

S1+

GEBRAUCHSANLEITUNG

Lawinen-Verschütteten-Suchgerät

MANUAL

Avalanche Transceiver

MODE D'EMPLOI

DVA

ISTRUZIONI PER L'USO

Localizzatore a.r.t.va.

INSTRUCCIONES DE USO

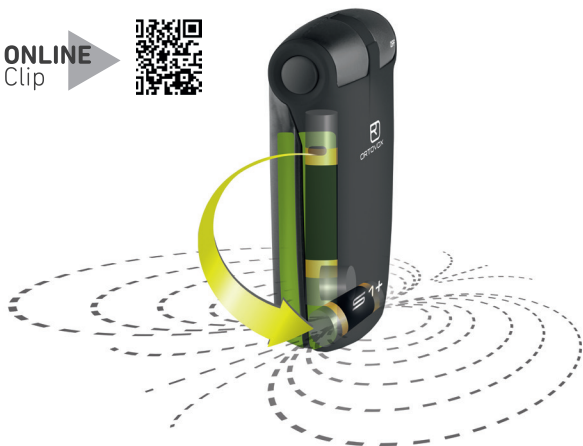
Aparato de búsqueda de víctimas de avalanchas



ORTOVOX
VOICE OF THE MOUNTAINS



ONLINE
Clip



BESSER GEFUNDEN WERDEN!

Automatische Umschaltung auf die optimale Sende-Antenne.

BE FOUND EASIER!

Automatic switchover to the best transmission antenna.

ETRE RETROUVÉ PLUS FACILEMENT!

Connexion automatique à l'antenne émettrice optimale.

SARETE TROVATI PIÙ FACILMENTE!

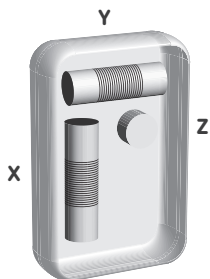
Commutazione automatica alla migliore antenna trasmittente.

¡SE LOCALIZA MÁS FÁCILMENTE!

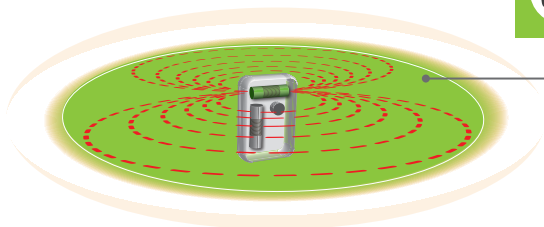
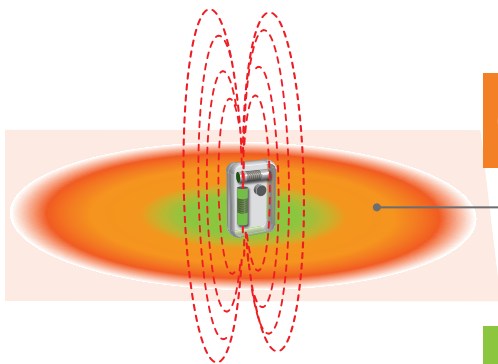
Comutación automática a la antena emisora óptima.



S1+



SMART
ANTENNA



THE ORTOVOX DEVICES HAVE THREE ANTENNAS (X, Y, AND Z)

All three antennas are used during **SEARCHES**. The x and y antennas are used to display the distance and the direction of movement. The z antenna is solely used for the fine search.

The ORTOVOX device **S1+**, **3+** and **ZOOM+** are the only devices on the market that can analyze the position of the antennas using smart antenna technology and **TRANSMIT VIA BOTH THE X AND THE Y ANTENNA**.

This vastly increases (**UP TO DOUBLES**) the victim's transmission range, making him or her far easier to find (**IMPROVED VISIBILITY**).

VERTICAL POSITION WITHOUT SMART-ANTENNA = POOR VISIBILITY

A vertically positioned transmitter antenna (x antenna) only emits a signal vertically and results in poor visibility due to minimum area coverage (range) in the search area. A vertical **TRANSMITTER WITHOUT A SMART ANTENNA** is therefore **MORE DIFFICULT TO LOCATE**.

