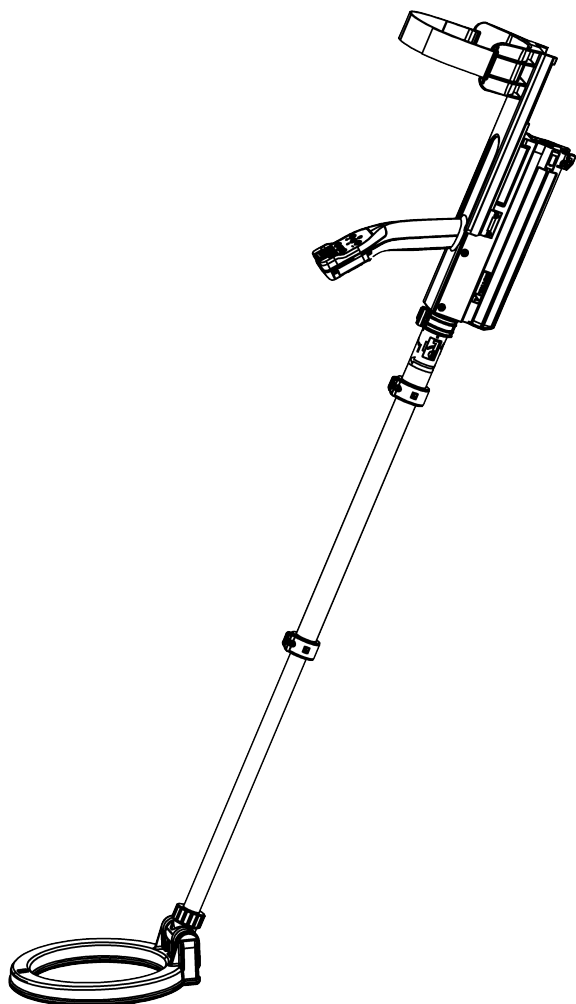


METAL DETECTOR

VMH4



OPERATION MANUAL

Issue EN 07/2023

Version 1.14

Firmware 1.7.0

Searching with Excellence



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1 Prior to starting

Thank you for purchasing one of our leading-edge products. Our company, which has been certified in accordance with ISO 9001 by an independent testing institute, stands for highest quality in the development and manufacturing of devices, assemblies and PC applications.

The technology and the equipment are state-of-the-art regarding their functionality and safety in accordance with national and international requirements. Further developments and improvements are continuously taken into account. Therefore, the figures, technical data, and general contents specified in this document may change due to adjustment to new findings¹.



This operation manual is designed to help you to use our product with its versatile possibilities optimally and safely.

This is why we ask you to read this manual thoroughly prior to putting the product into operation. Always keep this manual near the product so that it is quickly available when needed.

Please do not hesitate to contact us if you have any further questions.

¹All details as stated in this document comply with the technical standard that is applicable at the date of printing. It is subject to technical modifications and error.

2 Symbol explanation

2.1 Symbols in the operation manual

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.



Information

Useful Information

3 Safety instructions

3.1 Electromagnetic compatibility

While using the device, weak electromagnetic fields will be created which have an impact on the environment of the device. In the worst case other electronic devices can be disturbed by these fields. Also the function of this device can be disturbed by the electromagnetic fields of other devices.

3.2 Intended use

The metal detector VMH4 is used for the detection of metal objects and low conductive materials in the ground as well as in shallow water.

Under normal conditions of use, the VMH4 is harmless to humans. Only persons carrying a cardiac pacemaker or similar medical equipment in or on their body must avoid direct contact with the search coil.

3.3 Necessary qualification for operation

Personnel working with the detector must be thoroughly instructed and trained by their organisation in the operation of the detector and in the rules of conduct to be observed when working with the detector. The organisation must ensure that only appropriately trained and qualified personnel work with the device.

Personnel working with the detector must have the following knowledge and qualifications:

- ▷ Knowledge of these Operating Instructions
- ▷ Training in the operation of the device by the organisation of the personnel
- ▷ Knowledge of the applicable accident prevention regulations

3.4 Warnings

WARNING

Explosive device

Danger to life from explosions!

- ▷ Before the detection work, ensure that the expected target objects are reliably detected with the set configuration.
- ▷ Before the detection work, ensure that the expected target objects can be detected without danger, e.g. also those with magneto ignition.
- ▷ When searching for explosive devices, avoid touching the objects with the detector.

CAUTION

Electromagnetic waves

Risk of injury for persons with pacemakers!

- ▷ Do not use the detector to examine persons with pacemakers or similar medical devices.

CAUTION

Risk of hearing damage due to high volumes!

- ▷ Do not use the headphone at high volume settings.

4 Description

4.1 General

The metal detector VMH4 consists of a control unit with a telescopic pole and a search coil. The standard search coils VS20/VS25 (diameter 20/25 cm) can be replaced by the following optionally available search coils: VS30 (diameter 30 cm), VS60 (diameter 60 cm) or VSP4 (stick probe).

The search coils VS20 and VS25 are recommended for the detection of shallow buried small metal parts and low conductive objects (such as metal mines, plastic mines with low metal content and graphite rods). The UXO search coil VS30 is recommended for the detection of shallow buried larger metal objects (such as hand grenades, BLU etc.). The UXO search coil VS60 is recommended for the detection of large metal objects in larger depths (such as shells, bombs and other ammunition). The stick probe VSP4 is recommended for detection in hollow spaces, bushes and between roots.

Along with its digital signal processor, the metal detector VMH4 uses the functional principle of an advanced pulse-field specially improved by Vallon GmbH. It works even in strongly mineralized soils, like laterite, magnetite, magmatite as well as in shallow water (salt and fresh water) and under the electromagnetic influence of main power lines without largely affecting the metal detector's sensitivity. Ease of operation as well as a rigid and compact mechanical design ensure very reliable operation for professional ordnance clearing in rigorous military training programs and battlefield operations. When detecting with the metal detector VMH4, each detection alarm may indicate a mine with metal content or an UXO. Mines containing only very small metal parts made from special metallic alloy may eventually not be detected. Mines without any metal part will not be detected. It is strongly recommended to test in advance whether the estimated objects are detectable before the operator starts the detection work.

4.2 Scope of delivery

The scope of delivery of the VMH4-VS20 contains the following components (refer to fig. 4.2.1):

Pos.	Description	Part number olive green	Part number sand
1	Metal detector VMH4	on request	on request
2	Search coil VS20	2904090010	2904090010SND
3	Test piece VMH4 (at detector)	2905010020	
4	Alkaline battery D/LR20 (VMH4 3 pcs., VMH4L 4 pcs.)	5910001006	
5	Adjustment plate for brake screw	2805010000	
6	Backpack	8905010000	8905010000SND
7	Operation manual (no fig.)	8905010270	
8	Field manual (no fig.)	8905010280	
9	Backpack contents drawing (no fig.)	8905010290	

In the scope of delivery of the VMH4-VS25 the following components are different:

Pos.	Description	Part number olive green	Part number sand
2	Search coil VS25	2904090025	2904090025SND

In the scope of delivery of the VMH4-VS30 the following components are different:

Pos.	Description	Part number olive green	Part number sand
2	UXO search coil VS30	2904090200	2904090200SND

In the scope of delivery of the VMH4-VS60 the following components are different:

Pos.	Description	Part number olive green	Part number sand
2	UXO search coil VS60	2904090210	2904090210SND

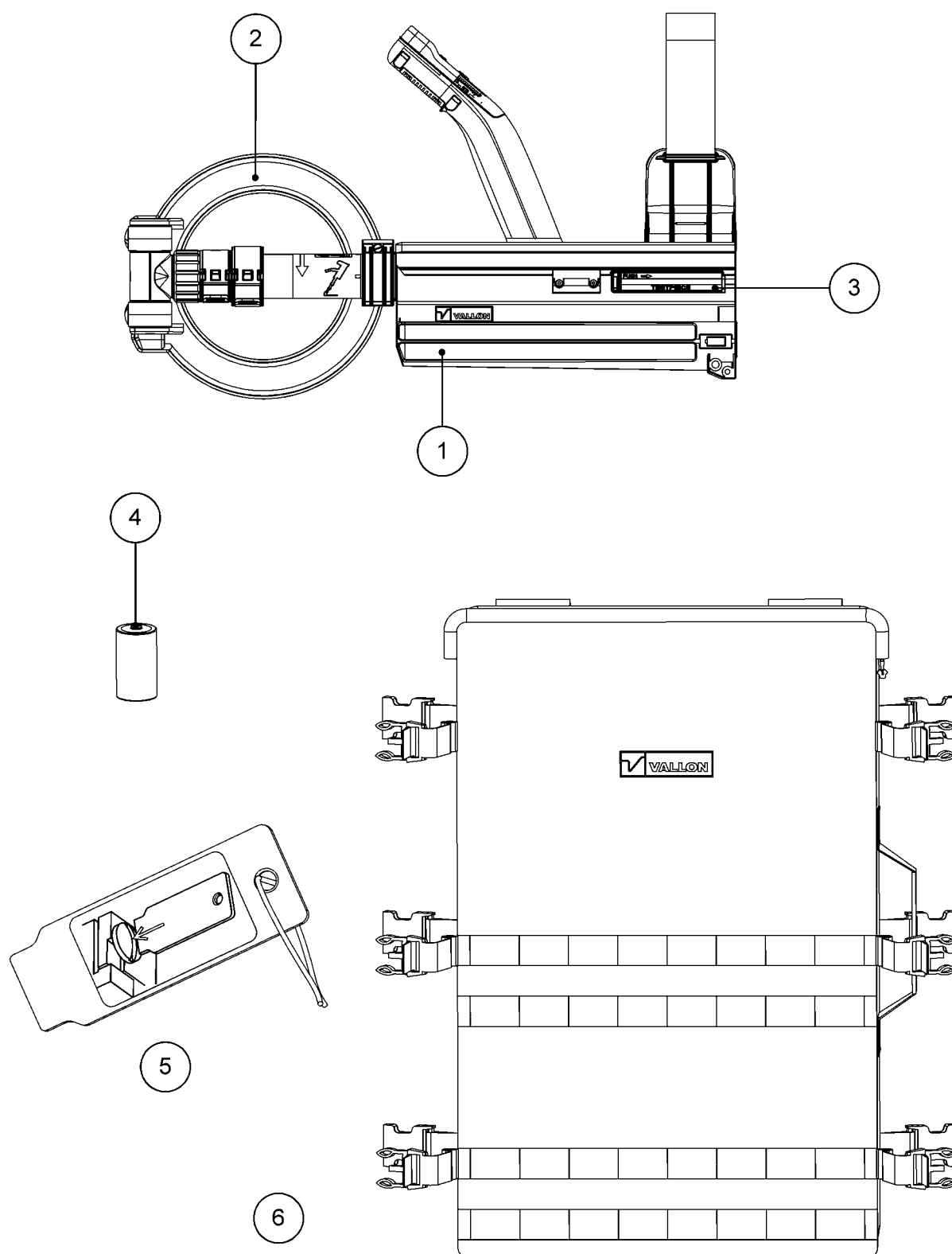


Fig. 4.2.1: Scope of delivery

4.3 Options

Optionally available (refer also to fig. 4.3.1 on page 13):

Pos.	Description	Part number olive green	Part number sand
1	Hard case	2905010050	2905010050SND
2	Search coil VS20	2904090010	2904090010SND
3	Search coil VS25	2904090025	2904090025SND
4	UXO search coil VS30	2904090200	2904090200SND
4.1	Bag for UXO search coil VS30 (no fig.)	8904090890	8904090890SND
5	UXO search coil VS60 with carrying strap	2904090210	2904090210SND
5.1	Bag for UXO search coil VS60 (no fig.)	8702360002	8702360002SND
6	Stick probe VSP4	2904090230	
7	Data cable	5110307076	
8.1	On-ear headphone single-sided, watertight and non magnetic	2904090090	
8.2	Over-Ear headphone single-sided, water-tight and non magnetic	2904090480	
8.3	Over-ear headphone single-sided with cover for the second ear, watertight and non magnetic	2904090450	
9	Rechargeable NiMH battery 10,000 mAh D/HR20 (VMH4 needs 3 pcs., VMH4L needs 4 pcs.)	5920001006	
10	Charging cable VMF4/ VMH4/ VMC4 for charging of NiMH rechargeable batteries directly in the detector by using a vehicle plug socket 12/24V	2504090071	
11	Power supply adapter 100–240 V / 12 V with Euro plug; suitable for the charging cable VMF4/ VMH4/ VMC4	5900001030	
12	USB adapter cable kit (USB adapter cable + USB storage device)	2509990170	
13	Universal charger 100–240 V / 50–60 Hz, 12 V (no fig.)	2909990847	

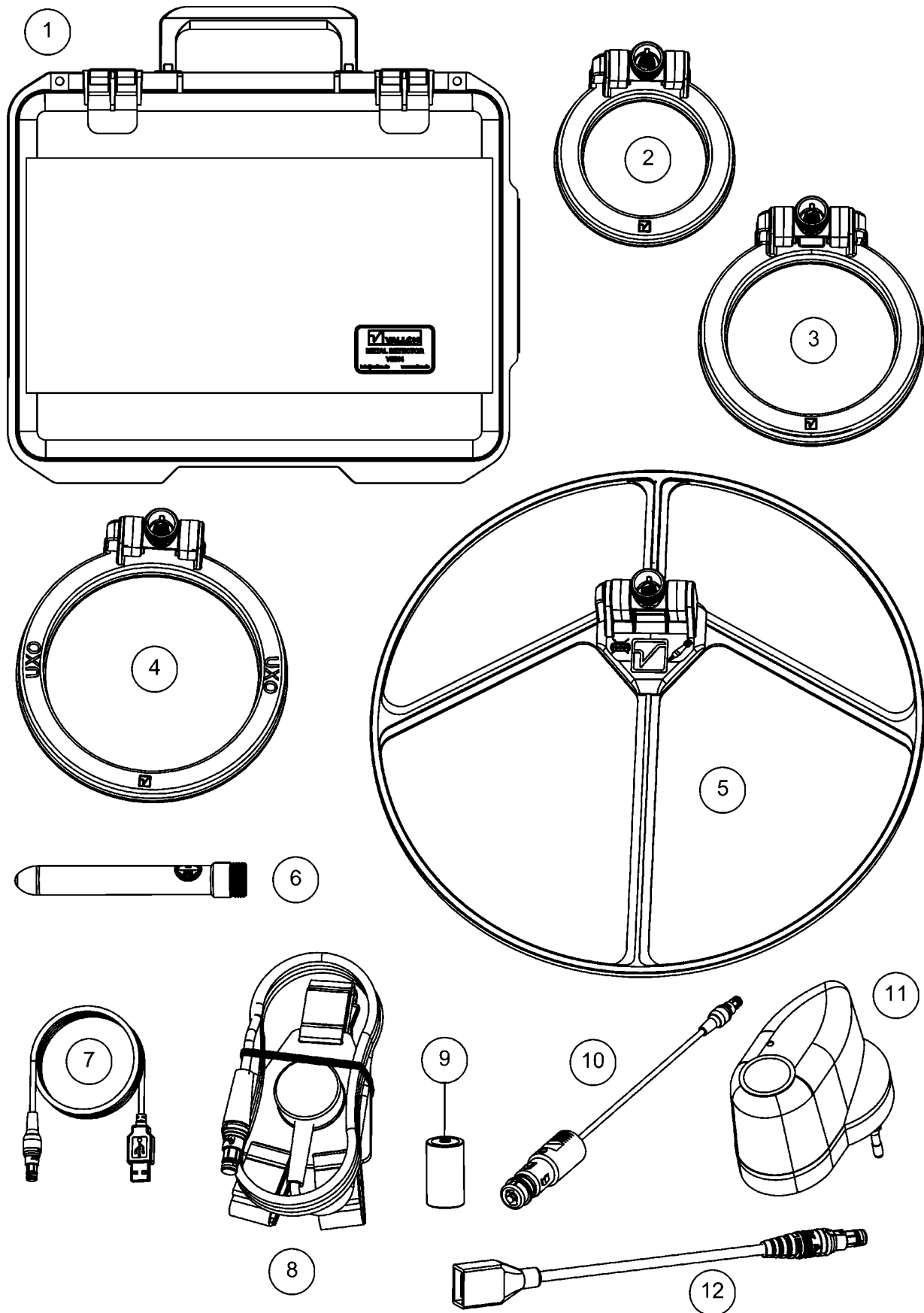


Fig. 4.3.1: Optional accessories

4.4 Structure

The detector VMH4 consists of the following assemblies (refer also to fig. 4.4.1):

- ▷ Control unit (with hand grip, control panel, arm rest and battery compartment)
- ▷ Telescopic rod with clamps
- ▷ Search coil

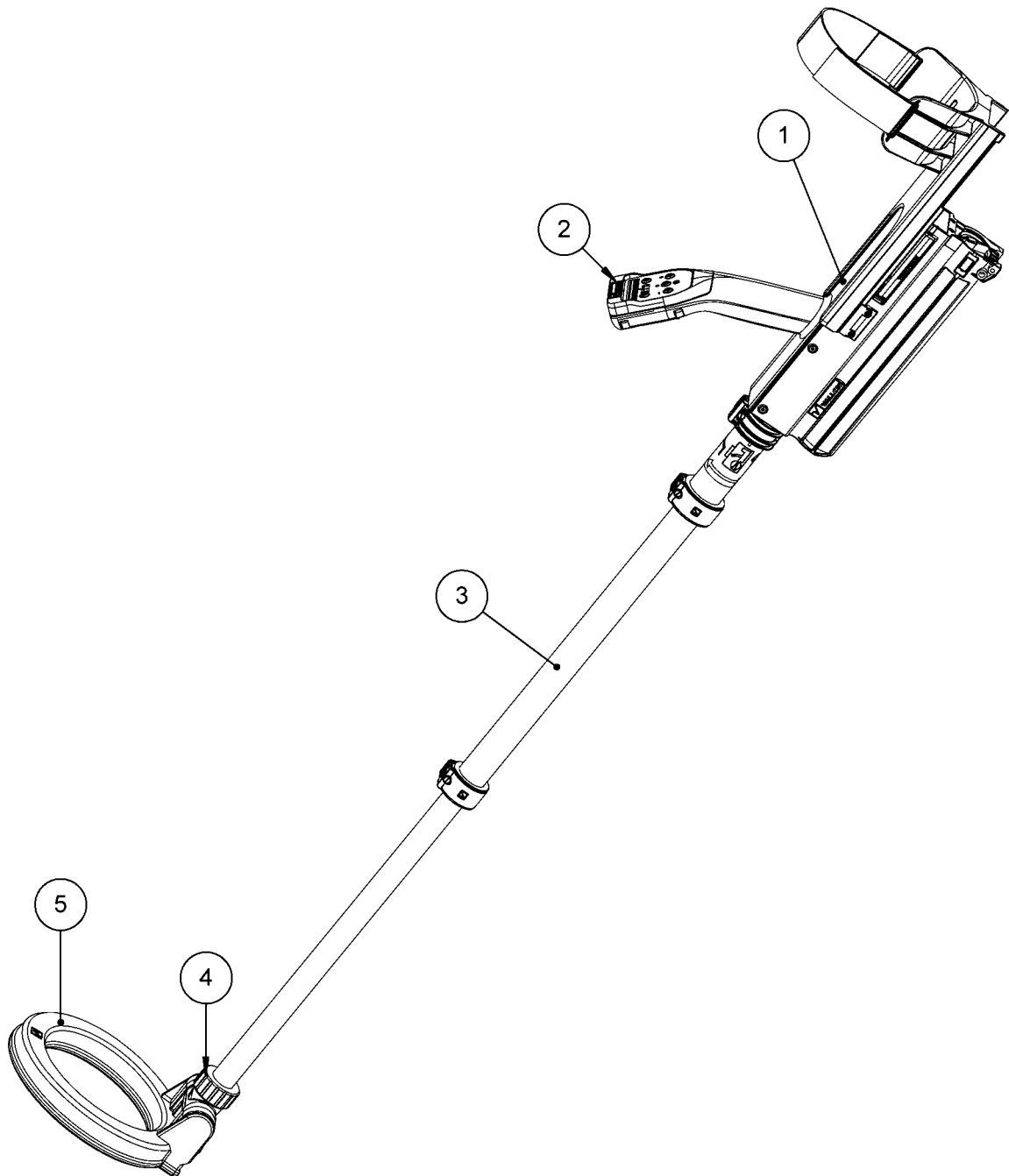


Fig. 4.4.1: Structure

(1) Control unit; (2) hand grip with control panel; (3) Telescopic rod with clamps; (4) Plug connection with screw fastening; (5) Search coil

4.4.1 Headphones (option)

The headphones contain a non-magnetic piezo speaker and can also be worn under a helmet.

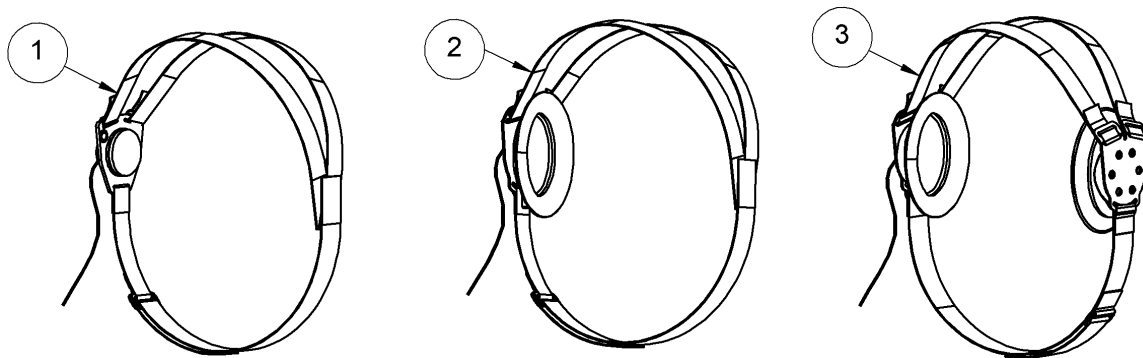


Fig. 4.4.2: Headphones: (1) On-Ear headphone single-sided; (2) Over-Ear headphone single-sided; (3) Over-ear headphone single-sided with cover for the second ear

4.4.2 Transport case (option)

The transport case consists of hard plastic and is equipped with two latches and an automatic pressure regulation valve. To open, grip under the safety levers at the latches and flap the latches upwards, see fig. 4.4.3. To close the latches press the snaps shut.

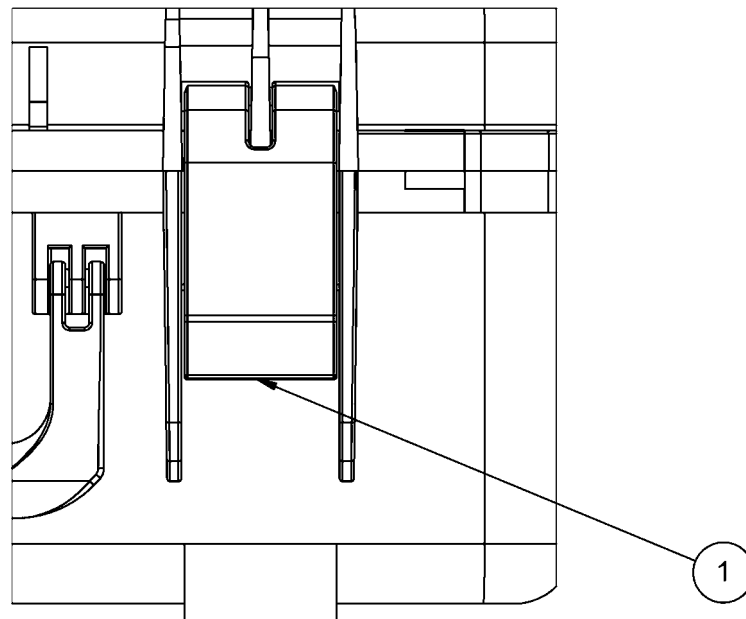


Fig. 4.4.3: Lock transport case: (1) Safety lever

NOTICE

Permanent moisture can damage the device.

