

TETRA Radio Set

Funkwerk FT4 (S)



Operating Manual

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Notes:

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Instructions for use

This chapter contains information on how to use the operating instructions.

Features and type designation

The Funkwerk FT4 radio set is available in many versions.

The colour of the display frame is the external identification of the features of your radio set.

The type designation on the type decal provides detailed information about the features of your radio set.

Features and type designation

FT4 S Ex _ 1 a A 1 ig

g = with GPS receiver
= without GPS receiver

i = with IOS receiver
= without IOS receiver

1 = Air Encryption TEA1
2 = Air Encryption TEA2
3 = Air Encryption TEA3
4 = Air Encryption TEA4

A = Explosion group IIA
B = Explosion group IIB
C = Explosion group IIC

a = Frequency 380 MHz ... 430 MHz
b = Frequency 410 MHz ... 430 MHz
c = Frequency 410 MHz ... 470 MHz

1 = 1 W
2 = 2 W
3 = 3 W

Ex = explosion-proof
= not explosion-proof

= Standard
L = Unit with "Position sensor" feature
S = Secure (personal emergency signal unit)

Nomenclature of type designation on the type decal

Technical terms and abbreviations

Overview

Term	Description
AIE	Air Interface Encryption: air interface encryption
BetrSichV	German Ordinance on Industrial Safety and Health: Ordinance on safety and health protection when making working means available and using them for work, on security when operating systems needing supervision and on the organisation of in-house industrial safety measures in Germany.
BG	Employers' liability insurance association (Berufsgenossenschaft)
BOS	Authorities and organisations fulfilling security tasks
DGNA	Dynamic Group Number Assignment: The radio set is assigned new group call numbers by radio.
DMO	Direct Mode: Direct connections with other subscribers without the TETRA infrastructure.
E2EE	End-to-End-Encryption
IOS	Inductive tracking beacon: By receiving the identification code of a tracking beacon, the personal emergency signal centre can determine the possible location of the radio set.
ISSI	Individual Short Subscriber Identity: Individual, unambiguous subscriber call number of a terminal unit within the TETRA network.
Group scanning	The radio set may include several scan lists. If one of the scan lists is marked as "selected" and if the scan function is activated, your radio set will monitor the radio traffic in all associated groups. Consequently, you can listen to several important channels without switching over. This feature is referred to as "Group scanning". The scan lists are saved in the radio set by means of programming.
Group	A group unites several subscribers who communicate directly with one another. Calls to a group reach all subscribers within this group at the same time. Other subscribers cannot hear these group calls. Group calls are possible even when not all users of this group can be reached, e.g. because a radio set is switched off.
GSSI	Group Short Subscriber Identity: Call number of a group in the TETRA network

Overview (cont'd)

Term	Description
Late entry	You can participate in an already set-up group call even when you have not received the beginning of that group call. This feature is referred to as "Late entry". You can also use this feature when dialling from another group or when changing the radio cell.
MNI	Mobile Network Identity
MSP software	Part of FT4 firmware controlling the behaviour of the sensors.
PABX	Private Automatic Branch Exchange: Private telephone system
PNA	Personal emergency signal system
PNG	Personal emergency signal unit, special version of the radio set with personal security functions.
PNZ	Personal emergency signal centre
PSTN	Public Switched Telephone Network: Public telephone network
PTT	Push to talk, i.e. push before talking (PTT key)
REG	The TETRA radio set registers with a TMO infrastructure (registration).
Call priority	The radio set evaluates the call priority of each single group call if it is either a member of this group or has selected this group as "selected group" or scans this group. When several calls are made at the same time, you can only hear the call with the highest priority.
SSI	Short Subscriber Identity: SSI is the collective term for the TETRA call numbers (subscriber identities).
TA	The TETRA radio set looks for carrier frequency entries in an internal list that are to be used for radio operation. It compares these entries with the signals of the received TMO infrastructure and attempts to register with the infrastructure found on the best suited frequency.
TEA	TETRA Encryption Algorithm: Encryption algorithm of the TETRA system. Further classifications are defined in the standards according to ETSI TR 101 053-1 to ETSI TR 101 053-4.
TETRA	Terrestrial trunked radio

Overview (cont'd)

Term	Description
TMO	Trunked Mode: Connections with other subscribers through the TETRA infrastructure.
TS	The TETRA radio set scans the pre-set frequency range for carrier frequencies that are suitable for radio operation. It assesses the carrier frequencies found and attempts to register with the TMO infrastructure on the best suited frequency.

Symbols and special fonts

Symbols and special fonts emphasize important information.



DANGER

This is a safety instruction!

Safety instructions serve to assist you in identifying hazards and in avoiding negative consequences.

→ An arrow indicates a precaution you have to take in order to avoid the hazard.

Carry out the following work steps: Start of a procedure

1. First work step to be carried out.
2. Second work step to be carried out.

→ Work step to be carried out (without any following work steps).

✓ End of procedure instructions.

Wildcard for variable values, e.g. synonym for a call number: [Call number]

Key on the radio set **<#>** key, **<Select>** function

Menu items in the radio set display: **SETTINGS** menu

Sequence of menu items in the display that you are to carry out one after the other, e.g. when navigating: **MENU > SETTINGS > LANGUAGES**

TIP

This is a tip. Tips contain additional useful information.

Safety information

This chapter contains important warning statements regarding the use of the radio set and the battery.

FCC

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, 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.

Industry Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated.

- Antenna b FT4 (410-430 MHz):
 - Maximum permissible gain: +0,5 dBi
 - Required impedance: 50 Ω
- Antenna bc FT4 (410-470 MHz):
 - Maximum permissible gain: +2 dBi
 - Required impedance: 50 Ω

Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotope rayonnée quivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne.

- Antenna b FT4 (410-430 MHz):
 - Gain admissible maximal: +0,5 dBi
 - L'impédance requise: 50 Ω
- Antenna bc FT4 (410-470 MHz):
 - Gain admissible maximal: +2 dBi
 - L'impédance requise: 50 Ω

Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Safety information

This chapter contains important safety instructions regarding the use, reliability, and performance of the radio set and the battery.

Intended use

The radio set is intended for operation in radio networks following the TETRA standard. Due to the unit design, direct use with other interfaces of public telecommunication networks is not possible.

During operation, it enables connections using the network infrastructure of a TETRA network provider in the trunking mode (TMO) as well as direct connections between two terminal units (DMO).

The robust radio set is dust-tight and jet-proof.

Explosion-proof radio sets are available for use in hazardous areas (explosive atmospheres). Contact your dealer. Such explosion-proof unit versions are accompanied by a separate document with safety instructions.

Duties of the system operator

The operator of a personal emergency signal system must set up operating instructions covering the use of the personal emergency signal units. The present operating manual will not replace these operating instructions.

The national occupational safety regulations and legal provisions in force shall apply. The operator of a personal emergency signal system in the Federal Republic of Germany (usually the employer) prepares operating instructions defining which will-independent alarm types are used in hazardous workplaces where employees work alone for employee protection, on the basis of a hazard analysis. The employer can make the use of personal emergency signal units as personal protective equipment mandatory for the employees.

The operator of a personal emergency signal system may use the present operating manual for preparing operating instructions. In this process, he must take the current programming of the specific personal emergency signal units into account which applies specifically to his personal emergency signal system.

The overall system must meet the device and test requirements of the preliminary standard DIN V VDE V 0825 part 1 if the personal emergency signal system is used for hazardous work carried out alone. In this context, please refer to the requirements and safety rules issued by the employer's liability insurance association according to BGR 139 (formerly ZH 1/217).

Radio network/Reachability

In any radio network, there is no guarantee of permanent reachability due to system properties.

- Check the proper login of your radio set into the TETRA infrastructure at regular intervals.
- TETRA emergency calls are a TETRA feature and have top priority within the radio network. When a large number of connections is active, other connections may be terminated in order to transmit a TETRA emergency call.
- TETRA units without a personal emergency signal function offer the feature of a TETRA emergency call to a ISSI or a GISSI.
- TETRA units with a personal emergency signal function which do currently not operate in Secury mode offer the feature of a TETRA emergency call to a ISSI or a GISSI. At that time, the alarm types of the personal emergency signal function cannot be used.
- TETRA units with a personal emergency signal function which currently operate in Secury mode offer all TETRA personal emergency call alarm types. In Secury mode, a TETRA emergency call cannot be transmitted.
- Use of the TETRA emergency call requires that the radio set used is either no personal emergency signal unit or is not logged in as a personal emergency signal unit (FT4 S) with a personal emergency signal centre. In these cases, no TETRA emergency call can be transmitted when no radio connection is available due to insufficient radio coverage. Transmit the TETRA emergency call one more time as soon as the radio connection is re-established.

Information on use

Please observe the following safety instructions regarding the use of the radio set:

- Before using the radio set, ensure that it works flawlessly.
- If the radio set is damaged or if it does not work flawlessly, switch it off. Prevent the reactivation of the radio set, and have it inspected by authorised technical personnel.
- Avoid prolonged direct sunlight exposure of the radio set. Protect the radio set against extreme environmental influences.
- Do not use the radio set at temperatures outside of the temperature range specified in the technical data.
- Do not expose the radio set to strong magnetic fields such as those that may occur e.g. near induction furnaces and induction stoves.
- Use only the antenna included in the scope of supply. An unapproved antenna might damage the radio set or violate the applicable regulations for radio sets.
- Ensure that the radio set is securely fastened to your clothing at all times.

TIP

If you have any questions, please contact your network provider, your dealer or our service.

Instructions for personal emergency signal units

In case of insufficient radio coverage or a high call volume on the TETRA network, your radio set may not be able to transmit a personal alarm immediately. In this case, the radio set will repeat the alarm transmission until the personal alarm has been transmitted successfully.

If the personal emergency signal unit detects a malfunction or that the radio connection with the personal emergency signal centre was lost, a technical alarm is triggered on the personal emergency signal unit and at the personal emergency signal centre.

The emergency signal functions must only be programmed by the operator of the personal emergency signal system or by technical personnel authorised by them.

Observe the operating instructions and the accident prevention regulations in force. The currently valid version shall be binding.

Always use a battery which is sufficiently charged for the intended period of use.

Antennas used for TETRA radio sets

The following antennas shall be used commensurate with the assigned frequency:

Antennas used for TETRA radio sets

Frequency range	Antenna type	Part No.
380 MHz to 400 MHz	Antenna a FT4	5900102838
410 MHz to 430 MHz	Antenna b FT4	5900102839
380 MHz to 430 MHz	Antenna ab FT4	5900102888
450 MHz to 470 MHz	Antenna c FT4	5900102985
410 MHz to 470 MHz	Antenna bc FT4	5900103739

Frequencies used

TETRA radio communications

Frequency range 380 MHz to 430 MHz or 410 MHz to 470 MHz.

The official frequency allocation by the local approval authorities is decisive.

IOS localisation signals

Fixed frequency 65.536 kHz.

Refer to the documentation for system-compatible IOS localisation beacons.

GPS-Localisation services

Fixed frequency 1.57542 GHz.

Emission of radio signals

Like any mobile communication unit, your radio set is a transmitter and receiver of radio signals.

- The unit meets EC requirements for the emission of radio signals.
- The transmitter is designed so that the high-frequency (HF) energy threshold values recommended by the Council of the European Union will not be exceeded provided the intended use is respected.
- These threshold values are part of comprehensive guidelines defining allowed HF energy values for the general public.
- These guidelines were prepared by independent scientific organisations, using regular and thorough evaluation of scientific studies. These guidelines include a substantial safety margin that is to guarantee the safety of persons of any age and health condition.

TIP

You can find further information about the state of knowledge regarding possible health hazards caused by TETRA radio signals on the internet on the web pages of the German Federal Radiation Protection Office.

Risk of hearing damage

The radio set is equipped with an additional loudspeaker for hands-free talking mode and PTT operation at the back of the housing. Never hold this loudspeaker directly to your ears!

A level of more than 80dB(A) as measured at the sound source can be reached when signalling a call and in open listening mode (hands-free talking) and may cause permanent hearing damage if the distance between the loudspeaker and the ear is too small, or if this exposure occurs very often.

The following operating conditions of your radio set produce a high volume:

- Open listening (hands-free talking mode)
- Call signalling
- Pre-alarms, personal alarms, and sensor tests

Always keep a safe distance between your ear and the loudspeaker at the back of the radio set.

If you use headphones/a headset together with your radio set, your hearing may also be damaged due to excessive volume levels. For this reason, reduce the volume to the minimum (anticlockwise rotation as viewed on the knob from above) before connecting and putting on the headphones/headset. Make a test call and set the volume to suit your taste. Now lock the function of the rotary control so that the volume cannot be changed unintentionally.

Effects on electronic body aids

Although there are at present no scientifically founded indications of health hazards caused by the influence of electromagnetic fields below the recommended limit values, we recommend that people using pacemakers or other electronic body aids always carry the radio set on the side of the body opposite of the pacemaker or body aid.

Do not wear the radio set directly above the implanted pacemaker, e.g. in your breast pocket. If necessary, consult your doctor.

Risk of hearing damage

Digital radio is subject to the requirements for commercial mobile radio networks. In the Federal Republic of Germany, the limit values according to the regulations on electromagnetic fields in the 26th BImSchV (twenty-sixth regulation for implementing the Federal Immission Protection Law) are decisive.

TIP

Consult a hearing aid specialist if you have any questions regarding the compatibility of the radio set with a hearing aid. You can find further information on the internet on the web site of the German Federal Office for Radiation Protection.

Malfunctions of other units caused by the radio set

Usually, other electronic devices are protected against high-frequency irradiation. However, if such a unit is insufficiently shielded, malfunctions may result that can be eliminated by a sufficiently large distance between the units.

Switch off the radio set wherever the operation of mobile communications units is forbidden. Always observe local information and prohibitions.

The use of radio sets may be forbidden or restricted, e.g.

- when you drive a vehicle,
- in hospitals or near medical equipment,
- in blasting areas,
- in aircraft,
- at filling stations,
- near explosives, fuels and chemicals.

Repair and maintenance

The radio set does not contain any parts that can be repaired or serviced by the user.

- Never open the housing. Otherwise, the radio set will be damaged and develop leaks.
- Repairs and modifications of the radio set and its accessories may only be carried out by the manufacturer himself or by specialist personnel trained and authorised by the manufacturer.

Storage

If the radio set is not used for an extended period of time, store it in a non-conductive packaging providing protection against dirt and moisture. Use the original packaging if possible.

The antenna socket and the battery compartment must not get dirty while the unit is in storage.

Keep the side connector closed as tightly as possible, e.g. with the special screw-on FT4 side connector cover or with the connector of an accessory.

Disposal

The returning and the environmentally friendly disposal of old electric and electronic units is governed by the German Electrical and Electronic Equipment Act.

- All electrical and electronic devices marked with the crossed-out rubbish bin as well as their components, e.g. empty batteries, must not be disposed of together with household waste, but must be collected separately and disposed of / reused in an environmentally friendly manner.
- Return these units and components to a public electronic scrap collecting point. All components of these old units which contain hazardous substances will be collected separately and disposed of in an environmentally friendly way, according to their degree of harmfulness. All other components not containing any hazardous substances are reused as secondary raw materials.
- Always dispose of batteries in discharged condition.



Battery

Funkwerk Security Communications GmbH will not assume any liability for damage resulting from improper use of the battery.