VERTICAL POSITION WITH SMART-ANTENNA = VERY GOOD VISIBILITY

The **PATENTED SMART-ANTENNA-TECHNOLOGY** resolves this problem of poor visibility in the vertical position. The position sensor analyzes the device's position in the avalanche and **AUTOMATICALLY SWITCHES TO THE Y-ANTENNA**. As a result, the antenna once again transmits horizontally and expands the area coverage to almost the maximum range, making it easier to locate victims in less time.

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The **S1+** combines the success stories of two unique avalanche transceiver innovations: the **DISPLAY SHOWING THE RELATIVE POSITION OF AVALANCHE VICTIMS** and the **SMART-ANTENNA-TECHNOLOGY!**

Handling the device is more intuitive than ever. Once switched on, it transmits, but when opened up it switches straight to search mode. The illuminated **360° REAL-TIME DISPLAY** shows the position in the avalanche and gives **UNMISTAKABLE ACTION INSTRUCTIONS**. As soon as the person searching begins the pinpoint search, the **PATENTED CIRCULAR** display and **INTUITIVE SEARCH ACOUSTICS** help the location process. Located victims can now be flagged and the search can continue. **FOLLOW-UPAVALANCHESWITCHOVER** and **SMART-ANTENNA-TECHNOLOGY** provide a safety plus for the user, while the **ECONOMIC POWER MANAGEMENT** protects the environment and your wallet – just two batteries are sufficient for 250 hours in transmission mode. Of course the device can be **UPDATED**.

RECCO

**RECCO
REFLECTOR
INSIDE!**

So professional rescuers can quickly find avalanche victims! The backup technology is used by more than 700 ski areas and rescue teams around the world.



official
supplier

Made in
GERMANY

Valuable information on how to help companions, accident prevention and the latest safety products from ORTOVOX can be found at www.ortovox.com.

You can reach us by e-mail at:
ortovox@ortovox.com

ORTOVOX hopes you have wonderful, safe trips!



1 ON/OFF switch

2 OK button

3 MENU button

4 Transmission monitoring lights

5 Sensors

6 Position of the victim

7 Direction indication

8 Position of the searcher

9 Distance indicator

10 Loudspeaker

11 Battery compartment (on rear)



EXTENDED WARRANTY

Register your **S1+** at:

www.ortovox.com/registration

In doing so, your warranty period will extend from two to five years from the date of purchase.

If you opt in, we will regularly inform you about updates and the latest news in relation to the **S1+**. This keeps you and your device up to date at all times. Further information about software updates can be found at: **www.ortovox.com/update**



Avalanche transceivers are designed to support the assistance offered by companions in the event of avalanche burial.

Your presence in areas where avalanche hazards exist is fraught with potential risk. The effective use of an avalanche transceiver requires appropriate training and constant practice.

ORTOVOX strongly recommends that you carefully read the operating instructions provided with the avalanche transceiver and take the appropriate avalanche education courses.

In addition, always take a shovel and a probe when you go off-piste in areas where avalanche hazards exist, and never head out alone.

Plan your off-piste activities using the current avalanche report at: **www.ortovox.com**

Before you enter an area at risk of an avalanche, you should make sure that all avalanche transceivers are working properly and all batteries are in good condition.

The **S1+** fulfills the maximum safety requirements and is characterized by its simple operation!

HOW TO CARRY THE DEVICE

The **S1+** is carried close to your body in the comfort carrier bag (**12**) and should always be covered by at least one layer of clothing.

In warmer temperatures, the **S1+** can also be carried in a zippered pant pocket (not in sewn-on pockets).



IMPORTANT NOTICE

People with pacemakers should wear the **S1+** on the right side of their body. It is essential to observe the pacemaker manufacturer's instructions!

AVOIDING INTERFERENCE



In **TRANSMISSION MODE**, no electronic devices (wireless devices, mobile phones, other avalanche transceivers) or other metal objects should be located in the immediate vicinity (within a few centimeters).

