STP9000 Family

Hand-Portable Radios

Issue 2

PRODUCT BULLETIN

Contents

INTRODUCTION

PURPOSE

The purpose of this document is to give a description of the functions and features of the STP9000 family of Hand-Portable radios. This will include the STP9000, STP9100 & STP9200.

OTHER DOCUMENTS

DN108 STP9000 – STP9000 series data sheet.

DN109 STP9100 – STP9100 series data sheet.

DN110 STP9200 – STP9200 series data sheet.

SB-P-08-4094 – STP80/9000 family accessory bulletin

GLOSSARY

Term	Explanation
COTS	Commercial Off The Shelf
CCK	Common Cipher Key
DCK	Derived Cipher Key
DUN	Dial Up Networking – Bluetooth support of packet data sessions
E2E	End to End - encryption
HSP	Head Set Profile – Bluetooth support of a headset
LIP	Location Information Protocol – IOP compliant location reporting protocol
OTAR	Over The Air Rekeying – TETRA key delivery method
RAC	Rugged Accessory Connector
SASI	Sepura Advanced Serial Interface
SCK	Static Cipher Key
SPP	Serial Port Profile – Bluetooth support of an RS232 serial port
TFT	Thin Film Transistor - LCD display technology
UI	User Interface
RM2	Radio Manager 2

CHANGE HISTORY

Issue	Explanation
1.2	Corrected examples shown on page 45
1.3	Updated battery capacity figure from 1260mAh to 1160mAh - Std cap pack
1.4	Add water jet ‘ fit for purpose’ on page 11

1.5	Added colour bezels on page 40
1.6	Clarified Connector Protect function (page 12); Clarified soft keys on radio.
1.7	Added use cases for smart technology (page 30)
2.0	Removed +EDR from BT section as BT device only supports v2.0

SUMMARY

The STP9000 family is the flagship of a truly innovative range of TETRA hand-portable radios, designed for users who want the best. It features a large colour screen and full keypad, offers superb functionality coupled with extremely robust hardware and meets the ever-increasing demands and requirements of sophisticated users worldwide.

The STP9000 family consists of three models. STP9000 - a top of the range, feature-rich hand-portable radio; The STP9100 – a reduced keypad variant of the STP9000, for users who just require quick & easy access to specific features and the STP9200, the entry level model providing all of the essential features that you would expect on a ruggedised entry level TETRA radio.

ROBUST

Waterproof, submersible, dust proof and marine-hardened, the STP9000 family has the design and construction values that enable it to withstand the most harsh and challenging environments. Its IP67 environmental protection rating and Connector Protector technology, to counter the potential corrosive damage from salt water and salt fog, mean that the STP9000 family can be used in a huge range of wet, salt-laden and dusty environments.

Audio accessories can be attached to the STP via the large, rugged audio connector (RAC), located on the side of the radio. The RAC provides a secure, finger-tightened, screw down feature offering a reliable connection for a comprehensive range of audio accessories, including a Remote Speaker Microphone with remote antenna for superior operational performance.

USER SAFETY

The innovative hardware design of the STP9000 blocks out background noise, whilst its advanced audio equalisation technology provides a radically enhanced full-duplex telephony audio experience. With extended GPS capabilities, Man-Down and the STProtect in-building localisation solution as options, Sepura has put user safety firmly at the heart of the design for the STP9000 family of TETRA radios.

USER INTERFACE

The STP family uses the latest high resolution display technology allowing it to be easily read, even in direct sunlight. This is further helped by the large display combined with the large text mode options, high resolution and sharp image. The enhanced Sepura menu system, uniquely offering three different presentation styles, which users can select according to their personal preference, thus reducing training costs and improving choice, offers the very best user experience in TETRA today.

SMART TECHNOLOGY

New ‘Smart technology’ has been incorporated within the STP9000 family to provide additional benefits to the user. These include: **Twist and Zoom[1]** to enable the screen image to rotate and be zoomed to full-screen size as the user rotates the radio; **Haptics[1]** to provide vastly improved feedback, even through thick gloved hands when a button is pressed on the

radio, and **RFID** to enable additional applications such as automated pairing of the user to pool issued radios, radios to pool issued vehicles and the support of asset tracking.

Future proofed application support is available via SDA, WAP based radio apps, plus up to 4GB of local data storage is available using a standard Micro SD Card slot. This is ideal for the storage of photographs, maps, missing person information and hazardous chemical data. All these are capable of being viewed on-board or transferred to and from a standard PC or Tablet, as required, for easy management.

SUMMARY OF KEY FEATURES

Key features include:

- Dustproof, waterproof and fully submersible ruggedised hand-portable
- 1.8W high power RF and class- leading audio performance
- Unique high definition colour transmissive and reflective TFT screen[1]
- Capable of displaying maps and images[1].
- Screen images clearly viewable without back light and in direct sunshine
- Fully integrated, ultra-sensitive GPS option
- Fully integrated Bluetooth™ wireless interface option[1]
- Haptic – glove friendly, technology[1]
- Twist and Zoom image presentation[1]
- Integrated RFID tag
- Supports standard Micro SD Memory cards up to 4GB in size for image storage, maps and applications[1]
- End to End (E2E) encryption is hardware-enabled, requiring only a software upgrade for activation
- Integrated E2E encryption module
- Comprehensive tamperproof protection[1]
- A SIM Smart Card connector for ISO 7816 ID000 Smart Card based E2E encryption.
- The UI can display:
  - 3 sizes of text, 17+ languages
  - ISO 8859-1 and ISO 8859-5 character sets including English, Italian, Swedish, French, German, Spanish, Dutch and Cyrillic based languages.
  - Ideographic character sets; Simplified Chinese, Traditional Chinese, Korean, and Arabic.
- Support for TEA1, TEA2, TEA3 and TEA4 air interface encryption algorithms.
- Full set of standard and enhanced accessories
- Rugged side accessory connector
- Accessories 100% compatible with STP8000 family of hand-portables
- Batteries 100% compatible with STP8000 family of hand-portables

[1] Features available on STP9000 and STP9100 series only

Notes:

- The STP9000 family requires Radio Manager 2 (RM2), for programming/ customisation. Details of RM2 are available in the Sepura publication MOD-12-1426.

- After exposure to a salt water environment it is recommended that the radio product is lightly rinsed in clean fresh water to prevent the build-up of salt crystals'

STP9000 FAMILY

STP9000 series **STP9100 series** **STP9200 Series**

The following information provides details of the various products and the features that are specific to the individual model types.

POWERFUL RF AND AUDIO

AUDIO

All of the STP9000 family boasts a package of design features delivering class leading audio clarity and power.

The STP uses a large, forward-facing loudspeaker mounted within an acoustically optimised case.

Rated at 1.2W, the speaker is operated only in its optimal range and is never over-driven.