Safety instructions for battery use:

- Place the radio set in a system-compatible charger to charge the battery. Or, where available, use the separate charging slot of the single unit chargers for charging a single battery.
- Do not throw the battery into the fire as it might explode.
- Avoid all risks of short-circuiting between the contact faces of the battery. When the contact faces are short-circuited, the battery is discharged. In very rare cases, a short-circuited battery might explode or cause a fire.
- Unusual or pungent smells as well as unusual deposits on the radio set or the battery point to a leaky battery. Switch off the radio set and return it to the service dept.
- Liquids or gases may escape from leaky batteries. Avoid direct skin contact with escaped liquids. Do not inhale any escaping gases. Health hazards such as skin irritation, skin burns or poisoning would be the consequences. In case of doubt, consult a doctor!

Instructions for storage and transport of the battery:

- Store or transport the radio set and the battery in suitable, non-conductive packaging. Use the original packaging if possible.
- During extended storage periods, the battery should be recharged every 3 to 6 months. During long-time storage, the storage temperature of the battery should be below the usual room temperature.

Batteries are wear parts. The battery of your radio set loses its initial capacity over the course of time due to use, long storage periods, and ageing. Such capacity losses are normal and will not give rise to a warranty claim.

Charger

Safety instructions for charger use:

- The charger and the plug-in power supply unit are designed for use in an office-type environment.
- Operate the charger near a socket outlet installed properly by specialist personnel. The specifications on the plug-in power supply unit (e.g. 100 V to 240 V, 50 Hz to 60 Hz) must match those of the available mains power supply.
- The plug-in power supply unit and the outlet must be accessible at all times.
- Use an anti-slip pad for the charger, especially on new or polish-treated furniture.
- Protect the charger against heavy dirt, dust, humidity and moisture as well as direct heat radiation.
- Varnishes or polishes may contain substances that soften the base of your charger. The softened base can leave unwanted spots on furniture surfaces. Funkwerk Security Communications GmbH will not be liable for such damage.
- The charger and the plug-in power supply unit do not contain any parts that can be repaired or serviced by the user. Any manipulations are allowed only by the manufacturer or by authorised technical personnel.

Be careful when handling damaged plug-in power supply units:

- Danger to life when touching live parts connected to the mains.
- Before disconnecting an externally damaged plug-in power supply unit from the outlet, de-energise the outlet, e.g. by switching off the fuse of the relevant circuit.
- Replace a damaged charger or plug-in power supply unit with an original spare part, even if only the connecting cord is damaged.

Conformity and approvals

This chapter contains information about the conformity and the approvals of the radio set.

EC declaration of conformity

The markings on the radio set housing shall apply.

CE0 7 ① Funkwerk Security Communications GmbH herewith declares that
0 0 the product Funkwerk FT4 and its variants are in compliance with

the basic requirements and other relevant stipulations of Directive 1999/5/EC (Radio & Telecommunication Terminal Equipment, R&TTE). The radio set carries the CE mark of conformity, followed by the identification number of the notified body.

24 Conformity and approvals
EC declaration of conformity

The radio set is notified in the following EU countries and may be used there:

- AT Austria
- BE Belgium
- BG Bulgaria
- CY Cyprus
- CZ Czech Republic
- DE Germany
- DK Denmark
- EE Estonia
- ES Spain
- FI Finland
- FR France
- GB Great Britain
- GR Greece
- HU Hungary
- IE Ireland
- IT Italy
- LU Luxembourg
- LT Lithuania
- LV Latvia
- MT Malta
- NL Netherlands
- PL Poland
- PT Portugal
- RO Romania
- SE Sweden
- SI Slovenia
- SK Slovakia

The radio set is notified in the following EFTA countries and may be used there:

- IS Iceland
- LI Liechtenstein
- NO Norway
- CH Switzerland

The radio set works in non-harmonised frequency ranges.

- Prior to setting up the system and operating the units including the use of transmission frequencies in the Federal Republic of Germany, the approval of the responsible branch office of the Bundesnetzagentur (Federal Network Authority for Telecommunications and Post (BnetzA) must be obtained.
- System operation in other European countries is subject to the country-specific frequencies, regulations and approval procedures.

TIP

You may request the EC declaration of conformity from our service address.

26 Conformity and approvals
EC declaration of conformity

Structure and function

This chapter enables you to make yourself familiar with the controls, displays and connections of the radio set.

Scope of supply

Please check if the delivery received is complete. The use of the radio set requires at least the following components:

- Radio set Funkwerk FT4
- Antenna
- Interchangeable battery
- Charger with plug-in power supply unit
- Operating Manual

If needed, you can order the following optional accessories. Ask your specialist retailer for more information..

- SIM card (for storing encryption data)
- Mini SIM card (for future extensions)
- Micro-SD card (for storing application-related data and settings)

The part numbers and the exact type designations of the individual components can be found in our sales and accessories lists. Contact your dealer.

Control elements



Control elements on the radio set

Legend (section 1 of 5)

No.	Designation	Function
1	Volume / group selection	<p>Setting of volume, selection of a group, disabling of rotary switch.</p> <p>The following functions are possible:</p> <ul style="list-style-type: none"> ▪ Press the button briefly to change between volume setting and group selection. ▪ Turn the control knob for setting the volume or selecting the desired group. ▪ Press the control knob briefly to confirm the selected group. ▪ Press the control knob long to disable or re-enable its function as a rotary switch.
2	Alarm	<p>If the radio set is logged into the personal emergency signal centre:</p> <p>Triggering of a personal alarm (will-dependent alarm). Decide for yourself if you wish to trigger alarm 1 or alarm 2:</p> <ul style="list-style-type: none"> ▪ Alarm 1: Press key for more than 1 second. ▪ Alarm 2: Press key briefly three times. <p>If the radio set is not logged into the personal emergency signal centre:</p> <p>Triggering a TETRA emergency call: Press the button long to trigger the TETRA emergency call.</p>

Control elements*Legend (section 2 of 5)*

No.	Designation	Function
3	Function key 1	<p>If the radio unit is registered with the personal emergency signal centre:</p> <p>Triggering a warning alarm. Decide for yourself if you wish to trigger warning alarm 1 or warning alarm 2:</p> <ul style="list-style-type: none"> ▪ Warning alarm 1: Press key for more than 1 second. ▪ Warning alarm 2: Press key briefly three times. <p>If the radio set is not logged into the personal emergency signal centre:</p> <p>Execution of a pre-set function: Press the key to execute the function.</p> <p>Depending on the programming of the radio set, one of the following functions is possible:</p> <ul style="list-style-type: none"> ▪ No function. ▪ Toggling the operating type between TMO/DMO. Changing the operating mode is possible only when the radio set is not logged into a personal emergency signal centre. ▪ Switching the screen saver on/off. ▪ Confirming a group selected via rotary switch or menu. ▪ Vertical cursor movements up. ▪ Vertical cursor movements down.
4	Function key 2	<p>Execution of a pre-set function: Press the key to execute the function.</p> <p>Depending on the programming of the radio set, one of the following functions is possible:</p> <ul style="list-style-type: none"> ▪ No function. ▪ Toggling the operating type between TMO/DMO. Changing the operating mode is possible only when the radio set is not logged into a personal emergency signal centre. ▪ Switching the screen saver on/off. ▪ Confirming a group selected via rotary switch or menu. ▪ Vertical cursor movements up. ▪ Vertical cursor movements down.

Legend (section 3 of 5)

No.	Designation	Function
5	Function key 3	<p>Execution of a pre-set function: Press the key to execute the function.</p> <p>Depending on the programming of the radio set, one of the following functions is possible:</p> <ul style="list-style-type: none"> ▪ No function. ▪ Toggling the operating type between TMO/DMO. Changing the operating mode is possible only when the radio set is not logged into a personal emergency signal centre. ▪ Switching the screen saver on/off. ▪ Confirming a group selected via rotary switch or menu. ▪ Vertical cursor movements up. ▪ Vertical cursor movements down.
6	PTT (transmit key)	<p>Starting and controlling an individual call (direct through) or a group call:</p> <ul style="list-style-type: none"> ▪ Press key long for setting up a connection and talking while the connection is active. ▪ Release key to hear other subscribers.
7	Left softkey	Executing the menu function shown in the footer at the bottom display edge: Press the key for executing the function displayed directly above the key.
8	Right softkey	Executing the menu function shown in the footer at the bottom display edge: Press the key for executing the function displayed directly above the key.
9	Cursor keys	Changing the selection marking on the display. Press cursor keys to move the select marking or the cursor to the left, right, up or down.
10	Picking up	<p>The following functions are possible, depending on the operating situation:</p> <ul style="list-style-type: none"> ▪ Starting or accepting an individual call in duplex mode (full duplex voice connection) ▪ Show SELECTED NUMBERS list (automatic redialling list) in the display.

Control elements

Legend (section 4 of 5)

No.	Designation	Function
11	Hanging up	<p>The following functions are possible, depending on the operating situation:</p> <ul style="list-style-type: none"> ▪ Switching on the radio set. ▪ Terminating the voice connection. ▪ Switching off the radio set. ▪ Displaying the idle display. <p>In addition, this key enables the performance of the following functions:</p> <ul style="list-style-type: none"> ▪ Cancelling the connection setup. ▪ Rejecting an incoming voice call. ▪ Marking a text message as read and closing the message. ▪ Terminating the wake signal. ▪ Terminating the pre-alarm. ▪ Terminating the alarm.
12	1 to 9, 0	<p>The following functions are possible, depending on the operating situation:</p> <ul style="list-style-type: none"> ▪ Entering digits and letters, key 1 also allows for entering special characters. ▪ Speed dialling of a fixed target (according to programming of the radio set). Press the key long to execute this function. <p>For speed dialling, one of the following functions can be programmed:</p> <ul style="list-style-type: none"> ▪ Dialling the call number of a group (GSSI) ▪ Dialling the call number (ISSI) for an individual call ▪ Transmitting a status message ▪ Transmitting an SDS text message

Legend (section 5 of 5)

No.	Designation	Function
13	*	<p>The following functions are possible, depending on the operating situation:</p> <ul style="list-style-type: none"> ▪ Entering the * character. ▪ Muting the microphone. ▪ Activating and deactivating the keylock (together with the <Left softkey>key). ▪ Speed dialling of a fixed target (according to programming of the radio set). Press the key long to execute this function. <p>For speed dialling, one of the following functions can be programmed:</p> <ul style="list-style-type: none"> ▪ Dialling the call number of a group (GSSI) ▪ Dialling the call number (ISSI) for an individual call ▪ Transmitting a status message ▪ Transmitting an SDS text message
14	#	<p>The following functions are possible, depending on the operating situation:</p> <ul style="list-style-type: none"> ▪ Entering the # character. ▪ Switching between capitalization, non-capitalization and digits. ▪ Speed dialling of a fixed target (according to programming of the radio set). Press the key long to execute this function. <p>For speed dialling, one of the following functions can be programmed:</p> <ul style="list-style-type: none"> ▪ Dialling the call number of a group (GSSI) ▪ Dialling the call number (ISSI) for an individual call ▪ Transmitting a status message ▪ Transmitting an SDS text message

Connections



Connections on the radio set

Legend

No.	Designation	Function
15	Antenna	Socket for connecting the screw-on antenna.
16	Belt clip	Fixes the radio set, e.g. to the clothing.

Legend (cont'd)

No.	Designation	Function
17	Side connector	12-pin interface for connecting an optional system-compatible accessory, e.g. headphones/headset. When not in use, the interface is covered up with a special screw-on FT4 side connector cover.
18	Battery unlocking	To unlock the battery, pull both buttons down. The unlocking buttons are fitted on both sides of the battery. The locked status is depicted.
19	Contact strip (bottom connector)	Contacts for connecting an external antenna (e.g. for car adapters), a data interface and the charger.



Connections on the radio set

Legend

No.	Designation	Function
20	Tear-off contact	Triggers a tear-off/loss alarm as soon as the connector is pulled out of its holder and the programmed delay has expired.

Signal tones

Using signal tones, the radio set signals, among others, the following operating conditions and events:

- Calls and received messages
- Pre-alarms
- Alarms
- Pressed keys
- Acknowledgements
- Warning alarms
- Alarm clock

TIP

The settings of your radio set are individually programmed by the radio set operator. If you have any questions, please contact the responsible system administrator for your communication facilities.

Illuminated indicators

The radio set signals certain operating conditions by means of illuminated indicators.

Left signal LED

The left signal LED indicates the status relating to the TETRA radio connection.



Left signal LED on the radio set

Meaning of signals

Colour	Status	Meaning
OFF		The radio set is off.
red	flashing quickly (once per second)	The radio set is searching the radio network of the TETRA infrastructure.
	flashing slowly (once every 3 seconds)	The radio set cannot find a radio network.
	lit	No TETRA network, or TETRA deactivated (a parameterizable behaviour of the radio set in the charger).
green	flashing slowly	Idle status, the radio network is available.
	flashing quickly	The connection is now set up: no voice communication.
	lit	The connection is now set up: Voice connection or data transmission is active.
orange	flashing slowly	The radio set is connected with the TETRA infrastructure. The connection has been set up in local site trunking mode.
	flashing	Connections in direct mode (DMO) are not possible at the moment. The selected channel is busy.
	lit	The connection is now set up: Unit transmitting (TMO / DMO).

Right signal LED

The right-hand signal LED signals the charging status while the battery is being charged.



Right signal LED on the radio set

Meaning of signals

Colour	Status	Meaning
red	flashing	The radio set is inserted in the system charger. The battery is being charged.
green	flashing	The radio set is inserted in the system charger. The battery is fully charged.

When the battery is not being charged, the right-hand signal LED signals the status of the personal emergency signal mode.

Meaning of signals

Colour	Status	Meaning
OFF		The radio set is in idle mode. There are currently no active personal emergency signal events.
red	flashing slowly	A pre-alarm was triggered.
	flashing quickly	The radio set has received an alarm message.
	lit	An alarm was triggered.
green	lit	There is an active alarm. This alarm can be reset on the radio set.
yellow	lit	There is an active technical alarm or disturbance.

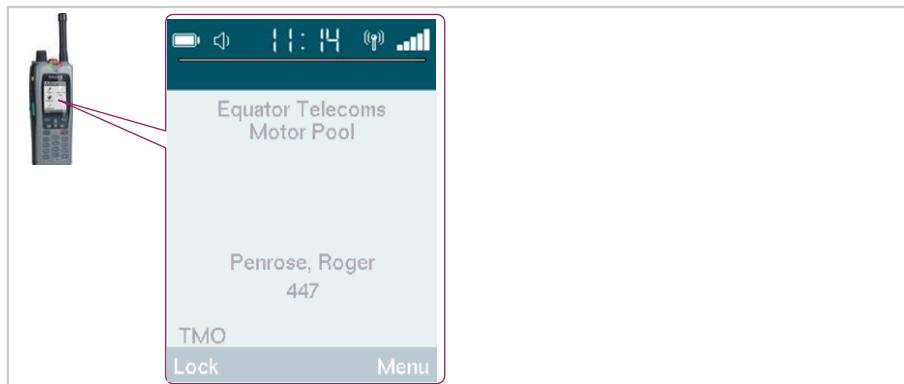
Display

Display

When the radio set is ON, the display shows the operating status and, depending on the operating situation, menus with functions.

Header line

The header at the upper display edge shows the time and important system status indicators. The following symbols are displayed, depending on the operating status:



Header in the display

Meaning of the displayed information

Symbol	Meaning
10:45	Current time in 24h format.
⚡	Battery charging status. For further information please refer to section „Signalling the charging status“ (p.59).
🎵	User-defined signalling process is active.
🔇	Muting is active. Calls are not signalled acoustically.
CALLTYPE	Call signalisation by vibration is active.
🔇	The loudspeaker is OFF.
🔉	The loudspeaker is ON (soft).
🔊	The loudspeaker is ON (loud).