In **SEARCH MODE** other electronic devices should be switched off or carried at a distance of at least 50 cm away.

Interference can also be caused by approaching storms, lifts and power systems.

INITIAL USE

The **S1+** can be switched on when open or closed.

SWITCHING ON

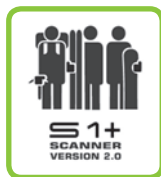
(device open)

Turn the ON/OFF switch (1) clockwise by 90° degrees.



SELF-TEST

Once the welcome screen with the software version (e.g. 2.0) has been displayed, the **S1+** starts a self-test.



The transmitter, receiver, and smart antenna sensors are checked.



The remaining battery capacity is also displayed as a percentage (e.g. "99%").

TRANSMITTING

Close the **S1+** after the self-test has successfully concluded. The transmission monitoring lights (4) now start flashing and the **S1+** transmits.

SWITCHING ON

(device closed)

Turn the ON/OFF switch (1) clockwise by 90° degrees.



When the **S1+** is switched on when closed, the battery status is given acoustically:

2 x HIGH = 100-50% battery capacity

1 x HIGH + 1 x LOW = less than 50% battery capacity

1 x HIGH + 1 x LOW and LONG = less than 25% battery capacity

Further important information about the battery can be found on p. 63

If the device self-test was not positively concluded, a warning signal sounds.

SWITCHING OFF

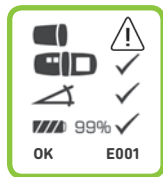
Lightly **PRESS IN** the ON/OFF switch (1) and turn **COUNTERCLOCKWISE** by 90° degrees.



FAULT

If a malfunction or problem is detected during the self-test, an acoustic warning sounds. The type of fault and warning code are displayed.

A warning can be triggered by the immediate proximity to another transmitting avalanche transceiver, mobile phone, wireless device, large metal parts or particularly strong magnetic fields.



If the malfunction warning is displayed during the self-test, then carry out the test again in the open in surroundings without interference.

When doing so, it is essential to make sure that no other transmitters are nearby. **SWITCH OFF** all **SOURCES OF INTERFERENCE** (mobile phones, wireless devices etc.) or move them well away.

If the warning is displayed again, the device must be sent to the ORTOVOX service department.

Further information about the service can be found on p. 66

WHAT THE WARNINGS MEAN

E001 Transmitter

E002 Receiver

E003 Transmitter and receiver

E004 Rotation angle sensor

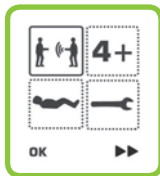
E005 Rotation angle sensor
and transmitter receiver

E008 Slope sensor

PARTNER CHECK

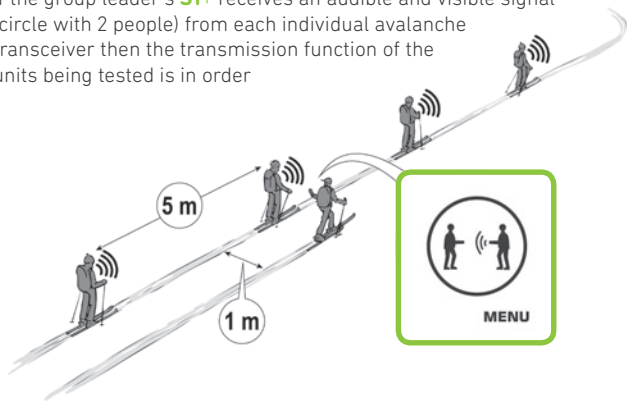
THE PARTNER CHECK WITH LIMITED RANGE SHOULD BE CARRIED OUT EVERY DAY BEFORE STARTING A TOUR.

The function is used to check the frequency (457 kHz), the width of the transmitting signal, and the cycle duration of the transmitting signal.