- ▷ The seal in the cover must always be kept clean to ensure the water tightness of the hard case. In the event that the seal is cracked or damaged in any other way, it must be replaced.

4.4.3 Control elements and indicators

All control elements and indicators are installed in the control unit, see fig. 4.4.4 and table 4.6.

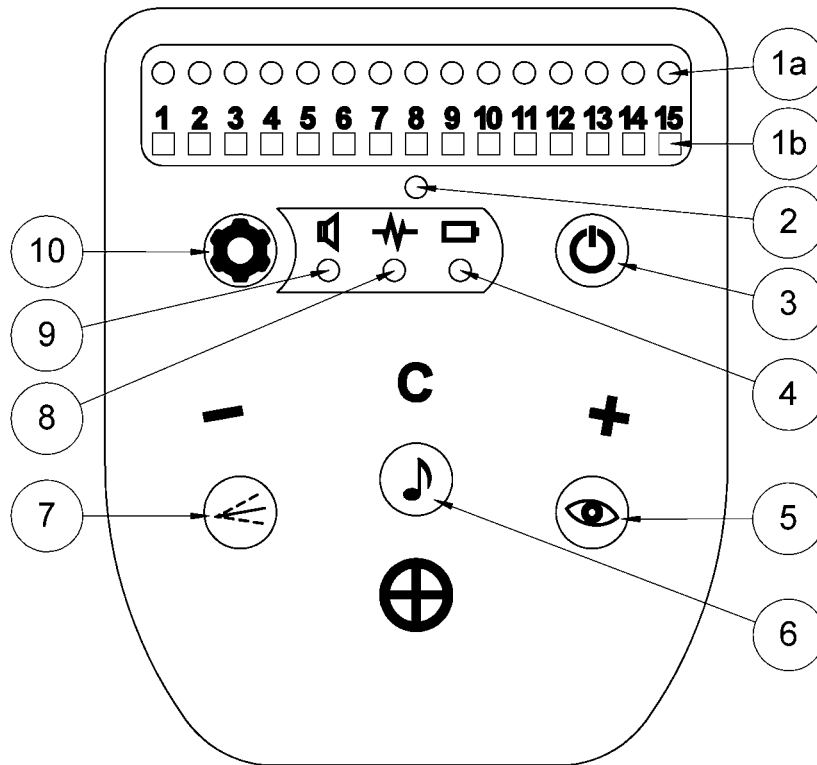


Fig. 4.4.4: Control panel

Table 4.6: Control elements and indicators

Pos.	Designation	Function	Symbol
1	LED display	Optical display (1a) green LEDs; (1b) infrared LEDs	
2	Brightness sensor	Automatically regulating brightness	
3	Button ON/OFF	<ul style="list-style-type: none"> ▷ Detector on/off ▷ Displaying current battery charge status ▷ WLAN, Bluetooth, USB on/off 	
4	LED OPERATION INDICATOR	<ul style="list-style-type: none"> ▷ lights up red when battery charge status < 25 % (standard value) ▷ blinks red when battery charge status < 5 % ▷ blinks blue if USB, WLAN or Bluetooth is active ▷ lights up green when GNSS signal is sufficient ▷ blinks green when GNSS signal is not sufficient 	     

Pos.	Designation	Function	Symbol
5	Button PLUS	<ul style="list-style-type: none"> ▷ Increasing the value; e.g. increasing the sensitivity of the detector ▷ Activating LED display 	
6	Button C	<ul style="list-style-type: none"> ▷ Coil calibration ▷ Compensating detector ▷ Pinpointing ▷ Setting GNSS waypoint (if GNSS active) ▷ Activating audible alarm 	 
7	Button MINUS	<ul style="list-style-type: none"> ▷ Reducing the value; e.g. reducing the sensitivity of the detector ▷ Activating vibration alarm 	
8	LED WORKING CHANNEL	Operation indicator; is lit green when setting of the working channel is activated	
9	Button SET	<ul style="list-style-type: none"> ▷ Setting the speaker volume and going to the working channel ▷ Soil compensation ▷ Mode selection ▷ “On-the-fly”-Training for the <i>Objekt discrimination mode</i> 	
10	LED VOLUME	Operation indicator; is lit green when setting of speaker volume is activated	

5 Setup

5.1 Inserting the batteries

As power supply either standard batteries or rechargeable batteries (accumulators) are used, see also chapter [Technical data](#) on page 58. For each device only use batteries of the same type and the same charging level! The battery compartment is placed at the control unit, see fig. 5.1.1.

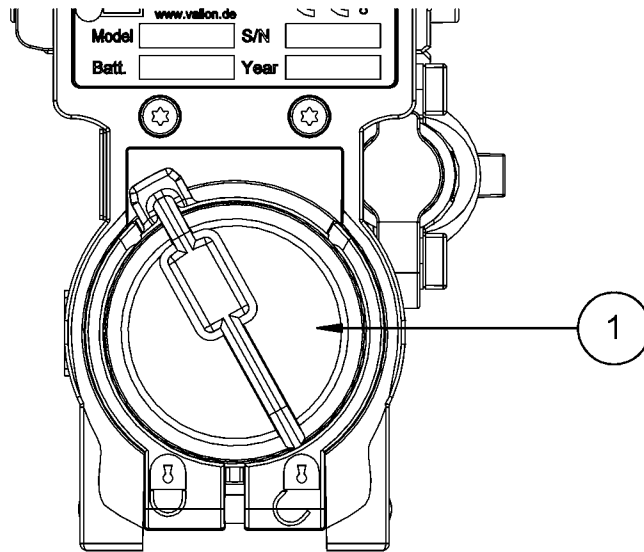


Fig. 5.1.1: Insert the batteries: (1) Cover battery compartment

1. Open the cover of the battery compartment (press downwards and turn counter-clockwise).
2. Hold the device in a horizontal position and slowly insert batteries into the battery compartment. When doing so, observe the polarity indicator  on the housing.
3. Close the cover of the battery compartment.

NOTICE

Letting the batteries fall into the battery compartment can cause damages.

- ▷ Keep the battery compartment horizontally when inserting the batteries and slowly slide the batteries in.

NOTICE

Permanent moisture may cause damage to the device.

- ▷ Make sure that no water can ingress into the battery compartment. Only open the battery compartment when it is dry. Keep the battery compartment and the cover of the battery compartment free of dust and salt.

5.2 Unfolding the detector and adjusting the search coil brake strength

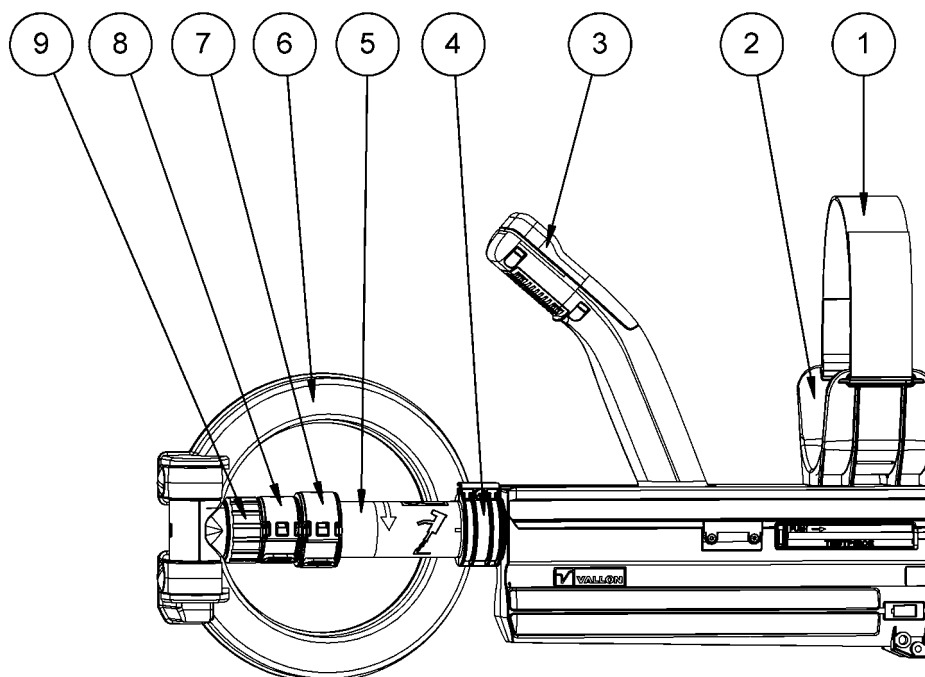


Fig. 5.2.1: VMH4 folded: (1) Strap; (2) Arm rest; (3) Hand grip with control panel; (4) Top clamp; (5) Telescopic rod; (6) search coil; (7) Centre clamp; (8) Bottom clamp; (9) Screw fastening search coil

1. Open the strap of the arm rest.
2. Unfold the search coil. If necessary adjust the correct brake strength by turning the brake screws with the included “adjustment plate for brake screw”, see fig. 5.2.2. Turning clockwise increases the brake strength, turning counterclockwise decreases the brake strength.

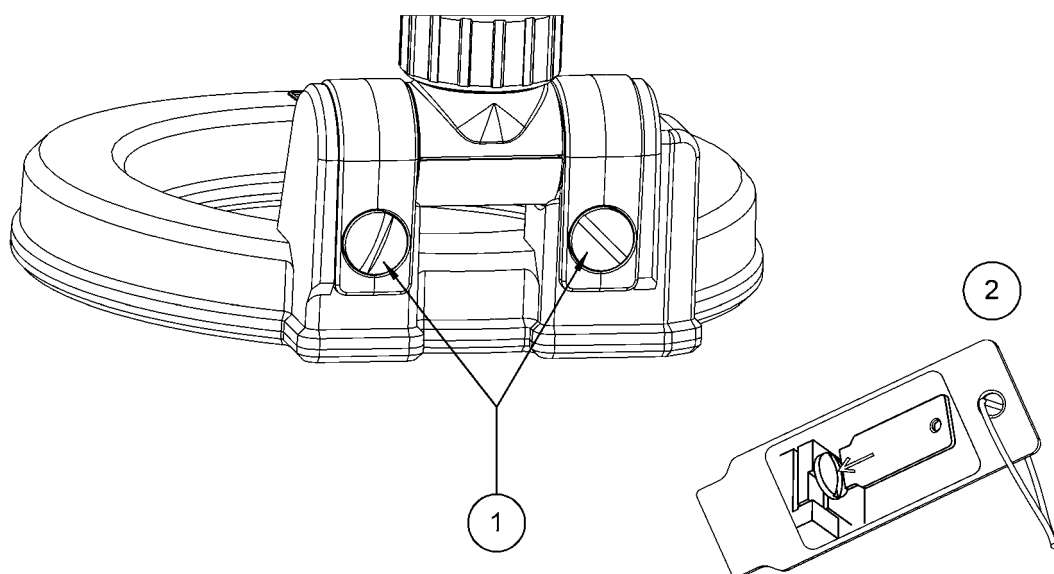


Fig. 5.2.2: Adjusting the search coil brakes: (1) brake screws; (2) adjustment plate

3. Open the top clamp, see fig. 5.2.3. Rotate the search coil into the desired position. Close the top clamp.

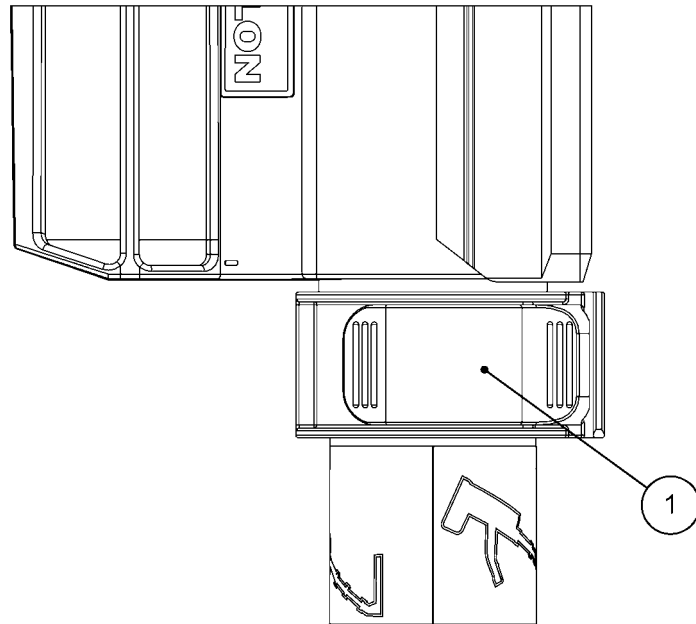


Fig. 5.2.3: Rotating the search coil: (1) Top clamp

4. Open the center and bottom clamp on the telescopic rod, see fig. 5.2.4. Extend the telescopic rod to the desired length. Close the centre and bottom clamp.

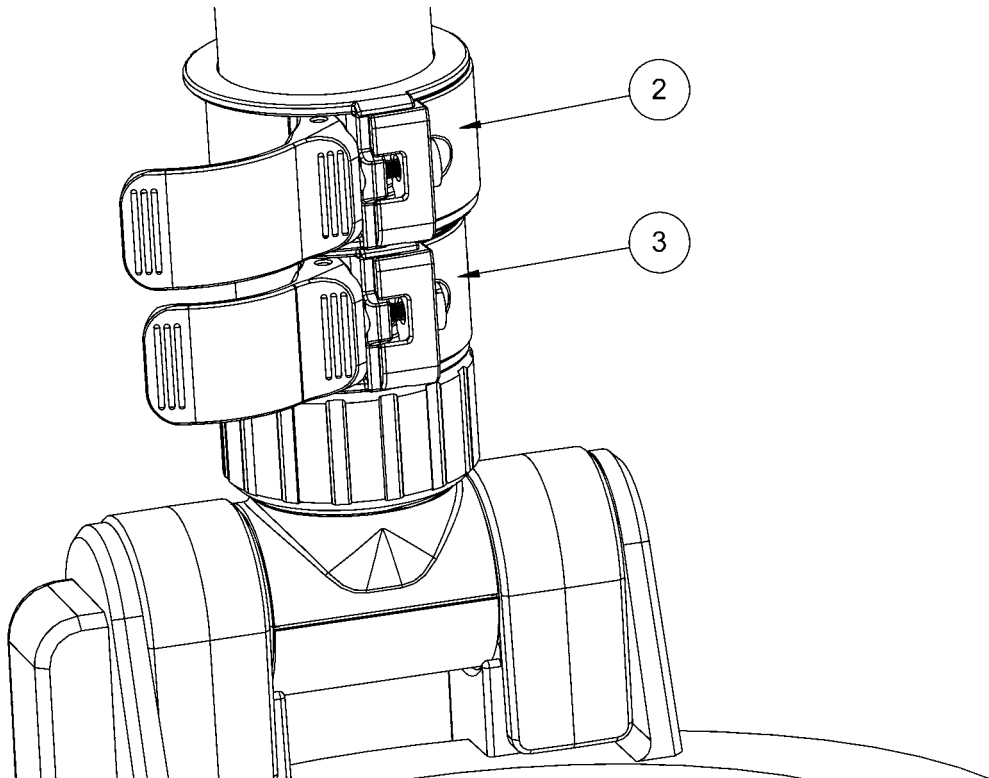


Fig. 5.2.4: Adjusting the telescopic rod: (2) Center clamp; (3) Bottom clamp

5. Slide the arm rest into the desired position, see fig. 5.2.5.

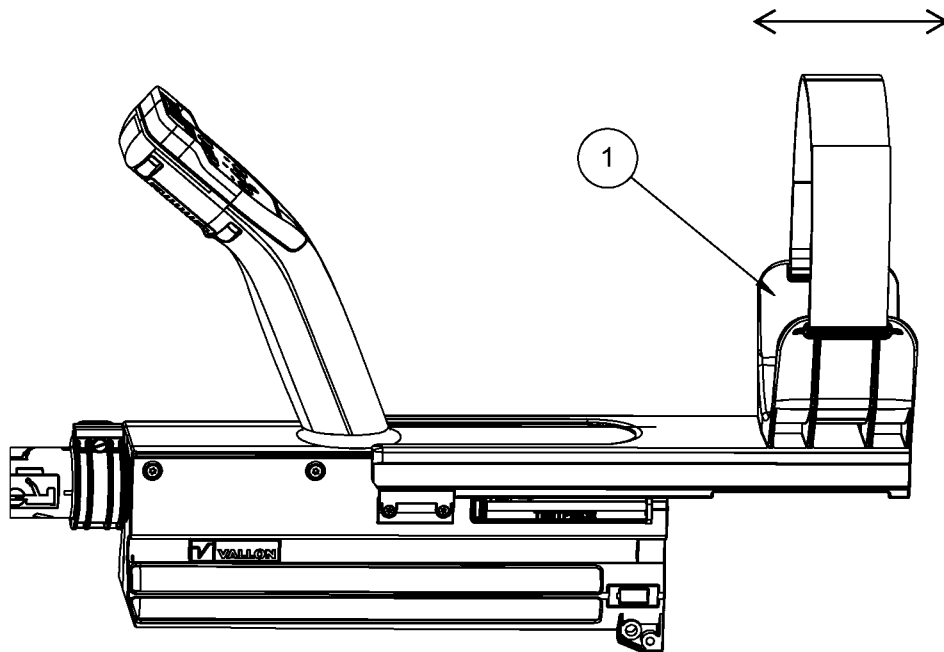


Fig. 5.2.5: Adjusting the arm rest: (1) Arm rest

5.3 Changing the search coil

It is recommended to change the search coil with the detector switched off.

1. Open the union nut of the plug connection and remove the search coil, see fig. 5.3.1.
2. Plug in the new search coil and fix the union nut hand tight. The metal detector recognizes automatically which search coil has been connected.
3. Carry out a soil compensation after each change of the search coil if detecting in mode *Mineral* (see section [Soil compensation](#) on page 30). This also applies if you subsequently detect in the same soil.

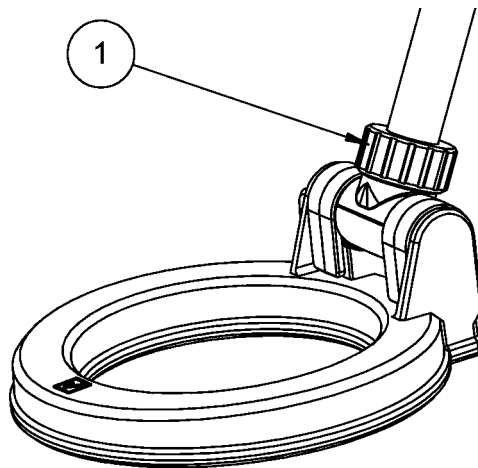


Fig. 5.3.1: Changing the search coil: (1) Plug connector with union nut

WARNING

Explosive device
Danger to life from explosions!

- ▷ The union nut of the plug connection must be tightened sufficiently to ensure safe operation.

5.4 Connecting external devices

At the control unit of the device you can find the cable interface, see fig. 5.4.1. Here you can connect the optional headset and the Vallon charging cable without further settings. Furthermore you can connect third party devices via the optional Vallon data cable, such as a PC for advanced device settings, firmware update or data evaluation via web interface, see chapter [Vallon Webserver](#) on page 72. The headset can be used as an alternative or additionally to the speaker in the control unit. This function can be set in the web interface.

5.4.1 Connecting a cable to the cable interface

1. Remove the protection cap of the cable interface.
2. Connect the plug connector of the external device to the cable interface (this will be easier if you press the button at the bottom of the cable interface). Pay attention to the markings on the plug connector and cable interface.

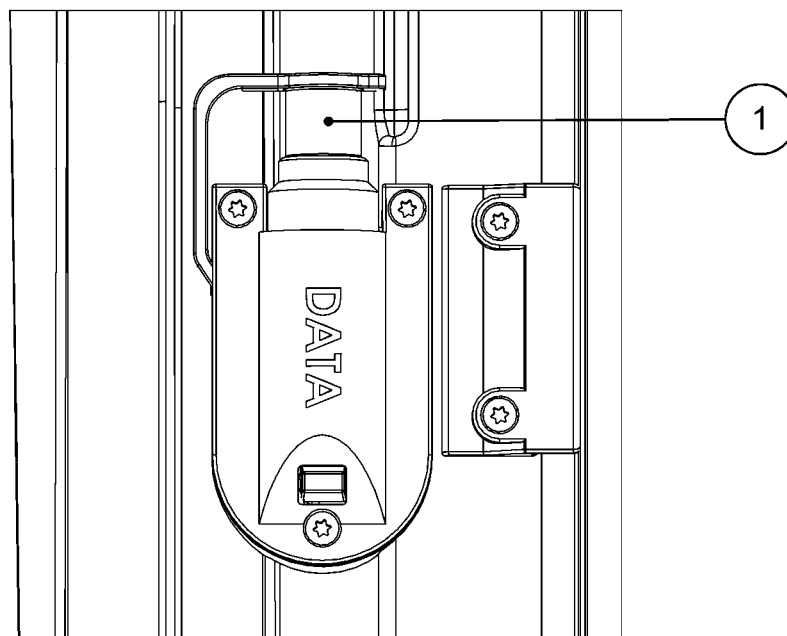


Fig. 5.4.1: (1) Cable interface



Information

- ▷ The plug connector is secured by a locking mechanism. To unplug the connector pull the metal handle sleeve.

6 Operation

6.1 Switching on the device

To switch on, press button ON/OFF  on the control panel until the automatic self-test starts, refer also to fig. 6.1.1.

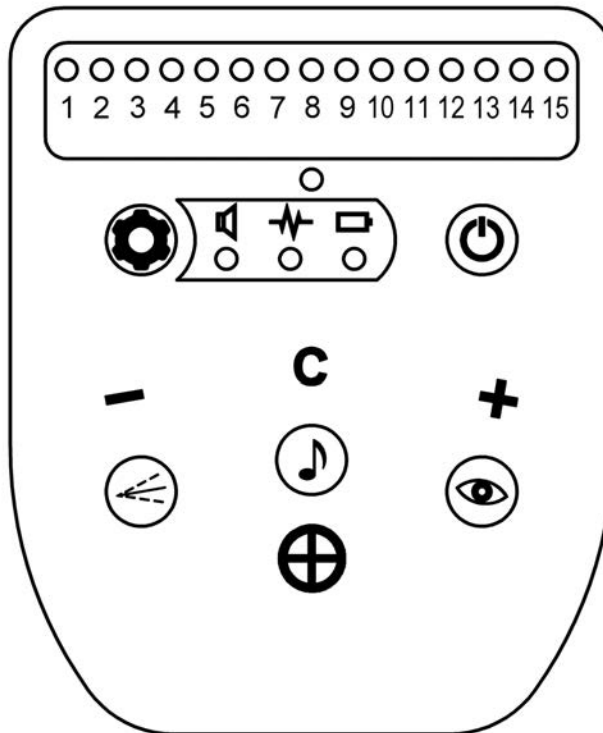


Fig. 6.1.1: Control panel



Information

- ▷ During the start, a battery check is performed and its result is emitted as a signal. The faster the sequence the fuller the batteries, see section [Battery test during switching on](#) on page 26.
- ▷ If no alarm signal is emitted, a *confidence click* (operation signal) will occur during the operation of the detector (audio signal and blinking of LED 8), see also section [Confidence click](#) on page 26. The confidence click indicates the readiness of the device.