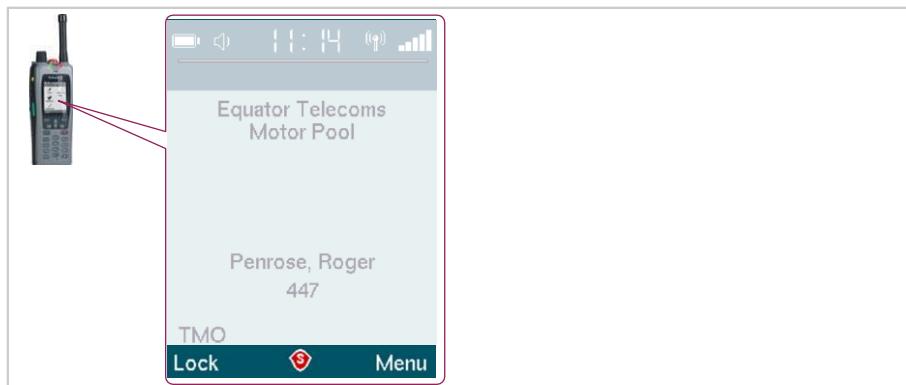
Meaning of the displayed information (cont'd)

Symbol	Meaning
	The radio set is logged into the TETRA infrastructure.
	The radio set is not logged into the TETRA infrastructure or set to the DMO connection type.
	Network field strength level.
	Unread message with standard priority.
	Unread message with increased priority.
	Unread message with high priority.
	Call in absence with standard priority.
	Call in absence with increased priority.
	Call in absence with high priority.
	Alarm/alarm clock is activated.
	Radio set is locked. To unlock the unit, the PIN must be entered.
	The keylock is activated.

Display

Footer

The footer at the bottom display edge shows functions you can activate with the **«Left softkey»** and **«Right softkey»** keys. The following symbols are displayed, depending on the operating situation:



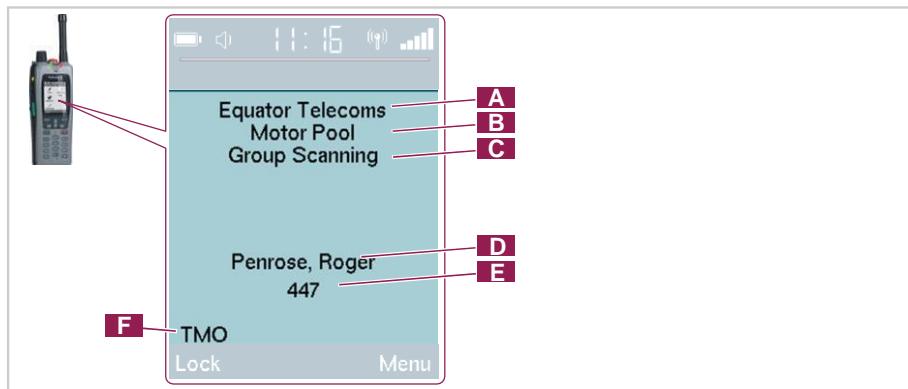
Footer in the display (example)

Meaning of the displayed information

Symbol	Meaning
Lock	To execute this function, press the key «Left softkey» . The designation and function of this field vary, depending on the operating situation.
Menu	To execute this function, press the key «Right softkey» . The designation and function of this field vary, depending on the operating situation.
	Indicates the personal emergency signal mode if the radio set is logged into the personal emergency signal centre. For further information please refer to chapter „Personal emergency signal functions“ > „Login status“ (p. 124).

Idle display

The idle display always appears on the display when the screen saver is deactivated. As an alternative, press key **Hang up** briefly to display the idle display.



Idle display

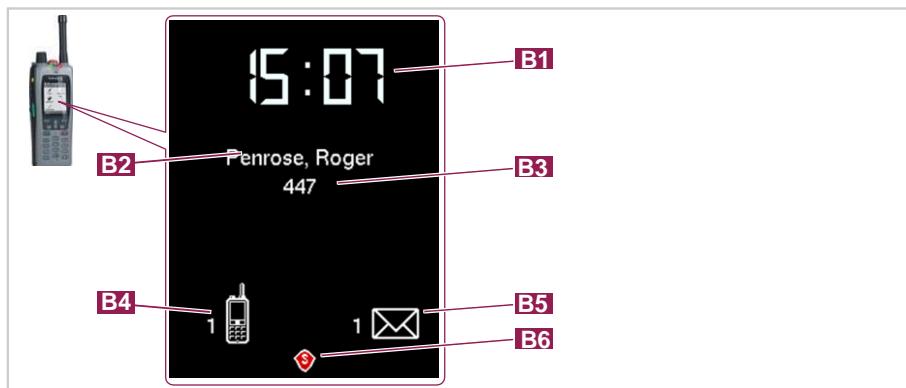
Meaning of the displayed information

No.	Designation/function
A	Name of TETRA infrastructure your radio set is logged into. Other information is displayed as an option. The infrastructure name is a parameter in the radio set.
B	Call number (GSSI) or name of group under which the radio set can be reached in the TETRA infrastructure.
C	If this is displayed, the group scanning feature is activated.
D	Designation or name of user to whom the radio set was issued. This name is firmly linked to the call number of the radio set (ISSI).
E	Call number (ISSI) at which the radio set can be reached individually in the TETRA infrastructure.
F	TETRA mode presently used by the radio set for connections, see also section „TETRA basics“ > „TETRA connection types“ (p. 61). Possible display values include: <ul style="list-style-type: none"> ▪ TMO (Trunked Mode Operation) ▪ DMO (Direct Mode Operation) ▪ TA (TETRA Activation) ▪ TS (TETRA Scanning) ▪ REG (Registration)

Display

Screen saver

The screen saver is activated automatically when the radio set is on and you have not pressed a key for a certain amount of time.



Screen saver on the display

Legend

No.	Designation/function
B1	Current time.
B2	Designation or name of user to whom the radio set was issued. This name is firmly linked to the call number of the radio set (ISSI).
B3	Call number (ISSI) at which the radio set can be reached in the TETRA infrastructure.
B4	Number of calls in absence.
B5	Number of unread messages.
B6	Indicates the personal emergency signal mode if the radio set is logged into the personal emergency signal centre. For further information please refer to chapter „Personal emergency signal functions“ > „Login status“ (p. 124).

TIP

The waiting time until the screen saver is automatically activated was programmed individually by the operator. If you have any questions, please contact the responsible system administrator for your communication facilities.

Menu

Your radio set makes numerous functions available to you in the menu:

- The menu is shown in the display when pressing the **<Right softkey>** key, starting from the idle display. Deactivated menus are greyed out.
- Depending on the features of your radio set, only part of the functions and options will be available to you. If necessary, consult your specialist retailer.

Display

Main menu

The main menu is the table of contents of the menu system. From here, you can access further menus sorted by subjects which, in turn, contain the individual functions.



Main menu in the display

Legend

Symbol	Designation	Function
	Security	This menu contains functions connected with the personal emergency signal functions. For further information please refer to section „SECURITY“ (P. 47).
	Settings	This menu contains functions which allow you to adapt the settings of your radio set individually. For further information please refer to section „SETTINGS“ (P. 48).
	Calls	This menu contains functions connected with voice calls. For further information please refer to section „CALLS“ (P. 49).
	Messages	This menu contains functions connected with messaging and SDS text messages. For further information please refer to section „MESSAGES“ (P. 49).

Legend (cont'd)

Symbol	Designation	Function
	Personal scheduler	<p>This menu contains functions you can use for your personal organisation.</p> <p>For further information please refer to section „PERSONAL SCHEDULER“ (P. 50).</p>
	Addresses	<p>This menu contains functions connected with subscriber and group lists.</p> <p>For further information please refer to section „ADDRESSES“ (P. 50).</p>

TIP

Please refer to section „Navigating the menu“ (p. 69) to learn how to navigate through the menu and how to select a menu item.

Security*Functions in menu*

Designation	Function
Login	Starts the procedure for logging into the personal emergency signal centre including a sensor test if the radio set is programmed for manual log-in and log-off.
Log-off	Logs the logged-in radio set out of the personal emergency signal centre if the radio set is programmed for manual log-on and log-off.
Sensor test	Starts a sensor test. If the radio set is logged into the personal emergency signal centre, you should perform the sensor test regularly.
Sensor settings	Displays the settings of the programmed sensors.
Show position	Displays the current location.

Display

Settings

Functions in menu

Designation		Function
Signal profile		Displays the available signal volume profiles. Changing the pre-set profile modifies several settings at the same time and allows adapting the signalling to environments with different loudness levels. You can switch the vibration signal on and off along with every signal profile.
Signal tones	Key tone	Selects the type of confirmation tone (key tone) and switches it on or off. If the key actuation tone is switched on, each key operation is confirmed acoustically.
Display	Illuminance	Adjusts the brightness of the display.
	Illumination duration	Sets the time after which the display illumination goes out.
	Colour scheme	Displays the available colour profiles for the display. You can adapt the colour appearance of the display by changing the pre-set profile.
Languages		Changes the language settings of the display.
Date & time		Sets the date and time.
Networks		Changes the pre-set connection type (TMO or DMO). So long as the radio set is logged into a personal emergency signal centre, the connection type TMO is permanently set.
Unit information		Displays the following information: <ul style="list-style-type: none"> ▪ Version (software and hardware version of radio set) ▪ Network data (MMC, MNC, network name, individual call number of radio set ISSI) ▪ Extended data if enabled (hardware test, IOP test mode, RSSI values, RSSI plot, see FT4 configuration instructions) ▪ IOS test mode (received IOS data)

Calls

Functions in menu

Designation	Function
Missed calls	Displays names or call numbers (SSI) of subscribers whose individual calls have not been accepted.
Received calls	Displays names or call numbers (ISSI) of subscribers whose individual calls have been accepted.
Dialled numbers	Displays the last dialled call numbers (ISSI) or the associated names of the subscribers.

Messages

Functions in menu

Designation	Function
Postbox	Displays the list of SDS text messages the radio set has received.
New message	Opens the SDS EDITOR window. You can edit, transmit and delete SDS text messages here.
Transmitted	Displays the list of SDS text messages you have written and transmitted using the SDS editor.
Templates	Opens the TEMPLATES window containing a list with pre-defined SDS text messages. When selecting an SDS text message, you can edit and transmit the text message in the SDS editor.
Status	Displays the list of status messages. Status messages are pre-edited and unchangeable text blocks. When sending, only bit combinations are transmitted. This makes the transmission time very short. To achieve successful communication, the assignment of bit combinations and text blocks must be the same in your radio set and the receiving unit and have the same meaning.
Message folder	Displays the list of SDS text messages you moved from the postbox into the message folder (and saved them).
Delete	Deletes the contents of the message lists. To delete the content, select a list and confirm the delete process.

Display**Personal scheduler***Functions in menu*

Designation	Function
Calendar	You can have a calendar displayed here.

Addresses*Functions in menu*

Designation	Function
Preferred groups	Displays the groups declared "preferred" beforehand in a list. From this list, select the group with which you wish to communicate in the half-duplex call operating mode (simplex communication using the PTT button) (group call).
Group list	Contains the list of available groups: When programming the radio set, you can transfer groups from this list into the "Preferred groups" list.
Scan lists	Contains the scan lists in which the operator has summarized several groups when programming the radio sets. When a scan list is selected and activated, the radio set monitors the radio traffic in all associated groups. Otherwise, the radio set will receive only calls from the preferred group.
User list	Contains the list of call numbers (ISSI) of the available subscribers. Here you can select a subscriber to whom you wish to make an individual call.

First steps

This chapter describes how to put the radio set into operation.

Programming

Before using the radio set in daily operations for the first time, it must be programmed with all required operational data and the desired function options and parameters.

The programming procedure requires a configuration tool, consisting in a PC and a configuration program. Ask your specialist retailer for more information..

The data to be programmed take into account the operating conditions as well as individual requests from the operator/user. They are stored in the radio set.

If required, the settings can be saved on a Micro-SD card.

Putting the radio set into operation

Prerequisite:

- A frequency must have been assigned for TETRA operation.
- The radio set must be programmed.
- The trunking mode (TMO) must be activated if the radio set is to be used within a TETRA infrastructure.

Carry out the following work steps:

1. Carefully place the antenna on the antenna socket of the radio set.



Putting the radio set into operation

2. Fasten the antenna hand-tight by turning it clockwise.



3. Insert memory cards (where available and specified for use) into the card slot with the contacts facing down.



The figure shows the radio set with the maximum number of features (three card slots). From left to right: SIM card, Micro-SD card, Mini-SIM card.

4. Introduce the battery lugs carefully into the recesses in the radio set.



5. Carefully push the battery into the radio set until the battery lock engages.



Both battery locks must engage completely. They are then at their upper limit stop.



6. Charge the battery before switching the unit on for the first time.

✓ Done. After charging the battery, the radio set is ready for operation.

TIP

After the unit is switched on, the display may show a prompt concerning a missing card. In this case, you can only use your radio set if a Micro-SD card is inserted. Check to ensure that all cards required for operation are inserted, see work step 3.

Charging the battery

Always charge batteries with the system-compatible chargers supplied by Funkwerk. These are optimally suited for the radio set and the battery. Always use the chargers outside of hazardous areas (explosive atmospheres).

Charging the battery with a FT4 Desktop Charger II / FT4 Desktop Station

The Desktop Charger II FT4 and Desktop Station FT4 chargers charge both the battery in the radio set and a spare battery. When the radio set and the spare battery are connected with the charger at the same time, the battery in the radio set is charged first. After this, the charging process of the spare battery starts. The charging time for an empty battery is roughly 5 to 8 hours.

Connect the charger to the power supply

Carry out the following work steps:

1. Connect the plug-in power supply unit with the charger.
2. Plug the plug-in power supply unit into a suitable power outlet.

Done.

Placing the radio set into the charger

Carry out the following work steps:

1. Place the radio set with its bottom into the charger.



2. Carefully push the radio set into the charger until the lock engages.



The charging process starts.

The charging status of the battery is shown on the radio set display, see section „Signalling the charging status“ (p.59)

Done.

Removing the radio set from the charger

Carry out the following work steps:

1. Push the unlocking knobs of the charger together.



Charging the battery

2. Remove the radio set carefully from the charger.

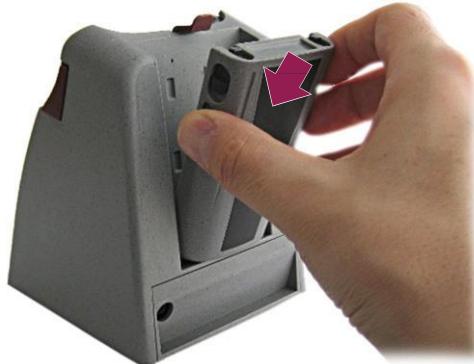


Done.

Inserting the spare battery into the charging slot

Carry out the following work steps:

1. Place the bottom of the battery into the charging slot on the rear.



2. Carefully push the battery into the charging slot until the lock engages.



The charging process starts.

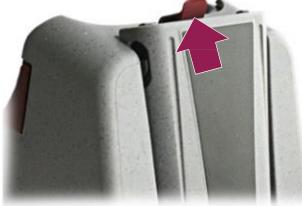
The charging status of the battery is indicated by the LED on the front of the charging slot, see section „Signalling the charging status“ (p. 59).

Done.

Removing the spare battery from the charger

Carry out the following work steps:

1. Carefully push the unlocking element on the charger upwards.



Charging the battery

2. Remove the battery carefully from the charging slot.



Done.

- ✓ The battery is now charged.

Charging the battery with a FT4 Travel Charger

This charger charges the battery in the radio set. This charger is perfect for travelling due to its compact design. The charging time for an empty battery is roughly 5 to 8 hours.