CHECKING THE TRANSMITTERS

- The group leader selects the **"PARTNER CHECK"** function from the menu.
- The group participants switch their avalanche transceivers to transmission mode and go past the group leader one by one at an interval of 5 m.
- A distance of at least 1 m must be maintained from the group leader.
- If the group leader's **S1+** receives an audible and visible signal (circle with 2 people) from each individual avalanche transceiver then the transmission function of the units being tested is in order



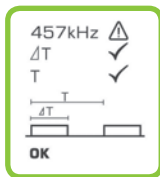
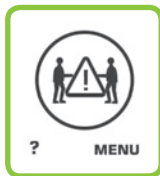
WARNING

If a warning triangle appears on the screen, this indicates a major fault with the transmitting avalanche transceiver:

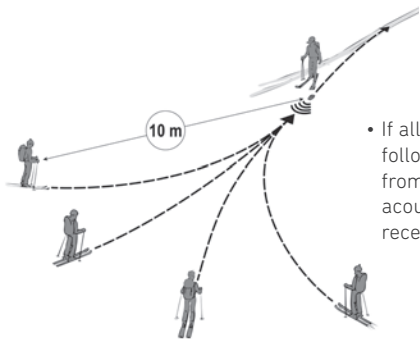
- Transmission frequency (457kHz)
- Transmission duration
- Cycle duration

The determined fault can be queried by pressing the "OK" button (2).

Return to the partner check by pressing the "OK" button (2).

**CHECKING THE RECEIVERS**

- All participants are located 10 m away from the group leader and set their avalanche transceivers to receive mode.
- The group leader closes his **S1+** (transmission mode).



- If all the group members can follow the transmitting signal from the group leader (both acoustically and optically), the reception test was successful.

SEARCHING - LOCATING - RESCUING

LOCATING

On opening the **S1+** the search situation will be automatically displayed on the screen.



VICTIM'S POINT OF DISAPPEARANCE KNOWN

If the point of disappearance is known or objects are visible, the search area is narrowed down to below this point in the avalanche flow direction.

This can save valuable time.

SIGNAL SEARCH

Search the avalanche debris in the indicated manner during the signal search.

When using the **S1+** a search strip width of **50 m** (equates to 50-60 steps) must not be exceeded. The distance from the edge of the avalanche must remain less than **25 m**.

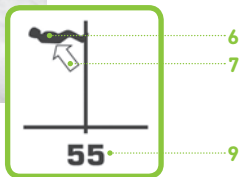
At the same time, keep an eye out for objects or partially buried victims.



SEVERAL SEARCHERS

The searchers move across the search area in parallel.

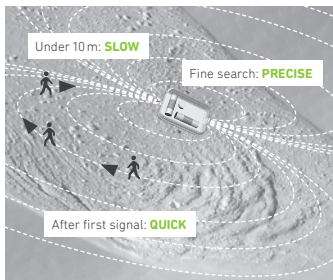
The distance between the searchers must remain less than **50 m**.



COARSE SEARCH

Always hold the **S1+** horizontally during coarse searches!

From a distance of approx. **55 m** from the victim, the direction arrow (**7**), relative position (**6**), and distance indicator (**9**) appear on the screen and lead you along the field line to the target location.



INTUITIVE SEARCH ACOUSTICS

After the first signal, move quickly during your search. The intuitive search acoustics confirm your approach.

At 10m you should move slower and get more precise in your search.

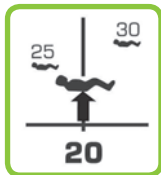
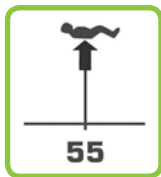
An acoustic change will help you to do so.

Point the vertical line on the crosshair to the symbol representing the victim (6) and move toward him.

The distance indicator goes down and confirms that you are getting closer.

The distance to the victim is now 20 m. Two more victims are shown by two smaller symbols (25 m and 30 m). The device continues to hone in on the nearest victim (biggest symbol) 20 m away.

If there are several rescuers, each of the signals displayed can be honed in on and located at the same time.



FINE SEARCH

The fine search begins automatically at a distance of 2.5 m.

During the fine search, determine the smallest distance.

Move the device forward and back once and left and right once in a cross shape.

Do not turn the **S1+** during this process!

