ENGLISH

An immediate search with an avalanche transceiver and a rescue using avalanche shovels and a probe that is carried out by the tour participants themselves offers almost the only chance of survival for an avalanche victim.

Pay attention to the avalanche report and select safe routes. Always take the avalanche transceiver S1+ with you together with the necessary **ORTOVOX SAFETY products** such as an avalanche shovel and a probe.
Read the S1+ operating instructions carefully and practice both the handling of your avalanche transceiver S1+ and avalanche search procedures.

Contact us by e-mail at
ortovox@ortovox.com

ORTOVOX wishes you wonderful, safe tours!

THE CRUCIAL BENEFITS OF THE ORTOVOX S1+:

- Sensor-controlled avalanche scanner with 3 antennas
- Large display shows the relative location of all buried victims
- Precise signal separation and flagging function (up to 5 signals)
- Special search mode (4+) for multiple burials
- **SMART ANTENNA** (automatically switches to the best transmitting antenna)
- Large range: up to 55m
- Intuitive refined location process with circular illustration
- Search strip width: 50m
- Partner check incl. frequency check
- Inclinometer
- Automatic Transmission Switch Over (subsequent avalanches)
- Only 2 AAA ALKALINE batteries
- Customization
- Update option

Sensors

Position victim

Direction indication

Position searcher

Distance indication

Loudspeaker

(4) Transmission monitoring lights

(1) ON/ OFF-Switch

(2) Button OK

(3) MENU button

Battery compartment (on rear)

DEVICE NAME: ORTOVOX S1+
FUNCTION: digital
CASING: ergonomic, waterproof, impact resistant
SIZE: 120 x 80 x 30 mm (when closed);
215 x 80 x 30 mm (when open)
TRANSMITTING FREQUENCY:
457 kHz
DIGITAL RECEPTION RANGE:
up to 55 m.
SEARCH STRIP WIDTH: up to 50 m
TEMPERATURE RANGE: –20° to +45° C

If the device gets wet, never dry with radiator, hot air or hair dryer. Hot air causes lasting damage to the function of the device even after cooling down.

POWER SUPPLY: 2 AAA alkaline batteries 1.5 V LR03
OPERATING TIME Transmitting: approx. 250 hours
Receiving: approx. 15 hours
WEIGHT: 235 g incl. batteries;
(Comfort carrier bag approx. 95g

ADDITIONAL FUNCTIONS:

- Partner check incl. frequency check
- SMART ANTENNA
- Inclinometer: 0 – 60° degrees
- Function „4+" (multiple burials)

The ORTOVOX S1+ exceeds the high requirements of the European Standard EN 300 718.

Manufacturer:: **X-log Elektronik GmbH,**
Responsible person: **Johann Nowotny, Bahnhofstr. 95, D-82166 Gräfelfing,** declares that the product: Type: **ORTOVOX**, Model: **S1+** Intended Purpose: **Searching for avalanche victims** when used as intended satisfies thebasic requirements in accordance with Article 3 of the R&TTE guidelines, Directive 1999/5/EC, and that the following standards have been applied:

1. Health (Article 3.1.a of the R&TTE guidelines) ETS 300 718 issue: 05/01
2. Safety (Article 3.1.a of the R&TTE guidelines) ETS 300 718 issue: 05/01
3. Electromagnetic compatibility (Article 3.1.b of the R&TTE guidelines) ETSI EN 300 718-1 issue: 05/01
4. Efficient use of the radio frequency spectrum (Article 3.2 of the R&TTE guidelines) ETSI EN 300 718-2 issue: 05/01
5. Electromagnetic compatibility and radio spectrum matters (Article 3.3.e of the R&TTE guidelines) ETSI EN 300 718-3 issue 2004/02

Munich, August, 16, 2011 p. p. Andrea Reintges

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

INFORMATION FOR THE USER

FCC ID KF5ORTOVOXS1
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.

SWITCHING ON

The S1+ can be switched on when open or closed!