In addition, enhanced digital signal processing is employed to provide optimised audio quality at maximum sound pressure. This includes:

- Automatic gain (VOGAD) adjustment imparts additional gain to the radio when operating at low audio input level to cater for a wide range of differing operational requirements
- Noise cancelling technology decreases the unwanted background noise, thus increasing the overall volume and clarity of the received speech.
- Anti-howl processing provides superior audio quality.
- Maximum and minimum audio levels for speech and tones are independently configurable. This allows the hand-portables to be programmed for use in many different environments.
- Dual microphones and dual speaker/earpiece design - optimised for both radio and telephone-style calls.
- This same class-leading audio clarity and power is also supplied to the audio accessory interface

45mm diameter loudspeaker

Key Audio features

- ✓ Large 45 mm diameter front- facing speaker for improved clarity
- ✓ Acoustically optimised case
- ✓ Rated at 1.2W the speaker is operated only in its optimal range and is never over driven.
- ✓ Enhanced digital signal processing is employed to provide optimised audio quality at maximum sound pressure.
- ✓ Automatic gain (VOGAD) adjustment.
- ✓ Noise cancelling technology decreases the unwanted background noise, thus increasing the overall volume and clarity of the received speech.
- ✓ Anti-howl processing provides superior audio quality.
- ✓ Maximum and minimum audio levels for speech and tones are independently configurable.
- ✓ Dual microphone and speaker design optimised for both radio and telephone style calls
- ✓ Speaker mute feature for privacy

RF POWER

The STP is a true 1.8W MS Class 3L device. Typically this provides 30% extra range over a typical 1 Watt MS Class 4 (+/- 2dB) device, which approximates to 20% further range in the real world environment. This is the highest that can be achieved without impacting on battery life/product size and/or weight.

The increased range will allow DMO users to stay in contact over a greater area when working back to back or via a DMO Gateway or DMO Repeater.

The enhanced RF power will reduce the cost of network ownership by reducing both the number of base stations and the associated site links required when compared to a 1W hand-portable designed network.

Key RF features

- ✓ True 1.8W MS Class 3L device
- ✓ Typically 20-30% range improvement over a 1W MS Class 4 (+/- 2dB) device
- ✓ Improved RF power has no impact on battery performance.
- ✓ Allows enhanced DMO user coverage – compatible with DMO Repeater and DMO Gateway
- ✓ Reduces base station numbers in comparison to a typical 1 Watt designed network, subject to traffic loading.
- ✓ In comparison with a typical 1W device users, have a greater chance of obtaining TMO connectivity when in restricted coverage areas, such as within a building.
- ✓ SAR compliant, as per European Standard EN 50361:2002 of 2.0W/Kg.
- ✓ RF Power levels customisable for TMO/DMO in 5 steps
- ✓ Built in protection against accidental use without antenna fitted.

Antenna Options

The STP9000 family of hand-portable radios is available with a range of tuned antennas. These are selected depending on the operational frequency band, the carrying position of the hand-portable and even the level of RF coverage of the network.

- ✓ Extended Helical wide band antenna
- ✓ ¼ wave whip wide band antenna

See STP Accessory product bulletin number SB-P-08-4094 for full details

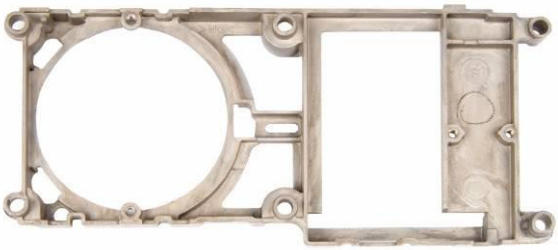
RUGGED DESIGN

RUGGED CONSTRUCTION

The unique design of the STP9000 family incorporates a sturdy metal chassis within a thick polycarbonate casing, together with shock mounted PCB, display and connectors. This enables the product to withstand severe drop/shock testing that is 3.25 times more than that defined in the ETSI EN 300 019 most onerous test classes 5M3 and 7M3

ETSI defines 12 'drops' as 2 times on each face onto concrete from a height of 1.0m.

A total drop distance of **12m**

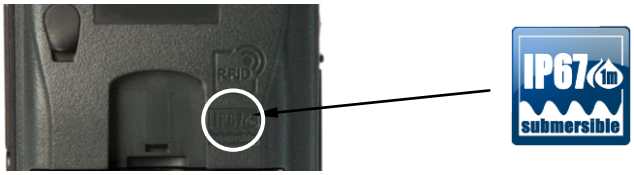


STP is tested to 26 'drops', 4 times on each face from a height of 1.5m on to concrete, plus two more drops at random.

A total drop distance of **39m**

IP67 CERTIFICATION

The STP9000 boasts an IP67 (submersible, waterproof and dustproof) environmental protection rating, which means that it will still function after having been submerged in up to 1m of water for up to 30 minutes. In addition, new Connector Protector technology provides Marine-hardened protection against the corrosive damage that salt water and salt fog can cause to exposed connectors



Key construction features

- ✓ IP67 certified with or without connector covers in place
- ✓ Dust & Water Protection IP67 (waterproof, submersible and dustproof)
- ✓ Shock, drop & vibration ETS 300 019
- ✓ Salt fog: MIL810E 509.4I; duration 24hr salt
- ✓ Robust light weight metal chassis
- ✓ Shock mounted PCB
- ✓ Shock mounted connectors
- ✓ Shock mounted LCD display
- ✓ Tested to 3.25 more than the prescribed ETSI 'drop' test EN 300 019 most onerous test classes 5M3 and 7M3
- ✓ Water Jet "fit for purpose" tested to IPx5
- ✓ Full 8hr shift in rain shower 'fit for purpose' tested (equivalent to 8hrs of IPX4 testing).

CONNECTOR PROTECTOR™ (SALT PROTECTION)

The STP9000 family of hand-portable radios are IP67 certified which means they are dust-poof, waterproof and submersible whether connector covers or accessories are fitted, or not. However, exposing an electrical connector to salt mist or salt water normally results in the pins of the exposed connector turning green within minutes.

The new 'Connector Protector™' feature 'marine hardens' the STP9000 family of hand-portable radios, protecting the exposed facility connector from the corrosive effects of salt mist and salt water. It does this by monitoring activity on the bottom facility connector. When no activity is detected (e.g. radio is working as a modem, or on charge), connector protector disables the bottom facility connector, thus making it safe against the corrosive effects of salt laden mist or salt water. (When Connector Protection is enabled a 'water drop' icon is displayed in the top right corner of the screen.)

If, whilst the radio is in use and Connector Protector is active and the radio is inserted into a car kit or another charging accessory then 'Connector Protector' is automatically disabled. It automatically re-enables on removal from the car kit or charging accessory.

If the radio is attached to a programing cable or data lead which has no dc power applied, then Connector Protector remains active and unless it is manually disabled via the radio settings, the radio cannot 'physically see' the attached cable. If disabled, then once the cable has been removed, Connector protection must be manually re-enabled.

The side RAC normally has a cover or an accessory fitted. Fitted accessories and the RAC cover protect against salt mist or salt water coming into physical contact with the RAC connector pins.

ADVANCED RUGGED ACCESSORIES

The STP supports audio accessories attached to its side mounted 'Rugged Accessory Connector' (RAC). The connector is certified to IP67 whether or not its cover is in place, or an accessory is connected or not.

The RAC provides a robust, tool-free accessory attachment method. Located on the side of the STP, it allows the user's accessory to remain attached whilst charging the radio, or allowing the use of an audio accessory whilst in a car kit.

The connector is 100% compatible with the existing STP8000 family of accessories. Up to 1Watt of audio drive is available from the RAC.

A SASI™ 1-wire interface provides future-proofed accessory support.

- SASI allows future accessories virtually unlimited control functionality.
- Multiple external soft keys – up to 1024.
- Multiple indicators, even alphanumeric display capabilities.

SASI allows the most complex of features to be built into cost-effective accessories.

Key accessory features

- ✓ RAC is IP67 rated, with or without its cover or accessory fitted
- ✓ The RAC provides a simple-to-use rugged accessory connection
- ✓ No tools are required to fit or remove an accessory
- ✓ SASI™ 1 wire interface future proofs the STP to allow support of advanced accessories going forward, for example SASI™ can support up to 1024 additional soft keys
- ✓ A range of advanced accessories - including the Advanced RSM with >1Watt audio.