6.1.1 Alarm options

LED display, audio alarm and vibration alarm can be combined as desired. To do so, specific button combinations must be pressed when switching on the device, see table 6.1. The setting is saved when switching off the device.

1. Press and hold the button combination for the desired setting.
2. Switch on the device.
3. Release the button combination approx. 1 to 2 seconds after the start of the device.

Table 6.1: Alarm options

Button	MINUS	C	PLUS
Symbol			
Alarms activated / button combination			
Vibration, audio and LED display	x	x	x
Audio and LED display		x	x
Vibration and LED display	x		x
Vibration and Audio	x	x	
Vibration only	x		
Audio only		x	
LED display only			x

The infrared LED display is configured via the web server, see chapter [Vallon Webserver](#) on page 72.

6.1.2 Battery test during switching on

After switching on, a self-test is carried out. For approx. 5 seconds signals will give information about the battery charge. The lower the battery charge is, the less signals per second will be emitted, see table 6.2. During operation the test can be executed again by shortly pressing button ON/OFF.

Table 6.2: Battery test

Acoustic signals	Vibration signals	LED display	Designation
Fast pulses (approx. 10/s)	Fast pulses (approx. 2/s)		Battery charge 100%
Medium pulses (approx. 6/s)	Medium pulses (approx. 1/s)		Battery charge 50%
Slow pulses (approx. 2/s)	Slow pulses (approx. 1/2s)		Battery charge 10%
Constant signal high (approx. 2300 Hz)	Constant vibration		Battery empty

6.1.3 Search coil calibration

After switching on the detector, changing the search coil, switching to another detection mode or when there is a large temperature change in the search coil, the search coil is calibrated. The calibration process takes a few seconds. During the calibration process LED 6 ... LED 10 light up.



6.1.4 Confidence click

If no alarm signal is emitted, a *confidence click* (operation signal) will occur during the operation of the detector (audio signal and blinking of LED 8), refer to table 6.3.

Table 6.3: Confidence click

Detection mode	Signal
Mode <i>Normal</i> : single short pulse signal every 5 seconds.	
Mode <i>Mineral</i> : double short pulse signal every 5 seconds.	

6.2 Testing the metal detector

Using the test piece, you can test the detector for proper functioning. In order to do so, the detector must be set to standard sensitivity (e.g. by restarting) and the detection mode must be set to *Normal*, see sections [Soil compensation](#) on page 30 and [Confidence click](#) on page 26. Take off all metal items from your hand (watch, rings etc.)

1. Make sure that the test site is free of metal parts or metallic objects. Move the search coil a few centimetres in all directions. If no alarm is emitted, the test site is free of metal parts or metallic objects.
2. Move the arm rest to transport position. Remove the test piece from the holder at the side of the detector (see fig. 6.2.1).

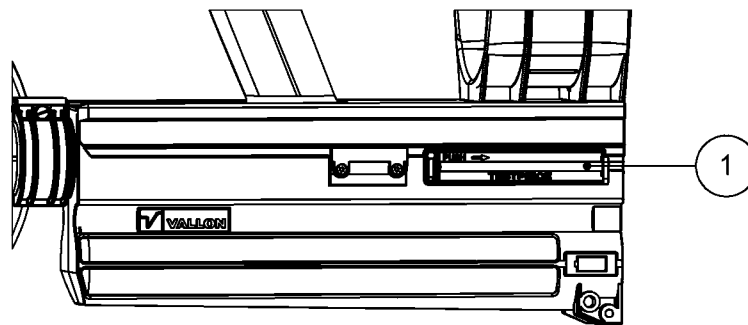


Fig. 6.2.1: Removing test piece: (1) Test piece

3. Move the test piece quickly to the center of the search coil, see fig. 6.2.2. If at least 7 LEDs are lit when reaching the search coil, the detector works correctly.

Note: This only applies when using the VS20 search coil with the factory-set standard detection sensitivity of 80 %. If a different search coil is used or a different standard detection sensitivity has been set in the web server, a different number of LEDs light up.

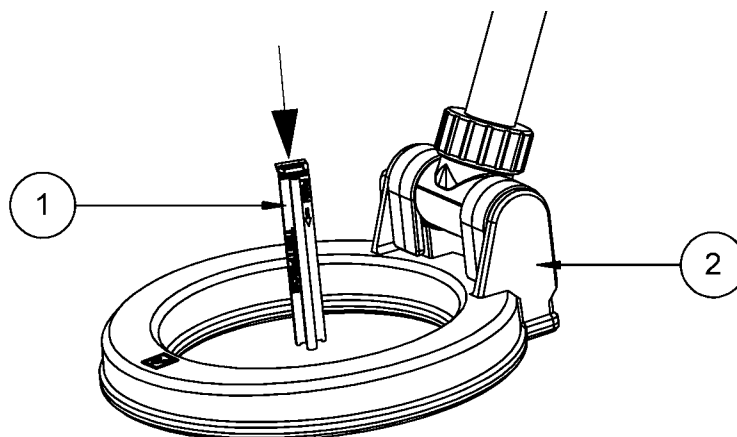


Fig. 6.2.2: Testing the detector: (1) Test piece; (2) Search coil

6.3 Settings

Parameter	Value range	Standard value
Volume	0–100 %	80 % (12 LED)
Sensitivity	0–100 %	80 % (12 LED)
Working Channel	Group A–E, channel 1–10	A3



Information

- ▷ The settings menu is automatically left if no button is pressed within 5 seconds.

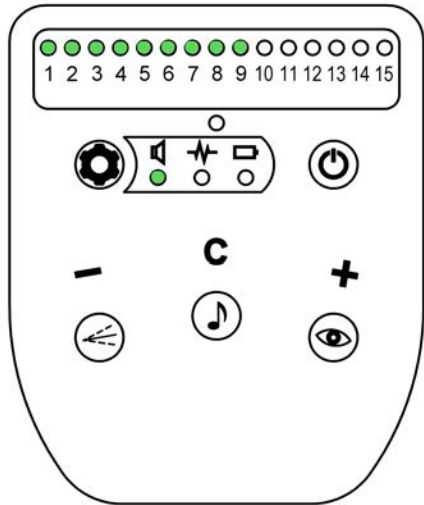
6.3.1 Speaker volume

The setting of the volume applies for the speaker, as well as for the headphone. The volume is not saved when switching off the device. For safety reasons, the device starts with standard volume.

⚠ CAUTION

Risk of hearing damage due to high volumes!

- ▷ Do not use the headphone at high volume settings.

Step	Activity	Display
1	Press button SET  once (LED VOLUME is lit). The current volume is displayed.	
2	Press button MINUS or PLUS until the desired volume is shown in the LED display.	

Step	Activity	Display
3	Press button C to go back to working mode.	

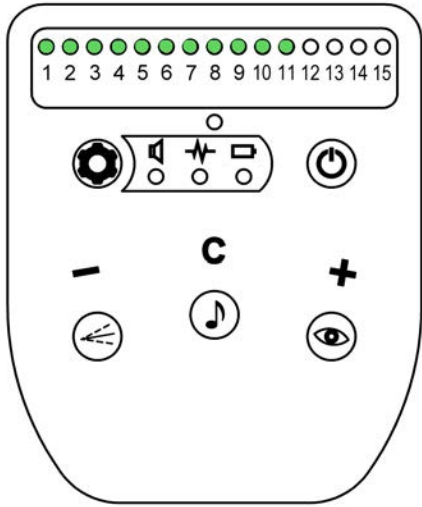


Information

- ▷ The settings menu is automatically left if no button is pressed within 5 seconds.

6.3.2 Detection sensitivity

Set the detection sensitivity only after the detector has adjusted to the ambient temperature. If the temperature difference between storage site and search site exceeds 20°C: Wait at least 10 minutes. For safety reasons the sensitivity is not saved when switching off the device. For safety reasons, the detector starts with standard sensitivity. The sensitivity setting done in standard mode (M1) will be transferred to all other modes.

Step	Activity	Display
1	In the working mode, press button MINUS (LED 1 flashes) or button PLUS (LED 15 flashes).	

WARNING

Danger to life from explosion of missed objects!

- ▷ Before the detection work, ensure that the expected target objects are reliably detected with the set configuration.

6.3.3 Soil compensation

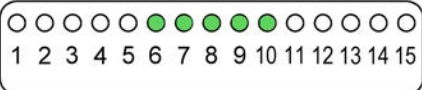
The standard mode is the mode *Normal*. If the soil is strongly mineralized and causes false alarms, the mode must be changed to *Mineral*. In addition a soil compensation must be carried out to adjust the detector to the local soil properties. The Confidence Click indicates if the detector is working in mode Normal (single click) or Mineral (double click), refer to [Confidence click](#) on page 26. The lastly used detection mode is saved when switching off the device. In the detection mode *Mineral*, also the soil compensation settings are saved. However, the search sensitivity must be checked every time the device is switched on.

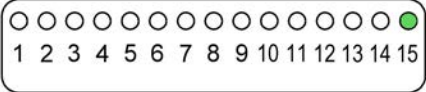
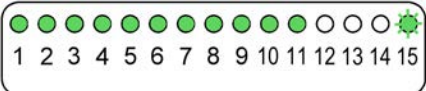
WARNING

Danger to life from explosion of missed objects!

- ▷ Do not carry out the soil compensation near to sources of electromagnetic interferences.
- ▷ After every soil compensation, check if the target objects are detected.

Carrying out a soil compensation

Step	Activity	Display
	Make sure Hold the search head at a minimum distance of 1 m to the ground and any metal objects.	
	Press and hold button SET  until the end of the soil compensation.	
1	After one second, the detector emits a high-pitched tone signal and a visual signal (depending on alarm configuration).	
	Note: If you release button SET before the soil compensation is completed, the compensation process will be cancelled and the detector will change automatically to mode <i>Normal</i> .	

Step	Activity	Display
2	<p>After another three seconds, the detector emits a sound signal with decreasing pitch and a vibration signal, LED 15 lights up (depending on alarm configuration).</p>	
	<p>After the signals, repeatedly move the search coil slowly up/down (between “close to the ground” and approx. 25 cm above the floor, see also fig. 6.3.1). During this activity, the search coil must not touch the ground. LED 15 blinks if mineralized soil is detected and is illuminated continuously if no mineralized soil is detected.</p>	
	<p>If mineralized soil is detected, the LED display shows the progress of the compensation process.</p>	

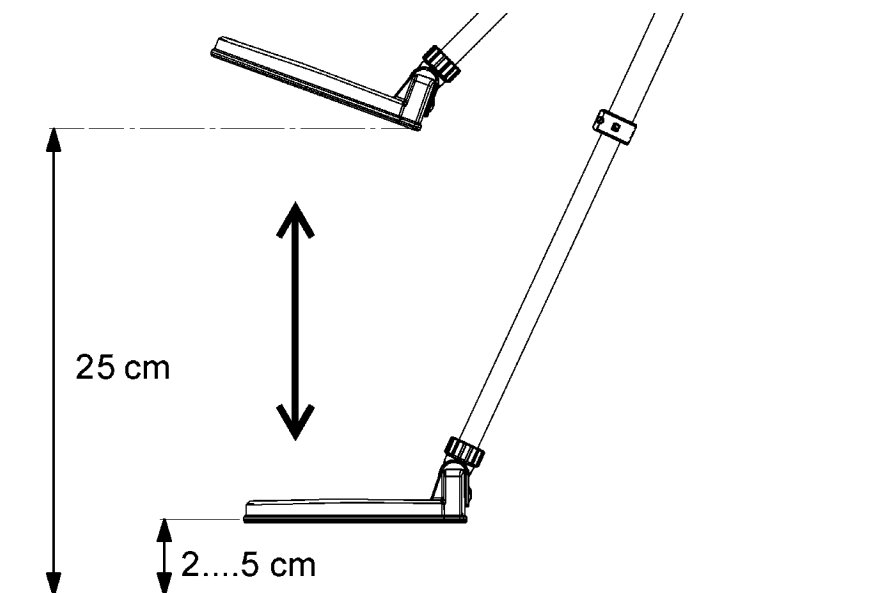
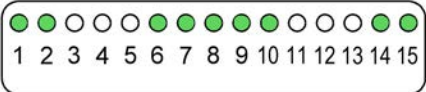
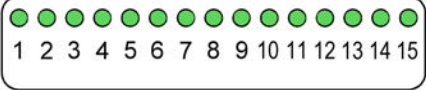


Fig. 6.3.1: Soil compensation

Step	Activity	Display
3	<ul style="list-style-type: none"> Soil compensation successful: high-pitched confirmation sound. If the detector identifies mineralised soil: detector will select mode <i>Mineral</i>, otherwise detector will select mode <i>Normal</i>. 	
	<ul style="list-style-type: none"> Soil compensation not successful: low-pitched warning sound, all LEDs blink, detector will select mode <i>Normal</i>. 	
<p>Now button SET can be released.</p> <p>Note: If the soil compensation was not successful: repeat soil compensation at another place.</p>		

Switching between mode *Normal* and *Mineral*

- Switching to mode *Mineral* ⇒ Press and hold button C. When LED 14 lights up, press additionally button PLUS. When LED 7 and 9 light up briefly to confirm the change, release the buttons.
- Switching to mode *Normal* ⇒ Press and hold button C. When LED 14 lights up, press additionally button MINUS. When LED 8 lights up briefly to confirm the change, release the buttons. If a soil compensation is cancelled or was not successful the detector will change automatically to soil setting *Normal*.

6.3.4 Working channel

Using several detectors with low distance between each other (< 20 m) can cause interferences. This can be prevented for Vallon detectors of the same type by setting different working channels. In this case choose the working channels manually, see sections [Working channel selection](#) on page 33 and [Setting working channel manually](#) on page 34.

In some cases changing the working channel can minimize interferences generated by of third-party sources (such as high-voltage lines, transformers, detectors of other types). In this case it is recommended to let the device search automatically for a suitable channel, see section [Setting working channel automatically](#) on page 35. If using the automatic working channel selection the selected working channel is unknown. Therefore, the minimum distance between the detectors is always 20 m. If the problem persists after performing the automatic working channel selection, repeat the automatic working channel selection or manually search for an undisturbed channel.

The working channel is saved when switching off the device.

Working channel selection

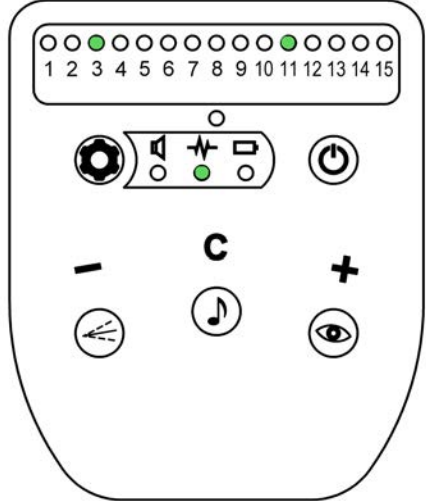
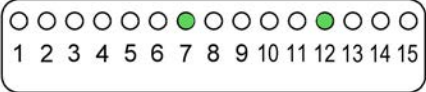
There is a total of 50 channels available. These are divided into five groups A–E. Each group consists of 10 working channels. The minimum distance between the groups when doing detection work is 20 m. The minimum distance between the detectors within a group depends on the number of detectors, see table 6.9.

Table 6.9: Working channels and minimum distances working with several detectors

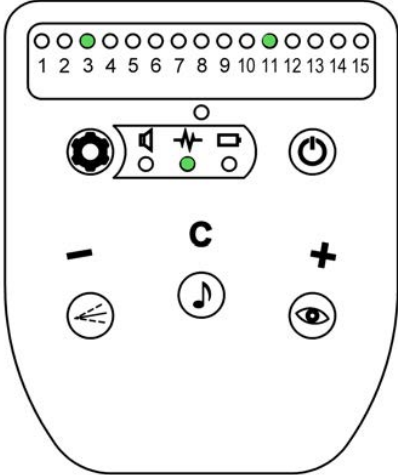
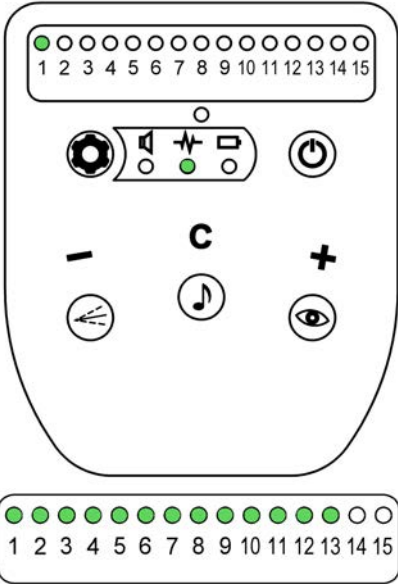
Detektors per group	Working channel selection	Distance within group
2 ... 3	D2, D3, D5	2 m
2 ... 5 Group D1: Group D2:	D1 ... D5 D6 ... D10	5 m
5 ... 10 Group A: Group B: Group C	A1 ... A10 B1 ... B10 C1 ... C10	10 m

Setting working channel manually

If the setup menu for the working channel adjustment is activated, the LED display indicates the working channel: the LEDs 1–10 indicate the channel number, the LEDs 11–15 indicate the channel group A–E.

Step	Activity	Display
1	Press button SET  repeatedly until LED WORKING CHANNEL lights up. The current working channel is indicated by the LED display. In the right-hand image, A3 is the current channel.	
2	Press button PLUS or MINUS until the left-hand LED marks the desired working channel (B7 in the example). The working channel is activated without delay, and can be tested immediately in the menu after setting.	
3	Press button C to go back to working mode.	
<div>  Information <ul style="list-style-type: none"> ▷ The settings menu is automatically left if no button is pressed within 5 seconds. </div>		

Setting working channel automatically

Step	Activity	Display
1	<p>Press button SET  repeatedly until the LED WORKING CHANNEL lights up. The current working channel is indicated by the left-hand LED. In the right-hand image, A3 is the current channel.</p>	
2	<p>Press button C until the automatic search for a suitable working channel starts (approx. 2 seconds). The LED display shows the progress of the search process. The search process can be cancelled by briefly pressing button C.</p> <p>After finishing the automatic working channel search, the detector puts out a short visual and acoustical success message.</p>	
3	Press button C to go back to working mode.	



Information

- ▷ The settings menu is automatically left if no button is pressed within 5 seconds.

6.3.5 Manual compensation

Due to its dynamic mode, the detector can compensate certain (alarm causing) factors automatically. If these factors cease very quickly, the detector can emit a permanent alarm which can not be compensated automatically anymore. In this case you can compensate manually by pressing button C briefly. Depending on the operating conditions, the compensation takes approx. 1 to 10 seconds.

6.3.6 MD Pinpoint function (static mode)

The pinpoint function  (static mode) allows for slow detection movements for a higher degree of location detection accuracy of very small objects.

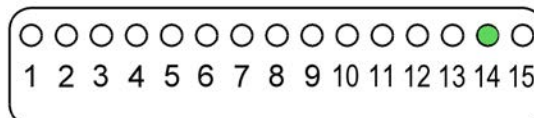
Activating the Pinpoint function

In the web server, you can choose between two methods for activating / deactivating the pinpoint function:

- ▷ Activation of the pinpoint function by permanently pressing down button C. Deactivation by releasing button C.
- ▷ Permanent activation of the pinpoint function by a long press (approx. 2 seconds) on button C. Deactivation the pinpoint function by another long press on button C.

Using the pinpoint function

1. Move the search coil to an area where no alarm is indicated.
2. Activate the Pinpoint function (LED 14 lights up).



3. Search for the center of an object (maximum signal) by moving the search coil very slowly.
4. Deactivate the Pinpoint function to go back to the dynamic mode (standard).

WARNING

Danger to life from explosion of missed objects!

- ▷ Do not activate the Pinpoint function when an alarm occurs.
- ▷ Before activating the pinpoint function, move the search coil to an area where no alarm is indicated.

6.4 Special detection modes

Beside the standard mode for regular metal detection the detector provides special detection modes:

- ▷ the *Low Conductive* mode for the detection of low conducting objects, see section “*Low Conductive*” mode on page 38.
- ▷ the *High Power* mode for the detection of objects that generate a weak detection signal or lie in deeper positions, see section “*High Power*” mode on page 39.
- ▷ the *Object Discrimination* mode that allows to recognize objects, see section “*Object Discrimination*” mode on page 40.
- ▷ the *Urban* mode for the detection in urban areas with large disturbing metal objects, see section “*Urban*” mode on page 46.
- ▷ the *UXO* mode for the detection of UXO, see section “*UXO*” Mode on page 48.
- ▷ the *Rescue* mode for safe rescue of persons after a mine accident, see also section “*Rescue*” mode on page 49.

Table 6.12 shows which detection modes are available with the different search coils.

Table 6.12: Special detection modes

Modus	VS20	VS25	VS30	VS60	VSP4
Low Conductive	✓	✓			
High Power	✓	✓	✓		
Object Discrimination	✓	✓	✓		
Urban	✓	✓	✓		
UXO	✓	✓	✓	✓	✓
Rescue	✓	✓	✓	✓	✓

6.4.1 “Low Conductive” mode

For the detection of low conducting objects, the metal detector VMH4 is equipped with a specially optimized *Low Conductive* mode. The detection of metal objects will not be influenced. When the *Low Conductive* mode is active, only the detection sensitivity for low conductives can be set with the PLUS and MINUS keys in the working mode. The sensitivity for metals is taken from the standard mode.

The *Low Conductive* mode will not be saved when switching off the detector; the detector always starts in the standard mode. The *Low Conductive* mode is only available with certain search coils, see table 6.12 on page 37.

Activating the “Low Conductive” mode

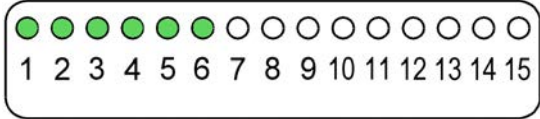
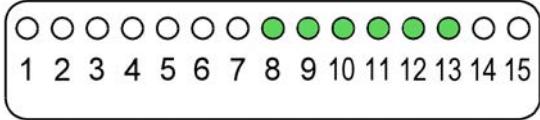
Step	Activity
1	Press button SET  repeatedly until LED VOLUME and LED WORKING CHANNEL light up. The active detection mode will be shown by the LED display (in the standard mode LED 1 lights up).
2	Press button PLUS or MINUS until LED 2 is lit.
3	Press button C to go back to working mode.



Information

- ▷ The settings menu is automatically left if no button is pressed within 5 seconds.

Alarm output with activated “Low Conductive” mode

Object	Alarm
Metal: LED 1 to 6	 High alarm tones
Low conductive objects: LED 8 to 13	 Deep alarm tones

6.4.2 “High Power” mode

For the detection of objects that generate a weak detection signal or lie in deeper positions, the detector’s *High Power* mode can be activated. Thus, the detector’s demand for energy is increased and its battery life is reduced. The *High Power* mode will not be saved when switching off the detector; the detector always starts in the standard mode. The *High Power* mode is only available with certain search coils, see table 6.12 on page 37.