SWITCHING ON – DEVICE OPEN

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

The welcome screen appears and the self-test begins.

SELF-TEST

The self-test checks:

- TRANSMITTING
- RECEIVING
- SENSORS
- BATTERY CAPACITY

If a malfunction or problem is detected, then an acoustic warning sounds. The type of fault and warning code are displayed.

If a 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, digital cameras etc.) or move them well away. If the malfunction is displayed again, then send the device to the service department.

TRANSMITTING

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

SWITCHING ON – DEVICE CLOSED

Turn ON/ OFF switch (1) clockwise by 90° degrees.
When the S1+ is switched on when closed, the result of the self-test is given acoustically.

3 short, acoustic signals =
at least 75% battery capacity;
2 short, acoustic signals =
at least 50% battery capacity
1 short acoustic signal =
at least 25% battery capacity.

Below 25% battery capacity, a permanent alarm signal sounds.
If the device self-test was not able to be positively concluded,
a repeat warning signal sounds.

SWITCHING OFF

Press ON / OFF switch and **turn** anticlockwise.

WARNINGS

Warnings can be triggered during the self-test by the immediate proximity to another transmitting avalanche transceiver, mobile phone, wireless device, large metal parts or strong magnetic field.

What the most important warnings mean:

E 001: transmitter
E 002: receiver
E 003: transmitter and receiver
E 004: rotation angle sensor
E 005: rotation angle sensor and transmitter
E 008: slope sensor

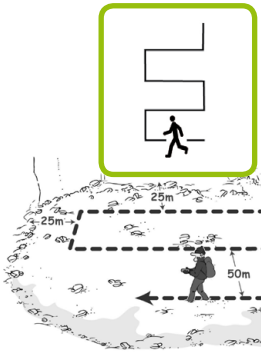
LOCATING

Open the S1+. The search situation will be displayed automatically on the screen.

ORTOVOX recommends switching off mobile telephones and radio equipment during the locating process!

SIGNAL SEARCH

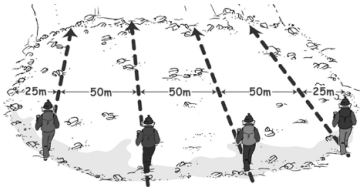
If there is no signal within the reception range, the S1+ asks you to do a signal search. A rescuer is shown running along the search strip.



Search the avalanche debris in 50m wide search strips after the first signal.

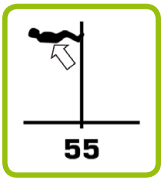
Tilt the S1+ slowly up and down at an angle of 30° during the SIGNAL SEARCH.
This compensates for particularly unfavourable positions of the transmitter aerial and the transmitting signal can be picked up even earlier

If there is more than one rescuer available, then search this avalanche track after the first signal at a distance of 25m to the edges of the avalanche and at a distance of 50m to each other..

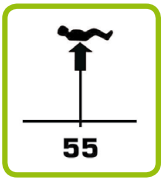


COARSE SEARCH

Always hold the S1+ horizontally during coarse and refined location!
From a distance of approx. 55 m away, coarse location starts by indicating the distance and direction. The S1+ displays the relative positions and distances of the victims (e.g. 55m).



The searcher points the vertical line on the crosshair to the symbol representing the victim and moves towards him. The acoustic signal gets faster when you get closer to the victim, the distance gets smaller to confirm you are getting closer.



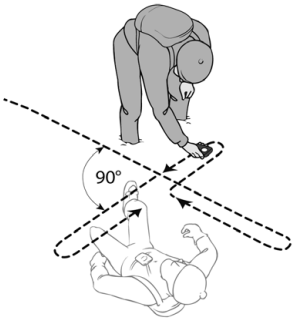
The closer you come to the destination, the more precise the user must be in the homing process!
The distance to the victim is now 20 m. Two more victims are shown by two much smaller symbols at a distance of 25 m and 30 m. The device continues to home in on the nearest victim (biggest symbol) 20 m away. If there are several rescuers, each of the signals displayed can be homed in on and located at the same time.