The smallest distance corresponds to the burial depth.

TENDENCY INDICATOR

The patented circular illustration with tendency indicator on the **S1+** makes the fine search process far easier.

- The arrows point toward the center of the circle.
- The closer you come to the victim, the smaller the distance shown and the smaller the circle.
- The arrows still point to the center of the circle. The acoustic signal beeps faster.



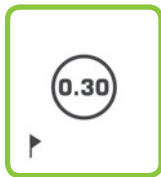
- If you move away from the victim, the circle becomes larger, the arrows point outward and the distance indication increases.
- The previously achieved, closer position is indicated by the inner, lighter circle.



- You change direction and get closer to the victim once again.
- The circle becomes smaller, the arrows point to the center and the distance indication reduces.



- The smallest distance corresponds to the burial depth

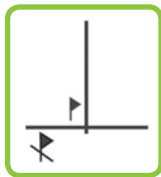


FLAGGING

A victim can be electronically flagged from a distance of less than 3 m.

To flag a victim, the OK button (2) is pressed **ONCE**.

The flagged transmitter is shown on the display as a flag.



REMOVING FLAGS

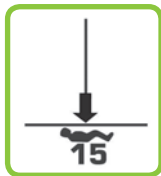
The crossed out flag shows that it is possible to remove flags.

By pressing the OK button (2) again for **2 SECONDS**, the flag set before can be removed.

If there is a second (or third) victim within a 3 m circumference, the signal cannot be removed. In this case, as soon as the first victim is flagged, the fine search for the next victim starts.

VICTIM IS BEHIND THE RESCUER

If the victim is shown behind your own position, then change the direction you are walking in by 180°, hone in on the victim again and walk toward him.



PINPOINTING (PROBING)

Mark the point with the smallest distance reading (using crossed poles or a shovel).

To now determine the precise location of the victim, probe in the displayed 25 cm grid.

Insert the probe quickly and deeply at a 90° angle to the snow. A clear decrease in the penetration depth indicates a hit.

The probe remains in the ground as a point of reference while you dig out the victim.

**DIGGING OUT**

Read the burial depth (1) on the probe. Move this distance down the slope and start shoveling in a V-shape.

If there are several rescuers, the person shoveling at the top should cut out blocks. Those behind should shovel and move the snow away. The air passages should be exposed as quickly as possible.



TIP Shovels with a **CLEARING FUNCTION** can save valuable time.

DEEP BURIAL

In the event of burial depths of more than 3 m, fine search can be triggered from a distance of less than 7 m by pressing the OK button (2).



The exact position is determined using systematic cross lines.

It is possible to flag a transmitter up to a depth of approx. 7 m. In case of deeper burials, the victim's position is determined by finding out the smallest distance indicator.

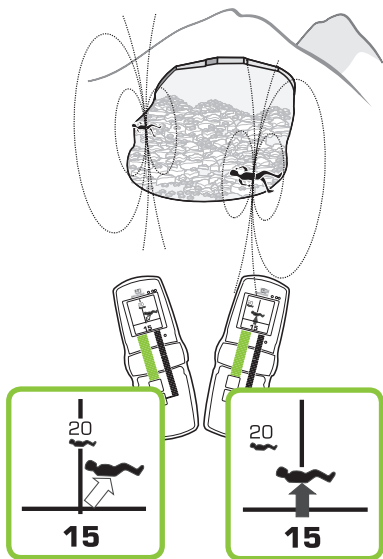
After that, every victim shown on the display can be honed in on and located.

SIMULTANEOUS LOCATION OF TWO VICTIMS BY TWO RESCUERS

The display shows the relative position and distance of the avalanche victims.

Each of the transmitters displayed can be honed in on and thus directly located.

Two rescuers can locate the transmitter independently of each other and thus save valuable time when rescuing the victims.



MULTIPLE VICTIMS

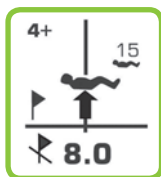
If 4 or more transmitting signals are detected, then "4+" appears on the display top left.