Activating the “High Power” mode

Step	Activity
1	Press button SET  repeatedly until LED VOLUME and LED WORKING CHANNEL light up. The active detection mode will be shown by the LED display (in the standard mode LED 1 lights up).
2	Press button PLUS until LED 3 is lit.
3	Press button C to go back to working mode.



Information

- ▷ The settings menu is automatically left if no button is pressed within 5 seconds.

6.4.3 “Object Discrimination” mode

The *Object Discrimination* mode is intended to recognize specific individually trained target objects, see section [Training target objects](#) on page 41. The *Object Discrimination* mode will not be saved when switching off the detector; the detector always starts in the standard mode (nevertheless the trained target objects will be saved). The *Object Discrimination* mode mode is only available with certain search coils, see table 6.12 on page 37.

Activating the “Object Discrimination” mode

Step	Activity
1	Press button SET  repeatedly until LED VOLUME and LED WORKING CHANNEL light up. The active detection mode will be shown by the LED display (in the standard mode LED 1 lights up).
2	Press button PLUS until LED 4 is lit.
3	Press button C to go back to working mode.
4	<p>Carry out a soil compensation, see section Soil compensation on page 30.</p> <p>If you already have trained your desired target objects, your detector now is ready for detection in <i>Object Discrimination</i> mode. Otherwise continue with section Training target objects on page 41.</p> <p>The alarm outputs in the <i>Object Discrimination</i> mode is indicated in section Display output with active “Object Discrimination” mode on page 46.</p>
<div>  Information </div> <p>▷ The settings menu is automatically left if no button is pressed within 5 seconds.</p>	

Training target objects

Training target objects using the web server

Step	Activity
1	Connect to the device with a computer (via cable, WLAN or Bluetooth) and open the webserver, see chapter Webserver setup on page 72.
2	<p>This step is only to be carried out if using the <i>Object Discrimination</i> mode the first time.</p> <ol style="list-style-type: none"> 1. Login and open the page <i>Permissions</i>, see section Customizing on page 92. 2. In the block <i>Edit user</i> select admin. In the block <i>Menu settings for user admin</i> make page <i>Object Discrimination</i> usable, in the block <i>Setup</i> make <i>Setup Object Discrimination</i> usable. 3. In the block <i>Edit user</i> select default. In the block <i>Menu settings for user default</i> make page <i>Object Discrimination</i> usable, in the block <i>Setup</i> make <i>Setup Object Discrimination</i> usable. 4. Logout
3	Go to page <i>Object Discrimination</i> .
4	Go to tab <i>Object administration</i> and enter the name of your target object (e.g. Object 1). Click button <i>Add object</i> , see fig. 6.4.1. No more than 30 objects should be created.
5	Continue with section Carrying out a training with a freely moveable target object on page 42 or section Carrying out a training with a target object buried in the ground on page 43.

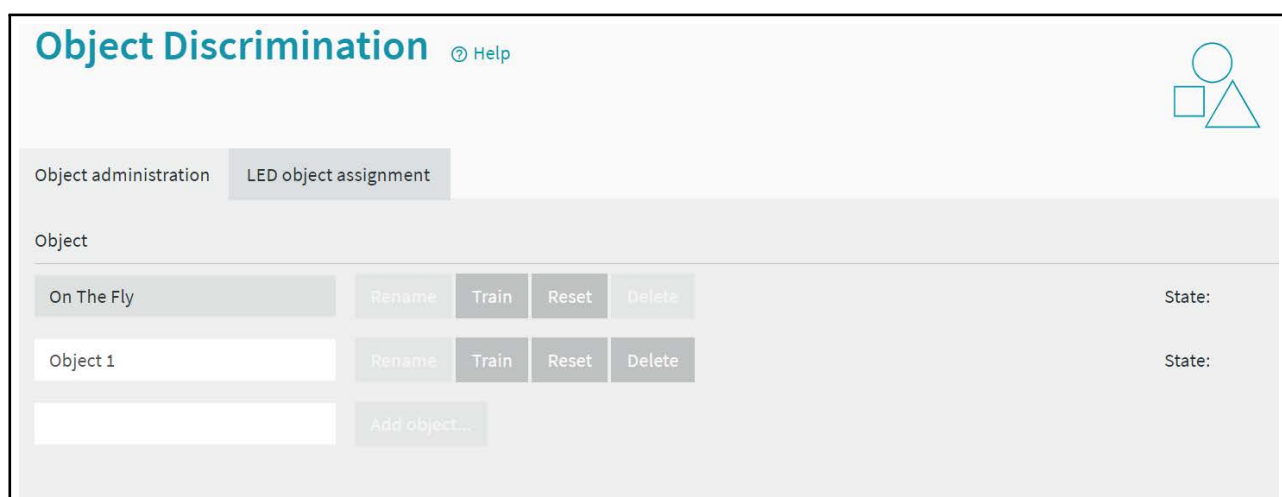
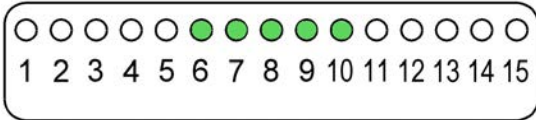
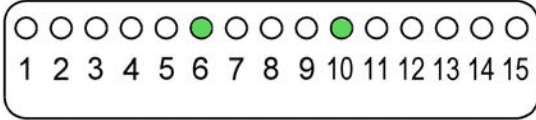
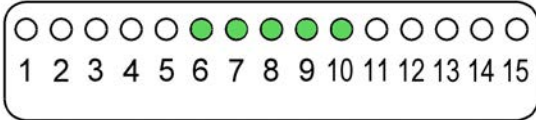
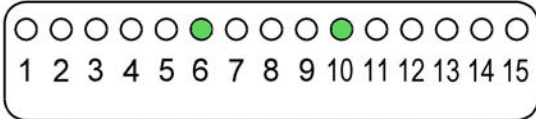


Fig. 6.4.1: Page *Object Discrimination* – tab *Object administration*

Carrying out a training with a freely moveable target object

Step	Activity
1	Position the detector immovable on a metal free ground with the search coil horizontal laying.
2	<p>Click button <i>Train</i>. In the computer display the message <i>Preparing</i> appears for a moment and the following pattern appears for a moment in the LED display of the detector:</p> 
	<p>The detector is ready for training when the message <i>Waiting for object</i> appears in the computer display and the following pattern appears for a moment in the LED display of the detector:</p> 
3	<p>Now position the target object centered above the search coil and keep it there. Only remove the target object from the search coil when the training is finished. A progress bar shows the progress. When it is full, the learning process is complete.</p> <p>Note: The object training may fail if the signal isn't strong enough, if the signal is too strong (overmodulation), or if the target is moved too much during the learning process. Failure is indicated by three low beeps.</p>
4	<p>If necessary repeat the training with different object orientations. To do so click button <i>Train</i> again and repeat the above described training procedure.</p> <p>Note: Several learning processes for an object complement each other and increase the probability that the assigned LED lights up when the object is detected (especially when the object is in a different position). However, this also increases the probability of false indications, since the number of recognition criteria increases, and thus also the number of other objects that could meet these criteria.</p>
5	Continue with section Assigning the target object to a LED on page 44.

Carrying out a training with a target object buried in the ground

Step	Activity
1	<p>Click button <i>Train</i>. In the computer display the message <i>Preparing</i> appears for a moment and the following pattern appears for a moment in the LED display of the detector:</p> 
	<p>The detector is ready for training when the message <i>Waiting for object</i> appears in the computer display and the following pattern appears for a moment on the LED display of the detector:</p> 
2	<p>Now position the search coil in detection height centered above the target object (only slightly moving). A progress bar shows the progress. When it is full, the learning process is complete. Now you can remove the search coil from the position above the target object.</p> <p>Note: The object training may fail if the signal isn't strong enough, if the signal is too strong (overmodulation), or if the detector moved too much during the learning process. Failure is indicated by three low beeps.</p>
3	<p>Continue with section Assigning the target object to a LED on page 44.</p>

Assigning the target object to a LED

Step	Activity
1	<p>Go to tab <i>LED object assignment</i> (see fig. 6.4.2) and assign your target object to one of the LEDs # 9 to 12. Whenever the target object is detected, the corresponding LED on the display lights up. You can adjust the detection threshold with the slider beside the target object name. The detection result is shown in the display by the side.</p> <p>If you want to train another target object, start the procedure again beginning with step 3. Otherwise your detector now is ready for detection in <i>Object Discrimination</i> mode.</p>



Fig. 6.4.2: Page *Object Discrimination* - tab *LED object assignment*

Resetting a training

To discard and repeat a training for a certain target object click button *Reset* to delete formerly trainings of that target and carry out the training(s) again, see fig. 6.4.1 on page 41.

Renaming objects

To rename an object, enter the new name into the field *Object* and then click button *Change*, see fig. 6.4.1 on page 41.

Deleting objects

To delete an object click button *Delete*, see fig. 6.4.1 on page 41.

Training of target objects without web server (“on-the-fly”)

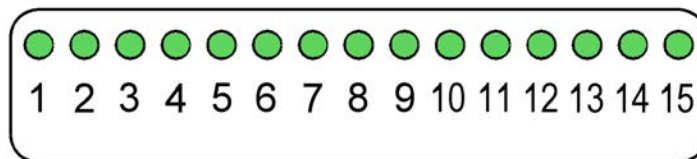
Step	Activity
1	Press button SET  repeatedly until LED VOLUME and LED WORKING CHANNEL light up. The active detection mode will be shown by the LED display (in the standard mode LED 1 lights up).
2	Press button PLUS repeatedly until LED 4 is lit. Note: Step 3 must be performed while LED 4 is lit. After 5 seconds of inactivity, LED 4 will automatically turn off. In this case, repeat step 1 before starting step 3.
3	Lift the search coil at least 1 m above the ground and hold it at a minimum distance of 1 m to any metal objects. Press and hold SET button  until LEDs 6 to 10 light up (LED 4 turns off now), then immediately Release the SET button. Wait three seconds. Once LEDs 6 and 10 light up, the detector is in training mode.
4	Guide the search coil at search height to the target object and hold it as still as possible centered above it. The LED display shows the progress of the training process. Note: The object training may fail if the signal isn't strong enough, if the signal is too strong (overmodulation), or if the detector moved too much during the learning process. Failure is indicated by three low beeps.
5	Press button C to go back to working mode. If the training process is successfully completed, LED 13 lights up when the object is detected. Note: Performing a new on-the fly training will overwrite a former training result.



Information

- ▷ The settings menu is automatically left if no button is pressed within 5 seconds.

Display output with active “Object Discrimination” mode



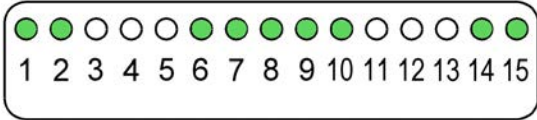
- ▷ LEDs 1 to 7 indicate metal.
- ▷ LED 8 indicates the “Confidence Click”.
- ▷ LEDs 9 to 13 indicate recognized objects (LED 13 is reserved for “on-the-fly” objects).
- ▷ LED 14 indicates the Pinpoint-function.
- ▷ LED 15 indicates the second detection range.

6.4.4 “Urban” mode

The *Urban* mode is intended to allow detection near large interfering metal objects, such as railway tracks or containers. The *Urban* mode (including the trained interfering object) will not be saved when switching off the detector; the detector always starts in the standard mode. The *Urban* mode is only available with certain search coils, see table 6.12 on page 37.

Activating the “Urban” mode

Step	Activity
1	Move the search head towards the interfering object that you want to suppress until not more than 12 LEDs are lit in the LED display. The present position of the search coil (with 12 LEDs lit) is what we will call the <i>shortest distance</i> .
2	Press button SET  repeatedly until LED VOLUME and LED WORKING CHANNEL light up. The active detection mode will be shown by the LED display (in the standard mode LED 1 lights up).
3	Press button PLUS until LED 5 lights up.
4	Press button C.
5	Move about 1 m away from the object, this position we will call (<i>longest distance</i>).
6	Start the training procedure by pressing and holding button SETUP.

Step	Activity
7	<p>Move the search coil in working height towards the object to the position <i>shortest distance</i> and back to the position <i>longest distance</i> several times while training. When the training is completed successfully, the following display appears for a moment:</p> 
8	<p>Check, that there is no alarm from the object you want to suppress. Check if the targets you want to detect are still causing alarm signals. If both tests are passed, the detector is ready for detection in <i>Urban</i> mode.</p>



Information

- ▷ The settings menu is automatically left if no button is pressed within 5 seconds.

6.4.5 “UXO” Mode

The *UXO* mode is specifically designed for searching UXO. To suppress small objects, a suitable delay can be set in the web interface. When the *UXO* mode is active, the alarms in the LED display will run from right to left; the *Low Conductive* mode will be blocked. The *UXO* mode is only available with certain search coils, see table 6.12 on page 37.

Activating the “UXO” mode

Step	Activity
1	<p>Activate the <i>UXO</i> mode via the web interface at <i>Setup</i>, see section Functions and settings on page 83.</p> <p>If the entry for activating the <i>UXO</i> mode is missing in <i>Setup</i>, the permission must first be granted, see section Customizing on page 92 (Block <i>Settings</i>).</p>
2	Click on the icon <i>Main menu</i>  .
3	<p>Click on the entry <i>UXO</i>, to open the <i>UXO</i> page, see fig. 6.4.3.</p> <p>If the entry <i>UXO</i> is missing, the permission must first be granted, see section Customizing on page 92, (block <i>Menu entries</i>).</p>
4	Adjust the desired delay (0 to 10).
5	Carry out a soil compensation, see section Soil compensation on page 30.

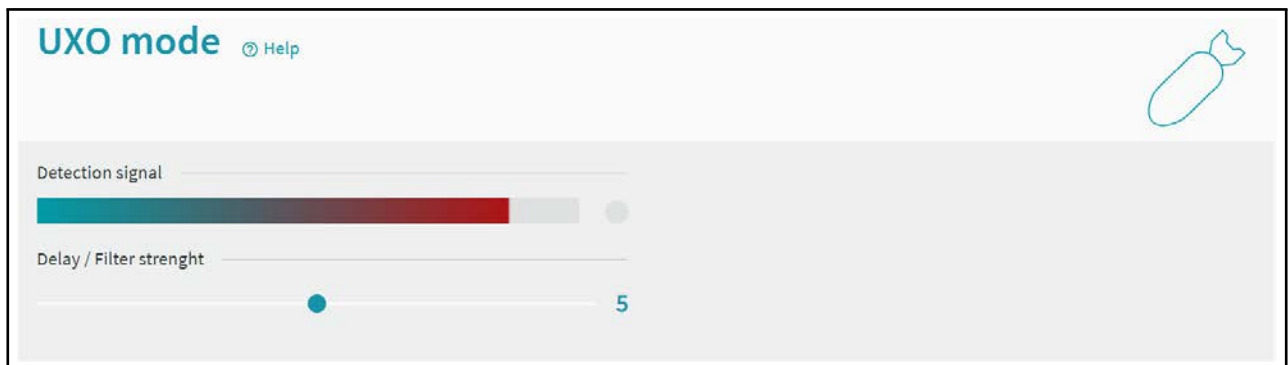


Fig. 6.4.3: Adjusting UXO delay

6.4.6 “Rescue” mode

In the event of a landmine accident, the rescue team must treat the injured person as quickly as possible. In order not to put themselves in danger, a metal detector must be used, as there may be other mines in the vicinity of the accident site. In order that the metal detector of the rescue team is not disturbed by the metal detector of the casualty, the *Rescue* mode must be switched on for the metal detector of the rescue team.

Requirements:

- ▷ Both detectors are Generation 4 Vallon detectors.
- ▷ Both detectors use firmware 1.7.0.
- ▷ The detectors use different working channels, see section [Working channel](#) on page 33.

Activating the “Rescue” mode

Step	Activity
1	Press button SET  twice. LED WORKING CHANNEL  lights up.
2	Press button ON/OFF  once. LED WORKING CHANNEL  starts blinking. The <i>Rescue</i> mode is switched on.

Deactivating the “Rescue” mode

Step	Activity
1	Press button SET  twice.
2	Press button ON/OFF  once. LED WORKING CHANNEL  stops blinking. The <i>Rescue</i> mode is switched off.



Information

If detection is disrupted when approaching the the injured person, both detectors are probably using the same working channel. In this case change the working channel.

6.5 Signal evaluation

During operation, the detected objects are indicated with visible alarms (LED-Display in the control panel, see fig. 6.5.1) and/or audible alarms (speaker or headphones) and/or vibration alarms. Find information on activating and deactivating of the various alarms in section [Alarm options](#) on page 25.

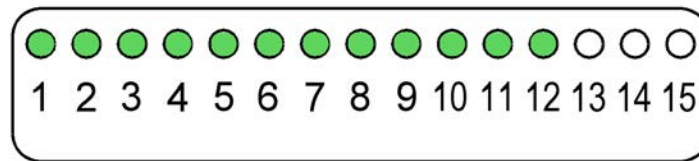


Fig. 6.5.1: LED-Display

If an alarm at the currently set detection sensitivity is so strong that LEDs 1–15 are not sufficient for its display, the LED display switches to the second range. In the second range LED 15 lights up permanently and LEDs 1–12 indicate the alarms.

6.5.1 Metal detector

By default, the metal detector operates in the dynamic mode, i. e.: The detection signal is compensated and disappears after a short time if the search coil is moved only slowly or not at all.

⚠ WARNING

Danger to life from explosion of missed objects!

▷ Move the search coil with adequate speed (0.2 ... 1.5 m/s).

During operation, the detected objects are indicated with audible and visible signals. Low lying large objects and small objects close to the surface lead to different types of signal. In the case of middle-size to large objects, the maximum signal strength is reached above the center of the object. Small objects can trigger a signal with two maxima at the edges of the object and with low signal strength above the center of the object, see fig. 6.5.2.

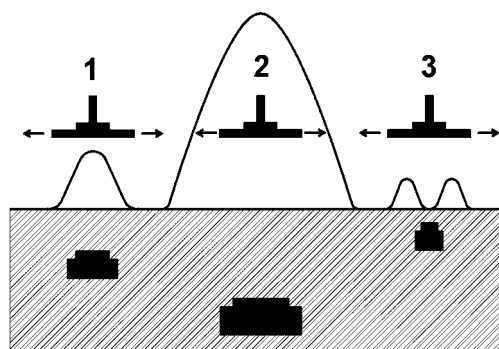


Fig. 6.5.2: Detection signal for different objects: (1) middle-size object; (2) large object; (3) small object

Large objects close to the surface may cause a signal saturation. To avoid this effect, the detector automatically switches to a second detection range and activates the static mode (pinpoint function). A different acoustic signal is emitted at low level, which causes a signal maximum above the object, see fig. 6.5.3.

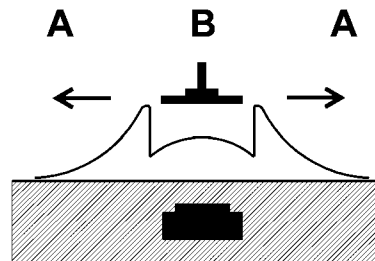


Fig. 6.5.3: Detection signal for large objects near the surface: (A) Area standard detection range; (B) Area second detection range

6.6 Global Navigation Satellite System (GNSS)

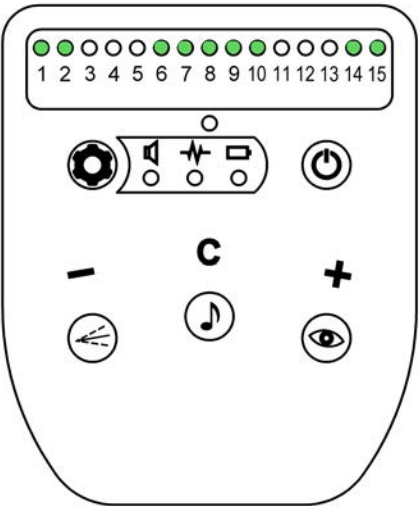
The built-in GNSS receiver is used to determine the position of the detector. If activated, automatic waypoints are set continuously. Manual waypoints can also be set. The saved data can be read out and settings made via the web server, see chapter [Vallon Webserver](#) on page 72.

The activation of the GNSS receiver will be indicated by LED BATTERY WARNING if not configured differently: green light signalizes sufficient satellite receiving, green blinking signalizes unsatisfactory satellite receiving.

The following functions can be set:

- ▷ Determining the position of the device. To do this, GNSS positions are stored at intervals.
- ▷ Establishing waypoints.

6.6.1 Setting waypoints manually

Step	Activity	Display
1	Press and hold button C. When LED 14 lights up, briefly press button SET. With that, a waypoint is stored. A high-pitched beep is emitted and the LED pattern shown to the right is displayed as confirmation.	

6.7 Switching off the device

Press the button ON/OFF  for at least 5 seconds until all indicators have turned off.

NOTICE

Improper storage and transport may cause device damages.

- ▷ Always store and transport the device in the intended container. Pay attention to chapter [Maintenance and storage](#) on page [56](#).

6.8 Charging the battery

⚠ CAUTION

Risk of injury from exploding batteries!

- ▷ Only charge rechargeable batteries.
- ▷ For each device only use batteries of the same type and the same charging level.

6.8.1 Recharging batteries with a universal charger

Recharge batteries with the universal charger according to the operation manual of the universal charger (see section *Options* on page 12).

6.8.2 Recharging batteries inside of the device

For charging batteries inside of the device, the Vallon charging cable (see section *Options* on page 12) is needed.

1. Connect the charging cable to the cable interface of the device, see fig. 6.8.1 (this will be easier if you press the button at the bottom of the cable interface). Pay attention to the markings on the plug connector and cable interface.
2. Plug the bordnet plug into a bordnet socket or the Vallon power supply adapter (see section *Options* on page 12). The device changes to charging mode.

