only official, authorized update images.
1104	Update failed, image signature check did not pass	The image file was modified or corrupted.	Use only official, authorized update images.
2001	Missing DHCP address	DHCP client mode configured but no DHCP address received after n tries.	Check network settings - is a DHCP server available?
9000	Hardware fault: Flash #1	Firmware flash defect detected.	The device must be replaced

9001	Hardware fault: Flash #2	Application flash defect detected.	The device must be replaced
9002	Hardware fault: RAM	RAM defect detected.	The device must be replaced
9003	Hardware fault: WLAN calibration data	WLAN calibration data defect detected.	The device must be replaced
9004	Hardware fault: temperature sensor	Temperature sensor cannot be accessed.	The device must be replaced
9100	CAN communication error	Error in CAN communication.	Make sure that the Self Test adapter is plugged. Repeat test with same Self Test adapter and another unit. If the other unit tests successfully, get a replacement for the erroneous one.
9101	K-Line communication error	Error in K-Line communication.	Make sure that the Self Test adapter is plugged. Repeat test with same Self Test adapter and another unit. If other unit tests success- fully, get a replacement for erroneous one.
9102	DoIP communication error	Error in DoIP communication.	Make sure that the Self Test adapter is plugged. Repeat test with same Self Test adapter and another unit. If other unit tests success- fully, get a replacement for erroneous one.

9103	J1708 communication error	Error in J1708 communication.	Make sure that the Self Test adapter is plugged. Repeat test with same Self Test adapter and another unit. If other unit tests successfully, get a replacement for erroneous one.
9200	WLAN Self Test unsuccessful	Connection to the network unsuccessful after timeout.	Make sure that network settings and credential match the network you wish to connect to.
8000	USB unplugged while diagnostics session active	USB unplugged while diagnostics session active.	Plug device.
8001	Communication with vehicle communication CPU disturbed	Vehicle communication CPU is unreachable, connection disturbed.	Unplug device completely, then plug it in and try again. Update to latest firmware.
8010	RP1210App crashed (certain LED status)	Abnormal end due to crash	Re-power device and try again. Update to latest firmware.
8011	PTApp crashed (certain LED status)	Abnormal end due to crash	Re-power device and try again. Update to latest firmware.

Tab. 8-1: Troubleshooting machine faults of VOCOM II

9 Maintenance

Maintenance work serves to maintain the operational readiness and prevent premature wear. Maintenance is divided into:

- Care and cleaning
- Checks and updates
- Repairs

9.1 Care and cleaning

When cleaning the exterior of the device, proceed as follows:

- ▶ Remove dirt.
- ▶ Remove loose dirt and dust using a moist cloth.

9.2 Checks and updates

Checks and updates are divided into:

- Regular checks
- Firmware updates

NOTE The device is maintenance-free with the exception of regular firmware updates and the possibility to perform Self Tests.

9.2.1 Regular checks

To ensure that the device is in proper operating condition, you must regularly perform Self Tests and check that the device functions properly. (⇒ Chap. 6.5.2 "Self Test page")

- ▶ Report any defects found.
- ▶ Immediately report any defects found to the responsible supervisor. At shift change, the off-going member of staff must pass on any defects found as well as measures already taken.
- ▶ If there are defects that affect the operational safety, take the device out of service.

9.2.2 Firmware updates

(⇒ Chap. 6.2.4 "Perform Firmware Update")

9.3 Repairs

Repair works include the replacement of the complete VOCOM II device and are only required when components are damaged by wear or other external circumstances.

- ▶ Do not repair the VOCOM II device yourself.

10 Decommission

10.1 Switch off VOCOM II

To switch off VOCOM II, perform the following steps:

- ▶ Switch off the device.
- ▶ Disconnect the cables from the device.

10.2 Recommission

To recommission VOCOM II, perform the following steps:

- ▶ Switch on the device.
- ▶ Connect the cables to the device.

10.3 Final decommission / disposal

After the end of its useful life, VOCOM II must be properly taken out of service and disposed of.

The device contains electrical components that must be disposed of separately.

- ▶ Ensure that the disposal is done properly and in an environmentally sound way.
- ▶ Do not dispose VOCOM II with household waste.
- ▶ Bring the device to a specialist company for proper disposal.
- ▶ Observe the national and local regulations during disposal.
- ▶ Observe WEEE Directive 2012/19/EU.

11 Technical specifications

Parameter	Description
Dimensions (W x H x D)	160 mm x 91 mm x 44 mm
Weight	Approx. 400 g
Temperature range	-40 to +85°C / -40 to +185°F
EMC	CE and E1-marking
Voltage ratings	Electrical Letter code A and E 6 to 32 V operating voltage
Vehicle / Platform	
Power supply	12 V/24 V operation, VBAT: 6 to 32 V, max. 36 V
Vehicle connector	26-pin ECTA connector
Host connector	12-pin ECTA connector
Vehicle interfaces	
CAN	1 x CAN2.0B with up to 1 Mbit/s 1 x CAN FD with up to 8 Mbit/s
J1708	1 x J1708 J1708 bus topology, 20 nodes @9600 bit/s J1708 high-speed 1 to 1 @14400, 19200, 38400, 57600, 115200 bit/s
K-Line	1 x K-Line 1 x K-Line 5 V (non OBD)
DoIP / Ethernet	100Base-TX, supports DoIP Type A and Type B
Digital I/O	3 x Digital In (non OBD) 3 x Digital Out (non OBD)
Protocol support	ISO 11898, ISO 15765-2, SAE J1939, SAE J1708, ISO 9141, KWP 2000, ISO 13400-2
Legacy protocols	Knorr/Wabco ABS, NIRA EDC1, Volvo Penta MEFI, BOSCH EDC, J1708 DIS, Geartronic, SL2, Q/A, Free Running
Smartcable	SL2, Q/A, Free Running
USB / Ethernet interface	USB 2.0 with 480 Mbit/s USB/Ethernet communication via RNDIS interface