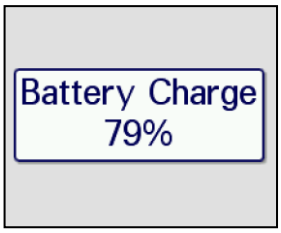
See STP Accessory product bulletin number SB-P-08-4094 for full details.

RUGGED INTELLIGENT BATTERIES

The Sepura robust battery clip in solution has been incorporated, allowing rapid one handed battery changing without tools or removal of covers. Like the SRH, replacing the battery causes the STP to power up in exactly the same mode it was in before the battery was removed. This action is customisable by RM2.

Intelligent Battery Packs

- Lithium Polymer technology - light and small, but high in power.
- 100% compatible with existing STP8000 family batteries and chargers
- Accurately report their 'state of health' to the radio. This is a measure of their true life expectancy and not simply a measure of charge. Users can identify and dispose of batteries nearing their end of life.
- During charging, the STP displays the "time to full charge" in hours and minutes on the STP User Interface. In addition, the state of the charging process is also indicated by the tri-coloured LED on the hand-portable.
- Authenticate with the radio to confirm an approved battery is connected and not an untested, unapproved clone – potentially causing an operational health and safety hazard.
- Battery charge check. When the radio is first switched on and an authentic Sepura battery identified, the display will show the remaining charge available from the connected battery. This feature is especially useful should the user wish to quickly check the state of charge of the battery before carrying out log-on functions and selecting the radio settings card.



Key features

- ✓ Robust, quick, no-tool battery changing
- ✓ Latest hi-capacity, lightweight battery technology
- ✓ Intelligent batteries reporting state of health and authenticity
- ✓ 1160mAh Standard Battery
- ✓ 1400mAh Mid Capacity Battery
- ✓ 1880mAh High Capacity Battery
- ✓ Battery charge check

ENHANCED USER INTERFACE

STP9000/STP9100 SERIES DISPLAY

Radio users can choose from three user interface presentations:

- Compatibility mode – resembles Sepura's existing user interface style
- List – resembles the layout on a standard GSM phone
- Grid – resembles the modern-day smart phone presentation

Compatibility mode brings familiarity to existing Sepura users, who will be comfortable with the STP9000 family from the moment they switch it on.

Grid and List styles appear familiar to new users who may be more familiar with the latest commercial mobile phones than with a professional radio. This minimises training costs, as users can intuitively work out how to use it.

Compatibility Mode

List Mode

Grid Mode

The STP9000/9100 series support a large and high resolution display, providing clarity and easy viewing of maps, missing or wanted persons or other photographs.

The display uses the latest 262K colour transflective TFT display technology, which incorporates a unique 'dual illumination' technology.

When the backlight is switched on a vivid colour display is seen.

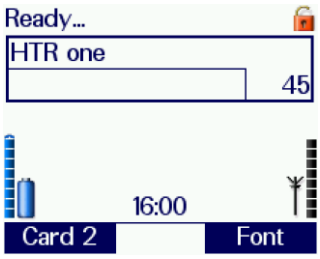
- 262K colours, 176x220 pixels on a 30x38mm active area, provides the largest display in TETRA
- Market leading 3396 pixel resolution per cm² provides the highest pixel dot resolution in TETRA and makes it ideal for image viewing

Where the back light is switched off, when viewing the STP screen in direct sunlight, or when using it in low ‘street light’ conditions, a crystal-clear greyscale image is seen.

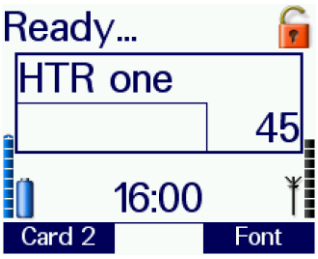
In the harshest of light conditions where other colour displays in TETRA products, PDAs or GSM products simply ‘wash-out’, (i.e. become unreadable and unusable), the STP uniquely provides crystal-clear greyscale visibility

The STP supports 3 sizes of text to enhance user readability. The character sizes are: 2.3mm (standard), 4.1mm (large) and a market leading 8.9mm (very large mode).

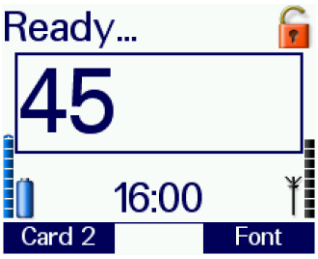
Characters are displayed on a clear white background to optimise viewing.



Normal Text Mode



Large Text Mode



Very Large Text Mode

Designed with security in mind, the ‘Privacy Screen’ is a customisable option which obscures the display after a period of inactivity. This protects the privacy of often sensitive information on the display. The privacy screen is removed by any activity on the radio that would normally need user interaction.

The privacy screen can be customised to show the Sepura logo or another logo, using RM2.

Default Privacy Screen

Your country, service or department logo

The large STP screen can display a total of 6 lines of 24 characters each in Normal Text Mode.

The STP9000/STP9100 series also retains the SRH 'Invert Screen' function that enables viewing while the hand-portable is worn on body.

TWIST AND ZOOM

In the normal upright position the STP9000/9100 radios have a landscape display. Consequently, whilst viewing portrait images stored on the micro SD card, they can appear quite small. If the radio is rotated through 90°, the new Twist and Zoom feature automatically adjusts the image, resulting in a larger image

Standard viewing of portrait image on a STP landscape screen

Rotating radio by 90º in the hand allows the image to be presented on a portrait screen

STP9000/STP9100 DISPLAY FEATURES SUMMARY

- ✓ Three user interface presentations – Compatibility, List & Grid Modes
- ✓ Market leading 3396 pixel resolution per cm² provides the highest pixel dot resolution on a TETRA hand portable
- ✓ 176x220 pixels on a 30x38mm active area provides the largest display on a TETRA hand-portable
- ✓ Vivid 262K colour images when back light on
- ✓ Unique 'dual illumination' technology provides screen clarity under all lighting conditions.
- ✓ Adjustable brightness and contrast settings
- ✓ Clearly viewable as greyscale in the harshest direct sunlight
- ✓ Clearly viewable as greyscale under poor streetlights without the back light on.

- ✓ White background adds to clarity when reading text
- ✓ A total of 6 lines each of 24 characters
- ✓ Sepura original 'Invert Screen' function retained to further aid viewing when worn on the body.
- ✓ Privacy screen security feature, displaying your service, department or country logo
- ✓ Twist and Zoom micro SD image display

STP9200 SERIES DISPLAY

The STP9200 series supports a back-lit high visibility monochrome transflective display.

The screen is clearly visible in all lighting conditions from the harshest of sunlight to total darkness.

As with the STP9000 & STP9100 series, the STP9200 supports three user interface presentations,

- Compatibility mode – resembles Sepura's existing user interface style
- List – resembles the layout on a standard GSM phone
- Grid – resembles a modern-day smart phone presentation

Compatibility Mode

List Mode

Grid Mode

To provide unparalleled clarity and ease of viewing - especially whilst being worn, carried, standing on a desk or mounted in a car kit - the UI supports a new 'Very Large Text Mode' on the top level menu. The text is approximately 3x that of Normal Text Mode.

Like the STP9000/9100, the STP9200 supports 3 text modes to enhance user readability with character sizes of 2.3mm (standard), 3.7mm (large) and 7.4mm (very large mode), displayed on a clear blue/white background to optimise viewing.

Normal Text Mode

Large Text Mode

Very Large Text Mode

Designed with security in mind, the 'Privacy Screen' is a customisable option which obscures the display after a period of inactivity. This protects the privacy of often sensitive information on the display. The privacy screen is removed if there is any activity on the radio that would normally need user interaction.

The privacy screen can be customised to show the Sepura logo or another logo via RM2.