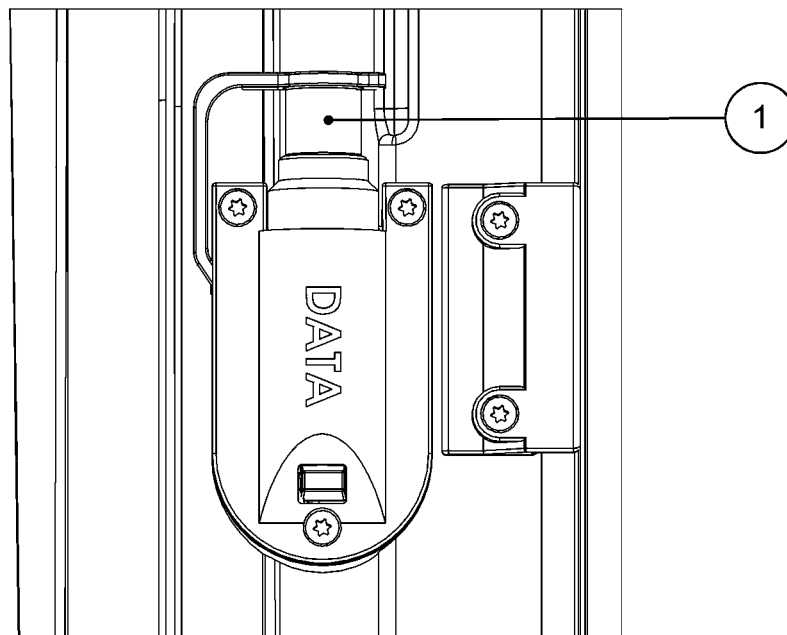
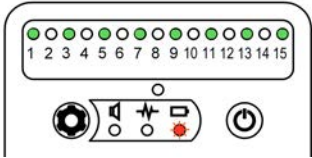
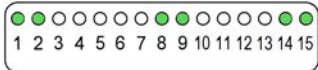
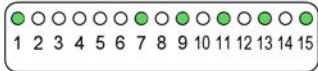
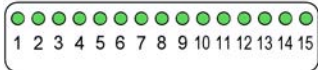
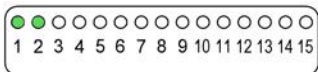
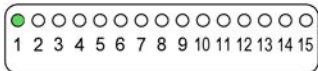
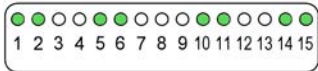


Fig. 6.8.1: (1) Cable interface

7 Troubleshooting

LED display	Tone / vibration	Cause	Remedy
	High continuous tone / continuous vibration	Batteries empty	<ul style="list-style-type: none"> ▷ Recharge rechargeable batteries ▷ Replace batteries
	High continuous tone / continuous vibration	Coil software version mismatch	<ul style="list-style-type: none"> ▷ Use coil with suitable software version
	Low continuous tone / continuous vibration	Search coil open circuit	<ul style="list-style-type: none"> ▷ Tighten the union nut ▷ Reload or update firmware ▷ Change search coil <p>Contact the service department</p>
	3 low tones / 3 vibrations	Soil compensation cancelled or failed	<ul style="list-style-type: none"> ▷ Keep button SET pressed during the entire compensation process ▷ remove metal in the ground
	7 high tones (repetitive) / 7 vibrations	General electronic fault	<ul style="list-style-type: none"> ▷ Recharge rechargeable batteries ▷ Replace batteries <p>Contact the service department</p>
	7 high tones (repetitive) / 7 vibrations	Boot up error	<ul style="list-style-type: none"> ▷ Recharge rechargeable batteries ▷ Replace batteries <p>Contact the service department</p>
	Low continuous tone / continuous vibration	BIST* error (*Built In Self Test)	Contact the service department

8 Maintenance and storage

Our detectors do not contain any corroding parts. Aside from charging the batteries, no periodic maintenance work is required.

- ▷ Clean the device after use and check it for visible damage. Use a soft, lint-free cloth or a paper towel for cleaning; slightly moistened with water if necessary. Abrasive cloths or cleaning agents may damage the coating.
- ▷ If necessary, clean plug-in contacts with a hard brush and pure alcohol (e.g. ethanol or isopropanol).
- ▷ If not used for a longer period some types of rechargeable batteries should be stored partly charged. We recommend to charge
 - LiPo batteries to approx. 20 % (± 10 %) of their capacity
 - NiMH batteries to approx. 50 % (± 10 %) of their capacity
 - lead batteries to 100 % of their capacity

Check charge and function of the batteries half-yearly.

NOTICE

Long-term exposure to salt water may cause damage to the device.

- ▷ Rinse the device thoroughly with fresh water after each contact with salt water. For devices with a telescope system, rinse it out by immersing it in fresh water several times.

NOTICE

Long-term exposure to polluted water (contaminated with oil, gasoline or other chemical substances) can damage the device.

- ▷ After each contact with polluted water, clean the device thoroughly with dishwashing detergent and then rinse it carefully with fresh water. For devices with a telescope system, rinse it out by immersing it in fresh water several times.

NOTICE

Using unsuitable cleaning agents for plug-in contacts can impair the function of the device.

- ▷ Do not use cleaning agents that can leave residues or damage the seals of the device (e.g. from automotive technology).

NOTICE

Permanent exposure to moisture may cause damage to the device.

- ▷ Store the detector in dry rooms to particularly protect the plug connections. Only close the hard case if all the internal parts are dry. Replace brittle or damaged seals without delay.

NOTICE

Leaking standard or rechargeable batteries may cause damage to the device.

- ▷ Remove empty batteries from the device. Recharge empty rechargeable batteries immediately. Remove standard / rechargeable batteries from the device prior to storage / transport.

NOTICE

Deep discharge (e.g. due to long-time storage) may cause damage to rechargeable batteries.

- ▷ Avoid deep discharge by charging the batteries frequently.

NOTICE

Very low or high temperatures may cause damage to standard and rechargeable batteries or reduce their performance.

- ▷ Comply with temperatures for use and storage, see chapter [Technical data](#) on page 58.

9 Technical data

Mechanical properties

See also fig. 9.0.1 on page 60 and fig. 9.0.2 on page 61.

Property	S.I. (metric)	U.S. customary units
Overall length (search coil 90°)	54 to 143 cm	21,26 to 56,30 in
Dimensions of backpack	53 x 36 x 16.5 cm	20.87 x 14.17 x 6.50 in
Dimensions of hard case	56,5 x 46 x 21 cm	22.24 x 18.11 x 8.27 in

Tolerances: lengths $\pm 3\%$; weights $\pm 10\%$

Property (with search coil VS20)	VMH4	VMH4L
Weight (without batteries)	2.06 kg (4.54 lbs)	2.06 kg (4.54 lbs)
Working weight (with batteries)	2.47 kg (5.45 lbs)	2.60 kg (5.73 lbs)
Transport weight in backpack	3.78 kg (8.33 lbs)	3.91 kg (8.62 lbs)
Transport weight in hard case	8.28 kg (18.25 lbs)	8.41 kg (18.54 lbs)

Tolerances weights: $\pm 10\%$, search coil: VS20

Property (with search coil VS20)	VMH4	VMH4L
Weight (without batteries)	2.14 kg (4.72 lbs)	2.14 kg (4.72 lbs)
Working weight (with batteries)	2.55 kg (5.62 lbs)	2.68 kg (5.91 lbs)
Transport weight in backpack	3.86 kg (8.51 lbs)	3.99 kg (8.80 lbs)
Transport weight in hard case	8.36 kg (18.43 lbs)	8.44 kg (18.61 lbs)

Tolerances weights: $\pm 10\%$, search coil: VS25

Electrical properties

Property	Value
Batteries (alternative)	Alkaline battery type D (LR20) NiMH battery type D (HR20)
Power supply for battery charging in detector	12 to 24 V DC, 1 A
Battery charging time in detector	Approx. 14 hours

Property	VMH4	VMH4L
Quantity batteries	3	4
Battery life*	LR20: approx. 16 h HR20: approx. 18 h	LR20: approx. 22 h HR20: approx. 25 h

*Environment temp. approx. 20°C, LR20: Varta Industrial, HR20: 10.000 mAh

Operating conditions

Property	S.I. (metric)	U.S. customary units
Ambient temperature	–31 °C to +63 °C	–23.8 °F to 145.4 °F
Storage temperature	–51 °C to +71 °C	–59.8 °F to 159.8 °F
Water tightness detector	IP68 up to 5 m water depth, 1 h at 20 °C	IP68 up to 16.4 ft water depth, 1 h at 68 °F
Water tightness search coils	IP68 up to 1 m water depth, 8 h at 20 °C up to 5 m water depth, 1 h at 20 °C	IP68 up to 3.37 ft water depth, 8 h at 68 °F up to 16.4 ft water depth, 1 h at 68 °F
Detection speed	0.2 to 1.5 m/s	0.66 to 4.92 ft/s
Minimum distance between two devices	Approx. 2 m	Approx. 6.56 ft

MIL standards

MIL-STD-810G 501.5-I+II, 502.5-I+II, 503.5-I, 506.4-III, 512.4-II, 514.6C-II, 516.6-IV

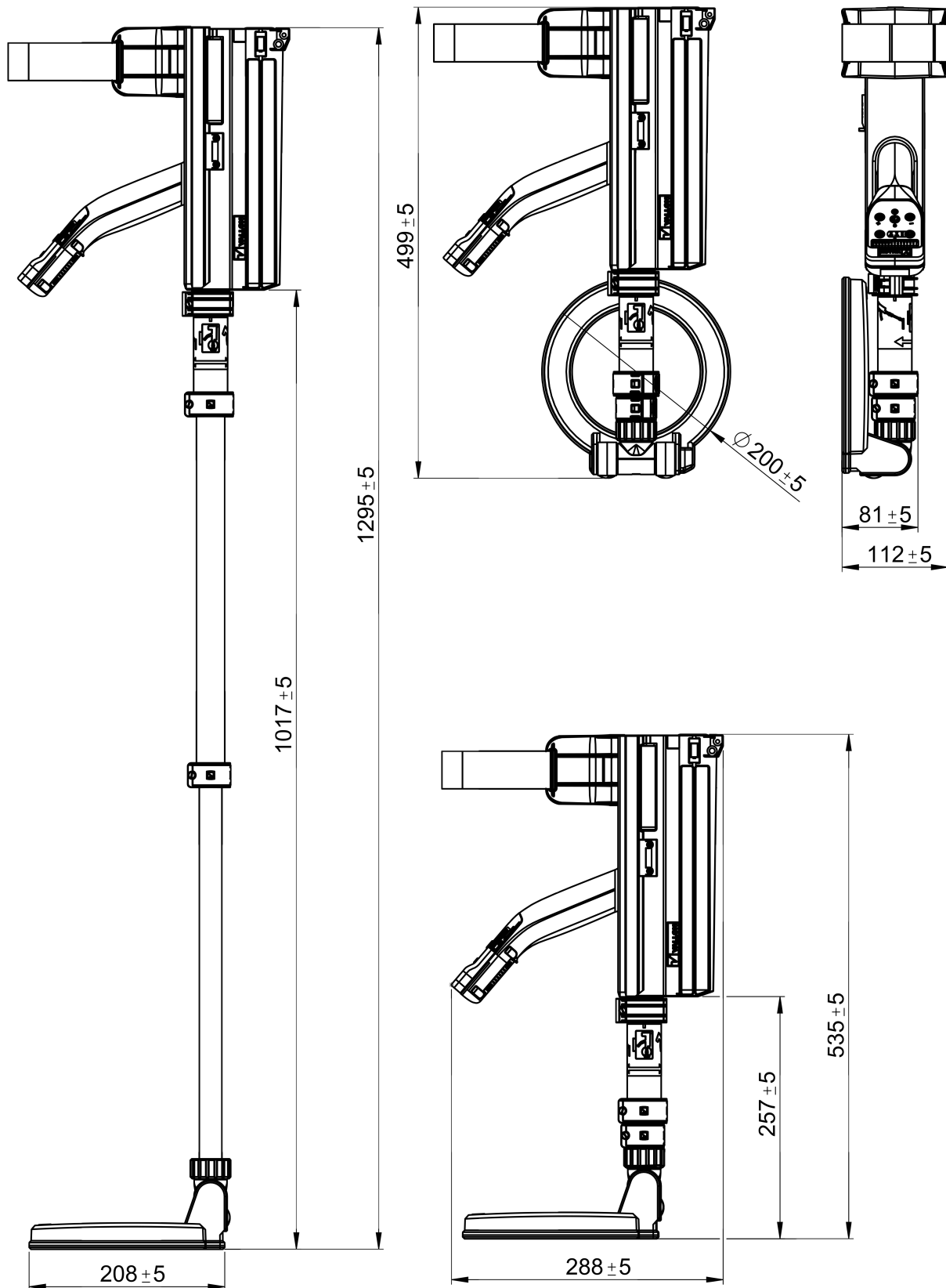


Fig. 9.0.1: Dimensions VMH4 with search coil VS20 (in mm)

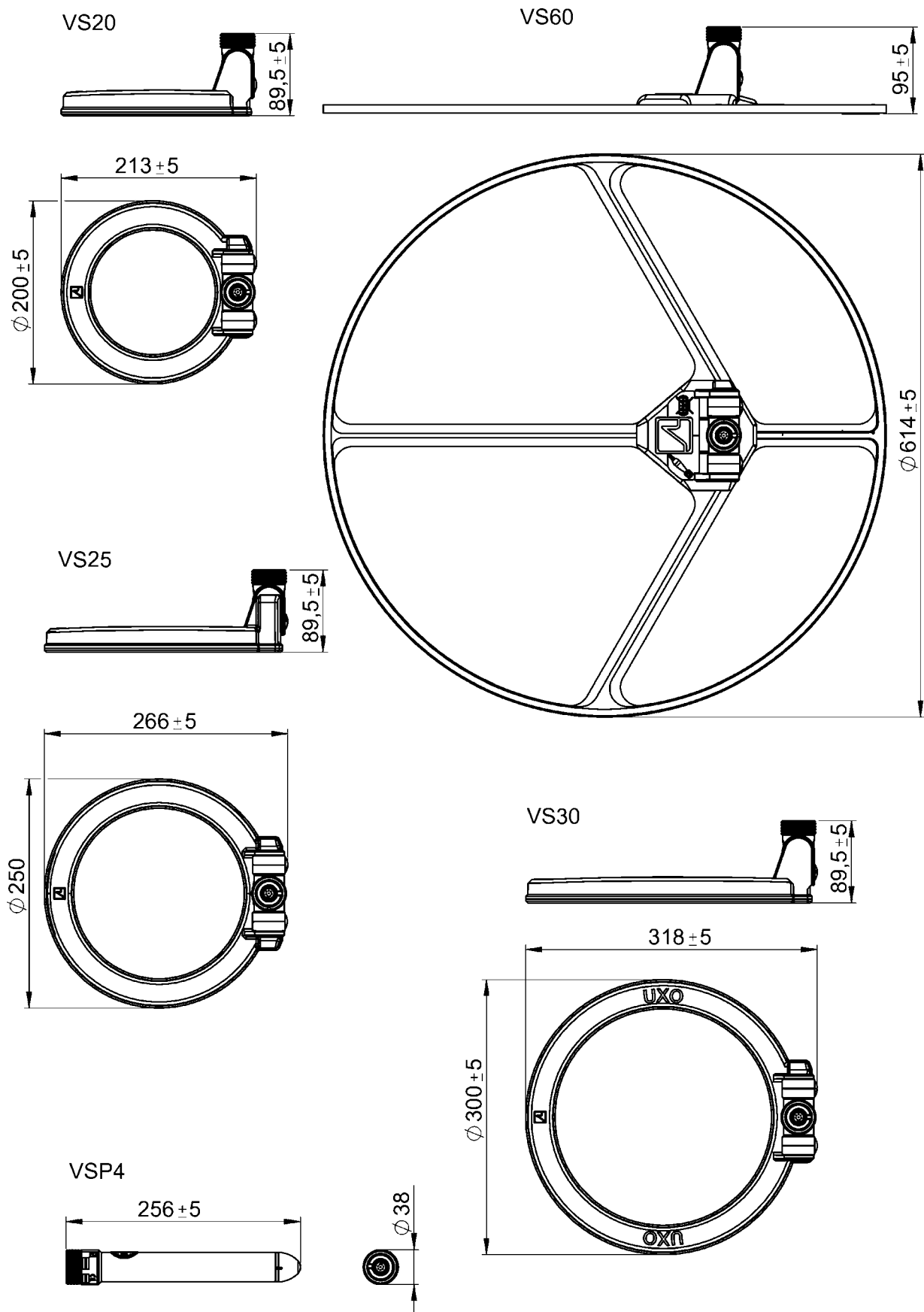


Fig. 9.0.2: Dimensions search coils (in mm)

10 Legal information

10.1 Warranty

Safe operation of the device is only possible if used as intended and according to the operation manual.

- ▷ Warranty claims will become void if the device is not used in accordance with the intended use.
- ▷ Do not open the device without the written permission of Vallon GmbH. Non-compliance will cause the loss of warranty claims.
- ▷ Due to their limited durability, parts subject to particular wear are excluded from the legal warranty obligation, such as e.g. batteries etc.

10.2 Disposal of the device

According to Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment, the device shall not be disposed of with unsorted municipal waste. You may return waste equipment free of charge or send them with sufficient postage to our company at the address below:

Vallon GmbH • Arbachtalstr. 10 • 72800 Eningen • Germany

10.3 Disposal of used batteries

The scope of delivery of our products normally includes standard or rechargeable batteries. We are required by law to inform you about the following facts:

Standard and rechargeable batteries contain substances which have harmful effects on the environment and human health. The *European Directive on batteries and accumulators* (2006/66/EC) explicitly prohibits the disposal of batteries and accumulators in household waste. End users are obliged to return spent batteries and accumulators.

Batteries and accumulators must be collected separately from household waste so that they can be recycled or disposed of in an environmentally friendly way. Therefore please hand in your batteries and accumulators at a designated collection point. You may also return standard and rechargeable batteries free of charge or send them with sufficient postage to our company at the address below:

Vallon GmbH • Arbachtalstr. 10 • 72800 Eningen • Germany

Labelling of batteries and accumulators

Standard and rechargeable batteries containing harmful substances are marked with a crossed out dustbin symbol similar to the one in the following figure, as well as by the chemical symbol of the harmful substance: **Cd** for cadmium, **Hg** for mercury, **Li** for lithium, and **Pb** for lead.

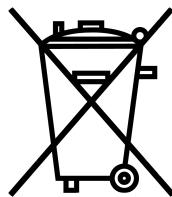


Fig. 10.3.1: The symbol means that standard and rechargeable batteries must not be disposed of in the household waste.

CAUTION

Risk of injury from exploding batteries!

- ▷ Only dispose of completely discharged batteries.
- ▷ Prior to disposal, isolate the contacts of lithium-ion batteries to ensure protection from short circuit.

10.4 Open source software and third party rights

This product contains an integrated Linux-kernel-environment and Linux-userspace-tools and contains as such open-source-software-components. Also included is our software which makes use of some of the open-source-software-components. The license agreements and terms and conditions for these open-source-software-components as well as notices about these open-source-software-components are available via the web interface of the device (please click on *Contact* in the web interface).

WARNING

Danger to life from explosion of missed objects!

- ▷ Use only Vallon-approved software to avoid the risk of malfunction.

Among other libraries we make use of the libraries libc.so, libpthread.so, libm.so and libdl.so of the glibc. These libraries are licensed under the license LGPLv2¹. We permit modifications of these parts of the software of the delivered product for your own use and permit reverse engineering for debugging such modifications. Possibly further rights provided by statutory law remain effective.

Integrated into the product is also the library liboxygense.so, which is licensed under LGPLv2.1.

Furthermore integrated into the product are the following libraries of the Qt Toolkits:

libQt5Widgets.so, libQt5SerialPort.so, libQt5WebSockets.so, libQt5Network.so, libQt5Gui.so, libQt5Core.so and libQt5Xml.so.

These libraries are licensed under the license LGPLv3². We do not restrict modifications of the portions of the libraries contained in our software and do not restrict reverse engineering for debugging such modifications. For information for installing modified library versions, please contact us by e-mail: info@vallon.de.

Informations about LGPLv2.1 software components are available via the web interface of the device. To receive the source code for software-components under the license GPLv2³ (used by the Linux kernel and user-space programs, e.g. busybox), GPLv3⁴ (used by user-space tools, e.g. nano), LGPLv3 and AGPLv3⁵: We offer to provide anyone with a complete machine-readable copy of the source code on a durable physical medium customarily used for software interchange, for a price no more than our reasonable cost of physically performing this conveying of the source code. This offer is valid for at least three years and valid for as long as we offer spare parts or customer support for that product model. Please contact us by e-mail: info@vallon.de.

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit, refer to www.openssl.org.

¹GNU Lesser General Public License Version 2.1

²GNU Lesser General Public License Version 3

³GNU General Public License Version 2

⁴GNU General Public License Version 3

⁵GNU Affero General Public License Version 3

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).

Please note that all parts of the software integrated into the product, which are under a open source software license, are conveyed free of charge.

10.5 EC declaration of conformity

EC DECLARATION OF CONFORMITY

Vallon GmbH
Arbachtalstr. 10
72800 Eningen
Germany

declares herewith that the device

METAL DETECTOR VMH4

in conception and construction as well as in the version brought into circulation by us complies to the requirements of the EU directive **2014/30/EU** (26.2.2014) on electromagnetic compatibility. In the event of a change to the device that has not been agreed with us, this declaration loses its validity.

The assessment of the a.m. product with regards to the electromagnetic compatibility is based on the following norms:

DIN EN IEC 61000-6-2:2019
DIN EN IEC 61000-6-4:2019
Class A

In addition, we declare compliance of the device with the EU directive **2011/65/EU RoHS2** (8.11.2011).

Eningen, 11.1.2023



Markus Vallon
Managing Director

A Description search coils

A.1 Search coil VS20

A.1.1 General

The search coil VS20 is recommended for the detection of shallow buried small metal parts (such as metal mines and plastic mines with low metal content), see fig. [A.1.1](#) and fig. [9.0.2](#) on page [61](#).

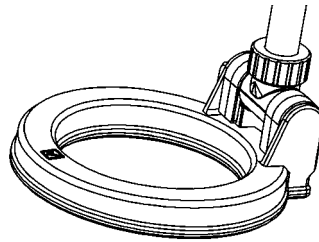


Fig. A.1.1: Search coil VS20

Important notes (see also section [Changing the search coil](#) on page [22](#)):

- ▷ It is recommended to change the search coil with the detector switched off.
- ▷ Carry out a soil compensation after each change of the search coil if detecting in mode *Mineral* (see section [Soil compensation](#) on page [30](#)). This also applies if you subsequently detect in the same soil.

A.1.2 Signal evaluation

See section [Signal evaluation](#) on page [50](#).

A.1.3 Technical data

Property	S.I. (metric)	U.S. customary units
Diameter	20 cm	7.87 in
Height	28 mm	1.10 in
Weight	0.42 kg	14.82 oz

Tolerances: lengths $\pm 3\%$; weights $\pm 10\%$

A.2 Search coil VS25

A.2.1 General

The search coil VS25 is recommended for the detection of shallow buried small metal parts (such as metal mines and plastic mines with low metal content), see fig. A.2.1 and fig. 9.0.2 on page 61.

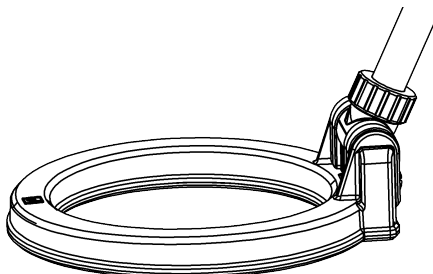


Fig. A.2.1: Search coil VS25

Important notes (see also section [Changing the search coil](#) on page 22):

- ▷ It is recommended to change the search coil with the detector switched off.
- ▷ Carry out a soil compensation after each change of the search coil if detecting in mode *Mineral* (see section [Soil compensation](#) on page 30). This also applies if you subsequently detect in the same soil.

A.2.2 Signal evaluation

See section [Signal evaluation](#) on page 50.

A.2.3 Technical data

Property	S.I. (metric)	U.S. customary units
Diameter	25 cm	9.84 in
Height	28 mm	1.10 in
Weight	0.50 kg	17.67 oz

Tolerances: lengths $\pm 3\%$; weights $\pm 10\%$

A.3 Search coil UXO VS30

A.3.1 General

The large diameter of the VS30 search coil makes it possible to reliably detect both unexploded ordnance (UXO) and metallic mines lying at medium depth in the ground, see fig. A.3.1 and fig. 9.0.2 on page 61.