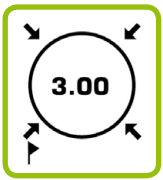
FINE SEARCH

During fine location with systematic cross lines, determine the smallest distance; keep the S1+ in the same direction!

Fine location with tendency indicator

The patented circular illustration with tendency indicator on the S1+ makes the fine location process much easier and more precise. Fine location begins automatically at a distance of 3m. The rescuer gets closer to the victim: the arrows point towards the centre of the circle (tendency indicator). The closer you come to the victim, the faster the acoustic signal sounds.





The searcher gets even closer to the victim: the distance is 2 m, the circle becomes smaller and the arrows are still pointing to the centre of the circle.

If you move away from the victim, the circle becomes larger, the arrows are now pointing outwards because the distance is increasing. The previously achieved, closer position is stored and is indicated by the inner, lighter circle.

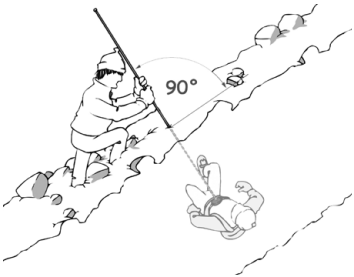
The searcher changes the direction of movement and gets closer to the victim once again. The circle becomes smaller, the arrows point to the centre and the distance to the victim reduces.

The point with the smallest distance display and the smallest circle is reached – The victim is thus located. The burial depth is 0.3 m.The smallest distance measurement on the screen corresponds to the burial depth.

PINPOINT SEARCH

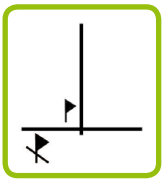
To exactly determine the victim's location at precisely the place with the smallest distance measurement, probe carefully in a systematic grid of 20cm.

Insert the probe at a right angle to the surface of the snow.
After determining the victim's location, the probe stays inserted and acts as a reference point for the digging out process.



FLAGGING

Flagging the located person electronically is possible from distance of less than 3m. To flag a located transmitter, the "OK button" (2) is pressed **once.** The flagged transmitter is immediately shown on the display as a flag.



REMOVING FLAGGING

By pressing the "OK" button (2) again for 2 seconds, the flagging carried out before can be removed. The crossed out flag in the soft key line (bottom left) shows that it is possible to remove the flaggings.
If there is a second (or third) victim within a 3 m circumference, the signal first found cannot be removed.
In this case, as soon as the first victim is flagged, fine location of the 2nd victim starts; after that, fine location of other victims takes place one after the other if need be!

VICTIM IS BEHIND THE RESCUER

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

DIGGING OUT

In the event of shallow burial depths (less than 0.5m), start digging out immediately along the probe and clearing the airway. In the event of deeper burial depths, digging out is started facing down the slope in accordance with this burial depth.
In doing so, take care to preserve any air pocket!

DEEP BURIAL

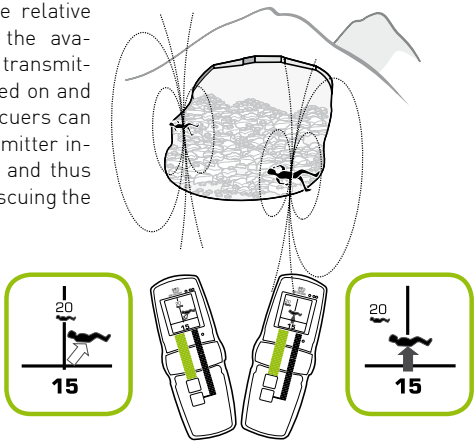
In the event of burial depths of more than 3m, fine location can be triggered from a distance of less than 7m by pressing the "OK" button. The exact position is determined using systematic cross lines.

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

After that, every other victim shown on the display can be homed on, located and flagged.

SIMULTANEOUS LOCATION OF TWO VICTIMS BY TWO RESCUERS

The S1+ display shows the relative position and distance of the avalanche victims. Each of the transmitters displayed can be homed on and thus directly located. 2 rescuers can locate the homed on transmitter independently of each other and thus save valuable time when rescuing the victims..