Carry out the following work steps:

1. Hook the holding clip of the charger into the recess in the radio set.



2. Carefully push the charger towards the radio set until the unlocking tab hooks into the recess on the radio set.



3. Plug the plug-in power supply unit into a suitable power outlet.

The charging process starts.

The charging status of the battery is shown on the radio set display, see section „Signalling the charging status“ (p.59)

✓ The battery is now charged.

Signalling the charging status

The battery charging status is displayed by the following symbols on the display of the radio set.

Battery charging status: Symbols in the radio set display

Symbol	Battery status
	The battery is being discharged. The bright bar indicates the available capacity.
	The battery is empty.
	The radio set is in the charger. Battery is being charged
	The radio set is in the charger. The battery is fully charged.
	The radio set has identified a faulty battery.

The charging status is also indicated by the LEDs of the radio set, see chapter „Structure and function“ > „Illuminated indicators“ (p.38).

Charging the battery

The indicator light on the charger indicates the charging status of the spare battery.



Indicator light of "Desktop Charger II FT4" charger

Meaning of charger indicator light

Colour	Status	Meaning
OFF		The charger is not connected to mains.
yellow	lit	The spare battery is not inserted.
red	flashing	The spare battery is defective or is not properly inserted.
	lit	The spare battery is being charged. If the radio set is in the charger, the charging process of the spare battery starts as soon as the battery in the radio set is fully charged.
green	lit	The spare battery is fully charged. This indicator is independent of the charging status of the radio set in the charging set.

TETRA basics

In this chapter, you can familiarise yourself with the basics and functions of the TETRA system.

Safety information

If the radio set is not logged into the personal emergency signal centre, the TETRA emergency call cannot be transmitted if radio contact is unavailable due to insufficient radio coverage. Transmit the TETRA emergency call one more time as soon as the radio connection is re-established.

TETRA connection types

Due to the TETRA transmission technology, your radio set can set up different connections with other subscribers. The following TETRA connection types are possible, depending on the situation and the application:

- Trunking mode (TMO) (p.62)
- Direct mode (DMO) (p.64)

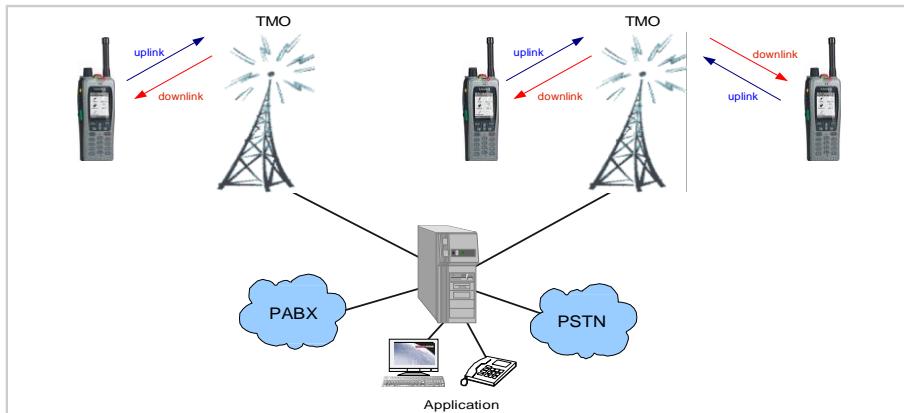
TETRA connection types

Trunking mode (TMO)

The trunking mode is a connection type for which all terminal units use a common TETRA infrastructure. All terminal units that can be reached are registered on the TETRA network.

Description

In trunking mode, your radio set sets up all connections from or to other users and other applications through the TETRA infrastructure.



Trunking mode (TMO): Schematic representation of possible calls and connections

In trunking mode, voice and data calls can be made simultaneously.

Identification features

The following features of your radio set enable you to identify that your radio set is connected with the TETRA network and that the trunking mode is activated:



Trunking mode (TMO): Identification features on your radio set

Legend

Identification feature	Behaviour
Display	Idle display reads TMO .
Left signal LED	green, flashing slowly

Activating the trunking mode

After registering in the TETRA infrastructure, the radio set is in trunking mode (TMO) and is ready for operation.

Activating the trunking mode manually

If your radio set does not automatically change over to trunking mode (TMO), you can activate this mode manually.

Prerequisite:

- The radio set must be located within the radio coverage range of the TETRA infrastructure.

Carry out the following work steps:

1. On the display, navigate to **MAIN MENU > SETTINGS > NETWORKS**.
The **NETWORK** menu is displayed.
2. Highlight the **TMO** menu item using the cursor keys.

TETRA connection types

3. Press the **<Right softkey>** key to select the menu item.



✓ Done.

Direct mode (DMO)

The direct mode is a connection type in which the terminal units communicate directly with one another.

Description

In direct mode, your radio set sets up all connections from or to other subscribers directly and without using the TETRA infrastructure. The subscribers must be within the transmit range of your radio set.



Direct mode (DMO): Schematic representation of possible calls and connections

Identification features

The following features of your radio set indicate to you that the direct mode is activated (in idle mode, without an active voice connection):



Direct mode (DMO): Identification features on your radio set

Legend

Identification feature	Behaviour
Display	Idle display reads DMO .
Left signal LED	green, flashing slowly

Activating the direct mode manually

If your radio set is not switched to direct mode (TMO), you can activate this mode manually. Ensure that other subscribers are within the range so you can communicate in this mode.

Carry out the following work steps:

1. On the display, navigate to **MAIN MENU > SETTINGS > NETWORKS**.
The **NETWORK** menu is displayed.
2. Highlight the **DMO** menu item using the cursor keys.
3. Press the **<Right softkey>** key to select the menu item.



✓ Done.

Operation

In this chapter, you can familiarise yourself with the operation of the radio set. Frequent operation steps are described on the following pages.

Switching on the radio set

PLEASE NOTE

Operating radio sets may cause disturbances!

Switching on or operating your radio set may cause a hazard to you or to other persons.

- Switch on your radio set only if its operation does not expose any persons to a hazard.
- Do not switch your radio set on in places where the operation of radio sets is not permitted.

Carry out the following work steps:

- Press the **<Hang up>** key long.



The display and keyboard illumination is switched on.

The radio set carries out a self-test. This will take a few seconds.

The radio set is connected with the TETRA infrastructure (if this has been programmed).

The display shows the idle display.

- ✓ Done, the radio set is switched on.

Switching off the radio set

PLEASE NOTE

Battery will self-discharge while radio set is switched off!

The self-discharge of the battery while the radio set is switched off may impair readiness for operation of the radio set!

- Place the radio set in a charger to charge the battery.
- Charge the battery regularly if it is not in use for a prolonged period of time.
Observe the safety instructions for storage and transport of the battery, see chapter „Safety information“ > „Battery“ (p.21).

Carry out the following work steps:

1. Unlock keyboard (if necessary).
2. Press the **Hang up** key for about three seconds.



The radio set cuts the connection.

The display and keyboard illumination is switched off.

The radio set switches itself off after a short time.

3. Charge the battery, see chapter „First steps“ > „Charging the battery“ (p.54).
- ✓ Done, the radio set is switched off.

Menu

The radio set makes numerous functions available to you. Many of these functions can be called up in the menu in a structured way.

Navigating the menu

The following pages tell you how to navigate through the menu for executing a function when starting from the idle display.

Prerequisite:

- The display shows the idle display.

Carry out the following work steps:

1. Press the **<Right softkey>** key to display the menu.



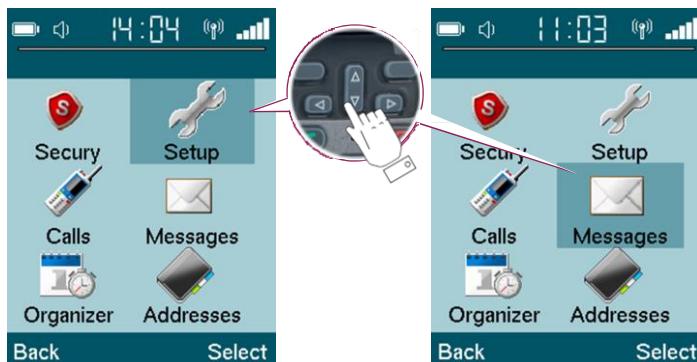
The display shows the main menu.



2. Highlight the desired menu item using the cursor keys.



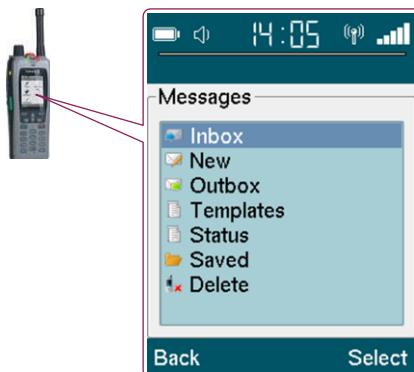
Every time a key is pressed, the adjacent menu item is highlighted in the display.



3. Press the **<Right softkey>** key to select the highlighted menu item.



The display shows the menu.



4. Highlight the desired menu item using the cursor keys.



Every time a key is pressed, the adjacent menu item is highlighted.



5. Press the **<Right softkey>** key to select the highlighted menu item.



The function is executed. Or: The display shows the menu which is subordinate to the selected menu item.

✓ Done.

TIP

After a prolonged inactivity period, the display switches to the screen saver, see section „Screen saver“ (p.44).

Changing back to the previous menu

If you have executed the desired function or if you simply wish to go back, you can go back as follows:

Prerequisite:

- The display shows a menu.

Carry out the following work steps:

1. Press the **<Left softkey>** key briefly when the **BACK** function is shown in the display.



The display content changes back to the previous content.

2. Repeat pressing the key if required.

✓ Done.

Group calls

Group calls are voice connections a subscriber sets up to several other subscribers at the same time. While one subscriber speaks, the other subscribers in that group listen to this call.

Selecting a group

You can select a group with which you communicate mainly from the **PREFERRED GROUPS** list. From now on, pressing the **PTT (transmit key)** key will automatically start a group call for this group. If the list is not programmed, the display shows the **GROUP LIST** list. Select the desired group from this list.

Prerequisite:

- The display shows the idle display.

Carry out the following work steps:

1. If required, press **Volume/group call** knob longer in order to enable its function as a rotary switch.



2. Press button **Volume/group call** briefly.

The display shows the **GROUP LIST OR PREFERRED GROUPS** field.



? The display shows the **VOLUME** field, not the **GROUP LIST** field?

The **Volume/group call** knob allows both setting the volume and selecting groups.

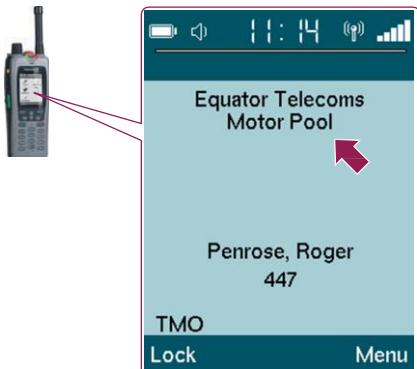
→ Press knob **Volume/group call** to switch between the **VOLUME** field and the Group list field.

3. Turn **Volume/group call** knob until the desired group is highlighted.

4. Press the **<Right softkey>** key to execute the **SELECT** function, or press the **<Volume/group call>** knob again briefly.

This setting is saved.

The display shows the idle display again. In the idle display, the selected group is shown.



✓ Done.

TIP

The group selection sub-menu can also be accessed from the idle display, using either the **MENU > ADDRESSES > PREFERRED GROUPS** or **MENU > ADDRESSES > GROUP LIST** paths. The group selection function of the rotary control may have been blocked while programming the radio set.

Starting a group call

A group call is a semi-duplex voice connection. While one subscriber speaks, all other subscribers in that group listen to this call. After that, the other subscribers can answer the call, one after the other.

Prerequisite:

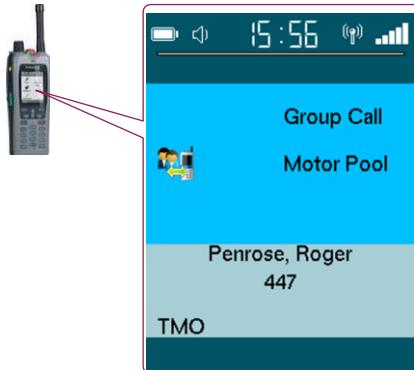
- The channel is not occupied by a call.

Carry out the following work steps:

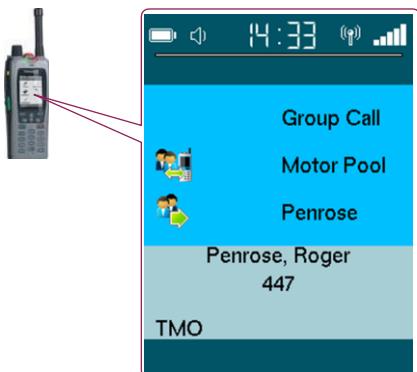
1. Push key **<PTT (transmit key)>** and keep it pressed.



The connection with the subscribers in the called group is set up. The display shows the name or the call number of the group (GSSI).



After a short time, your speaking enable signal is transmitted unless another subscriber is transmitting. The display additionally shows your name or your call number (ISSI).



2. Keep **«PTT (transmit key)»** key pressed while speaking.
3. After speaking, release key **«PTT (transmit key)»**.
4. Continue the conversation:
 - ➔ Hold the **«PTT (transmit key)»** key down to talk.
 - ➔ Release the **«PTT (transmit key)»** key to listen.

When neither you nor any other group members are talking, the connection is terminated after a pre-set period of time. To start another call to the group, start again at step 1.

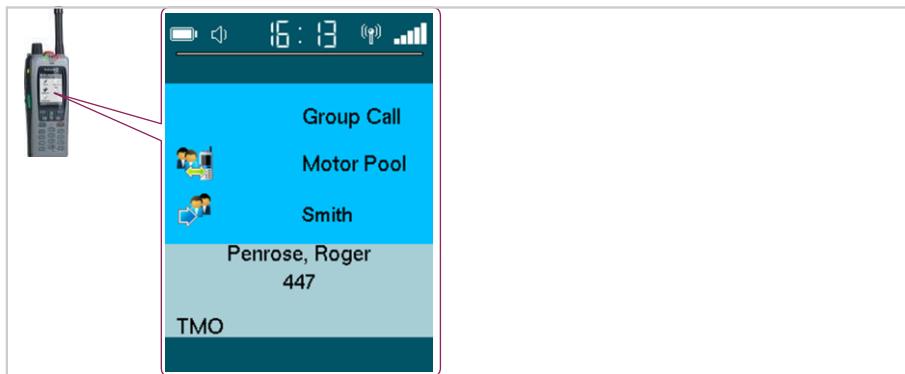
✓ Done.

Receiving a group call

An incoming group call from a member of the selected group is automatically received by your radio set. You do not have to do anything to accept the call.

During a group call, the following information is displayed on the display of your radio set:

- Name or call number of called group
- Name or call number of subscriber who is currently speaking



Display content while receiving a group call

Answering a group call

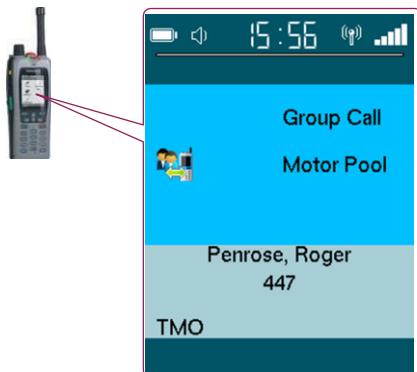
Prerequisite:

- Your radio set receives a group call.