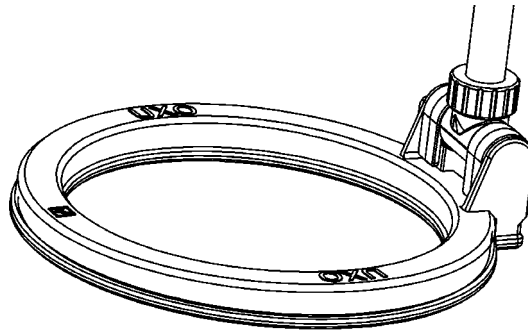


Fig. A.3.1: Search coil VS30

Important notes (see also section [Changing the search coil](#) on page 22):

- ▷ It is recommended to change the search coil with the detector switched off.
- ▷ Carry out a soil compensation after each change of the search coil if detecting in mode *Mineral* (see section [Soil compensation](#) on page 30). This also applies if you subsequently detect in the same soil.

A.3.2 Signal evaluation

The signal evaluation is the same as for the search coils VS20 and VS25, see section [Signal evaluation](#) on page 50. However, the detection sensitivity is lower.

A.3.3 Technical data

Property	S.I. (metric)	U.S. customary units
Diameter	30 cm	11.81 in
Height	28 mm	1.10 in
Weight	0.52 kg	18.34 oz

Tolerances: lengths $\pm 3\%$; weights $\pm 10\%$

A.4 Search coil UXO VS60

A.4.1 General

The large diameter of the VS60 search coil makes it possible to reliably detect both unexploded ordnance (UXO) and metallic mines in large depths below the surface with reliable and consistent operation, see fig. A.4.1 and fig. 9.0.2 on page 61. As the search coil VS60 has a large penetration depth, it is recommended to keep a distance of approx. 20 cm to the ground. This facilitates not only the swinging movements in dense vegetation but allows the safe detection of bomblets as well. The search coil VS60 is delivered completely with a carrying strap.

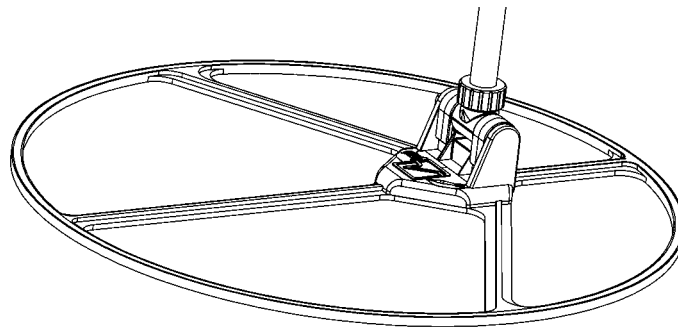


Fig. A.4.1: Search coil VS60

Important notes (see also section [Changing the search coil](#) on page 22):

- ▷ It is recommended to change the search coil with the detector switched off.
- ▷ Carry out a soil compensation after each change of the search coil if detecting in mode *Mineral* (see section [Soil compensation](#) on page 30). This also applies if you subsequently detect in the same soil.

A.4.2 Signal evaluation

The signal evaluation is the same as for the search coils VS20 and VS25, see section [Signal evaluation](#) on page 50. However, the detection sensitivity is lower.

A.4.3 Technical data

Property	S.I. (metric)	U.S. customary units
Diameter	61.5 cm	24.21 in
Height	10.7 mm	0.042 in
Weight	1.05 kg	37.04 oz

Tolerances: lengths $\pm 3\%$; weights $\pm 10\%$

A.5 Stick probe VSP4

A.5.1 General

The stick probe VSP4 allows the detection of metal mines or IEDs in fissures and cavities of stones, trunks and walls, see fig. A.5.1 and fig. 9.0.2 on page 61.

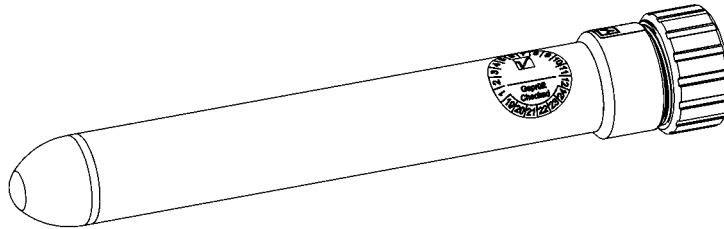


Fig. A.5.1: Stick probe VSP4

Important notes (see also section [Changing the search coil](#) on page 22):

- ▷ It is recommended to change the search coil with the detector switched off.
- ▷ Carry out a soil compensation after each change of the search coil if detecting in mode *Mineral* (see section [Soil compensation](#) on page 30). This also applies if you subsequently detect in the same soil.

A.5.2 Detection with stick probe VSP4

The white markings at the tip of the stick probe VSP4 indicate the search area. To cover all directions the stick probe must be turned 90° while detecting.

A.5.3 Technical data

Property	S.I. (metric)	U.S. customary units
Length	26 cm	10.24 in
Diameter	32.3 mm	1.27 in
Weight	0.23 kg	8.11 oz

Tolerances: lengths $\pm 3\%$; weights $\pm 10\%$

B Vallon Webserver

B.1 Webserver setup

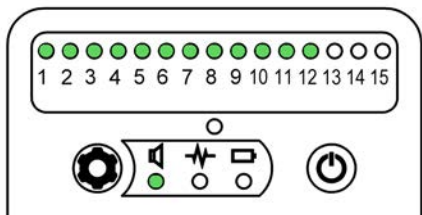
B.1.1 Activating data interfaces

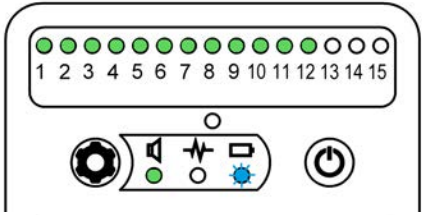
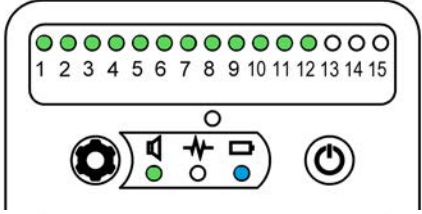
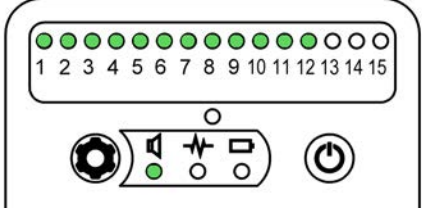
Only one of the three data interfaces (WLAN, Bluetooth, USB) can be activated at the same time. After each restart, the WLAN interface and the Bluetooth interface are deactivated, the USB interface is active. If the USB interface is not connected to a computer, it switches off automatically after 2 minutes.



Information

- ▷ The Bluetooth interface and the WLAN (Wi-Fi) interface are not available with every version of the detector.
- ▷ The setup menu is left automatically if no button is pressed within 5 seconds.

Step	Action	Display
1	Switch on the detector. Press key SET  repeatedly until the LED Volume is illuminated. The current volume is displayed.	

Step	Action	Display
2	<ul style="list-style-type: none"> activate WLAN: press button ON/OFF repeatedly until the LED OPERATION INDICATOR blinks blue. 	
	<ul style="list-style-type: none"> activate Bluetooth: press button ON/OFF repeatedly until the LED OPERATION INDICATOR lights up blue continuously. 	
	<ul style="list-style-type: none"> deactivate interfaces: press button ON/OFF repeatedly until the LED OPERATION INDICATOR switches off. 	
3	<p>Press button C to go back to working mode. If a data interface is activated, the LED OPERATION INDICATOR blinks blue in working mode for monitoring every 7 seconds.</p>	

B.1.2 Connecting Vallon detectors with computer via WLAN

The detector can directly (i.e. without internet) be connected to any suitable computer (notebook, tablet, smartphone or similar) via WLAN. In order to install a connection via WLAN, the WLAN interface of the detector has to be activated first, see section [Activating data interfaces](#) on page 72.

1. Select detector in the WLAN connection menu on your computer (VMH4-serial number) and establish a connection.
2. Open the internet browser and empty its cache.
3. Enter IP address 192.168.14.1 in the to open the web interface.



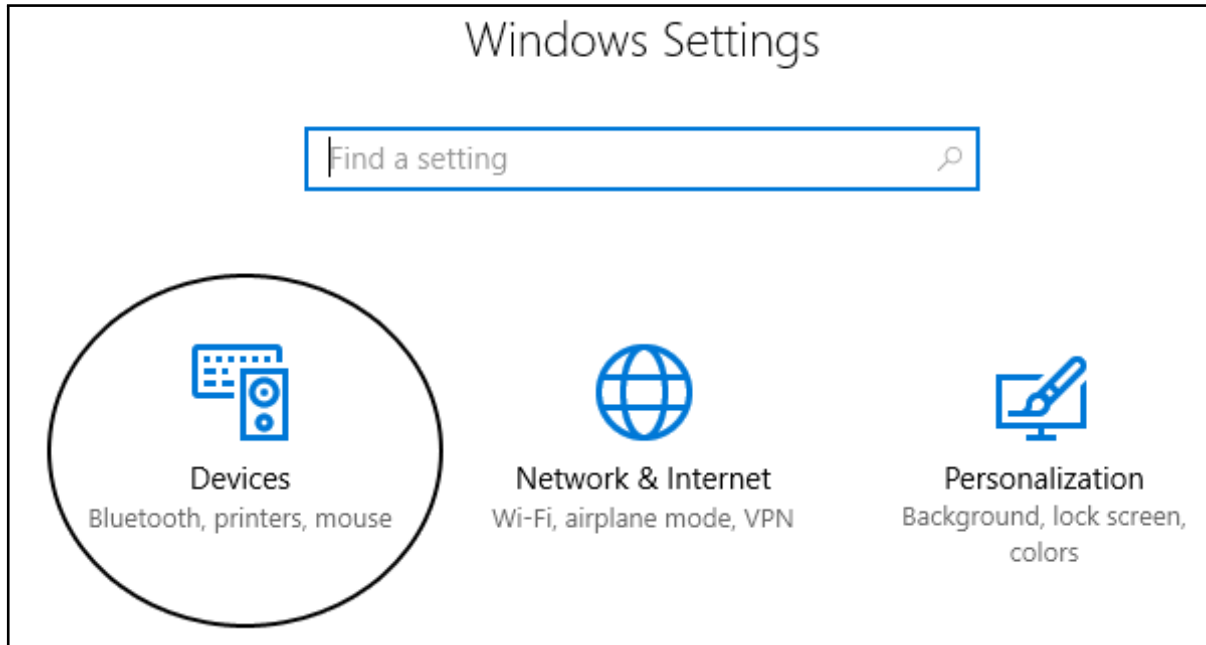
Information

- ▷ A secure function of the web interface has been established with the current versions of Microsoft Edge, Mozilla Firefox and Google Chrome.

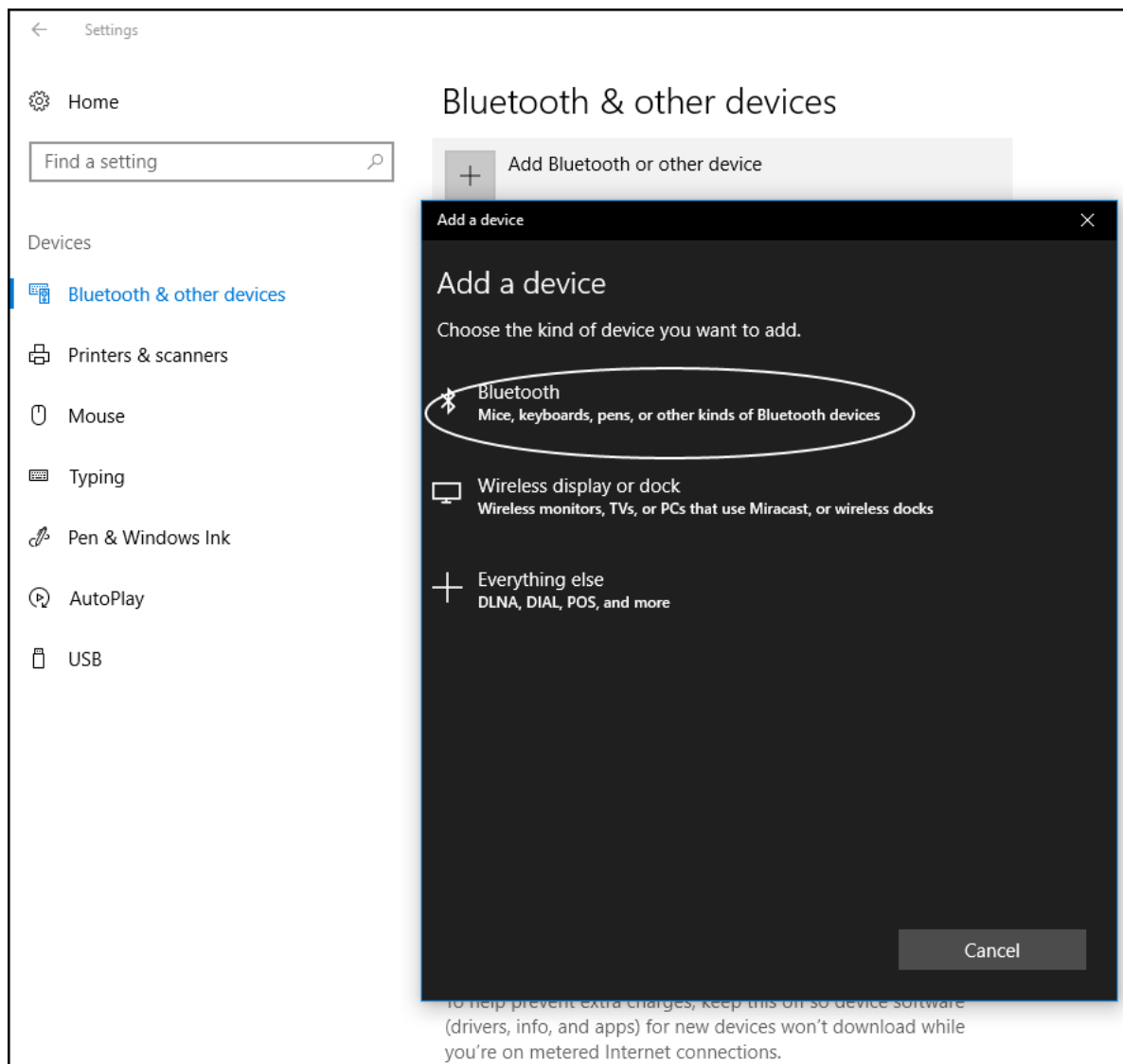
B.1.3 Connecting Vallon detectors with PC via Bluetooth (Windows 10)

To set up a connection via Bluetooth, the Bluetooth interface of the detector must be activated, see section [Connecting external devices](#) on page 23.

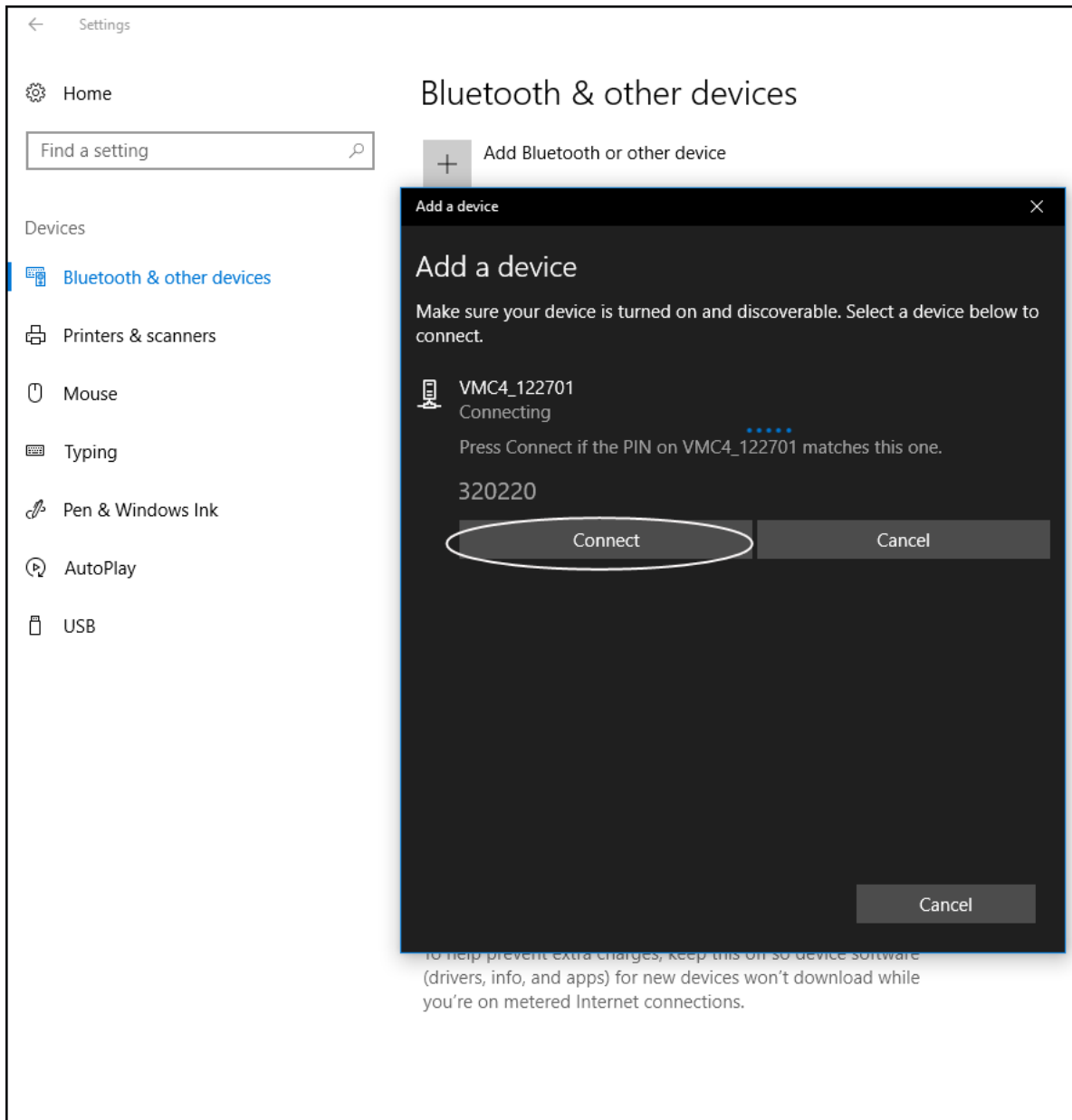
1. Go to page *Settings* and select *Devices*. Select Bluetooth & other devices. Make sure that Bluetooth is activated at the detector.



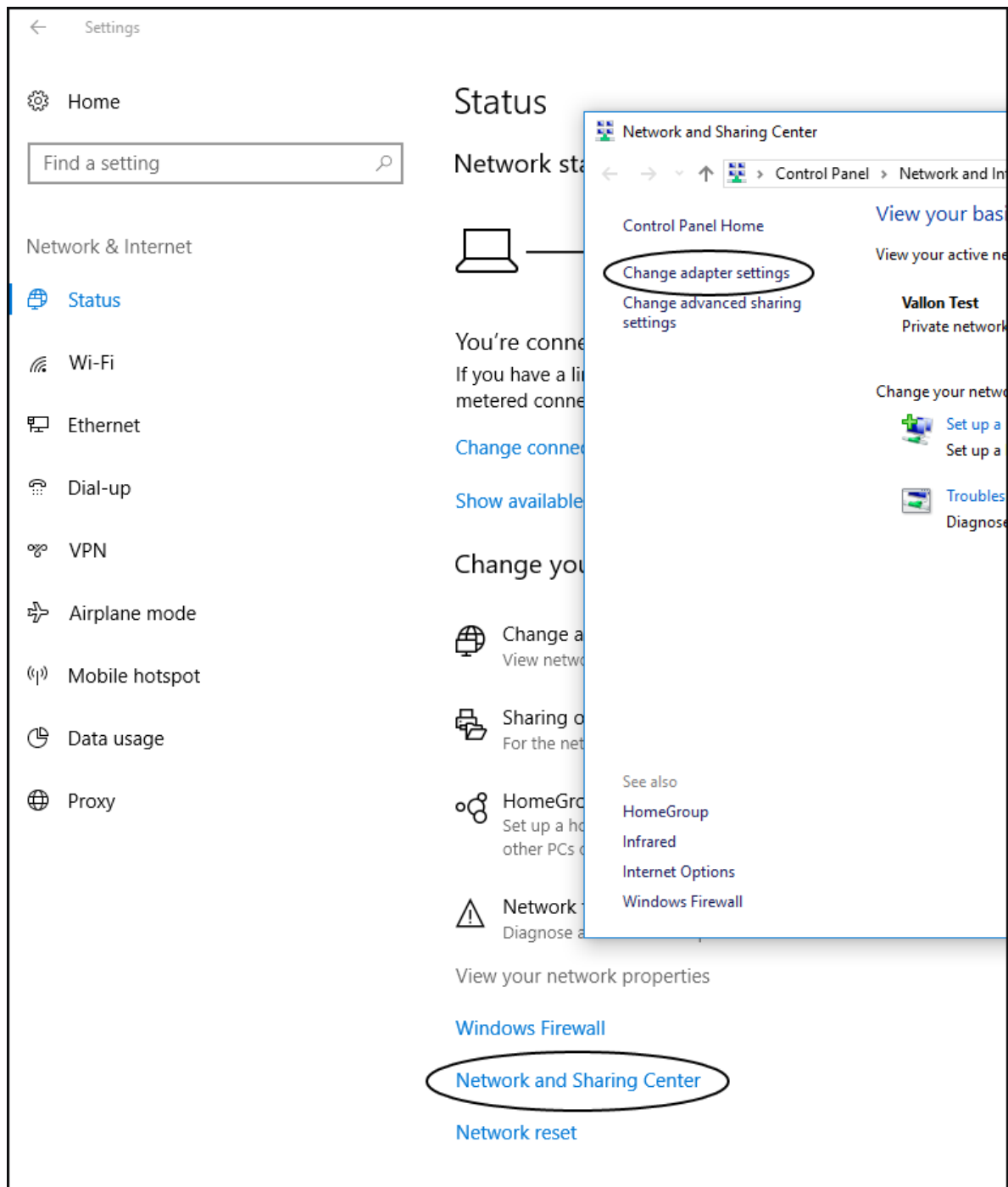
2. If connecting the detector the first time with the PC, you need to pair the devices: Select *Add Bluetooth or other device*, then select *Bluetooth*.