In this case use the MENU button (3) to select the "4+" function and access it with the OK button (2).

"4+" FUNCTION

After accessing the "4+" function, the S1+ locates the nearest victim with an unlimited range (approx. 55 m). After flagging the first signal the range is automatically limited to approx. 5 m.

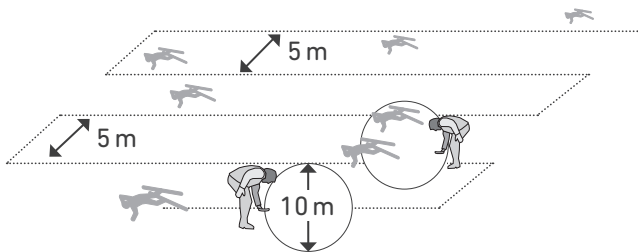
The search strips should now be reduced to a width of 5 m. The restriction to a 5 m micro search strip width is indicated by two black bars on the sides of the display.



MICRO SEARCH STRIPS

Access the "4+" function and start the search. Once the first victim has been located and rescued by the helper(s), the avalanche area is slowly searched in 5 m search strips.

The S1+ now scans circular-shaped areas with a diameter of 10 m max. and every victim in this circle is displayed.



SIGNAL OVERLAP

The transmission signals are measured and analyzed by the **S1+**.

If several transmission signals are received that are transmitting at the same time then a signal **OVERLAP OCCURS**.

The signals overlap and can no longer be technically distinguished. In the worst cases, this can last for several seconds.

The signal overlap is illustrated with a stop sign and the distance "**55**".

You must wait until the signal overlap period has passed before you continue your search.



RECOMMENDATION

If the number of victims is not known, one of the above-mentioned methods must be applied for safety's sake before the search is ended in order to detect other victims and rescue them if need be.

AUTOMATIC TRANSMISSION SWITCH OVER

In the event of a **SECONDARY AVALANCHE** to which you fall victim (with your device in search mode), the **S1+** automatically switches to transmission mode after 2 minutes of non-movement. This is indicated by a 10-second warning tone.

This makes it possible for you to also be found if buried in an avalanche while searching.



MENU

**ACCESS THE MENU**

Press the MENU button (3) down for 3 seconds.

SELECT FUNCTION

Press the MENU button (3) several times.

**ACCESS THE FUNCTION**

Press the OK button (2).

**PARTNER CHECK**

With limited range.

**"4+" FUNCTION**

Locating more than 3 victims.

**SEARCH****SETTINGS**

STATUS DISPLAY

**"4+" FUNCTION**

The searcher is requested to select the "4+" function from the MENU.

**ATTENTION**

Low battery.

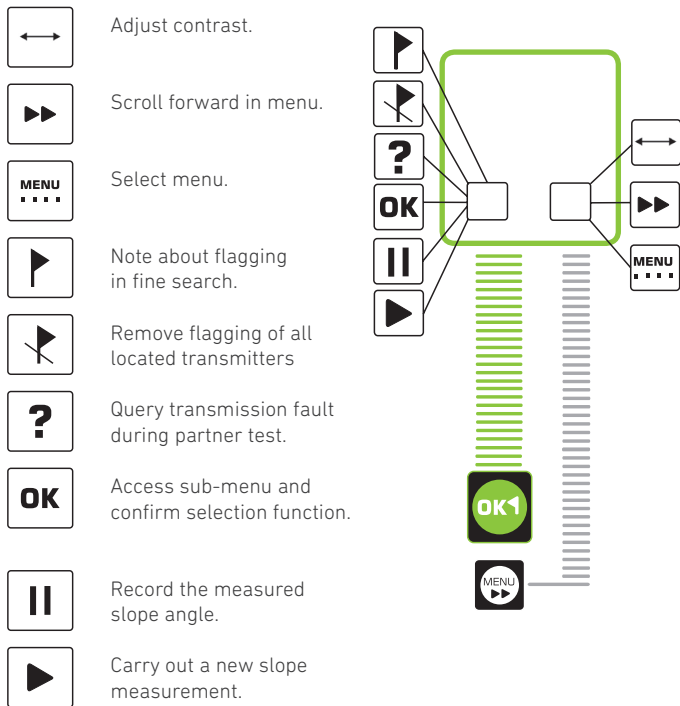
**WARNING****ATTENTION**

Automatic transmission switch over is switched off.