The screen can display a total of 6 lines of 24 characters each in Normal Text Mode. The STP retains the 'Invert Screen' function that enables viewing while the hand-portable is worn on the body.

Key display features

- ✓ Three user interface presentations – Compatibility, Grid & List modes
- ✓ 128x64 pixels on a 37x19mm active area
- ✓ Clearly visible in harsh sunlight and under all lighting conditions.
- ✓ Adjustable brightness and contrast settings
- ✓ Bright background adds to clarity when reading text
- ✓ A total of 6 lines of 24 characters
- ✓ Sepura original 'Invert Screen' function retained to further aid viewing when worn on the body.
- ✓ Privacy screen security feature displaying your service, department or country logo

STP9000 FAMILY - CONTROLS

The popular Sepura original Navi knob™ and 'Mode' button are retained, allowing simple and rapid access to volume control, talk group selection, status messaging and even text entry.

Dedicated four way menu navigation keys - Up, Down, Left and Right - are situated directly below the display. The familiar Sepura emergency button is also retained, this is easy to find without looking and is protected to guard against accidental operation

Taking the lead from the mobile phone industry, the STP9000 & 9100 intuitively support 'Context Sensitive' keys, linked to the options shown on the bottom line of the screen.

Customisable soft keys are also available. The number available for customisation depends upon the actual radio and the number of pre-allocated keys as follows:-

STP9000 – total of 16 soft keys are available for customisation.

-

STP9100 – total of 4 soft keys available for customisation.

STP9200 – total of 7 soft keys available for customisation.

A large tactile PTT key is located on the side of the hand-portable. Immediately above it is a soft key, typically used as a 'Call clear' function when wearing on the belt, making it quick and easy to find.

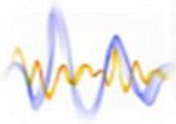
The Sepura tri-colour LED is retained and is clearly visible from both the top and the front of the hand-portable. This allows the user to quickly establish either the radio's status or progress of a call, without looking at the screen.

A Blue LED is also present to indicate to the user if they have missed a call. (Also used if Bluetooth is enabled on STP9000 or STP9100, to indicate activity)

HAPTICS

Another exciting innovation from Sepura is the introduction of haptic technology. Available only on the STP9000 and STP9100 series, haptic is the science of applying touch (tactile) sensation and control to interaction with computer applications. Designed for users with heavy gloves the STP9000 series has used this technology to provide tactile feedback that can be felt through the whole hand, whenever the Mode, Missed Event, Side Softkey (above PTT), Emergency and any of the keymat keys are operated (0-9, * and #), thereby giving the user instant confirmation and assurance that the selected keys have been pressed

A user can choose to enable the haptics from the radio's menu system whenever they wish to wear gloves, and can also disable it when they no longer need to wear gloves



USER SAFETY

EMERGENCY CALLS/WAKE UP ON ALARM FEATURE

The STP9000 family of hand-portable radios have a dedicated emergency button. The button is coloured red and is the only button on the top of the unit, meaning that it can be easily and quickly located when required.

In addition to use in emergency, the alarm button also supports the new Wake-On-Alarm feature. Pressing and holding the new red Alarm button for two seconds whilst the radio is switched off will cause the radio to power up. It will go through the normal process of registering on the network, as it would if the radio's Mode key had been activated, before initiating the alarm call.

The emergency call behaviour is fully configurable when using the Sepura RM2. This includes live microphone operation, automatic GPS position update and status messaging options

Key features

- ✓ Easy to find button
- ✓ Wake up on Alarm feature
- ✓ Protected from accidental use
- ✓ Customisable behaviour including open mic, location update and status messaging
- ✓ Works in conjunction with Lone Worker
- ✓ Works in conjunction with optional Man-Down Alarm

Note: if the radio or network security policy mandates that the user must enter a PIN, the user must enter a valid PIN before an emergency call is made.

Lone Worker

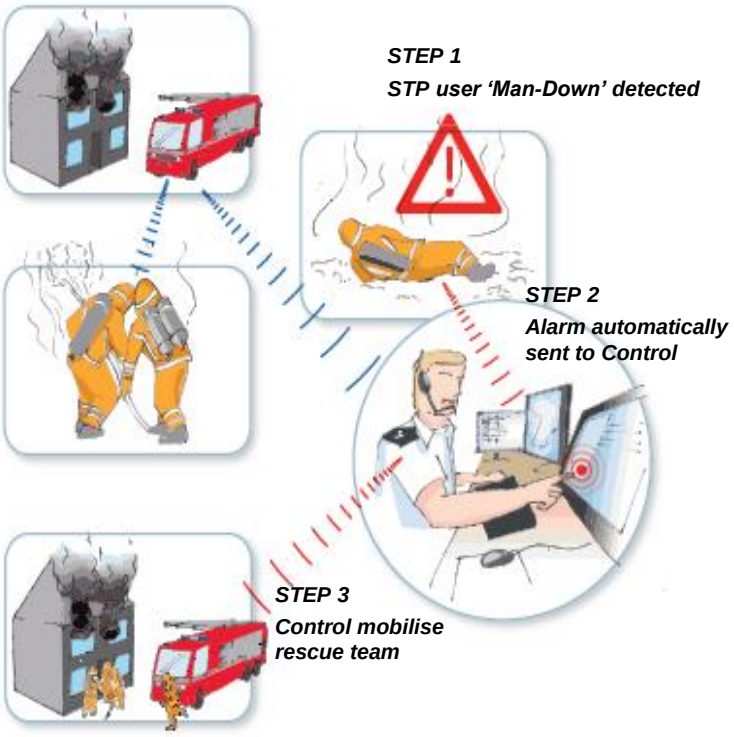
Additional user protection is provided through compatibility with Lone Worker systems. When enabled, the radio will emit an audio alarm to advise the user of a period of none activity. If the user fails to provide a response a second alarm is activated, automatically sending an emergency alarm call to the control centre and/or specific users, alerting them of an emergency situation and to mobilise a response team.

Key features

- ✓ Easy to use
- ✓ Location update
- ✓ Works in conjunction with emergency button
- ✓ Works in conjunction with optional Man-Down Alarm

Man-Down Alarm

Man-Down allows the radio to automatically detect when the user may have become incapacitated. A solid state accelerometer allows the user to be monitored for lack of motion and/or abnormal inclination or 'tilt'.



Motion detector – designed to trigger if the user stops moving for a customised period of time. This can be useful for fire-fighters and anyone else who would normally be moving whilst working. By contrast, a covert operator who remains stationary for long periods may not want to switch on the motion detector.

Tilt sensor – automatically 'baselines' on switch on and is designed to trigger when the angle of the radio varies by more than a customised angle for more than a customised period of time. Both a fire-fighter and a covert operator could want the tilt sensor enabled.

Should a sensor trigger – via lack of motion and/or an inclination greater than the trigger angle - a local alarm sounds. A visual and audible indicator invites the user to confirm status as OK.

The user can clear the local alarm by pressing a soft key or by simply moving or tapping the radio to indicate 'I am OK'. If the alarm is not cleared, an emergency status is sent to control and the local alarm helps colleagues find the source of the alarm.

If the user does press the soft key, the Man-Down system can be customised via Radio Manager to re-calculates its base line to accommodate the way in which the user is now wearing the STP and how the user is now moving or positioned. For example – if the user switched on 'Man-Down' whilst standing and now they are crawling, the fact that crawling is now the 'norm' will be recognised. This prevents multiple false alarms.

Man-Down is available as a factory fitted-hardware option only. The hardware only becomes enabled if a Man-Down feature licence code is assigned to the STP by Radio Manager.