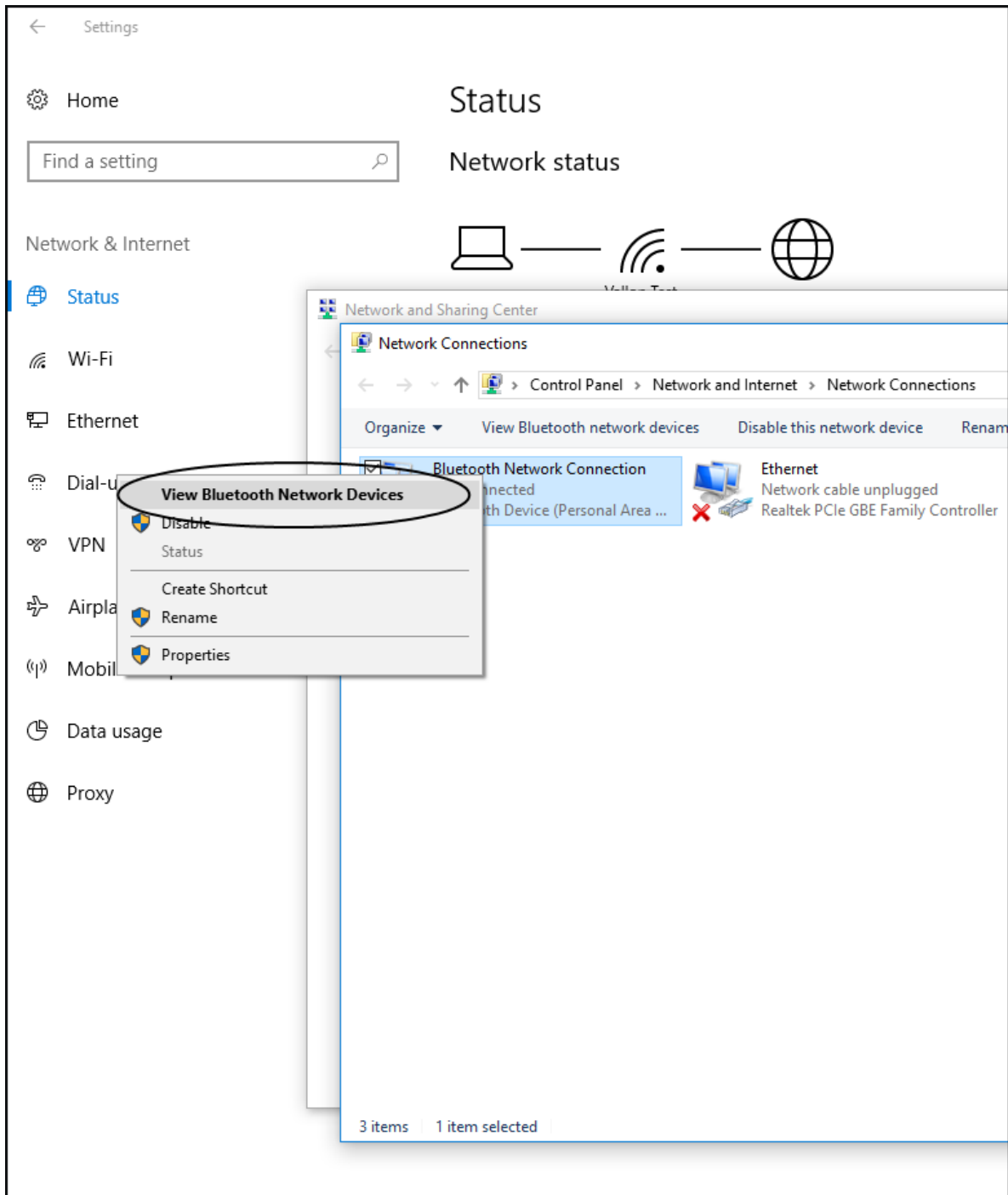
3. Select the detector (appears as VMxx-Serial number). Then select *Connect*. Click *Done* to finish the pairing process.



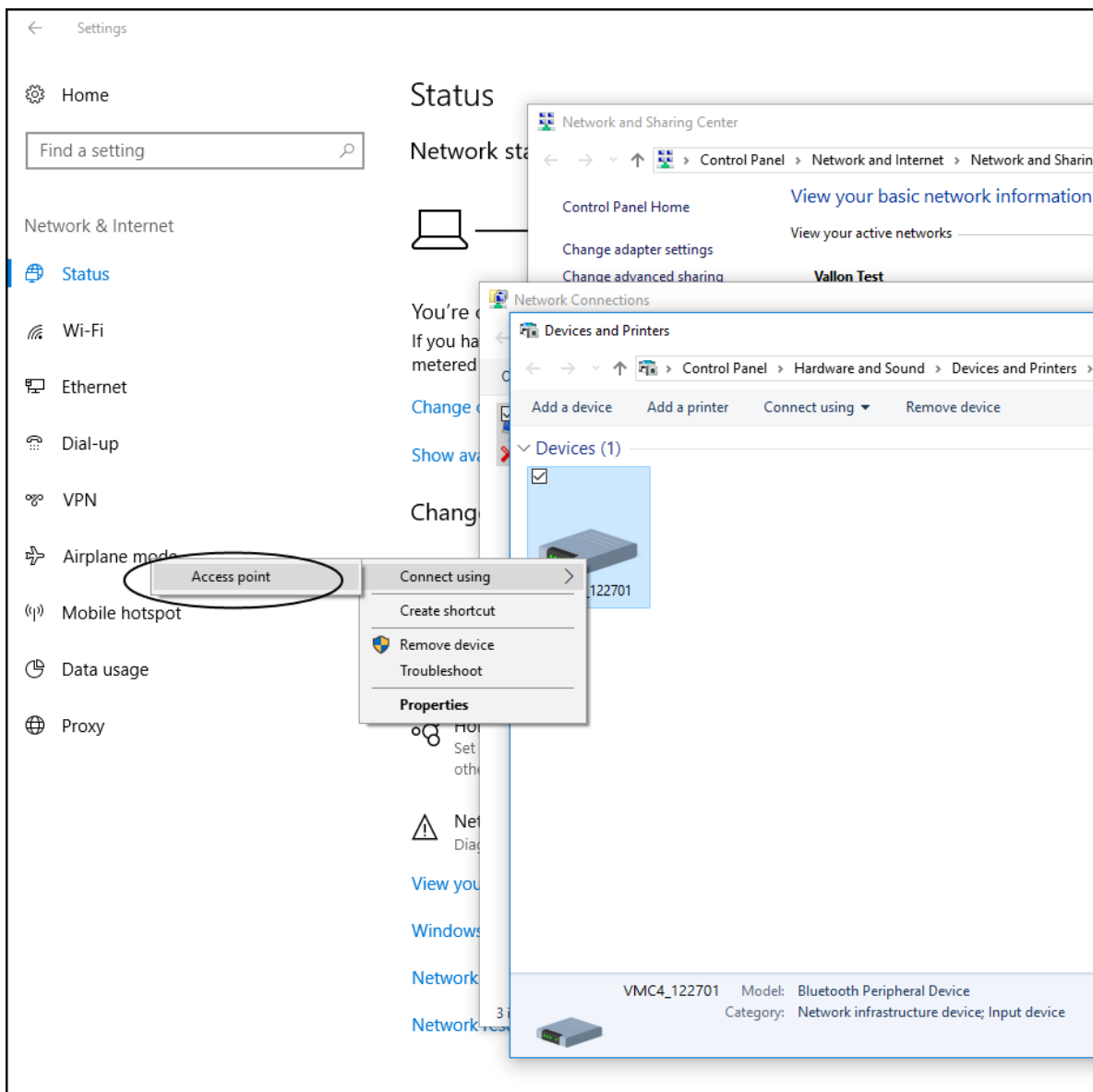
4. Go back to page *Settings*. Select *Network & Internet*, then select *Network and Sharing Center*, then select *Change adapter setting*.



5. Click *Bluetooth Network Connection* with the right mouse button. Then click *View Bluetooth Network Devices*.



6. Click the icon of the detector with the right mouse button. Select *Connect using > Access point*. The connection will be established. For disconnecting click the detector icon with the right mouse button. Select *Disconnect from device network*.



7. Open the internet browser and empty its cache.
8. Enter the IP-address 192.168.13.1 to call the web server.

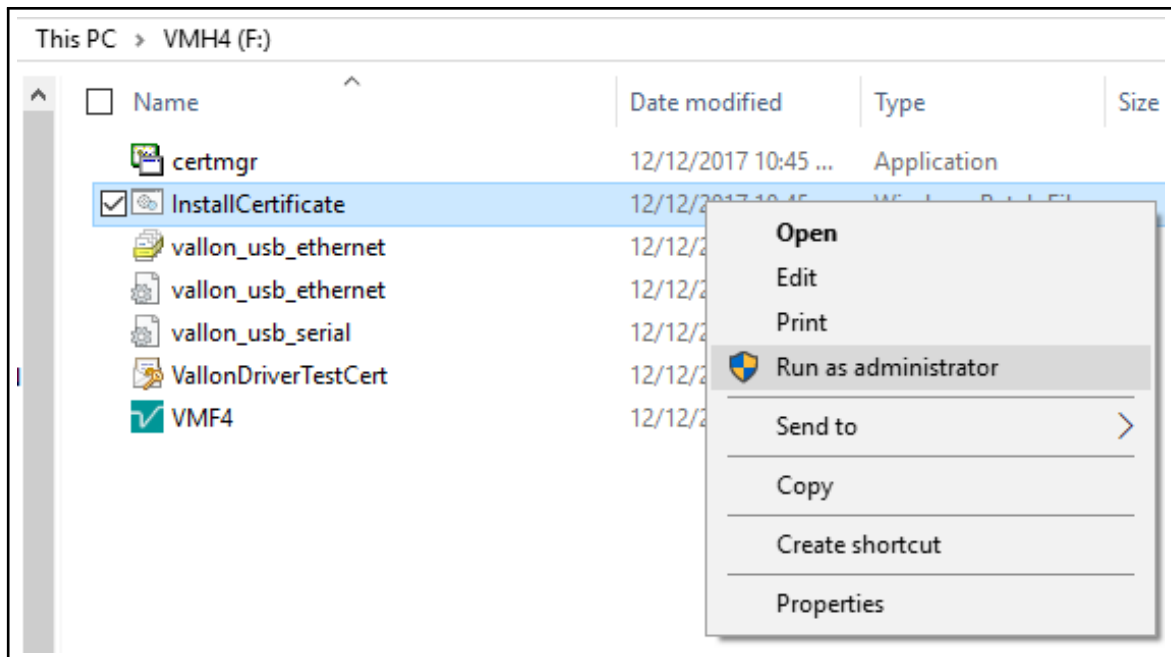


Information

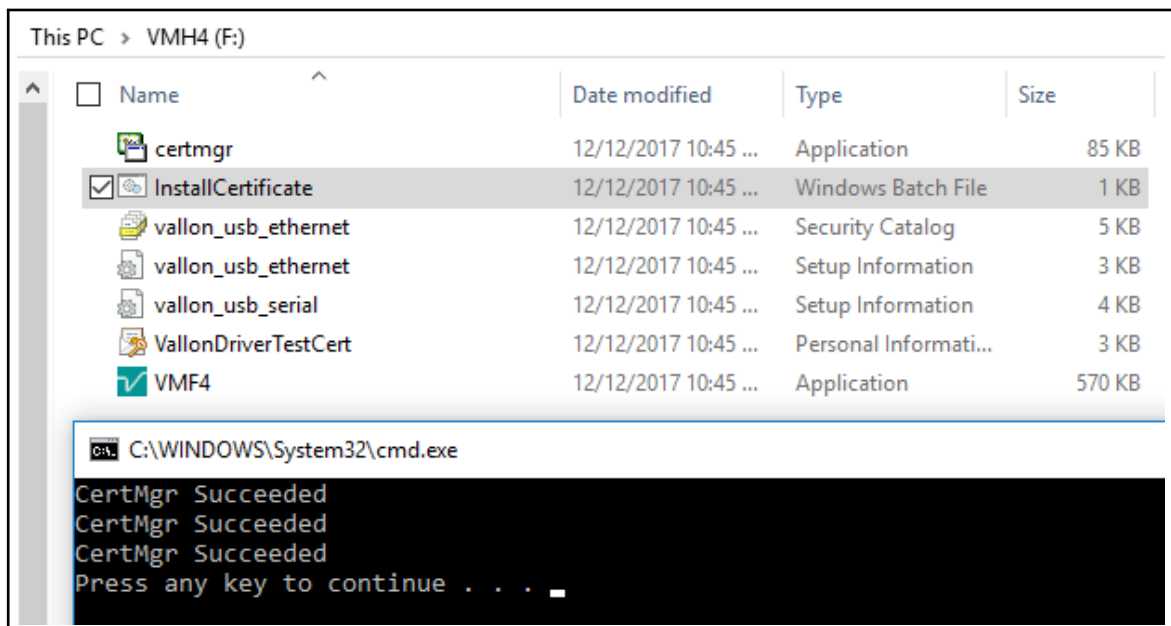
- ▷ A safe function was verified with current versions of Microsoft Edge, Mozilla Firefox and Google Chrome.
- ▷ The USB interface will automatically switch off after 2 minutes if the detector is not connected to a PC.

B.1.4 Connecting Vallon detectors with PC via cable

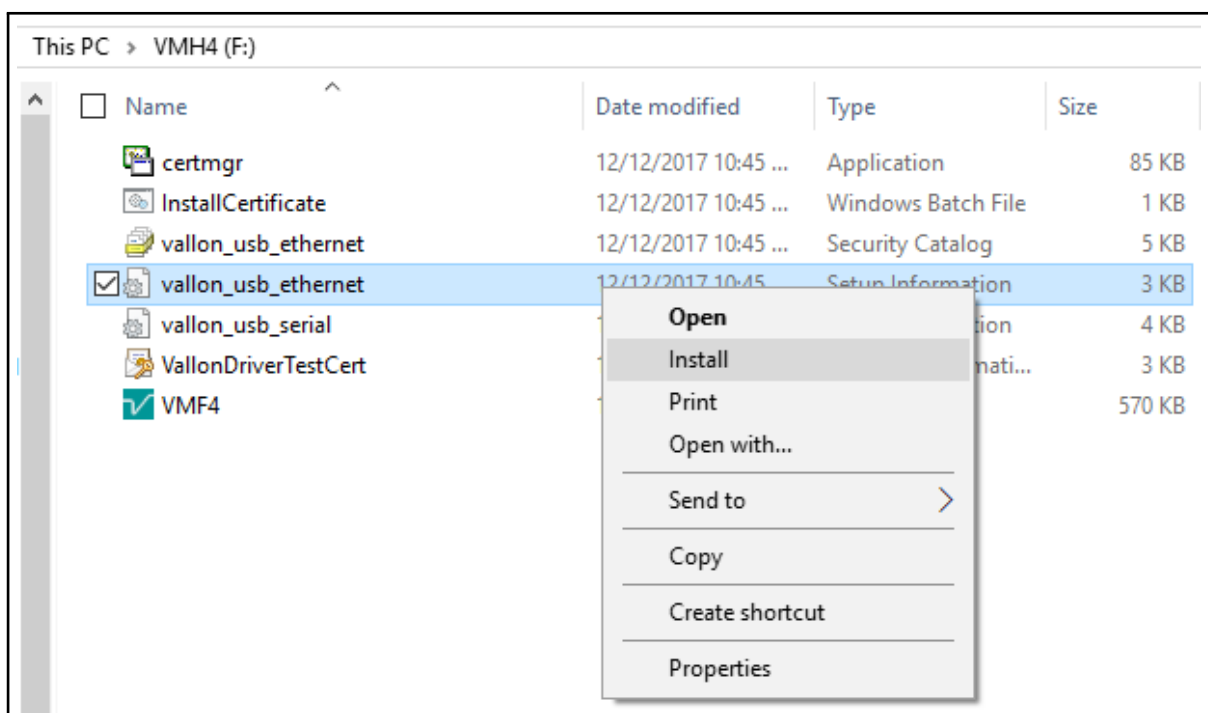
1. Connect the detector with the PC using the Vallon USB cable.
2. Switch on the detector and wait approx. 10 – 20 seconds. A device with the name of the detector appears and its directory opens. The directory contains the device driver certificate for Windows 10 (*InstallCertificate.bat*) and the installation file for the device driver (*vallon_usb_ethernet.inf*). If you connect the detector the first time with the PC, continue with step 3, otherwise with step 6.
3. Click the file *InstallCertificate.bat* with the right mouse button and select *Run as administrator*.



4. A window opens and shows the installation. After successful operation click any key to close the window.



5. Click the file *vallon_usb_ethernet.inf* with the right mouse button and select *Install*.



6. Open the web browser and empty its cache.
7. Enter the IP-address 192.168.12.1 to call the web server.



Information

- ▷ The used browser must support HTML5. A safe function was verified with current versions of Microsoft Edge, Mozilla Firefox and Google Chrome.
 - ▷ The USB interface will automatically switch of after 2 minutes if the detector is not connected to a PC.
-

B.2 Webserver operation



Information

- ▷ After some settings or a firmware update, it is advisable to reload the cache of the browser and the web server, otherwise the changes may not be visible.

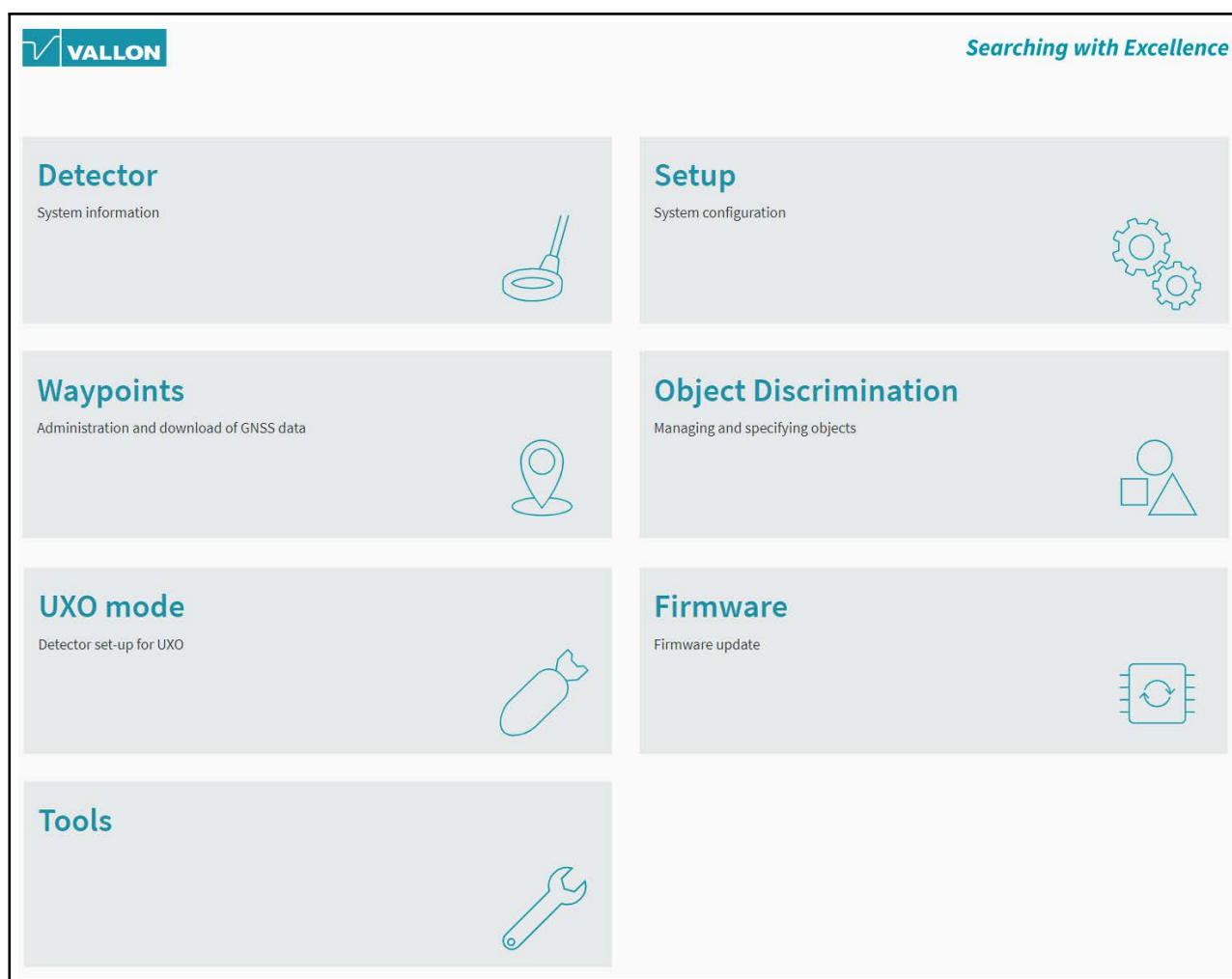
This can be done, for example, by pressing the Ctrl key and the function key F5. In the case of notebooks, the Fn key may also have to be pressed to activate the function keys.

B.2.1 Functions and settings

In order to use the web server, please connect the detector with a suitable computer (PC, smartphone, tablet etc.), see also section [Webserver setup](#) on page 72.

Click on the icon *Main menu*  and choose your preferred language.

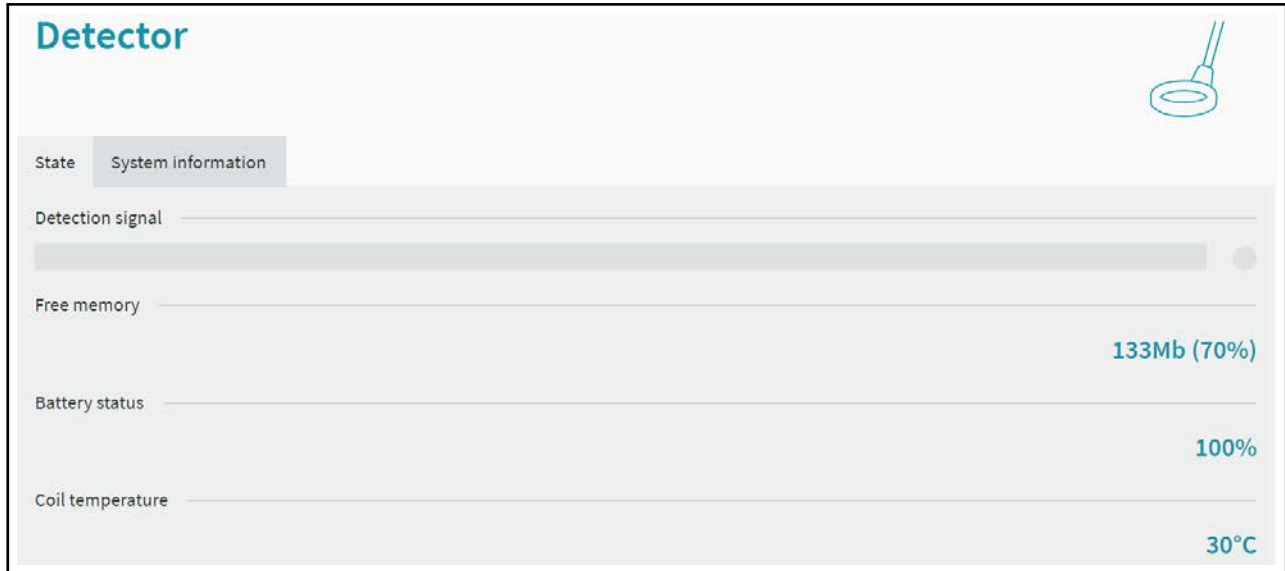
The following menu entries are available in the web server (depending on the individual configuration, see section [Customizing](#) on page 92).