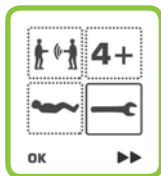
SOFTKEYS

The OK (2) and MENU (3) buttons control several functions.
The softkeys show the respective key function:

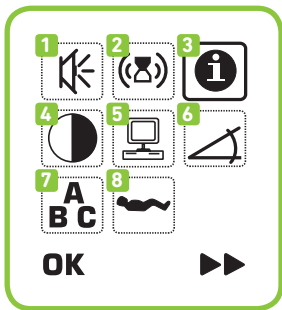


SETTINGS

The “**SETTINGS**” menu symbol can be used to query, select, or change the following settings:



- 1 Loudspeaker
- 2 Automatic transmitter switch over
- 3 Information about:
 - Device number
 - Software version
 - Receiving function
 - Battery capacity
- 4 Display contrast setting
- 5 Update
- 6 Inclinator
- 7 Customizing the welcome screen
- 8 Search



1 LOUDSPEAKER

The loudspeaker function can be set to "ON" and "OFF".



2 AUTOMATIC TRANSMITTER SWITCH OVER

The automatic transmission switch over is pre-set to 120 seconds when delivered.

The automatic transmission switch over can be reduced to 60 seconds or switched off.



ATTENTION

If automatic transmission switch over is switched off, the device will not switch back in the event that someone is buried by a secondary avalanche!

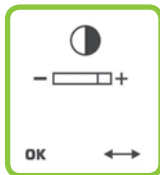
3 INFORMATION

The sub-menu shows: device number, software version, transmitter and receiver function, and current battery capacity.



4 DISPLAY CONTRAST SETTING

The desired contrast is adjusted using the MENU button (3) and confirmed with the OK button (2).



5 UPDATE

An infrared reader (accessories) can be used to connect the S1+ to a PC for updates and log printouts.



6 INCLINOMETER

The slope angle can be determined using the "SLOPE MEASUREMENT" function.

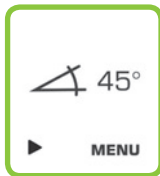
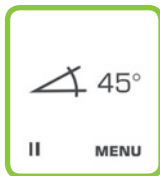
If this function is selected, then the S1+ transmits while the slope angle is being measured.

During the measurement, place the top side of the S1+ exactly flush with the snow surface.

Tolerance of accuracy of the slope sensor: $\pm 1^\circ$

The determined measurement can be retained by pressing the OK button (2).

A new measurement can be taken by pressing the OK button (2) again.



7 CUSTOMIZATION

The welcome screen that appears immediately after being switched on can display 5 personalized lines (e.g. your name, address, telephone and email).

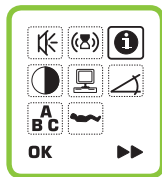
Perform the desired customization of the start screen using the "SETTINGS" menu icon and "ABC".

Hold the S1+ horizontally. Select the characters by tilting the S1+ sideways left and right.

Confirm the character by tilting the S1+ down.

Delete a character by tilting the S1+ up.

Confirm your full entry by pressing the OK button (1).



STORAGE

After the tour take off the S1+ and store it in its switched off status in a well-ventilated dry location.

To ensure that the S1+ will function for many years we recommend the gentle drying of the carrying system. If the transceiver gets wet, do not use direct heat such as a hair dryer to dry it out. Heat applied in such a direct manner may cause permanent damage to the S1+. Protect the S1+ from excessive heat.

Protect the batteries from cold temperatures.

BATTERY

ORTOVOX recommends that you change the batteries when their remaining capacity falls below 50%.

CHANGING BATTERIES (when the equipment is switched off)

Remove the screw from the battery compartment on the back of the **S1+** and remove the batteries from the battery shaft using the strap.