Carry out the following work steps:

1. Wait for the calling subscriber to stop speaking.

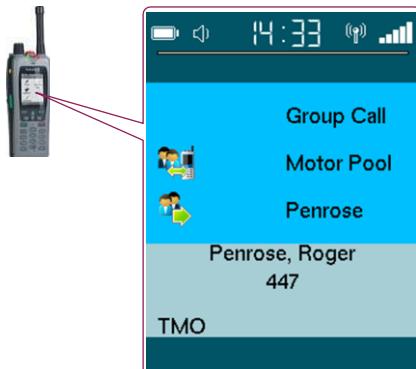
The display shows only the call number of the group (GSSI) or its name. The lower icon with the blue arrow is no longer displayed.



2. Push key **PTT (transmit key)** and keep it pressed.



After a short time, your speaking enable signal is transmitted unless another subscriber is transmitting. The display additionally shows your name or your call number (ISSI).



3. Keep **PTT (transmit key)** key pressed while speaking.
4. After speaking, release key **PTT (transmit key)**.

You may now be able to hear other subscribers.

As soon as no more subscriber answers, the connection is disconnected after a pre-set time.

✓ Done.

Scanner function

If the scanner function is activated, your radio set will scan the radio communications in multiple groups simultaneously. If the radio set receives a call from one of the groups being scanned, the speaker is switched on automatically, and the hands-free mode is activated. To use the scanner function, you must

- Select a scan list and
- activate the scanner function.

Selecting a scan list

The groups to be scanned are grouped in scan lists. To use the scanner function, you must select at least one scan list.

Carry out the following work steps:

1. On the display, navigate to **MAIN MENU > ADDRESSES > SCAN LISTS**.

The **SCAN LISTS** menu is displayed.



2. Highlight the desired menu item using the cursor keys.
3. Press the **<Right softkey>** key to execute the function **OPTIONS**.



The **OPTIONS** menu is displayed.

4. Highlight the **SELECT** menu item using the cursor keys.

5. Press the **<Right softkey>** key to execute the function **SELECT**.

The display changes back to the **SCAN LISTS** menu. The desired scan list is marked there as "selected".



✓ Done.

TIP

To find out which groups are summarised in the scan lists, highlight the function **SHOW** in work step 4 instead of the **SELECT** function.

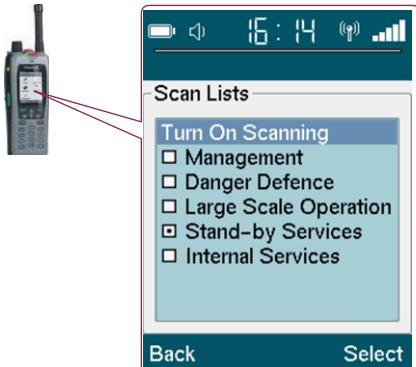
Switching the scan function on/off

You can switch the scan function on and off at any time when a scan list is marked as "selected". When a scan list is selected and activated, your radio set monitors the radio traffic in all associated groups. When receiving a call, the hands-free talking mode is activated and the loudspeaker is switched on.

Carry out the following work steps:

1. On the display, navigate to **MAIN MENU > ADDRESSES > SCAN LISTS**.

The **SCAN LISTS** menu is displayed.



2. Highlight the **ACTIVATE SCANNING** entry using the cursor keys.
3. Press the **<Right softkey>** key to execute the function **SELECT**.

After a short time, the title of the menu item changes from **ACTIVATE SCANNING** to **DEACTIVATE SCANNING**.

The scan function is now active.

The symbol of the "selected" scan lists changes as follows:



The idle display screen shows the message "Scanning groups".

4. If required, press the **<Right softkey>** key one more time to deactivate the scan function again.

✓ Done.

TIP

The scan function is active when the title of the menu item is **DEACTIVATE SCANNING**. The scan function is inactive when the title of the menu item is **ACTIVATE SCANNING**.

Leaving a group call early

Given the large number of group calls that you receive with your radio set, not all information may be important for you. If required, you can therefore leave a group call early.

Prerequisite:

Your radio set receives a group call.

Carry out the following work steps:

→ Press the **<Hang up>** key briefly.



The connection is disconnected.

The radio set ignores the active group call.

✓ Done.

Individual calls

Individual calls are voice connections between two individual subscribers. Individual calls are always started by entering the desired call number. Individual calls can be set up in the following ways:

- as a full-duplex voice connection, see section **Duplex mode**
- as a half-duplex voice connection, see section **„Two-way call (direct through)“ (p.88)**

Duplex mode

An individual call in duplex mode is a full-duplex voice connection in which you hold the radio set near your ear just like a telephone set. During this time, both you and the called subscriber can listen and speak at the same time.

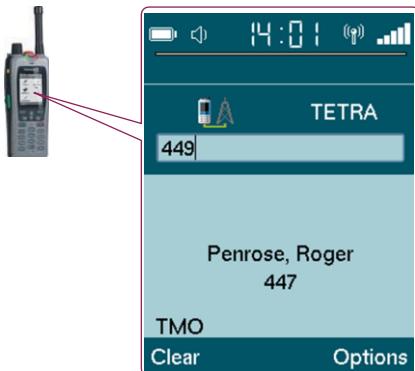
Starting a call

Prerequisite:

- The display shows the idle display or the screen saver.

Carry out the following work steps:

1. Enter the call number. Choose one option:
 - Entering the call number using the number keys.
 - Selecting the call number from the subscribers' list: Navigate to **MAIN MENU > ADDRESSES >USER LIST** in the display and highlight the desired user.



The condition as shown appears in the following cases:

- After entering the call number in the idle condition.
- After highlighting the user in the user list and **Calling**.
- After marking the user and **Picking up**.

Starting from this display, start the call by **Picking up**.

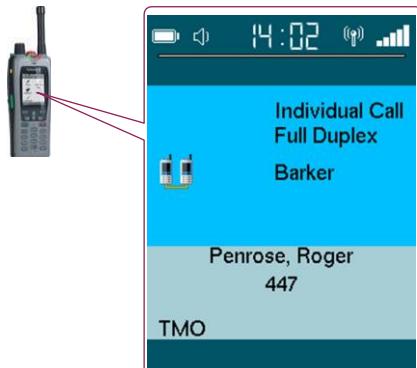
2. Press the **«Right softkey»** key if the **CALLING** function is available to select a gateway (telephone, TETRA, ...) , then press the **«Pick up»** key. Or, after marking a user in the user list, press the **«Pick up»** key twice.



The connection is set up.

The display shows the call number or the name of the called subscriber.

As soon as the called party accepts the call, the connection is set up.



3. Hold the radio set close to your ear like a telephone receiver for listening and speaking.

✓ Done.

TIP

The settings of your radio set are individually programmed by the radio set operator. You may be able to start a call to a pre-set target by means of a speed dialling key as well. If you have any questions, please contact the responsible system administrator for your communication facilities.

Accepting a call

Prerequisite:

- Your radio set signals an incoming individual call.

Carry out the following work steps:

1. Press the **<Pick up>** key.



The connection is now set up.

2. Hold the radio set close to your ear like a telephone receiver for listening/speaking.

✓ Done.

Terminating a call

Carry out the following work steps:

→ Press the **<Hang up>** key.



The connection is disconnected.

✓ Done.

Two-way call (direct through)

At the factory, two-way calls are configured in "direct through" mode. A call in the "Direct Through" mode is a half-duplex voice connection during which you alternately set the radio set to transmit mode (by keeping the PTT button pressed) or in receive mode (by releasing the PTT button). The hands-free talking mode is activated, and the loudspeaker is on. The called subscriber does not need to accept the call to hear you. Either you or the called user can speak.

Starting a call

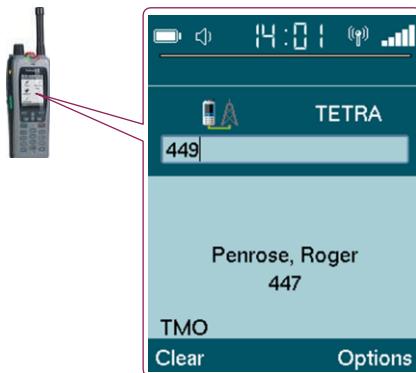
Prerequisite:

- The display shows the idle display or the screen saver.

Carry out the following work steps:

1. Enter the call number. Choose one option:

- Entering the call number using the number keys.
- Selecting the call number from the subscribers' list: Navigate to **MAIN MENU > ADDRESSES >USER LIST** in the display and highlight the desired user.



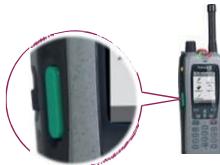
The condition as shown appears in the following cases:

- After entering the call number.
- After highlighting the user and **Calling**.
- After highlighting the user and actuating (pressing or releasing) the **PTT (transmit key)**.

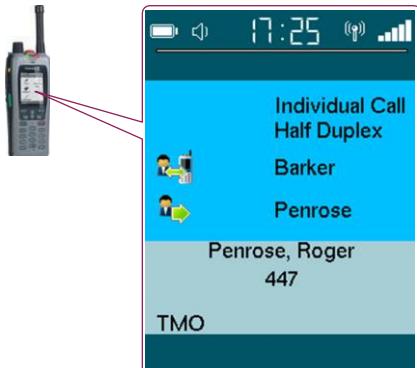
Starting from this display, start the call with the **PTT (transmit key)** key (thumb, keep pressed and talk; release and listen).

2. Press the **Right softkey** key if the **CALLING** function is available, then press the **PTT (transmit key)** key and hold it down. Or, after highlighting a user from the

user list, press the **<PTT (transmit key)>** key twice and keep it pressed after pressing the second time.



The connection is established as soon as the display shows the call number or name of the called subscriber.



The called subscriber can hear you.

3. Hold the radio set next to your head a little at the side of the mouth for listening and speaking.
4. Keep the **<PTT (transmit key)>** key pressed for speaking.
5. To listen, release the **<PTT (transmit key)>** key.

✓ Done.

TIP

The settings of your radio set are individually programmed by the radio set operator. You may be able to start a call to a pre-set target by means of a speed dialling key as well. If you have any questions, please contact the responsible system administrator for your communication facilities.

Terminating a call

Carry out the following work steps:

→ Press the **«Hang up»** key.

✓ Done.

TIP

When neither you nor the called subscriber are speaking, the connection is cut automatically after a certain period.

TETRA Emergency Calls

Triggering a TETRA emergency call starts a group call of a particular priority. Use this function only when you are in an emergency situation.

Special features

So long as the radio set is logged into the personal emergency signal centre, triggering the emergency call will generate a "personal alarm" and transmit it to the personal emergency signal centre. A TETRA emergency call is only possible when the radio set has not logged into the personal emergency signal centre.

During an active TETRA emergency call connection, the radio set works with the following restrictions:

- The scan function is deactivated. Group monitoring is not carried out.
- Individual calls cannot be received.

Triggering a TETRA emergency call

Prerequisite:

- The radio set is switched on.

Carry out the following work steps:

1. Press the **<Alarm>** key long.



All services, e.g. a voice connection, are terminated.

The radio set starts a group call with a particular priority.

The hands-free talking mode is activated and the loudspeaker is on.

The emergency call connection appears on the display on a red background.

The radio set is now in TETRA emergency call mode.

2. Hold the radio set clearly away from your head for listening and speaking (open listening / hand-free talking).
 - Push the **<PTT (transmit key)>** key and keep it pressed.
 - To listen, release the **<PTT (transmit key)>** key.



✓ Done.

Terminating a TETRA emergency call

When neither you nor the called subscribers are no longer speaking, the connection is cut automatically after a certain period. Otherwise, you can terminate the emergency call by hand.

Carry out the following work steps:

- Press the **Hang up** key to terminate the connection.



✓ Done.

Messaging

Message types

For sending and receiving text messages, the following text message types are being differentiated.

Text message types on radio sets Funkwerk FT4

Designation	Type	Behaviour of the Funkwerk FT4 radio set for reception
Status message	Pre-defined, non-modifiable text message (The transmission is bit-coded and is possible from and to any radio of the FT4 series. Prerequisite for a successful communication is that the allocation of bit combinations and text messages is programmed in the same way on your radio set and the receiver's unit and have the same meaning.)	Alert tones and display content. After executing the OK function (press <Right softkey> key), the message is no longer accessible. The message indicator on the display disappears. The message is not being saved.
SDS text message	Text message that is individually composed (Message is transmitted in clear text and transmission is possible from and to any TETRA-compatible terminal unit.)	Alert tones and display content. After executing the OK function (press <Right softkey> key), the message is no longer displayed. The message is saved in the post box. It can be displayed again later.

Composing an SDS text message

An SDS text message is a text message that you can compose individually.

Prerequisite:

- The display shows the idle display.

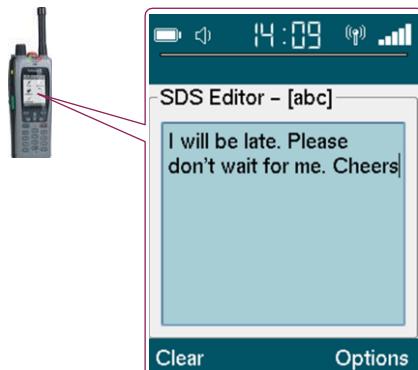
Carry out the following work steps:

1. On the display, navigate to **MENU > MESSAGES > NEW MESSAGE**.

The empty **SDS EDITOR** window is displayed.

2. Entering text:

- Enter letters with keys **<2 to 9, 0>**.
- Enter digits with keys **<1 to 9, 0>**.
- Enter special characters with keys **<1>** and **<*>**.
- Switch between capitalization and non-capitalization with the **<#>** key.



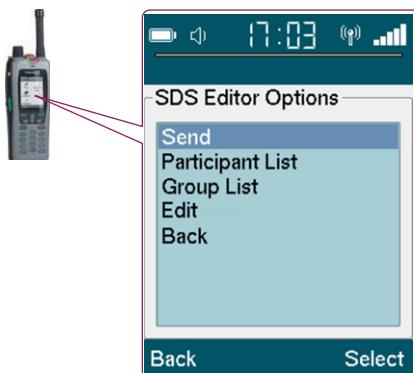
As long as no text has been entered, the footer (left softkey) shows the **DELETE** element **INSTEAD OF BACK**. The display of the left softkey changes to the **DELETE** only after the first character has been entered.

3. Press the **<Right softkey>** key to execute the **OPTIONS** function.



The displayed text is accepted including all changes.

The **SDS EDITOR OPTIONS** window is displayed.



4. Transmit the message, see section „Transmitting an SDS text message“ (p.100).

✓ Done.

Composing an SDS text message from a template

An SDS text message is a text message that you can compose individually. In practice, similar information is often transmitted repeatedly. For this reason, your radio set is programmed with pre-defined, frequently used text blocks. These text messages can be transmitted directly, but you can also modify and supplement them before sending them.

Prerequisite:

- The display shows the idle display.

Carry out the following work steps:

1. On the display, navigate to **MENU > MESSAGES > TEMPLATES**.

The **TEMPLATES** window is displayed.

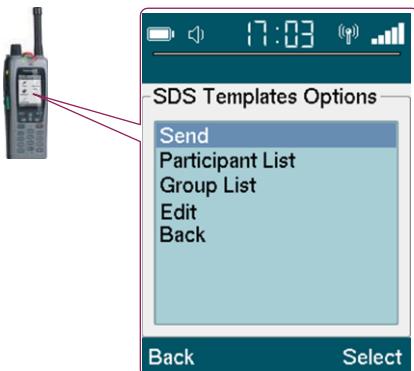


2. Highlight the desired template using the cursor keys.

3. Press the **<Right softkey>** key to execute the **OPTIONS** function.



The **SDS TEMPLATE OPTIONS** window is displayed.