TRANSMISSION SAFETY SWITCHBACK

If the S1+ is not moved while open then the transmission mode will be automatically activated from every function depending on the setting selected. In the event of a subsequent avalanche the S1+ switches to transmit after 60 seconds (factory setting). The time interval can be increased to 120 seconds via the "Settings" menu.

MENU

Accessing the MENU:
Press the "MENU" button down for 3 seconds

Select function:
press "MENU" button several times

Accessing the function:
Press "OK" button

PARTNER-CHECK
with limited range (approx. 5m)

Locating more than 3 victims

Scanning

Settings

STATUS DISPLAY

If the S1+ detects 4 or more victims' (= multiple burials), then the status line of the displays shows: 4+

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

Warning about low battery capacity

Warning

Warning that automatic transmission switch over is switched off

SOFTKEYS

The buttons and control several functions. The softkeys show the respective key function;

Adjust contrast

Scroll forward in menu

Select MENU

Note about flagging in fine location

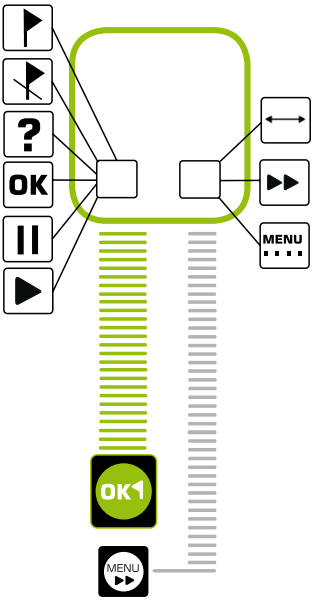
Remove flagging of all located transmitters

Query transmission fault during partner test

Access sub-menu and confirm selection function

Record the measured slope angle

Carrying out a new slope measurement



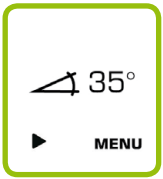
MEASURING THE SLOPE ANGLE

Open S1+, use the "MENU" button to select the "Slope measurement" function via "Settings".

Place top side of the S1+ exactly flush with the snow surface. Tolerance of accuracy of the slope sensor: +-1°.

The determined measurement can be kept by pressing the „OK" button (2).

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



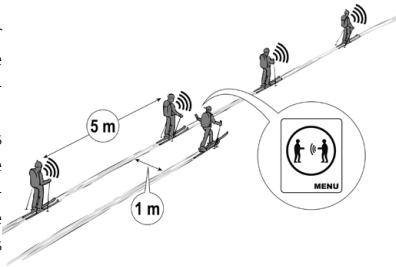
PARTNER-CHECK

The PARTNER CHECK with limited range should be carried out every day before starting a tour!

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

CARRYING OUT THE DAILY PARTNER CHECK

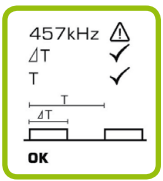
- The group leader selects the "PARTNER CHECK" function.
- The group participants switch their S1+ to "TRANSMIT" and go past the group leader one by one at an interval of 5m.
- If the group leader's S1+ receives an audible and visible signal (circle with 2 persons) from each individual avalanche transceiver then the transmission function of the units being tested is in order..



If a fault is detected on one of the devices being checked, then the warning triangle appears on the display, hence signalling a substantial device fault relating to:

- transmission frequency (457 kHz)
- transmission duration
- cycle duration

tThe determined fault can be queried by pressing the "OK" button (2). Go back to the quick test using the "OK" button (2).



WARNINGS

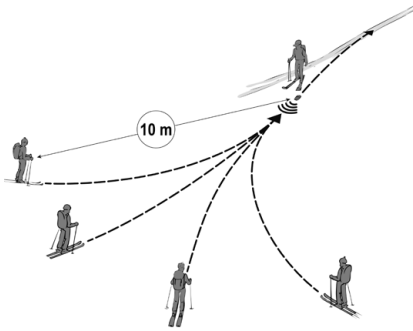
People wearing a heart pacemaker are recommended to wear the S1+ on the right side of their body. It is essential to observe the pacemaker manufacturer's instructions!