Radio Manager also allows full control of how and when the user is monitored as well as what control the user has over Man-Down functionality.

Key features

- ✓ Customisable operation to match the user's working environment
- ✓ Automatically adjusts as the user's inclination 'norm' alters (customisable)
- ✓ User's last valid GPS location sent on activation
- ✓ 90dBA (at 3m), loud Local Alarm function automatically triggers to guide colleagues to source of alarm (customisable)
- ✓ Simple to use
- ✓ Solid state – no moving parts
- ✓ Built-in hardware option on the GPS module
- ✓ Man-Down enabled by software Feature License Code assigned by Radio Manager
- ✓ Works in conjunction with emergency button
- ✓ Works in conjunction with Lone Worker systems

Important:

- The Man-Down Alarm should in no way be regarded as a substitute for compliance with appropriate risk assessment and other safety procedures and practices.
- The Man-Down Alarm should increase the chances of incapacitated users of units being detected. However, users should not wholly entrust their safety to the Man-Down Alarm.
- If you wish to take advantage of this option now, or in the future, please contact your local Sepura representative to make sure that the correct hardware is specified when ordering your STP9000/9100 or STP9200 radio.
- Please note that the hardware only becomes enabled if a Man-Down feature licence code is purchased and assigned to the STP by Radio Manager.

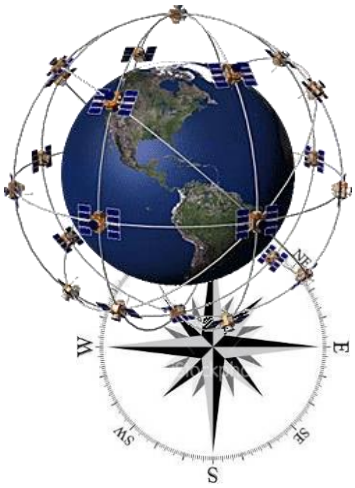
Note: The vibratory alerts are disabled whilst Man-Down is switched on'

GPS

The STP9000 family uses the very latest in GPS technology, thereby enabling the GPS module to operate in a wide variety of user environments, including some in-building coverage. Ensuring that the position of a user is known will enable appropriate resources to be swiftly deployed when assistance is required.

Features of the in-built GPS module are:

- Ultra-sensitive technology, achieving a market-leading -162bBm tracking thus ensuring that the module continues tracking even in very weak GPS signal areas, such as between high rise buildings.
- Using Predictive Ephemeris, the STP9000 family dramatically shortens the time to start tracking in weak signal areas by taking a pre-stored ephemeris (up to 48hrs old) , applying a series of rapid computations to the data to predict the current orbital status of available GPS satellites, thereby allowing tracking to commence where previously this would not have been possible.
- Low power consumption and efficient power management system to place the receiver into a sleep mode until required, minimising the impact on the battery duty cycle.



The GPS module and antenna are fully integrated into the radios and are therefore protected by the STP's rugged casing.

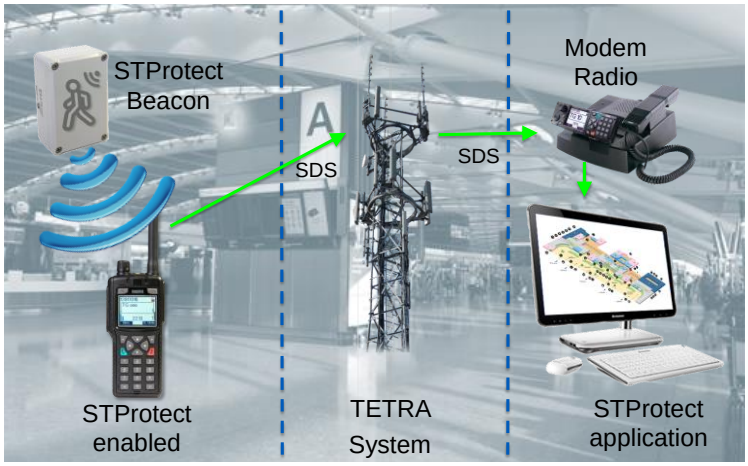
The STP also supports a GPS-powered 'compass' direction finder facility to enable a user to navigate their way to a particular destination.

Key features

- ✓ -192dBw (-162dBm) Tracking Sensitivity
- ✓ GPS-Based Compass display
- ✓ Enhanced indoor start-up and acquire through 'predicted ephemeris'
- ✓ LIP short and long format support
- ✓ NMEA Sepura Compact Format support
- ✓ Simple and full SDS-TL support
- ✓ Comprehensive location updates based on
  - Trigger events - such as in an emergency, or removal from car kit for example
  - Time and distance
  - Third party equipment requests connected to PEI port
  - OTA location update control
- ✓ Speed and Direction indication

STPROTECT – IN-BUILDING LOCALISATION

A further enhancement to user safety is by the introduction of Sepura's STProtect. This solution provides information on the whereabouts of users whilst they are operating inside buildings. A device fitted inside the STP9000/9100 series radio, receives messages from a set of beacons that have been pre-located in strategic positions inside the building. Upon receiving messages from the beacons, the STP will send a specific SDS message to the command centre, where the location of the radio can be displayed and stored using STProtect software.



For further information see DN101 STProtect Solution Product Brochure

DMO REPEATER – EXTENDING OPERATIONAL COVERAGE

In locations where normal TMO coverage is not available or is un-reliable, users can revert to Direct Mode for communication.

In DMO, the operational range of radio coverage between users may be extended by having one of the users switch their radio to Repeater mode. Calls may be set up from one radio via the Repeater terminal to another, which can be any radio within range of the Repeater provided that they are on the same Talkgroup.

Any Sepura hand-portable can operate as a DMO Repeater

The Sepura Direct Mode Repeater will relay half duplex voice calls, Status messages, SDS

messages, Emergency calls, GPS location data and in-band tone signalling when transmitted from a TETRA radio working in Direct Mode and transmitting on the same Talk-group as the Repeater.

Call Participation

The user of the TETRA radio operating as a Repeater can also hear and participate in the repeated call - This feature is configurable and can be disabled if required.

All E2E Encrypted traffic will also be relayed and if the Repeater has the correct E2E encryption keys installed, local monitoring and participation in voice calls is possible. This feature is configurable and can be disabled if required.

Repeater operation is governed by ETSI. The Sepura repeater uses the 'type 1A' solution which allows one call per channel and is by far the most spectrum efficient method of providing Repeater solution.

Key features

- ✓ DMO Voice Repeated
- ✓ DMO Tone Signalling Repeated
- ✓ Group Status & SDS Repeated
- ✓ Type 1A Efficient Operation over a single RF Channel (25 KHz).
- ✓ Presence Signal Support
- ✓ Emergency Call repeated
- ✓ Monitoring & Participation in Calls
- ✓ Software enabled by a Radio Manager assigning a Feature Licence Code

ALERTS

Depending on the application, the STP9000 family can provide the user with a series of different alerts.

Selective Alerts turns the STP in to a TETRA Pager, enabling the users to remain in touch with their control centre by leaving the radio on but only being alerted when the call centre needs their attention, such as in a disaster/ emergency situation.

Vibrator Alert[1] allows for incoming call notification in environments that require quiet operations. Vibrator Alert[1] can also be invoked with normal call notifications to aid operation in noisy environment

The blue LED, Missed Call Indicator makes the User aware of unanswered individual calls or messages (see page 22).