Page Detector

Click on *Detector* to get information about the detector. The following information is displayed:

Tab State



- ▷ Detection signal
- ▷ Free memory
- ▷ Battery status
- ▷ Coil temperature

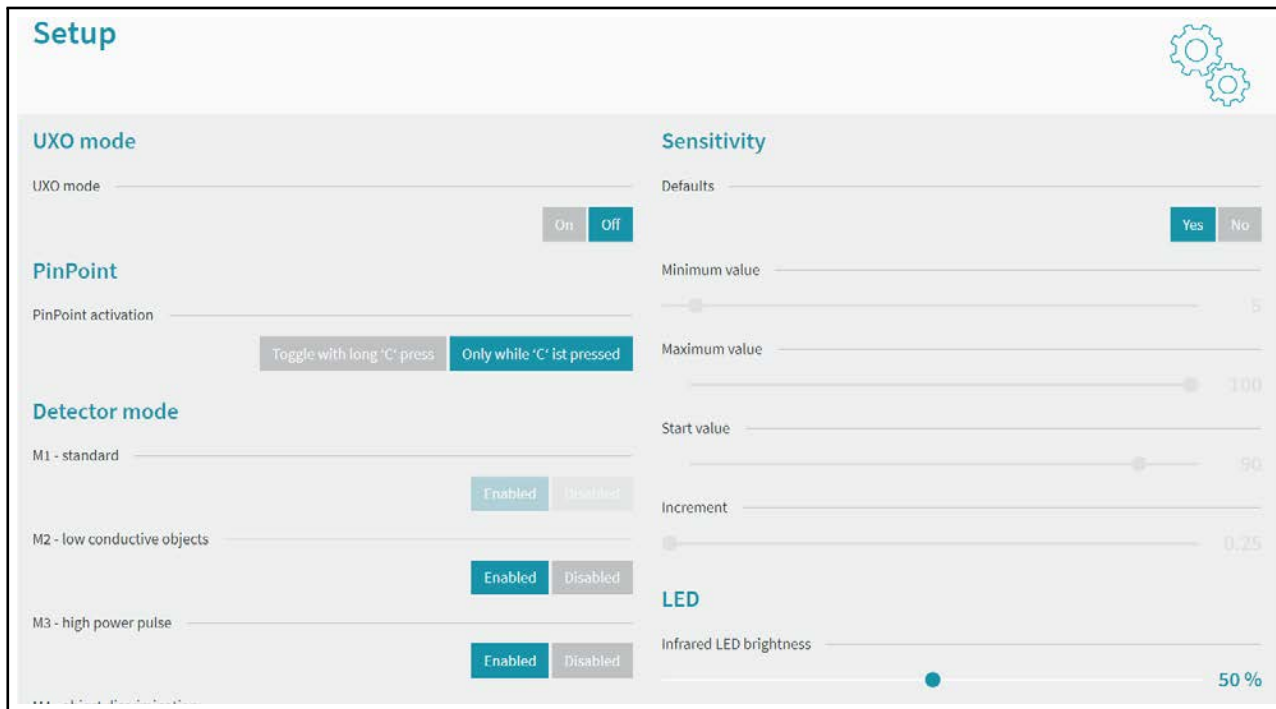
Tab System information



- ▷ Device name
- ▷ Serial number
- ▷ Firmware
- ▷ Coil type
- ▷ Device capabilities

Page Setup

Click on *Setup* to adjust the detector's settings.



The following settings are available:

UXO mode

UXO mode (On / Off)

Pinpoint

Pinpoint activation (Toggle with long 'C' press / Only while 'C' is pressed)

Detector mode

- ▷ M1 – standard
- ▷ M2 – low conductive objects
- ▷ M3 – high power pulse
- ▷ M4 – object discrimination
- ▷ M5 – object suppression

GNSS

- ▷ GNSS (On / Off)
- ▷ Indication GNSS (On / Off)
- ▷ GNSS track interval (1–60 s)

Sensitivity

- ▷ Defaults (Yes / No)
- ▷ Minimum value (0–100 %)
- ▷ Maximum value (0–100 %)
- ▷ Start value (0–100 %)
- ▷ Increment (0.25–5)

LED

- ▷ Infrared LED brightness (0–100 %)
- ▷ LED brightness (Min / Auto / Max)
- ▷ Infrared LED (Off / On if vibration only / On if LED off)

LED color mode*

- ▷ UXO mode (DEFAULT / RED)
- ▷ Object discrimination (DEFAULT / RED)
- ▷ High power pulse (DEFAULT / RED)
- ▷ Low conductive objects (DEFAULT / RED)

*only with appropriate hardware

Audio signal

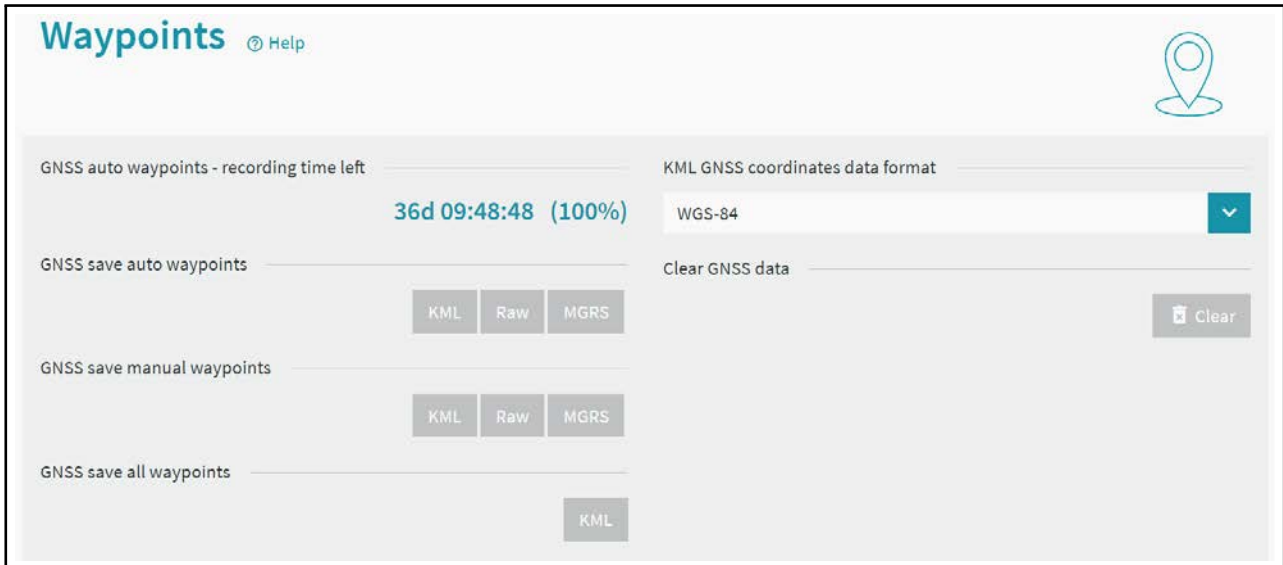
Headphone / Speaker (Use both / Use either-or)

Language

Language (DE, EN, FR, ES, RU, ...)

Page Waypoints

Click on *Waypoints* to adjust the settings of the detector's GNSS system, download GNSS data or delete all GNSS data.

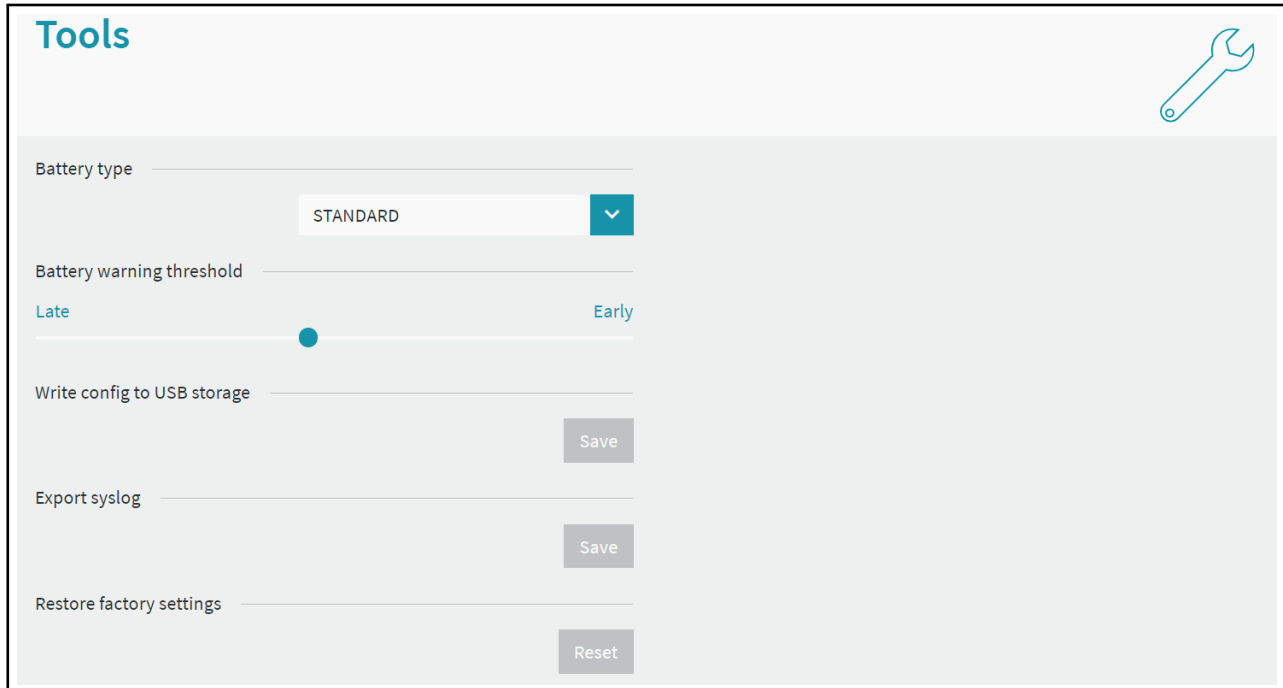


The following settings/functions are available:

- ▷ GNSS auto waypoints – recording time left
- ▷ GNSS save auto waypoints (KML / Raw / MGRS)
- ▷ GNSS save manual waypoints (KML / Raw / MGRS)
- ▷ GNSS save all waypoints (KML)
- ▷ GNSS data format (WGS-84 / GCJ-02 / BD-09)
- ▷ Clear GNSS data

Page Tools

Click on *Tools* to use special functions.



The following special functions are available:

▷ Battery type

- Default
- Zinc-carbon
- Nickel-metal hydride NiMH
- Alkaline
- Nickel-cadmium NiCd

▷ Battery warning threshold (5–60 %)

▷ Write config to USB storage

The USB adapter cable kit (see section [Options](#) on page 12) is required to save the web server configuration on a USB storage device.

1. Connect the USB storage device to the detector using the USB adapter cable.
2. Switch on the detector and go to page *Tools* in the web server.
3. Click on *Write config to USB storage*.
4. When the message “Safe to remove storage” appears, the web server configuration is completely saved.
5. Remove the USB adapter cable from the detector.

The web server configuration is saved including all passwords.

▷ Export syslog

By clicking on *Export syslog*, a system log file can be saved on the device that is connected to the detector (this file is used to evaluate the detector function and can be sent by email to service@vallon.de).

▷ Restore factory settings

Page Firmware

Click on *Firmware*, for carrying out a firmware update. You can request a current firmware at service@vallon.de.

NOTICE

Switching off the detector during firmware update may cause irreparable damage.

- ▷ Only use a connection via cable interface, see section [Connecting Vallon detectors with PC via cable](#) on page 80.
- ▷ Ensure the detector batteries are fully charged and do not turn off the detector during a firmware update.



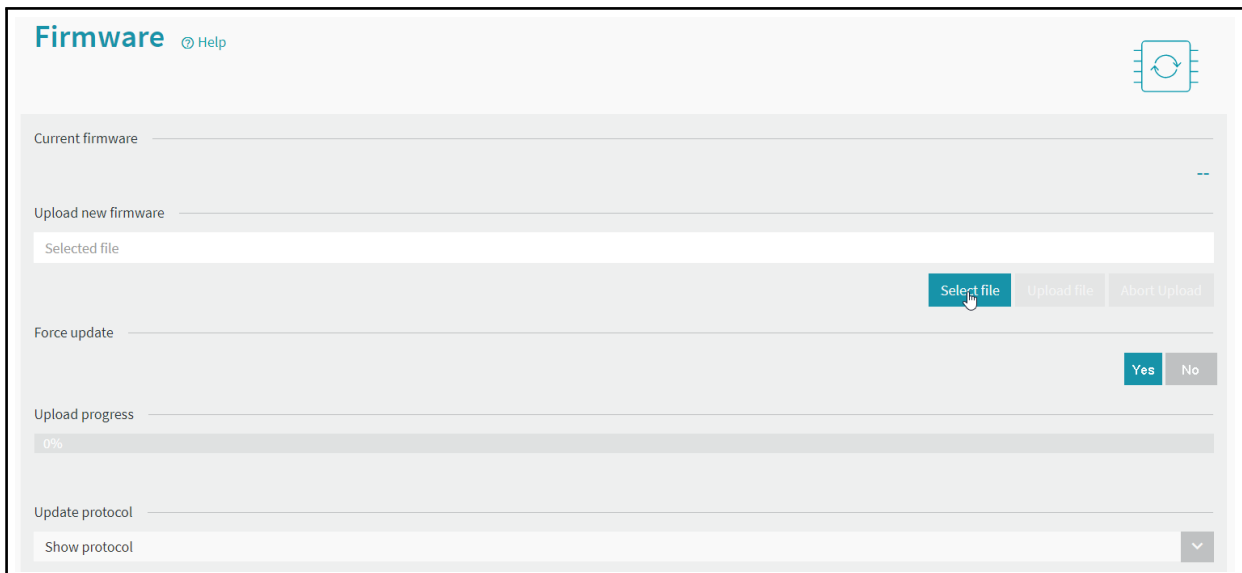
Information

- ▷ It is recommended to perform the firmware update completely twice to update the fallback partition as well.

Performing the firmware update

Further information can be found in the help file of the web server.

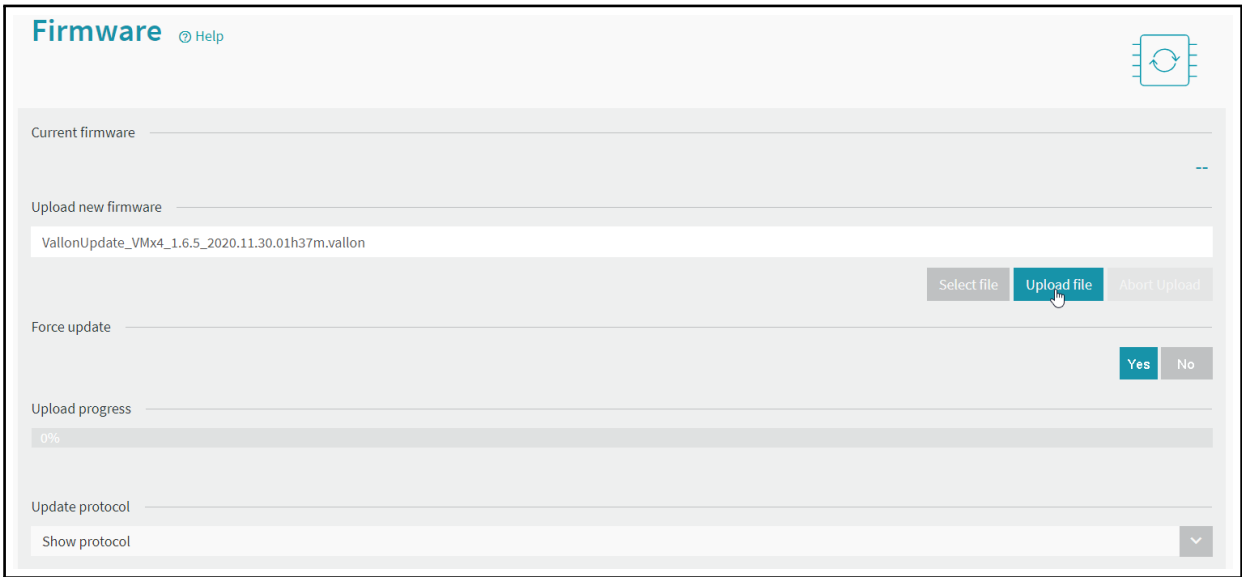
1. Click *Select file*. A window will open where you can select the firmware file. The firmware file must already be saved on your PC.



The screenshot shows a web interface for firmware updates. At the top, there is a header with 'Firmware' and a 'Help' link. Below this, there are several sections: 'Current firmware' with a dropdown menu, 'Upload new firmware' with a 'Selected file' input field and 'Select file', 'Upload file', and 'Abort Upload' buttons, 'Force update' with a 'Yes' (selected) and 'No' button, 'Upload progress' with a 0% progress bar, and 'Update protocol' with a 'Show protocol' button and a dropdown arrow.

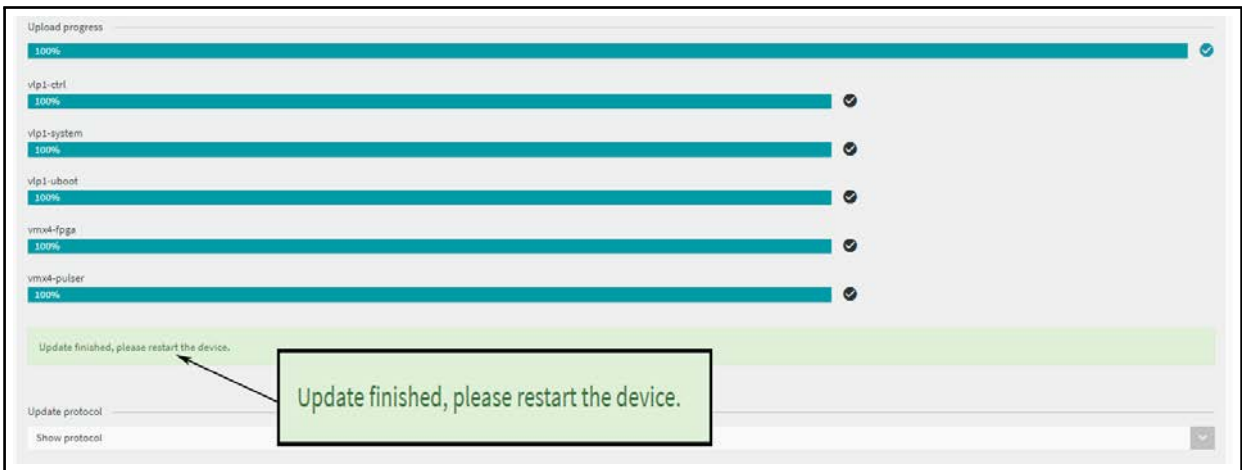
2. Make sure that *Yes* is selected in line *Force update*.

3. Click *Upload file*. The firmware file is uploaded onto the detector. A progress bar will appear on the screen during the upload.



The screenshot shows the 'Firmware' section of a web interface. At the top, there's a 'Current firmware' field and a 'Help' link. Below it is the 'Upload new firmware' section, which includes a text input field containing the filename 'VallonUpdate_VMx4_1.6.5_2020.11.30.01h37m.vallon'. To the right of this field are three buttons: 'Select file', 'Upload file' (highlighted with a mouse cursor), and 'Abort Upload'. Below the upload buttons is a 'Force update' section with 'Yes' and 'No' radio buttons. Further down is an 'Upload progress' section showing a 0% progress bar. At the bottom is an 'Update protocol' section with a 'Show protocol' button.

4. The firmware update will start automatically. Progress bars indicate the update progress.



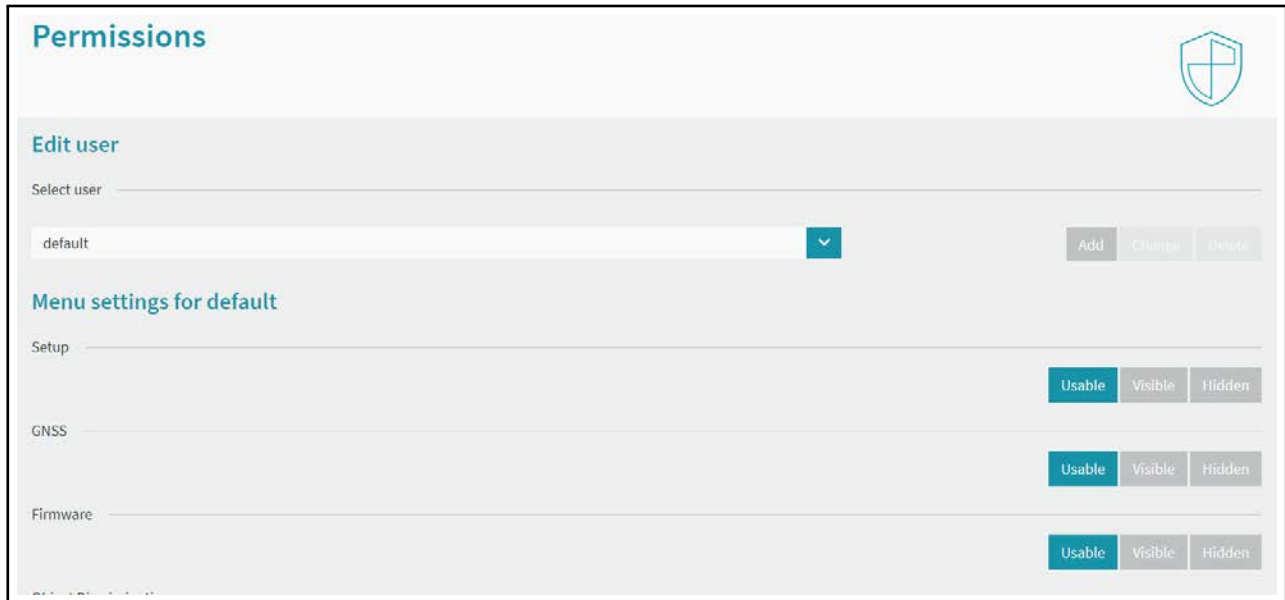
The screenshot shows the 'Upload progress' section of the web interface. It displays several progress bars for different components, all at 100% completion. The components listed are: 'vlp1-ctrl', 'vlp1-system', 'vlp1-uboot', 'vmx4-fpga', and 'vmx4-pulser'. Each bar is accompanied by a checkmark icon. Below the progress bars, a green message box states 'Update finished, please restart the device.' A callout box points to this message with the text 'Update finished, please restart the device.' The 'Update protocol' and 'Show protocol' buttons are visible at the bottom.

5. When the success message "Update finished, please restart the device" appears, the firmware update is complete. After a restart, the new firmware is activated.

If the firmware update stops without a success message: Restart the detector. Repeat the firmware update selecting *No* in the *Force update* line. Repeat the firmware update until the success message appears.

B.2.2 Customizing

1. Click on the icon *Main menu* . Click *LOGIN*. Enter the password (default password = serial number detector). In the index an additional tab with name PERMISSIONS will appear.
2. Click PERMISSIONS. Now you can customize the web interface individually.



The screenshot shows the 'Permissions' web interface. At the top, there is a 'Permissions' header and a shield icon. Below the header, there is a section titled 'Edit user' with a 'Select user' dropdown menu showing 'default'. To the right of the dropdown are three buttons: 'Add', 'Change', and 'Delete'. Below this is a section titled 'Menu settings for default'. It contains three rows of settings: 'Setup', 'GNSS', and 'Firmware'. Each row has three buttons: 'Usable', 'Visible', and 'Hidden'. The 'Usable' button for 'Setup' is highlighted in blue.

The following configurations are possible:

- ▷ Section *Edit user*: Add users, Change passwords, Remove users
- ▷ Section *Menu settings for ...* : make pages usable, make pages visible, hide pages
- ▷ Section *Setup*: make functions usable, make functions visible, hide functions
- ▷ Section *GNSS*: make functions usable, make functions visible, hide functions
- ▷ Section *Tools*: make functions usable, make functions visible, hide functions



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