FULL FUNCTION TEST BEFORE STARTING A TOUR

A full check on the transmitting and receiving functions should be made at the start of a week's tours.

Checking the receivers

- All participants are located 10m away from the group leader and set the S1+ to RECEIVE.
- The group leader closes his S1+ (= TRANSMIT) and places this device on the ground in front of him.
- When all the group members receive the transmitting signal from the group leader (acoustic and optical signal), the participants walk towards this signal and locate the signal.

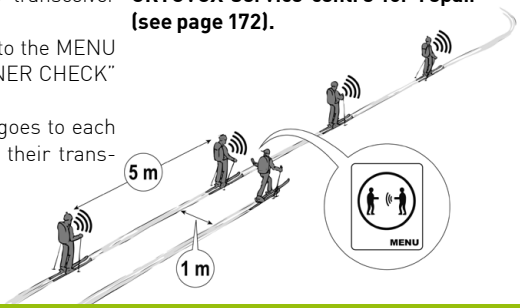


- The receiving function on the participants' devices and the group leader's transmitting function are thus checked.

Checking the transmitters

- All the members of the group stand 5m away from each other and switch their avalanche transceiver to TRANSMIT.
- The group leader goes to the MENU and selects the "PARTNER CHECK" function.
- The group leader then goes to each participant and checks their transmitting function.

If you notice any fault on your transceiver, please send it directly to the ORTOVOX service centre for repair (see page 172).



INFORMATION ABOUT SIGNAL SEPARATION

By choosing the S1+ you have opted for the most innovative concept among avalanche transceivers. The unique, visual display of the victim's situation and the signal separation help you when locating one, and above all, several victims.

In the event of a multiple burial, several signals are received at the same time. In this case – depending on the rhythm of the individual transmitters – it is possible for two or even more transmitters to transmit simultaneously over a long time. This can lead to signal overlaps, particularly with analogue devices with a long pulse and digital devices that transmit synchronised pulses. The signals are overlapped and can no longer be technically distinguished. The signal from an individual transmitter cannot be measured either by analogue or digital means. That is why the stop sign appears for a few seconds. Wait until the stop hand disappears and then continue the locating process!

This physical phenomenon can be solved with the ORTOVOX S1+ using two locating strategies:

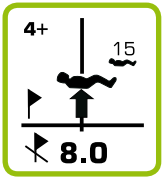
1. Application of the 4+ mode and a micro search strip width of max. 5 m (Page 57/ 58).

2. Applying the ORTOVOX sector method (Page 58) with the "4+" function.

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 locate them if need be.

Multiple burials

If 4 or more than 4 transmitting signals are detected, then "4+" appears on the display top left. In this case use the "MENU" button (3) to select the "4+" and access it with the "OK" button.



"4+" function

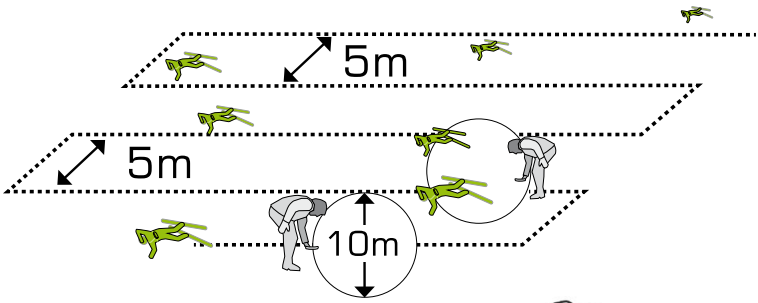
After accessing the "4+" function, the S1+ locates the nearest victim with an unlimited range (approx. 55m). After marking the first signal the range is automatically limited to approx. 5m. The search strips should now be reduced to a width of 5 m. The restriction to a 5 m micro search strip width is indicated by two black bars on the sides of the display.