4. With the cursor keys, highlight the **<Edit>** menu item to modify or supplement the template as needed.

5. Press the **<Right softkey>** key to execute the **SELECT** function.



The **SDS EDITOR** window is displayed.



As long as no text has been entered, the footer (left softkey) shows the **DELETE** element **INSTEAD OF BACK**. The display of the left softkey changes to the **DELETE** only after the first character has been entered.

6. Modify or supplement the text as needed.

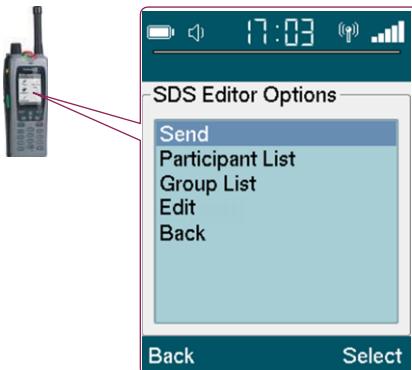
- Enter letters with keys **<2 to 9, 0>**.
- Enter digits with keys **<1 to 9, 0>**.
- Enter special characters with keys **<1>** and **<*>**.
- Switch between capitalization and non-capitalization with the **<#>** key.

7. As the last step, press the  key to execute the **OPTIONS** function.



The displayed text is accepted including all changes.

The **SDS EDITOR OPTIONS** window is displayed.



8. Transmit the message, see section „Transmitting an SDS text message“ (p.100).

✓ Done.

Transmitting an SDS text message

When you have finished composing a text message or adapting a template, you can transmit the message. SDS text messages are transmitted in plain text, using Short Data Service (SDS).

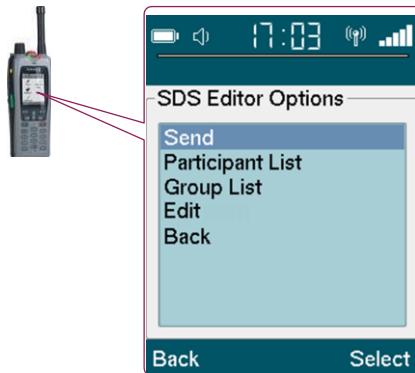
Prerequisite:

- The text message to be transmitted is composed, see section „Composing an SDS text message“ (p.94) or section „Composing an SDS text message from a template“ (p.96).
- The **SDS EDITOR OPTIONS** or **SDS TEMPLATE OPTIONS** window is displayed.

Carry out the following work steps:

1. Select the recipient if needed:

- With the cursor keys, highlight the **USER LIST** menu item and select the recipient from the address book.
- With the cursor keys, highlight the **GROUP LIST** menu item and select a group from the group list as a recipient.



2. Highlight the **TRANSMIT** menu item using the cursor keys.

3. Press the **<Right softkey>** key to execute the function.

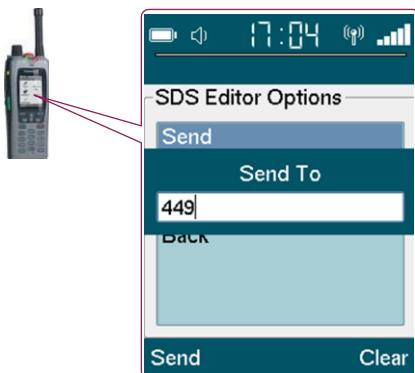


The **TRANSMIT TO** entry field is displayed.



If the entry field is already filled, a recipient was already selected in work step from the address book or a group was selected from the group list. Continue with work step 5.

4. Enter the call number of the recipient with keys **<1 to 9, 0>**.



5. Press the **<Left softkey>** key to execute the function **TRANSMIT**.



The SDS text message is sent.

✓ Done.

Transmitting a status message

A status message is a pre-defined text message that cannot be modified by the sender. bit-coded data is transmitted to the recipient. This makes the transmission time very short. The data is decoded on the recipient's unit, the original message is being displayed. Prerequisite is:

- Each pre-defined text message has the same meaning on the sender's and the recipient's unit.
- The data to be transmitted are encoded in the same manner on the sender's and the recipient's unit.

Transmitting a status message (via menu)

Transmit a pre-defined text message by selecting the function in the menu of the radio set.

Prerequisite:

The display shows the idle display.

Carry out the following work steps:

1. On the display, navigate to **MENU > MESSAGES> STATUS**.

The list of status messages is being displayed.

2. Highlight the desired status message using the cursor keys.

3. Press the **<Right softkey>** key to execute the **OPTIONS** function.



The **SDS TEMPLATE OPTIONS** menu is displayed.

4. Highlight the **SEND** menu item.

5. Press the right **SELECT** softkey.

The **TRANSMIT TO** entry field is displayed.

6. Enter the call number of the recipient with keys **<1 to 9, 0>**.

7. Press the **<Left softkey>** key to execute the **TRANSMIT** function.



The status message is sent.

✓ Done.

Setting the volume

You can set the volume as required by the situation both for the receiver and for the loudspeaker.

Carry out the following work steps:

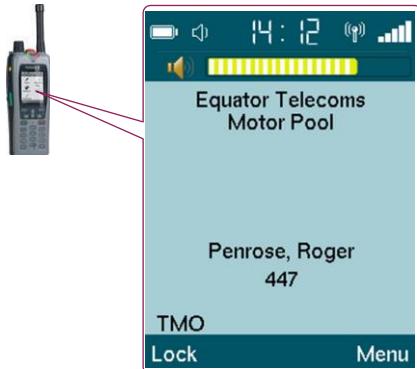
1. If required, press **<Volume/group call>** knob longer in order to enable its function as a rotary switch.



Setting the volume

2. Turn **Volume/group call** knob.

The display shows the **VOLUME** field.



? The display shows the **GROUP CALL** field, not the **VOLUME** field?

The **Volume/group call** knob allows both setting the volume and selecting groups.

→ Press **Volume/group call** control knob to switch between volume setting and group call.

3. Turn **Volume/group call** knob until the desired volume has been set.



The **VOLUME** field is hidden again after a short time.

This setting is automatically saved.

✓ Done.

Key lock

You can lock the keys of your radio set in order to avoid accidental entries. However, you have to unlock the keys of your radio set before it can be operated again as usual.

Locking the keys

Prerequisite:

- The display shows the idle display.

Carry out the following work steps:

1. Press the **<Left softkey>** key to execute the **Lock** function.



2. Press the **<*>** key within one second.



The display shows the **Keys locked** message.

- The keys are locked.

Open listening mode ON/OFF during a call**Unlocking the keys**

Prerequisite:

- Keyboard is locked.

Carry out the following work steps:

1. Press the **<Left softkey>** key to execute the **UNLOCK** function.



2. Press the **<*>** key within one second.



The display shows the **Keys unlocked** message.

- Keyboard is unlocked.

Open listening mode ON/OFF during a call

If you are performing a call in duplex mode (full duplex voice connection), you can switch on the loudspeaker to hear the other party openly.

Prerequisite:

- Individual call in duplex mode (full duplex voice connection) is established.

CAUTION

High volume

High volume may damage your hearing seriously.

→ Never hold the radio set directly near your ear when open listening is activated!

Carry out the following work steps:

1. Press the **<1>** key long.

The loudspeaker is ON. You can hear the other party speak via speaker.

2. Press the **<1>** key long again to switch off the loudspeaker.

Hold the radio set close to your ear like a telephone receiver for listening and speaking when open listening is deactivated.

✓ Done.

Muting the microphone during a call

If you are performing a call in duplex mode (full duplex voice connection), you can mute the microphone to talk discreetly off the radio. Your called party will not be listening in.

Prerequisite:

- Individual call in duplex mode (full duplex voice connection) is established.

Carry out the following work steps:

1. Press the **<*>** key long.

The microphone is muted. The person you have called or who has called you cannot hear you.

2. Press the **<*>** key long again to switch the microphone back on.

✓ Done.

Brief instructions for selected functions

The following tables list selected functions to be executed on the radio set by tasks.

General functions

Function	Operation	Prerequisite or special features
Locking/unlocking the rotary switch	Press <Volume/group call> button long.	Possible only if the idle display is being displayed.

Brief instructions for selected functions

General functions (cont'd)

Function	Operation	Prerequisite or special features
Switching on the radio set	Press the Hang up key long.	The radio set can only be switched off after it was logged out of the personal emergency signal centre. The radio set programming determines the procedure for logging in/out of the personal emergency signal centre.
Switching off the radio set	Press the Hang up key long.	
Destination call of a subscriber (via quick access)	Press the 1 to 9, 0 , * or # key long	Please contact the responsible system administrator for your communication facilities.
Activating/deactivating open listening	Press the 1 key long.	Possible only during an individual call in duplex mode (full duplex voice connection).
Changing the volume	Turn Volume/group call knob.	Press the button briefly to change between volume setting and group selection.
Muting the microphone	Press the * key long.	Possible only during an individual call in duplex mode (full duplex voice connection).
Calling up the postbox MENU > MESSAGES > CALL UP POSTBOX	Press the CURSOR UP key.	Possible only if the idle display is being displayed.
Calling up the idle display	Press the Hang up key.	–
Calling up the signal profile MENU > SETTINGS > CALL UP SIGNAL PROFILE	Press the CURSOR RIGHT key, then highlight and select the desired signal profile.	Possible only if the idle display is being displayed.

General functions (cont'd)

Function	Operation	Prerequisite or special features
Locking/unlocking the keys	Press the <Left softkey> key, then press the <*> key.	Possible only if the idle display is being displayed. Press keys in rapid succession.
Calling up the user list MENU > ADDRESSES > CALL UP USER LIST	Press the CURSOR DOWN key.	Possible only if the idle display is being displayed.
Calling missed calls CALL UP MENU > CALLS > MISSED CALLS AUFRUFEN	Press the CURSOR LEFT key.	Possible only if the idle display is being displayed.

TETRA functions

Function	Operation	Prerequisite or special features
Selecting a group (via the menu)	Navigate to MENU > ADDRESSES > PREFERRED GROUPS or GROUP LIST in the display. Press the cursor keys to highlight the desired group. Press the <Right softkey> key to select the item.	The group can be selected from the PREFERRED GROUPS list or from the GROUP LIST list.
Selecting a group (via quick access)	Press button <Volume/group call> briefly. Now turn the knob to highlight the desired group. Press the <Right softkey> key to select the item.	The group is selected from the PREFERRED GROUPS list if there are entries in this list, otherwise it is selected from the GROUP LIST list.
Group call (half-duplex voice connection)	Press the <PTT (transmit key)> key to transmit. Release the key to listen.	A group must be selected.

Brief instructions for selected functions

TETRA functions (cont'd)

Function	Operation	Prerequisite or special features
Individual two-way call in "direct through" mode (half-duplex voice connection)	Enter the call number. Press the PTT (transmit key) key to transmit. Release the key to listen.	Possible only if the idle display is being displayed.
Individual call in duplex mode (full duplex voice connection)	Enter the call number. Press the Pick up key. Make the call.	Possible only if the idle display is being displayed.
Switching over the connection type TMO <--> DMO	On the display, navigate to MENU > SETTINGS > NETWORKS . Press the cursor keys to highlight the desired connection type. Press the Right softkey key to select the item. It is possible that the radio set has been programmed so that you can alternatively switch with the Function key 2 key or Function key 3 the key.	Possible only if the radio set is not logged into the personal emergency signal centre. In operation, the connection type can be switched accidentally if the switching option is activated with the Function key 2 or the Function key 3 keys.

Triggering an emergency call

Function	Operation	Prerequisite or special features
Triggering a TETRA emergency call	Press the Alarm key long.	Possible only if the radio set is not logged into the personal emergency signal centre.

Triggering an emergency call (cont'd)

Function	Operation	Prerequisite or special features
Triggering a personal emergency call	Alarm 1: Press the «Alarm» key long. Alarm 2: Press «Alarm» key briefly three times.	Possible only if the radio set is logged into the personal emergency signal centre.
Triggering a warning alarm	Warning alarm 1: Press the «Function key 1» key long. Warning alarm 2: Press the «Function key 1» key briefly three times.	Alarm 2 may be blocked. Warning alarm 2 may be blocked.

Sending text messages

Function	Operation	Prerequisite or special features
Transmitting a status message (via quick access)	Press the «1 to 9, 0, *» or «#» key long	Depending on the programming of the radio set. Please contact the responsible system administrator for your communication facilities.
Transmitting an SDS message (via quick access)		
Speed call of a subscriber (via quick access)		
Toggling between capitalisation/non-capitalisation	Press the «#» key.	Possible only while entering text.
Inserting a space	Press the «0» key.	
Inserting a special character	Press the «*» or the «1» key.	

Brief instructions for selected functions*Function keys*

Function	Operation	Prerequisite or special features
Switching the screen saver on/off.	Press the Function key 1 , Function key 2 or Function key 3 key.	Depending on the programming of the radio set, you can execute one of the functions with the function keys. Each key is assigned only one function.
Moving the cursor vertically		
Selecting the highlighted group		Using the Function key 1 key is possible only when the radio set is not logged into the personal emergency signal centre.

Personal emergency signal functions

This chapter describes the emergency signal functions. Due to the integrated sensors and safety functions, you can use the radio set for security purposes during hazardous (single-person) jobs by connecting to a system-compatible personal emergency signal centre.

Will-dependent emergency signal functions

Will-dependent emergency signal functions are triggered by the user by an intentional action.

Control elements

The radio set offers the following control elements for triggering a will-dependent alarm or warning alarm.

Control elements for triggering will-dependent alarms or warning alarms

Designation	Function
Alarm	Triggering of a personal alarm (will-dependent alarm). Decide for yourself if you wish to trigger alarm 1 or alarm 2: <ul style="list-style-type: none">▪ Alarm 1: Press key for more than 1 second.▪ Alarm 2: Press key briefly three times.
Function key 1	Triggering a warning alarm. Decide for yourself if you wish to trigger warning alarm 1 or warning alarm 2: <ul style="list-style-type: none">▪ Warning alarm 1: Press key for more than 1 second.▪ Warning alarm 2: Press key briefly three times.

TIP

If the radio set is not logged into the personal emergency signal centre, the control elements may have different functions, see chapter „Structure and function“ > „Control elements“ (p.28).

Will-dependent emergency signal functions**Alarm types**

At the factory, the radio set is set to provide the following will-dependent alarms and warning alarms:

Will-dependent alarms and warning alarms of the radio set

Alarm type	Condition for release
Alarm 1	The «Alarm» key is pressed for more than 1 second.
Alarm 2	The «Alarm» key is pressed briefly three times.
Warning alarm 1	The «Function key 1» key is pressed for more than 1 second.
Warning alarm 2	The «Function key 1» key is pressed briefly three times.

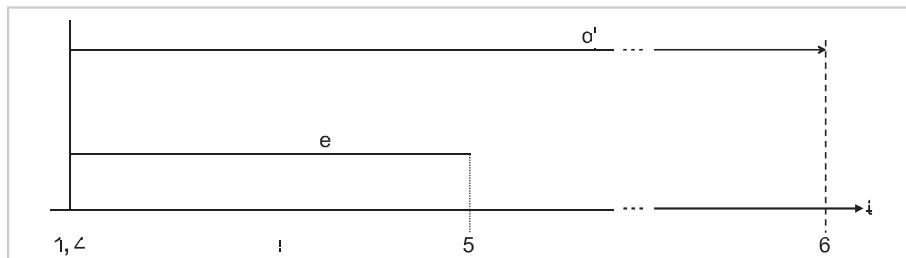
The criteria for evaluation and differentiation between alarm 1 and alarm 2 as well as between warning alarm 1 and warning alarm 2 have been defined by the operator of the personal emergency signal system.