[1] STP9000 and STP9100 only

SMART TECHNOLOGY

Sepura has brought a variety of “smart” technologies to the STP9000 family, including both “Haptics” (see page 11), for improved tactility when used with gloved hands; “Twist and Zoom” (see page 17), for improved image display; a Micro SD card (see page 29), for storing data and images, and STProtect (see page 27), Sepura’s advanced in-building tracking solution. Other areas where we have made use of smart technology to provide real benefits to the end users are described below

MICRO SD CARD SUPPORT

Data storage is no longer an issue for Sepura users as the STP9000/9100 support commercially available Micro SD cards which allows up to 4GB of storage to be added and changed by the user.

This capability allows the STP to support a large range of memory-hungry applications, such as picture storage, maps, missing and wanted person data. Other future applications could include audio and network logging or 3rd party applications.

In the case of images, up to 1000 images can be loaded on the micro SD card as JPEGs or Bitmaps.

Data on the memory card is simply managed on a standard PC or Tablet .

Informative text such as person information can be added to an image using a suitable PC-based ‘EXIF’ editor. This text is easily accessed from the STP user interface and could be used to inform the user as to whether to approach an individual or to call for assistance, for example.

Example use cases

Below are some examples on how the SD card feature can be incorporated into a real life application. Images and links can be downloaded onto the SD card using the Radio Manager.

Missing persons

- In this scenario a call comes in about a lost child. In the initial critical minutes,
    - Police officers attend and use a smart phone to take a copy of a recent photograph the parent has of the child and email this to their back office staff

- The back office process the picture (reduces the resolution), stores on the forces WAP site and then creates an SDS with a description of the child, the location they were last seen and embed a URL link to the picture on the forces WAP site
- The SDS is sent to targeted officers in the neighbourhood where the child was last seen
- Officers read the SDS, the child description etc. and just click the link in their SDS to download the child's photograph.

- When the next Police shift comes on duty, they would have not received the SDS with the URL that had been sent during the earlier shift. To resolve this,
  - The image that was sent by the officer earlier was placed on the forces WAP site and the URL sent in the SDS was pointing at the forces WAP site.
  - Before coming on duty, officers connect their radios to the Sepura RM to upload the new WAP site onto the radios Micro SD card.
  - Officers now have latest details of missing and wanted persons on Micro SD WAP site

In this way the child's image and related information can be rapidly dispersed to relevant officers and the chances of successful outcome are immensely increased

Wanted persons

- In this scenario, police receive intelligence that a wanted person is frequenting a specific neighbourhood.
- The wanted person is already known to the police and their details are already on the WAP site loaded on officers Micro SD card from a previous Radio Manager upload.
- The back-office staff creates an SDS with the wanted person's name and information that they might be found in a specific neighbourhood.
- A SDS message is sent to officers working around that neighbourhood. Officers read the message and clicks on the WAP URL shortcut which points to the details held on the SD card
- The link retrieves the wanted persons image from the Micro SD card on the officers radio and displays it on the officer's' radio.

The scenario shown in the above example can also be used in non-blue light situations, in fact anywhere where text and images would assist the user. This could be:

- Work flow management,
- Directions when a maintenance job is allocated to a technician

Another benefit of using the SD card in this way is that once the information is stored, no additional TETRA airtime is used when the users need to access the stored data. This feature is especially ideal for users where the network operators charge for airtime.

Key features

- ✓ Supports up to 4GB
- ✓ Easy transfer of data between STP and PC/Tablet
- ✓ Fast, simple retrieval of missing/wanted persons pictures and data
- ✓ Simple data organisation.
- ✓ Fast retrieval of maps, building floor plans or even hazardous chemical data

✓ Future proof memory-hungry application support.

Note: Images must not exceed 2 megapixels. If an image that is greater than 2 megapixels is loaded on the SD card and is selected for viewing, either a thumbnail of the image is displayed or the image is not displayed at all.

RFID

Each STP9000, STP9100 or STP9200 radio is factory fitted with a 'passive' Radio Frequency Identifier Device (RFID) containing preset data about the radio – hardware code, TEI and serial number of the radio. The RFID tag is able to operate in the presence of a RFID read/write unit, even when the radio has its battery removed or is switched off

Its exact position is marked by the RFID emblem as shown

The pre-programmed data may be overwritten using a compliant reader/writer device. The tag has a maximum storage of 2048 bits, of which user accessible storage is 1984 bits, made up of 576 bits pre-programmed by Sepura + 1408 bits spare

Example use cases

Having a RFID tag already incorporated within the STP9000 opens up a whole new range of exciting possibilities where this technology can be used to benefit users. Some examples include,

<u>Automation of logistical tasks</u>

- To automate the pairing of a user to a pool-issued STP9000 radio. In a hypothetical operational scenario, the user has a personal issued RFID identification badge provided by their organisation. When requested to take a 'pool issued' radio, the user simply swipes their ID tag and the STP9000 with its RFID tag, allowing a back-end management system to pair the user with the radio. Taking this one step further, vehicles are often pool issued to users and in many organisations are equipped with Mobile Data Terminals (MDT) which also may have RFID readers attached. In this extended scenario the user takes the keys for a pool issued vehicle, swipes his STP9000 on the MDT RFID reader and once again the back end management system can now allocate the vehicle to the users. Such automation would certainly help the logistical management of equipment in many large scale pooled equipment scenarios.
    - This could also be linked to vehicle management systems to ensure that the vehicle cannot start unless the correct RFID tag is read. Alternatively, this could also be used to indicate that a radio/user has not been returned to a specific vehicle.

Security/Person access applications

- Facilitate the secure access to rooms / complexes. Providing additional security on persons accessing secure locations within buildings by adding RFID confirmation in addition to any secure PIN/card swipe entry systems. Could also be used to locate the radio inside a secure building

- Used with high security lockers linking a locker to a radio. Providing a means of confirming that allocated radios are returned to specific lockers (which might be specialist lockers containing battery charger/programming facilities).

Asset tracking/service applications.

- Automate the audit tracking of pool-issued radios and providing an automatic update of when pool radios were issued. The RFID tag is swiped as the radio is handed to the user. This action updates the central records that the radio has been issued. The process is repeated when the radio is returned.

- Service centre in/out tracking. Simplifies the booking in-out of radios into service centres. Major benefit from using RFID tag is that the radio doesn't have to be switched on to record the information stored in the RFID tag.

- Sales channel stock tracking. Allows simplification of 'booking in' stock for resellers of the STP9000. The RFID tag can also be re-programmed by the reseller for their own logistics management

Summary specification

- RFID Standard – ISO11784 & ISO11785
- Internal tag type – NXP HITAG S2048
- Frequency – 125KHz
- Maximum storage – 2048 bits
- User accessible storage – 1984 bits (576 bits pre-programmed by Sepura + 1408 bits spare)

For further details about the STP9000 RFID tag see MOD-1201459 RFID information sheet.

BLUETOOTH™

The STP9000/9100 offers an integral Bluetooth™ option that allows the use of 'commercial off the shelf' (COTS) devices for audio and/or data connection to the STP.

Removing audio headgear cables makes the STP ideal for use on a motorcycle or in a public order situation where cabled accessories could be a risk to the user.

Support of the 'Head Set Profile' (HSP), 'Serial Port Profile' (SPP) and 'Dial Up Networking' (DUN) allows the user to connect up to 10 different devices to the STP, thus making use of the secure TETRA bearer for applications on the latest COTS Tablet PC

Security features

- Supports encryption on the Bluetooth link
- Customizable Access Code prevents unauthorized users from pairing devices.
- Secure PC/Tablet pairing via a random PIN to up to 16 alphanumeric characters.

New Bluetooth enhancements now supported are:

Trusted device/Auto reconnect - Any device that has been paired with the radio are awarded 'trusted' status. Subsequent connection requests initiated by a trusted device are automatically accepted by the STP radio without user prompt or interaction.