Multiple burial
(method for locating many victims)

- Micro search strips
- ORTOVOX sectors method

Micro search strip

Access "4+" function and start locating. After locating and rescuing the first victim by helpers, the avalanche area is 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.



ORTOVOX Sektors-Method
Access "4+" function and search the first sector.

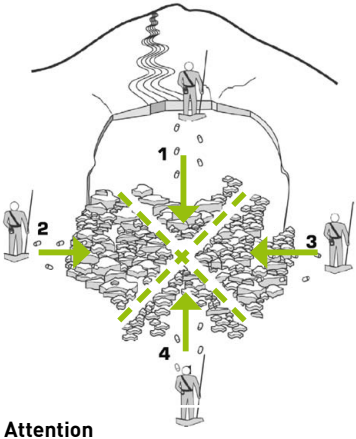
Sector 1: After the first victim is located and rescued by helpers, the surrounding area continues to be searched by sectors.

Sector 2: Approach from the left.

Sector 3: Approach from the right.

Sector 4: Approach from below.

Before any approach in a new sector, the "4+ function" must be started via the menu.

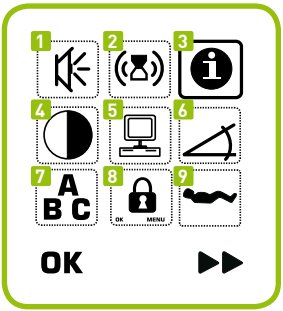


Attention
Already located signals can then naturally appear again. The searcher should then concentrate on signals that have not yet been identified in the avalanche area.

SETTINGS

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

1. Loudspeaker
2. Automatic transmitter switch ove
3. Information about device number, software version, receiving function and battery capacity
4. Display contrast setting
5. Update
6. Inclinometer
7. Customising the welcome screen
8. Saving the custom setting with password
9. Search



Loudspeaker

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

Automatic transmitter switch over

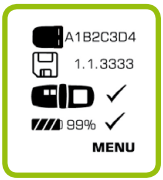
If the S1+ is not moved over a period of 60 or 120 seconds, then it automatically switches over to transmission mode from any operating mode. A short warning signal sounds 10 seconds before automatically switching over. The automatic transmission switch over is pre-set to 60 seconds when delivered. The automatic transmission switch over can be switched off.

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

Information about device status

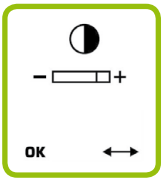
The sub-menu shows

- Device number
- Software version
- Transmitting and receiving function and
- Current battery status



Display contrast setting

The desired contrast is adjusted using the "menu" button (3) and set permanently with the "OK" button (2).

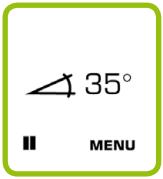


Update

The infrared sensor (8) can be used to connect the S1+ to a PC using an infrared reader (accessories) for

- Update
- Log printout of the device functions.

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.



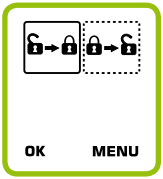
Customizing the welcome screen
The welcome screen that appears immediately after being switched on can be personalized with your name, address, telephone and email.

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

Selecting the characters in the "ABC" function is done by tilting the S1+ sideways left and right.

The "ABC" function can be used to create and save 5 lines e.g. with your name, address, telephone and email. The self-selected PIN code is required to make any changes.

SAVING the CUSTOM SETTING
The customised start screen is saved by entering the PIN code in the "LOCK" function.
The customised start screen can be modified at any time; to do so, enter the self-selected PIN code in the "open LOCK" function and carry out the desired change.



More details at ortovox.com

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 2 new AAA 1.5V LR 03 batteries of the same make. Check the correct positing of the positive and negative poles.

Use only brand name batteries. No rechargeable batteries and no lithium batteries.