TIP

Ask the system administrator of your communication systems which personal emergency signal functions are programmed on your radio set.

Time sequence

Each will-dependent alarm results in the alarm being transmitted directly after triggering. There is no delay and no pre-alarm.



Time sequence of will-dependent emergency signal functions in case of alarm

Legend

No.	Designation	Description
1	Alarm condition occurs	You, the user of the radio set, detects a dangerous situation.
4	Triggering the alarm	You, the user of the radio set, intentionally triggers a will-dependent alarm transmitted to the personal emergency signal centre. The radio set starts signalling the alarm (d). This will continue until the alarm is reset.
5	Arrival of alarm at the personal emergency signal centre	The alarm is received by the personal emergency signal centre. The personnel at the personal emergency signal centre begins to initiate emergency measures.
6	Resetting the alarm	The alarm is terminated by user action on the radio set or by a reset command from the personal emergency signal centre.
d	Alarm time	Period of time between triggering of the alarm (4) and alarm being reset on the radio set or a reset command being issued by the personal emergency signal centre (6).
e	Reaction time	(according to pre-standard DIN V VDE V 0825 part 1) Period of time between the occurrence of the alarm condition (1) and the arrival of the alarm at the personal emergency signal centre (5).

Will-independent emergency signal functions

Will-independent emergency signal functions

Will-independent emergency signal functions are automatically triggered by the radio set if you are in certain situations while in possession of the radio set. The triggering conditions can be caused "intentionally" or "accidentally".

Alarm types

At the factory, the radio set is set to provide the following will-independent emergency signal functions:

Will-independent emergency signal functions of the radio set

Alarm type	Condition for release
Position alarm	Radio set is tilted too far. The tilting angle is programmed by the operator of the personal emergency signal system. The standard value is 55° (based on a vertical, upright position, tolerance $\pm 5^\circ$).
No-motion alarm	The radio set is not moved.
Loss alarm	The tear-off contact is pulled out.
Time alarm	The radio set is not actuated within a certain period of time (dead man's time).

TIP

Ask the system administrator of your communication systems which personal emergency signal functions are programmed on your radio set.

Triggering the loss alarm

The loss alarm is triggered by the tear-off contact.



Tear-off contact for triggering the loss alarm

The tear-off contact triggers a tear-off/loss alarm as soon as the connector is pulled out of its holder and the programmed delay has expired.

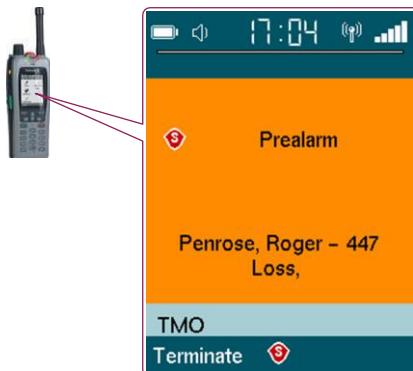
TIP

If the radio set is not logged into the personal emergency signal centre, the tear-off contact has no function.

Pre-alarm

Pre-alarms exist only for will-independent alarm types. After an alarm condition has occurred, your radio set will first attract your attention to this status by issuing a pre-alarm.

- The keyboard illumination switches on.
- An acoustic signal sounds (if programmed).
- The display shows a pre-alarm instead of the idle display.



Display content during a pre-alarm

While a pre-alarm is active, you can prevent the transmission of a personal alarm as follows:

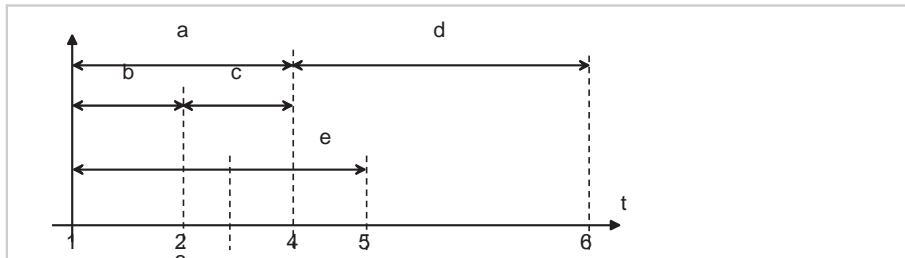
- Eliminate the alarm condition.
- Acknowledge the pre-alarm: Press the **Left softkey** to execute the **TERMINATE FUNCTION**. If you have not eliminated the alarm condition, the pre-alarm starts again after the programmed delay or waiting time.

After expiration of the pre-alarm delay without any actions, the radio set will send the alarm to the personal emergency signal centre.

Will-independent emergency signal functions

Time sequence

Any will-independent alarm results in the transmission of the alarm to the personal emergency signal centre as soon as the alarm condition occurs and the programmed delay and pre-alarm time have expired. You can stop the transmission of the alarm if you eliminate the alarm condition during the delay and pre-alarm time, or if you acknowledge the pre-alarm during the pre-alarm time.



Time sequence of will-independent emergency signal functions in case of alarm

Legend

No.	Designation	Description
1	Alarm condition occurs	The radio set identifies a will-independent alarm condition.
2	Start of pre-alarm on the radio set	The alarm condition detected at time (1) still exists. The radio set starts signalling the pre-alarm.
3	Acknowledgement of the pre-alarm by the user	If you acknowledge the pre-alarm during the pre-alarm period or if you eliminate the alarm condition, the pre-alarm signal will stop. The alarm is not triggered for the time being. The possibility of acknowledging the pre-alarm only exists during the pre-alarm time (c).
4	Transmission of the alarm	The radio set transmits an alarm to the personal emergency signal centre. In addition, the radio set starts signalling the alarm (d). This lasts until the alarm is reset.
5	Arrival of alarm at the personal emergency signal centre	The alarm is received at the personal emergency signal centre immediately after being transmitted by the radio set. The personnel at the personal emergency signal centre begins to initiate emergency measures.

Legend (cont'd)

No.	Designation	Description
6	Resetting the alarm	The alarm is terminated by user action on the radio set or by a reset command from the personal emergency signal centre.
a	Personal alarm time	Period of time between the occurrence of the alarm condition (1) and transmission of the alarm (4). The personal alarm time is the total of the delay time (b) and the pre-alarm time (c).
b	Delay time / waiting period	Period of time between the occurrence of the alarm condition (1) and beginning of pre-alarm on the radio set (2). The period of time can be individually programmed for each individual will-independent emergency signal function.
c	Pre-alarm time	Period of time between the beginning of the pre-alarm on the radio set (2) and triggering of the alarm (4). During this period of time, the radio set announces the impending alarm. You can avoid the alarm by acknowledging the pre-alarm during the pre-alarm time (3) or by eliminating the alarm condition. The period of time can be individually programmed for each individual will-independent emergency signal function.
d	Alarm time	Period of time between triggering of the alarm (4) and alarm being reset on the radio set or a reset command being issued by the personal emergency signal centre (6).
e	Reaction time	(according to pre-standard DIN V VDE V 0825 part 1) Period of time between the occurrence of the alarm condition (1) and the arrival of the alarm at the personal emergency signal centre (5).

Localisation functions

Localisation functions

With the localisation functions, the personal emergency signal centre can determine the location of the radio set. Prerequisite is that the radio set is equipped with a GPS receiver, or that inductive localisation beacons (IOS) are permanently installed on the premises where the personal emergency signal system is being operated. The radio set saves GPS position data or the code of the inductive localisation beacon (IOS) while it is within transmission range. The localisation functions can be used for the following application scenarios:

- Localisation of the radio set in case of alarm
- Tracking of the radio set in an alarm situation (p.120)
- Warden control mode (p.121)

Localisation of the radio set in case of alarm

After a personal alarm is triggered, the radio set transmits the codes of the last three inductive localisation beacons (IOS) saved to the personal emergency signal centre. The staff at the personal emergency signal centre can reconstruct the path you have covered with the radio set immediately before the alarm was triggered by analysing these codes.

Tracking of the radio set in an alarm situation

After a personal alarm is triggered, the radio set remains in alarm condition until the alarm is terminated, see section „Alarm and alarm processing“ (p.130).

If the radio set receives additional codes from inductive localisation beacons (IOS) while in alarm condition, e.g. because you are fleeing from a danger while carrying the radio set after triggering the personal alarm, the radio set will also transmit these codes to the personal emergency signal centre. In this way, the staff at the personal emergency signal centre can trace the escape route during the alarm condition.

Warden control mode

The warden control mode is used to log check points during an inspection round if you are working as guard personnel. The radio set can be programmed with the settings required for this purpose. During programming it can be defined which emergency signal functions shall be active in the radio set.

With the warden control mode active, the radio set will react as follows if it reads the code of an inductive localisation beacon (IOS):

- The code is signalled acoustically (if programmed).
- The code is displayed on the display.
- The code is transmitted to the personal emergency signal centre.

TIP

Radio sets with active warden control mode are typically specially marked. If necessary, ask the responsible system administrator of the personal emergency signal system whether the warden control mode is activated on your radio set.

Technical alarms and faults

Fault messages and technical alarms signal that a personal emergency signal unit is either non-functional or functional only with restrictions.

Technical alarms

The personal emergency signal centre sends out cyclical status requests. The personal emergency signal unit must respond to these status requests. If there is no status request from the personal emergency signal centre or no feedback from the radio set, a technical alarm is triggered both at the centre and on the radio set, provided this is technically possible.

Typical causes include:

- No feedback because the radio set is defective.
- No status requests because the personal emergency signal centre is defective.
- No radio connection between the radio set and the personal emergency signal centre because the radio set is out of radio range.

Technical faults

Technical faults, just like technical alarms, signal that a personal emergency signal unit is either non-functional or functional only with restrictions. As opposed to the technical alarms, technical faults are not defined in the requirements issued by the employer's liability insurance associations.

Typical causes include:

- The radio set detects that the battery is exhausted.
- The delay time for repeating the sensor test in continuous operation mode was exceeded.

Programming

The correct programming of your radio set is prerequisite for logging into the personal emergency signal centre. During programming, the user defines which emergency signal functions are activated on your radio set.

Putting into operation

The section below describes how to start up your radio set as a personal emergency signal unit. You will find a summary of all work steps in the quick reference guide. Following that, you will find detailed information about the most important work steps.

Quick reference guide

These short instructions provide a brief description of all work steps required for starting up your radio set as a personal emergency signal unit.

Prerequisite:

- Your radio set was correctly programmed by the operator of the personal emergency signal system.
- You know which emergency signal functions are programmed on the radio set.

Carry out the following work steps:

1. Perform a visual inspection (p.123).
2. Switching on the radio set (p.67).

When you remove the radio set from the charger, it is already switched on.

3. Logging into the personal emergency signal centre (p.124), Perform the sensor test (p.128).

If the automatic log-in procedure is programmed on your radio set, it will automatically start the sensor test (work step 3) after it is removed from the charger.

? *You cannot log into the personal emergency signal centre?*

- Activate the trunking mode (TMO), see section „Activating the trunking mode“ (p.63).
- Repeat work step 3.

4. Fitting the tear-off cord (p.129).

5. Affixing the radio set to your clothing (p.129).

✓ Done.

Perform a visual inspection

Check the radio set thoroughly and diligently every time before starting up the unit.

Check the following criteria:

- Is any damage visible?
- Are any impaired functions detectable?
- Are all accessories properly connected and tightly seated?
- Is the battery charge sufficient for the intended period of use?

Your radio set must pass the visual inspection without any suspected damage or impairment. If you feel that your radio set might not be in proper condition, ensure that it will not be used until a specialist has examined its condition.

TIP

Continue the start-up only if the radio set passes the visual inspection.

Logging into the personal emergency signal centre

To log the radio set into the personal emergency signal centre, the trunking mode (TMO) must be activated on the radio set.

Login status

A symbol in the footer of the display indicates whether the radio set is logged into the personal emergency signal centre.

Symbols indicating the log-in status

Symbol	Login status	Remark
	Not logged in	The emergency signal functions are not available on the radio set.
	Logged in	The emergency signal functions are available on the radio set.
	Error	The radio set is logged in, but the connection is interrupted. Triggered alarms are not being transmitted until the connection is restored.

Login types

When the radio set is programmed, the operator defines how the radio set will log into the personal emergency signal centre. One of the following login types is programmed on the radio set:

Login types of the radio set to the personal emergency signal centre

Programmed value	Description
"automatically"	<p>The radio set logs into the personal emergency signal centre automatically as soon as you remove it from the charger or start it up by attaching the battery.</p> <p>Before the radio set logs into the personal emergency signal centre, the radio set will prompt you to perform a sensor test, see section „Sensor test“ (p.127).</p> <p>The radio set will automatically log out of the personal emergency signal centre when you place it back in the charger.</p> <p>Manual log-in and log-off to the personal emergency signal centre are not possible.</p>
"automatically and manually"	<p>Your radio set automatically logs into the personal emergency signal centre as soon as you switch it on or after you remove it from the charger.</p> <p>Before the radio set logs into the personal emergency signal centre, the radio set will prompt you to perform a sensor test, see section „Sensor test“ (p.127).</p> <p>You can abort the sensor test and operate the radio without emergency signal functions.</p> <p>After completing the mission, manually log the radio set out of the personal emergency signal centre. If needed, you can log it back in manually.</p>
"manually"	<p>You have to log the radio set into the personal emergency signal centre manually, see section „Logging in the radio set manually“ (p.126).</p> <p>After completing the mission, you have to log the radio set out of the personal emergency signal centre manually.</p>

Putting into operation

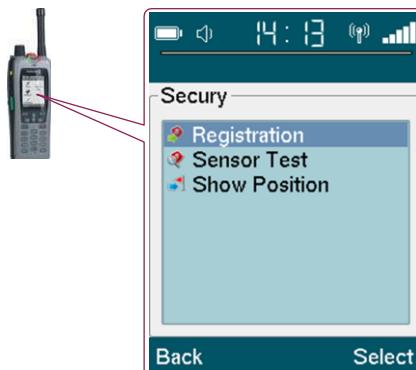
Logging in the radio set manually

If the automatic log-in procedure is programmed on your radio set, it will automatically start the log-in procedure after it is removed from the charger. If manual log-in and log-off is programmed on the radio set, you must log the radio set into the personal emergency signal centre manually.

Carry out the following work steps:

1. Unlock keyboard (if necessary).
2. On the display, navigate to **MAIN MENU > SECURITY**.

The **SECURITY** menu is displayed.



3. Highlight the **LOGIN** menu item using the cursor keys.

? *The menu item **LOGIN** is not being displayed?*

→ Activate the trunking mode (TMO), see section „Activating the trunking mode“ (p.63).

4. Press the **<Right softkey>** key to execute the function.



The radio set will then prompt you to perform the sensor test, see section „Sensor test“ (p.127).

After successfully completing the sensor test, the radio set logs into the personal emergency signal centre.

✓ Done.

Sensor test

During the sensor test, the radio set tests the integrated sensors. Before the radio set logs into the personal emergency signal centre, the radio set will prompt you to test the sensors.

Please note:

During the sensor test, the sensors for all emergency signal functions programmed on the radio set are being tested. In the meantime, you have to initiate a variety of different actions on the radio set. These actions are described in section „Perform the sensor test“ (p.128).

The menu **SENSOR TEST** on the display guides you through the test procedure. Each individual sensor is tested consecutively. When a sensor passes the test, the pertinent display content changes from **TEST** to **OK**. An acoustic signal is heard additionally (if programmed)



Display with menu **SENSOR TEST**

Putting into operation

If the radio set is not offering the testing of individual sensors, either the pertinent emergency signal function or the pertinent sensor test was not programmed.