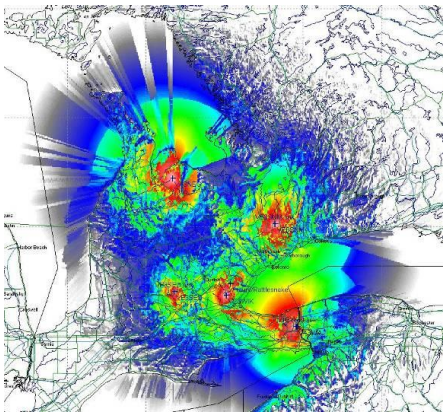
Master Pairing - Up until now, you could only pair a master data device with a Sepura radio rather than the other way round. All the intelligence was expected to be in the Master data device...like a tablet PC. With Sepura 'Master pairing' we can now pair the STP radio with a dumb device, such as the BT RFID reader

Key features

- ✓ Factory fitted option
- ✓ Bluetooth™ Class 2
- ✓ Bluetooth 2.0
- ✓ HSP, DUN & SPP support
- ✓ Typical 7m range
- ✓ Full UI on STP
- ✓ Up to 10 devices can be paired with the STP ready for use.
- ✓ Trusted device, Auto reconnect & Master pairing fully supported.
- ✓ Both a data and an audio Bluetooth™ link can be active at the same time, so a user could have an audio conversation via a Bluetooth™ headset in progress whilst sending an SDS message from a Bluetooth™ linked Tablet PC.
- ✓ Up to 16 digit alpha numeric PIN support
- ✓ Supports 56bit and 128bit AES Bluetooth™ air interface encryption.
- ✓ Compatible with all commercial off the shelf Bluetooth-equipped Tablet PCs etc
- ✓ Full duplex call support
- ✓ Half duplex call support
- ✓ PTT control via STP or wired attached accessory
- ✓ Compatible with third-party in building Bluetooth APL tracking solution

Note: Bluetooth™ option is only available on the STP9000 and STP9100 series hand-portable radios

PERFORMANCE MONITORING



Enables 3rd party control room applications to monitor the performance of the TMO network

Provides 'On demand' and periodic information allowing evidence to be submitted to network operators where actual coverage varies from the expected coverage.

Response from the radio provides:

- ✓ Position and horizontal velocity
- ✓ Timestamp
- ✓ Serving cell information
- ✓ Neighbour cell information

SECURITY OPTIONS

AIR INTERFACE ENCRYPTION

Full support for TEA1, TEA2, TEA3 and unique in TETRA, TEA4 Air Interface Encryption (AIE) algorithms *(Note: Availability of AIE is subject to export licence)*

Support for the following TETRA security classes:

- TMO
  - Class 1 - Clear,
  - Class 2 - SCK
  - Class 3 – DCK, CCK, GSK plus OTAR of CCK and GSK.
- DMO - Support for Class DM-2C

Key features

- ✓ TEA1, TEA2, TEA3 TEA4 Air Interface encryption algorithms supported.
- ✓ All 3 TETRA TMO Security Classes
- ✓ Security class DM-2C in DMO

END TO END ENCRYPTION (E2EE)

Fully integrated security module capable of supporting:

- Smart Card E2E Encryption Support. Integral SIM connector allows support of 3rd party SMART Card hosted E2EE solutions
- Embedded E2E Encryption Support.

Notes

1) *End to End (E2E) encryption can be enabled with a software upgrade*
2) *Embedded E2EE support for ½ duplex Individual and Group calls in TMO only with OTAK support.*
3) *Embedded E2EE support for Full Duplex and SDS is NOT supported*
4) *In the case of the STP9200, only AES128 is supported*

In addition to the above and only applicable to the STP9000 and STP9100 are:

1) AES128 or AES256:
   - In-Country E2E Encryption Algorithm Support, (also known as 'local' or 'Private' Algorithm)
   - Multiple E2E Algorithm Support

2) Comprehensive tamper protection using hardware and software mechanisms are employed in the radio. When tampering is detected, the E2EE key material is destroyed.

3) Key management by:
   - Wireless 'Over The Air Keying' (OTAK) messaging
   - Direct wired connection to Sepura and 3rd party Key-fill tools.

Key features

- ✓ Over the Air Re-keying (OTAR)
- ✓ Fully integrated E2E encryption module
- ✓ For STP9000 & STP9100, twin dedicated security processors allow separation of secure and non-secure information
- ✓ Comprehensive tamper protection using hardware and software mechanisms (STP9000 & STP9100 only)
- ✓ Integral SIM connector for E2E encrypted SMART card solutions
- ✓ Key management by 'Over the Air Keying' (OTAK) messaging and direct connection to Sepura and 3rd party Key-fill tools
- ✓ Key management by Over the Air Keying (OTAK) messaging and direct connection to Sepura and 3rd party Key-fill tools.

TECHNICAL DATA

PRODUCT SPECIFICATION

DIMENSIONS

- Height: 133mm
- Width: 61mm (54mm)
- Depth: 33mm (Standard Battery)
- Depth: 37.5mm (High Capacity Battery)

WEIGHT (EXCLUDING ANTENNA)

- With Standard Battery <250g
- With High Capacity Battery <275g

FREQUENCY BANDS

- 344-400MHz – STP9035, STP9135 & STP9235 (available from July 2014)
- 380-430MHz – STP9038, STP9138 & STP9238
- 407-473MHz – STP9040, STP9140 & STP9240
- 806-870MHz – STP9080, STP9180 & STP9280 (available from July 2014)

RF PERFORMANCE - TRANSMITTER

- RF Power – MS Power Class 3L (1.8 Watts)
- RF Power customisable for TMO/DMO
    - 32.5dBm (1.8W)
    - 30dBm (1W)
    - 25dBm (300mW)
    - 20dBm (100mW)
    - 15dBm (30mW)
- Adaptive Power Control Supported

RF PERFORMANCE - RECEIVER

- Audio Power - >1 Watt into 8 ohms
- Receiver class A and B
- Receiver Static Sensitivity -112dBm (-115dBm typical)
- Receiver Dynamic Sensitivity -103dBm (-106dBm typical)

DISPLAY AND USER INTERFACE

STP90/91

- Large 30x38mm Active LCD Area
- 176 x 220 pixels
- Transflective TFT Display, 262K colours
- STP9000 series only - 16 Configurable Soft Keys + Alarm key + 2 context keys + potential 1024 SASI supported soft keys
- STP9100 series only - 4 Configurable Soft Keys + Alarm key + 2 context keys + potential 1024 SASI supported soft keys
- Three user interface presentations – Compatibility, List & Grid Modes
- Normal, Large & Very Large Mode Text
- Twist & Zoom
- Haptics

STP9200

- Large 37 x 19mm active LCD area
- 128 x 64 pixels
- Transflective, Monochrome Display
- 9 Configurable Soft Keys + potential 1024 SASI supported soft keys
- Three user interface presentations – Compatibility, List & Grid Modes
- Normal, Large & Very Large Mode Text

Common to all STP9000 family

- Vibrate Call/message
- Missed Event Indicator
- Call History
- Phone Book (2000 entries)
- 9900 Talkgroups in any combination of TMO/DMO
- 5000 Multi-layer Folders
- Quick Groups
- Transmit Inhibit
- Fixed & definable Scan Lists
- Remaining Charge Time Indication
- Man-Down Alarm status