INTERFERENCE
Interference to the transmission and reception performance can be caused by lightening, lifts and power plants, radio equipment, mobile phones and other electronic equipment. Mobile phones and radio equipment should be switched off whilst searching. The minimum distance between two avalanche transceivers and to metal, radio equipment, mobile phones, magnets etc. should be at least 50 cm.

WRIST STRAP

The protective case can be separated from the avalanche transceiver for cleaning purposes. The wrist strap can be attached in place of the protective case.

For safety reasons, ORTOVOX only recommends using the supplied protective safety case when wearing the beacon!

IMPORTANT INFORMATION!

Remove the batteries from the avalanche transceiver during the summer months. The ORTOVOX factory guarantee is invalid by damage due to battery leakage. Never use rechargeable batteries (rechargeable batteries such as Ni-Cd cells). Rechargeable batteries have significantly lower operating voltage, and thus lower range and limited service life. In addition defective rechargeable batteries cannot be detected immediately. Once they have been recharged they show full battery voltage, however they can drop off to 0 after extremely short service (life threatening hazard!).

STORAGE

After the tour take off the S1+ and store it in its switched off status in a well-ventilated dry location. Most often, the well-designed casing prevents condensation for the most part. To ensure that the device will function for several years we recommend a gentle drying of the carrying system and the avalanche transceiver, itself. If your transceiver gets wet, do not use direct heat, i.e. hair dryer, to dry it out. Heat applied in such a direct manner may cause permanent damage. Protect the avalanche transceiver from excessive moisture or excessive heat. Protect the batteries from cold temperatures.

WARRANTY

When purchasing a new ORTOVOX Avalanche Transceiver, on presentation of the filled out warranty card (see instructions for use) and dealer invoice we grant the 5-year ORTOVOX guarantee from the date of purchase, but no longer than 6 years from the date of manufacture. The number IV/16 on the seal in the battery compartment means, for example: ORTOVOX guarantee valid until 4th quarter 2016; the appliance was manufactured 5 years earlier in the 4th quarter 2011.

The seal also gives a reminder of the recommended transceiver test in the 4th quarter 2016.

As part of the ORTOVOX guarantee, faulty parts are repaired free of charge or the avalanche transceiver is replaced by a beacon of the same design. Damage caused by improper handling and natural wear is excluded. In the case of damage due to battery leakage, the ORTOVOX guarantee is voided. Batteries are excluded from the guarantee. Any further warranty and consequential damage are expressly excluded. Enforced guarantees do not extend the guarantee obligation nor does a new guarantee period begin.

Warranty expiry date
IV/16 (= 4th quarter 2016)
Recommended appliance test: 2016

SERVICE

The ORTOVOX S1+ is a rescue device. Its perfect operation might be crucial for life. To ensure your unit is functioning properly, send the device for factory inspection according to the dates shown on the test seal.

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

For repair or factory inspection please send the avalanche transceiver directly to our service center (see page 172).

IMPORTANT INFORMATION!

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; only remain in such areas in the company of experienced participants. Effective use of an avalanche transceiver requires appropriate training and constant practice. Wear your avalanche transceiver close to your body under your outer clothing. ORTOVOX strongly recommends that you carefully read the operating instructions provided with the avalanche transceiver. Always take a shovel and a probe when you go off-piste in areas where avalanche hazards exist, and never tour alone. Please check the avalanche reports prior to planning your off-piste activities at: **ortovox.com**

Before you travel in an area where an avalanche hazard exists, ensure that all avalanche transceivers are functioning properly and that all batteries are in good operating condition.

GUARANTEE CARD

S 1+ GUARANTEE CARD

Name

.....

Street

.....

City, State, Zip,

.....

Telephone , E-mail

.....

Model ORTOVOX S1+

.....

Serial number

.....

Purchased at

.....

Please provide below a detailed explanation and description of your unit`s faulty performance!

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In case of service please fill out this card and send it to the responsible ORTOVOX service cente (see page 172)

IMPORTANT!
KEEP CAREFULLY!