If a sensor is detected as faulty, the remaining display content remains on **TEST**. In this case, logging into the personal emergency signal centre is not possible. Have your radio set checked by a specialist and ensure it is not used before this check is completed.

TIP

Ask the system administrator of your communication systems which personal emergency signal functions are programmed on your radio set.

Perform the sensor test

In the following, all sensors that can be programmed on the radio set are listed. If an emergency signal function is not programmed on the radio set, the test for the pertinent sensor is skipped without performing the test.

Prerequisite:

- Your radio set is not in the charger.
- The **SENSOR TEST** menu is displayed.
- You can carry out the following work steps in any order.

Carry out the following work steps:

1. **PRESSURE ALARM** sensor: Press the **<Alarm>** key.
The display changes to **OK** if the sensor passes the test.
2. **WARNING ALARM** sensor: Press the **<Function key 1>** key long.
The display changes to **OK** if the sensor passes the test.
3. **LOCALISATION** sensor: Move the radio set near an inductive localisation beacon (IOS) so it will receive a valid localisation signal.
The display changes to **OK** if the sensor passes the test.
4. **LOSS ALARM** sensor: Remove and put the **<tear-off contact>** into your pocket.
The display changes to **OK** if the sensor passes the test.
5. **NO-MOTION ALARM** sensor: Move the radio set.
The display changes to **OK** if the sensor passes the test.
6. **TIME ALARM** sensor: Press the **<Right softkey>** key.
The display changes to **OK** if the sensor passes the test.

7. POSITION ALARM sensor:

- Position the radio set vertically. Wait for a short time.
- Position the radio set horizontally. Wait for a short time.

The display changes to **OK** if the sensor passes the test.

- ✓ The display shows the log-in status, e.g. "Secure - logged into Secury server".

TIP

After completing the log-in, the radio set will react to all programmed emergency signal functions and is constantly being monitored by the personal emergency signal centre.

Fitting the tear-off cord

The tear-off cord is connected to the tear-off contact, see section „Triggering the loss alarm“ (p. 116). If the radio set detaches from your clothing or is forcefully torn off, the tear-off cord is designed to open the tear-off contact and trigger a loss alarm.

Affix the free end of the tear-off cord to a suitable spot of your clothing near the radio set. Ensure that the cord will neither be in your way as you work nor become a hazard, e.g. by potentially coming into contact with rotating machine parts.

Affixing the radio set to your clothing

You should affix your radio set securely to your clothing directly after the sensor test. To do this, use the clip or the bag.

Choose a suitable carrying position. Please bear in mind:

- You must be able to reach all keys of your radio set reliably at any time.
- The position alarm and the no-motion alarm must be reliably triggered in case of an alarm.
- The radio set must not come off your clothing by mistake.

TIP

While affixing the radio set, hold it vertically and do not move it too slowly in order to avoid unintentionally triggering a position or no-motion alarm.

Operation

Operation

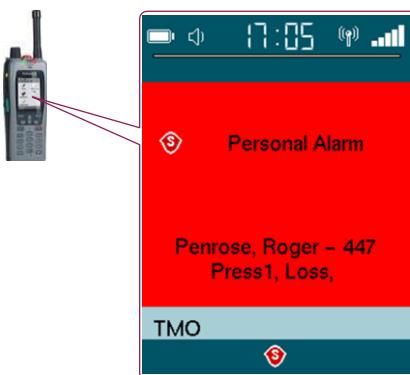
You can use your radio set to provide security for dangerous (single person) tasks if the unit is logged into the personal emergency signal centre. The radio set will react to all programmed emergency signal functions and will be constantly monitored by the personal emergency signal centre, see section "Alarm and alarm processing". In continuous operation mode, you should repeat the sensor test regularly, see section „Sensor test“ (p.133).

Alarm and alarm processing

When an alarm is triggered and transmitted to the personal emergency signal centre, the radio set will signal this event with display content and acoustic signals (if programmed). At the same time, evaluation and processing of the event starts in the personal emergency signal centre.

An alarm is triggered as follows:

- If you press the key **<Alarm>**, the radio set will trigger a pressure alarm and transmit it to the personal emergency signal centre. The display indicates the **PUSH ALARM** alarm type. An acoustic signal is heard additionally (if programmed)
- If you press the key **<Function key 1>**, the radio set will trigger a warning alarm and transmit it to the personal emergency signal centre. The display indicates the **WARNING ALARM** alarm type. An acoustic signal is heard additionally (if programmed).
- When the pre-alarm time of a will-independent alarm expires, and if the pre-alarm was not acknowledged, or if the alarm condition is not cancelled, the radio will trigger an alarm. The display indicates the respective alarm type. An acoustic signal is heard additionally (if programmed)



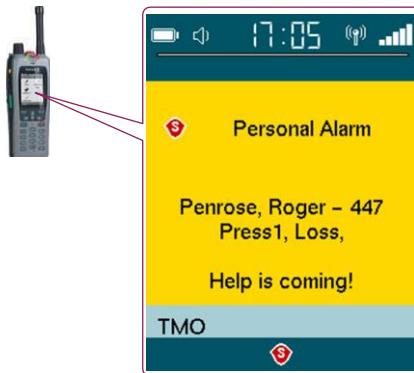
Display after an alarm is triggered (here: pressure alarm 1)

Acoustic signals for signalling alarms (default settings)

Event	Signal tone
Alarm 1	Very loud, quickly alternating tone sequence with high and low tones.
Alarm 2	Very loud, slowly alternating tone sequence with high and low tones.
Warning alarm 1	Very loud, quickly alternating tone sequences with tones of similar frequency
Warning alarm 2	Very loud, slowly alternating tone sequences with tones of similar frequency

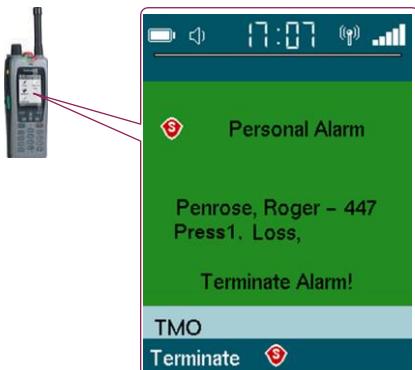
During that time, evaluation and processing of the event starts at the personal emergency signal centre.

First, the personal emergency signal centre personnel confirms receipt of the alarm. Your radio set receives the acknowledgement. The display shows the following message:



Display content after acknowledgement of receipt at the personal emergency signal centre.

After the personal emergency signal centre personnel has taken all necessary steps, the personal emergency signal centre grants the radio set the permission to reset the alarm. The display shows the following message:

Operation

Display content after granting the permission to reset by the personal emergency signal centre

Now you can reset the alarm on the radio set. Press the **Left softkey** to execute the **TERMINATE FUNCTION**. Alarm processing is now complete.

Sensor test

Repeat the sensor test regularly while the radio set is logged into the personal emergency signal centre. For this purpose, start the sensor test manually, see section "Activating the sensor test manually". If your personal emergency signal system is operated as per the specifications of the employer's liability insurance association, you are required to perform the sensor test at least once every 24 hours, see section „24-hours check“ (p. 135).

Activating the sensor test manually

Prerequisite:

- Your radio set is not in the charger.

Carry out the following work steps:

1. Unlock keyboard (if necessary).
2. On the display, navigate to **MAIN MENU > SECURITY**.

The **SECURITY** menu is displayed.



3. Highlight the menu item **SENSOR TEST** using the cursor keys.

Operation

4. Press the **<Right softkey>** key to execute the function.



The **SECURITY SENSOR TEST** menu is displayed.

The radio set will then prompt you to perform the sensor test, see section „Sensor test“ (p. 127).

After successfully completing the sensor test, the display indicates the current log-in status, e.g. "Secure - logged into Secure server".

✓ Done.

Please note:

During the sensor test, the sensors for all emergency signal functions programmed on the radio set are being tested. In the meantime, you have to initiate a variety of different actions on the radio set. These actions are described in section „Perform the sensor test“ (p. 128).

If your radio set detects a faulty sensor, the pertinent display remains set to **TEST**. The radio set transmits a technical alarm to the personal emergency signal centre.



Display with menu **SENSOR TEST**

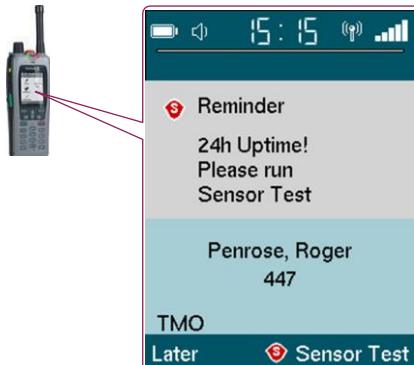
24-hours check

If your radio set has been certified by the employers' liability insurance association, you are required to perform the sensor test at least once every 24 hours.

The radio set will prompt you to test the sensors before this period expires. If you press the **<Left softkey>** key (later), you can postpone the sensor test by a few minutes. After that, the radio set will prompt you again to perform the sensor test.

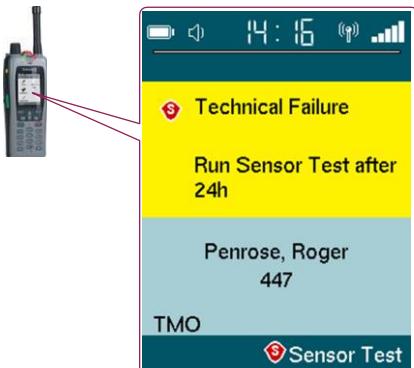
After successfully completing the sensor test, the counter will restart the time.

After expiration of the 24 hours without a sensor test or after premature abortion of the sensor test, the radio set will send a technical alarm to the personal emergency signal centre. A fault message is shown on the display. The emergency signal functions of the radio set continue to be active in the meantime.



Request to perform the sensor test (24-hours test) before the deadline expires

Shutting down



Technical alarm because the 24-hours test was not carried out in good time

TIP

You can also activate the sensor test manually before the period expires, see section „Activating the sensor test manually“ (p. 133).

Shutting down

After completing the mission, log the radio set out of the personal emergency signal centre.

Logging out of the personal emergency signal centre

If the automatic log-off procedure is programmed on your radio set, it will automatically log out of the personal emergency signal centre when it is placed back in the charger.

Logging the radio set out manually

If manual log-in and log-off is programmed on the radio set, you must log the radio set out of the personal emergency signal centre manually with the following steps.

Carry out the following work steps:

1. Unlock keyboard (if necessary).
2. On the display, navigate to **MAIN MENU > SECURITY**.

The **SECURITY** menu is displayed.



3. Highlight the **LOG-OUT** menu item using the cursor keys.
4. Press the **<Right softkey>** key to execute the function.



The radio set is logging itself out of the personal emergency signal centre.

✓ **Done.**

TIP

The emergency signal functions will be available to you only after another sensor test and logging into the personal emergency signal centre again.

Shutting down

Service and cleaning

This chapter contains information on how to service and clean the radio set.

Care information

The recommendations below apply in the same way to the radio set, the battery, the charger, and all accessories.

- Do not use any chemicals, solvents or aggressive cleaning agents for cleaning the radio set.
- Do not paint the radio set. The paint may stick the moving parts together, thus preventing proper unit operation.
- Wipe off the housing with a moist cloth as required. Never use a dry cloth. This involves a static charge hazard.
- From time to time, carefully blow out all openings accessible from the outside and the battery compartment.
- The radio set is jet-proof. After contact with liquid, remove the water from the radio set with an absorbent cloth. Knock the liquid out of the microphone opening.

Cleaning after contact with liquid

Should your radio set have come into contact with a large amount of liquid, and you suspect that liquid may have seeped in, e.g. because the battery was not completely locked or the antenna was not screwed on, proceed as follows:

- Switch off the radio set.
- Remove the battery.
- Carefully remove water or dirt.
- Remove the special screw-on FT4 side connector cover.
- Hold the radio set in a horizontal position with the battery compartment open and facing downward so the liquid can flow out.
- Hold the radio set in a vertical position. While doing so, tilt the radio set slightly to the front and the rear while shaking it slightly.
- Dab all parts dry. After that, store the radio set in a dry and warm place with the battery compartment open and the keys facing downward for at least 72 hours. Do not place the unit in a microwave oven or an oven.

After the radio set has completely dried, you can put it back into operation in many cases. Check all functions during an extended test operation.

Care instructions for the batteries

The battery capacity remains available for a long time if you consider the following instructions.

- Use only a system-compatible charger for charging the batteries.
- Charge the battery immediately as soon as it is exhausted.
- Charge the battery after switching off the radio set.
- If you anticipate not using the radio set for several days, disconnect the battery from the unit and charge it. This will prevent the battery from self-discharging.
- It is detrimental to the service life of the battery if the unit is heated to high temperatures during storage or operation. Never expose the battery to direct sunlight or other heat sources for an extended period of time.

Technical data

This chapter contains the technical data of the radio set.

Mechanical and electrical properties

Technical data

Properties	
Dimensions HxWxD (without antenna)	145 mm x 60 mm x 36 mm 148 mm x 60 mm x 42 mm (with belt clip)
Weight	approx. 295 g to approx. 360 g (depending on the battery type used)
Degree of protection	IP 65 according to IEC 60529 jet-proof and dust-tight
Battery	Lithium polymer battery 3.7 V or lithium ion battery 3.7 V (depending on the battery type)
Operating time (at room temperature)	up to 8 h with a battery capacity of 1500 mAh up to 14 h with a battery capacity of 2700 mAh (at 5 % transmit time, 5 % receive time and 90 % stand-by time)

TETRA-specific properties

Technical data

Properties	
Frequency band	380 MHz to 430 MHz
	450 MHz to 470 MHz (option)
Duplex spacing	10 MHz (380 MHz to 470 MHz)
Switching bandwidth	
TMO	Depending on frequency range
DMO	Depending on frequency range
HF transmit power	1 Watt
Range extension	Antenna with 3dB gain

Operating conditions

Technical data

Properties	
Temperature ranges (radio set)	
Operation	-20 °C to +55 °C
Charging	0 °C to +40 °C
Storage	-30 °C to +75 °C without battery
Temperature ranges (battery)	
Charging	0 °C to +40 °C
Short-time storage	-20 °C to +45 °C
Long-time storage	0 °C to +15 °C
Operating elevation range	up to 2000 m ASL

Energy supply data

Technical data

Properties	
FT4 2700 V battery	Lithium polymer battery 3.7 V DC; 2700 mAh; with vibrator Degree of protection III according to IEC 60950-1
FT4 1500 battery	Lithium polymer battery 3.7 V DC; 1500 mAh Degree of protection III according to IEC 60950-1
Desktop charger II FT4 and Desktop station FT4 with system-compatible plug-in power supply unit	Input: 100 V to 240 V AC; 50 Hz to 60 Hz; 0.4 A Output: 5 V DC; 2 A Degree of protection II according to IEC 60950-1

TIP

For information on charging accessories for travel and for use in automotive vehicles, contact your speciality retailer or our sales department.

Side connector

Technical data of audio interface

Properties	Technical data
Maximum output values of side connector interface in case of a fault (Output parameters - explosion protection Ex ib)	U_0 4.20 V I_0 2.7 A
Permitted combinations of capacitance and inductance which may be connected to this interface of the radio set:	max. capacitance: C_0 1.0 μF max. inductance: L_0 3.0 μH
Permissible ambient temperature range (T_a)	$-20 \text{ }^\circ\text{C} \leq T_a \leq + 55 \text{ }^\circ\text{C}$
For more detailed information on pin assignment and interfaces (input/output parameters), refer to the Funkwerk Security Communications GmbH document with part no. 5010941100_02_02.	

Accessories having their own power supply must not feed power into the side connector.

security communications



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