Always insert two new batteries (1.5 V, alkaline, AAA, LR 03).

When changing the battery, make sure the polarity is correct. See the information in the battery compartment.

Remove the batteries from the **S1+** during the summer months.

Damage caused by battery leakage invalidates the ORTOVOX factory warranty.



RECHARGEABLE BATTERIES


NEVER use rechargeable batteries (such as nickel-cadmium batteries, lithium-ion batteries etc.).

Rechargeable batteries have a significantly lower operating voltage, and thus a lower range and limited service life. In addition, defective rechargeable batteries cannot be detected immediately.

After recharging they initially show the full operating voltage, only to severely drop off again after a very short operating period (**THIS CAN BE VERY DANGEROUS**).

NAME	ORTOVOX S1+
FUNCTION	digital
CASING	ergonomic, waterproof, impact resistant
SIZE	215 x 80 x 30 mm (open), 120 x 80 x 30 mm
FREQUENCY	457 kHz

The **S1+** receives transmission signals from every avalanche transceiver conforming to standards (EN 300 718) without restrictions.

BACK-UP	RECCO  Reflector inside
DIGITAL RECEPTION RANGE	55 m
SEARCH STRIP WIDTH	up to 50 m
TEMPERATURE RANGE	-20° C to +45° C

If the transceiver gets wet, **DO NOT USE DIRECT HEAT** such as a hair dryer to dry it out! Heat applied in a direct manner may permanently damage the device beyond repair even after it has cooled down.

POWER SUPPLY	2 x alkaline AA A 1.5 V LR 06 batteries
OPERATING TIME	Transmitting: approx. 250 hours Receiving: approx. 15 hours
WEIGHT	S1+ approx. 235 g incl. battery Comfort carrier bag approx. 95 g

CE 0682

MANUFACTURER

ORTOVOX SPORTARTIKEL GMBH,
Rotwandweg 5, 82024 Taufkirchen,
Germany

DECLARES THAT THE PRODUCT

Type ORTOVOX
Model **S1+**

INTENDED PURPOSE

Avalanche victim search device

is in compliance with the essential requirements of the Council Directive 1999/5/EC (R&TTE), especially with the regulations

STANDARD

ETSI EN 300 718-1 V 1.2.1 (2001)
ETSI EN 300 718-2 V 1.1.1 (2001)
ETSI EN 300 718-3 V 1.2.1 (2004)



Dieter Kotlaba, Product Manager, Taufkirchen, 20.06.2013

USA FCC STATEMENT

FCC ID: KF50RTOVOXS1

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) the device may not cause harmful interference and
- (2) the device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for an intentional radiator pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CHANGES OR MODIFICATIONS TO THIS DEVICE NOT APPROVED BY ORTOVOX CAN VOID THE USERS AUTHORITY TO OPERATE THE EQUIPMENT.

As the **S1+** is a rescue device, a life could depend on it functioning properly.

As electronic components can stop working, we recommend that you always send the device for factory inspection on the recommended date shown on the test seal.

The number (e.g. "**2018**") on the seal in the battery compartment reminds you that the device should be checked in 2018.

The number such as "**1057**" identifies the batch number of the **S1+**.

Please use our inspection service in the summer months so that your device will be ready for operation when winter begins.

For repairs or the factory check, please send the **S1+ INCLUDING THE FILLED IN SERVICE CARD** directly to our service center. Service card see page 168.



On presentation of the dealer invoice, we grant the 2-year ORTOVOX warranty from the date of purchase.

If you register your **S1+** at: www.ortovox.com/registration we will extend the warranty by an additional three years.

Following online registration, the total warranty period is therefore five years.

As part of the ORTOVOX warranty, faulty parts are repaired free of charge or the avalanche transceiver is replaced by an appliance of the same design.

Damage caused by improper handling and natural wear is excluded.

Batteries are excluded from the warranty.

Any further liability for consequential damage is expressly excluded.

Enforced warranties do not extend the warranty obligation or start a new warranty period.

See page 164 for service center addresses.

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