WLAN interface	IEEE 802.11 a/b/g/n Dual band support 2.4/5 GHz MIMO support, 2 WLAN antennas WiFi-Direct support
Diagnostic APIs	RP1210C, J2534, J2534-1, VOCOM II Smartphone API
Processing	
Connectivity CPU	Qualcomm / Atheros AR9350 SoC
Vehicle CPU	SmartFusion2 SoC
Memory	2 x 128 MB DDR RAM, 128 MB NAND FLASH, 16 MB NOR FLASH

Tab. 11–1: Technical specifications of VOCOM II

12 Appendix

12.1 WLAN country settings

CC	Country	Req	Sup	Cert	1-11 2402-2472	12-13 2457-2482	36-48 5170-5250	PS 5250-5330	PS 5490-5710	100-140 5710-5730	PS 144 5710-5730	PS 149-165 5735-5835	PS	Comment	
00	Default				20	0	0	0	x	0	0	0	0	The factory WLAN setting is 2.4 GHz AP mode with CH 1-11 and 20dbm.	
AE	United Arab Emirates	x	x		20	20	17	20	x	20	x	14	x		
AR	Argentina	x	x		20	20	17	20	x	20	x	14	x		
AT	Austria	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
AU	Australia	x	x		20	20	17	20	x	20	x	14	x		
BE	Belgium	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
BG	Bulgaria	x	x	R&TTE	20	20	17	20	x	20	x	14	x	Channel 147 allowed as well	
BR	Brazil	x	x		20	20	17	20	x	20	x	14	x		
BY	Belarus	x	x		20	20	17	20	x	20	x	0	0		
CA	Canada	x	x	FCC	20	0	17	20	x	20	x	20	x	14	Channels 120/124/128 NOT allowed
CH	Switzerland	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
CL	Chile	x	x		20	20	17	20	x	0	0	14	x		
CN	China	x	x		20	20	17	20	x	0	0	14	x		
CO	Colombia	x	x		20	20	17	20	x	20	x	14	x		
CZ	Czechia	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
DE	Germany	x	x	R&TTE	20	20	17	20	x	20	x	14	x		
DK	Denmark	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
DZ	Algeria	x	x		20	20	17	20	x	20	x	0	0	Only 100-132, 136/140 not allowed	
EC	Ecuador	x	x		20	20	17	20	x	20	x	14	x		
EE	Estonia	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
ES	Spain	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
FI	Finland	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
FR	France	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
GB	United Kingdom of Great Britain and Northern Ireland	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
GR	Greece	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
HK	Hong Kong	x	x		20	20	17	20	x	20	x	14	x		
HR	Croatia	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
HU	Hungary	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
ID	Indonesia	x	x		20	20	0	0	0	0	0	14	x	NOT channel 165	
IE	Ireland	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
IL	Israel	x	x		20	20	17	20	x	20	x	0	0		
IN	India	x	x		20	20	17	20	x	0	0	14	x		
IS	Iceland	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
IT	Italy	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
JP	Japan	x	x		20	20	17	20	x	20	x	0	0		
KR	Korea, Republic of	x	x		20	20	17	20	x	20	x	14	x		
KZ	Kazakhstan	x	x		20	20	0	0	0	0	0	0	0		
LT	Lithuania	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
LV	Latvia	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
MX	Mexico	x	x		20	20	17	20	x	20	x	14	x		
MY	Malaysia	x	x		20	20	17	20	x	20	x	14	x	100-128	
NL	Netherlands, NL Antilles	x	x	R&TTE	20	20	17	20	x	20	x	14	x		
NO	Norway	x	x	R&TTE	20	20	17	20	x	20	x	14	x	Not 159, 161	
NZ	New Zealand	x	x		20	20	17	20	x	20	x	14	x		
OM	Oman	x	x		20	20	17	20	x	20	x	0	0		
PE	Peru	x	x		20	20	17	20	x	20	x	14	x		
PL	Poland	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
PR	Puerto Rico	x	x	FCC	20	0	17	20	x	20	x	14	x		
PT	Portugal	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
QA	Qatar	x	x		20	20	0	0	0	0	0	14	x		
RO	Romania	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
RU	Russian Federation	x	x		20	20	17	20	x	20	x	14	x	136-144	
SA	Saudi Arabia	x	x		20	20	17	20	x	20	x	0	0		
SE	Sweden	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
SG	Singapore	x	x		20	20	17	20	x	20	x	14	x		
SI	Slovenia	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
SK	Slovakia	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
TH	Thailand	x	x		20	20	17	20	x	20	x	14	x		
TR	Turkey	x	x	R&TTE	20	20	17	20	x	20	x	0	0		
US	United States of America	x	x	FCC	20	0	17	20	x	20	x	14	x		
ZA	South Africa	x	x		20	20	17	20	x	20	x	0	0		
ZZZ	Subset of all FCC/R&TTE countries, applicable upper limits for ALL countries				20	20	17	20	x	20	x	14	x	All channels above 48 are passive-scan so that no initiated radiation happens on channels that may not be allowed TxPower on U-NII-3 (149-165) is limited to 14 dBm because that is the maximum in some countries. This is only 25mW so it's doubtful if that is even usable. Channels 12-13 are not set to passive scan as they are of lesser concern to FCC, so if there happens to be scan packets on these frequencies because of a misconfiguration, it's not a show stopper	