Environmental performance

- Operational Temperature:
  - Conformance tested -20°C to +60°C,
  - Min/Max -30°C to +70°C
- Storage Temperature -40° to +85°C
- Dust & Water Protection IP67 certified, (waterproof, submersible and dustproof)
- Salt water submersion rated at 1m depth for 30 minutes
- Salt fog: MIL810E 509.4I; duration 24hr salt (*see note 1*)
- Shock, Drop & Vibration in excess of ETS 300 019 (*see note 1*)

Power

- 7.4V (nominal) Lithium Polymer Battery Packs
- Intelligent Reporting Batteries
- 1160mAh Standard Battery
- 1400mAh Mid Capacity Battery
- 1880mAh High Capacity Battery

Battery Pack Endurance

Tx:RX:Standby	Standard 1160mAh Battery	Mid-Capacity 1400mAh Battery	High Capacity 1880mAh Battery	Notes
5:5:90	>14 hours	>16 hours	>22 hours	Typical performance in normal operations – no GPS enabled
5:20:75	>12 hours	>14 hours	>18 hours	Typical performance in normal operations – no GPS enabled

Battery charge time

- Typically <2 hours for a Standard and Mid Capacity Battery
- Typically <3 hours for a High Capacity Battery

Location Based Services

- GPS Integrated Option
- -192dBw (-162dBm) Tracking Sensitivity
- GPS Based Compass display
- Enhanced indoor start-up and acquire through 'predicted ephemeris'
- Bluetooth Location System compliant (see note 2)
- STProtect (see note 2)
- RFID tag equipped

LANGUAGE SUPPORT

ISO 8859-1 LATIN1	Covers most **West European** languages, such as French (fr), Spanish (es), Catalan (ca), Basque (eu), Portuguese (pt), Italian (it), Albanian (sq), Rhaeto-Romanic (rm), Dutch (nl), German (de), Danish (da), Swedish (sv), Norwegian (no), Finnish (fi), Faroese (fo), Icelandic (is), Irish (ga), Scottish (gd), and English (en),
ISO 8859-5 CYRILLIC	With these **Cyrillic** letters the languages supported are Bulgarian (bg), Byelorussian (be), Macedonian (mk), Russian (ru), Serbian (sr)
Ideographic languages	Simplified Chinese, Traditional Chinese (Zhuyin), Korean, Arabic

The following keymats are available for the STP9000 series only

- Latin
- Simplified Chinese
- Zhuyin Chinese
- Russian Cyrillic
- Arabic

The STP9100/9200 keymat have no language markings and is suitable for all users.

PRODUCT OPTIONS

- GPS
- Bluetooth (*STP9000/9100 series only*)
- Up to a 4GB Micro SD Card can be fitted (*see notes 2 & 4)*
- Man-Down Alarm
- STProtect (see note 2)
- DMO Repeater Type 1A
- Air Interface Encryption Options *(see note 3)*
- End to End Encryption Options *(see note 3)*
- ISO 7816 ID 000 Smart Card based E2E encryption *(see note 3)*.
- Wide Range of Languages
- Wide Range of Keymats (*see note 5*)

BEZELS

The STP9000 have a set of colour bezels available to assist in identifying radios. These can be used for example, to identify groups of users with radios that have been pre-programmed with specific functionality. Colours available are: Blue, Red, Yellow and Green.

Part numbers for these bezels can be found on the STP9000 accessories ordering guide.

TETRA Specifications

- ETSI EN 300 392 V+D Air Interface
- ETSI EN 300 394 V+D Conformance testing
- ETSI EN 300 395 Speech Codec
- ETSI EN 300 396 Direct Mode Operation

TETRA Services Supported

The STP9000 family of hand-portable radios supports a full range of TETRA features and functionality.

The following sections illustrate the available features. Sepura will add features with each release of software. For further information please refer to the latest software bulletin.

Some specific functions can be enabled or disabled as required when programming the radio.

Operation Mode

- Trunk Mode Operation (TMO)
- Direct Mode Operation (DMO)
- DM-Repeater Operation (DM-REP)

- Interworking with DM-Repeater
- Interworking with DM-Gateway

Voice Services

- Full Duplex Calls (to MS and PABX/PSTN).
- Half Duplex Calls (Individual and Group).
- Emergency Call (Pre-emptive Priority Call).
- Priority Call.
- Talking Party Identity.
- Calling Line Identity Presentation.
- DTMF Dialling *(see note 7)*
- MSISDN Dialling *(see note 7)*
- Abbreviated Dialling *(see note 5)*
- Dynamic Group Number Assignment
- Background (hidden) Groups – Group Scanning
- DMO Individual Call
- DMO Group Call
- DMO Emergency Call
- DMO Intelligent Emergency Call
- Ambience Listening
- Privacy Mode
- Whisper Mode
- Group Focus

DATA SERVICES AND APPLICATIONS

- Status Messaging (in TMO & DMO)
- Short Data Service Messaging (SDS Type 4 in TMO & DMO) *(see note 6)*
- Short Data Applications/SDS Templates
- Concatenated SDS up to 1000 characters
- SDS Store and Forward
- Multi slot Packet Data
    - Supporting Static and Dynamic IP addressing
    - Simultaneous WAP and Packet Data sessions *(see note 5)*
    - Ping facility from the MS *(see note 5)*
- Text Message Data Store.
- Up to 4GB of image & map storage on micro-SD Memory Card
- Wireless Application Protocol (WAP) (*see note 5)*
- Over the Air GPS reporting using the following protocols:
    - ETSI Location Standard Reporting (LIP)
    - NMEA &
    - Sepura Compact Message
- Lone Worker Feature
- Missed Event Application
- TETRA Pager and Call Out profiles
- GPS based compass
- Man-Down Alarm
- ETSI compliant PEI port. AT-command interface for applications
- Tactical Number Addressing

SECURITY SERVICES

- Authentication – infrastructure initiated and made mutual by the radio.
- Class 1 (clear), Class 2 (SCK), Class 3 (DCK, CCK & GCK)
- Air Interface Encryption
    - TEA1/2/3/4 Supported *(see note 3)*
- SMART Card E2E Encryption Support *(see note 3)*
- Embedded E2E Encryption Support *(see note 3)*
- Indigenous E2E Encryption Algorithm Support *(see note 3)*
- DMO SCK encryption
- AES128 and AES256 support

DIRECT MODE SERVICES

- Interworking with DM-Repeater
- Interworking with DM-Gateway
- Group calls
- Individual Calls – Simplex
- SDS and Status message – Group addressed and Individually addressed *(see note 6)*
- Concurrent SDS and Status with voice communication
- Over the air modification of GPS reporting characteristics via DM-Gateway
- Intelligent Emergency Call between TMO and DMO
- Static Cipher Key (SCK) Air Interface Encryption.

DMO Repeater services

- DMO Voice Repeated
- DMO Tone Signalling Repeated
- Group Status & SDS Repeated
- Type 1A Efficient Operation over a single Frequency Channel
- Presence Signal Support
- Emergency Call
- Monitoring & Participation in Calls

Connectivity

- TETRA V+D
- Bluetooth Support for Voice and Data (PEI)
- PEI Data and Programming via:
  - [ITU-T V.24] and [ITU-T V.28] RS232 serial data lead
  - USB 2.0 (Full Speed device 12Mb/s) data lead
- Audio Connections via Rugged Accessory Connector (RAC)
- SASI High Speed Interface for Feature-rich Audio Accessories
- Audio and Data Connection via Facility Accessory Connector (FAC)

Other functions and features

- Support for up to 9900 pre-programmed Talkgroups, any combination of TMO or DMO talkgroups.
- 5000 Muliti-layer Talkgroup Folders
- Up to 50 DGNA talkgroups and supporting Lifetime Timers.
- Talkgroup Folder Management via PEI and SDS.
- Fixed and User Defined Talkgroup Scan Lists.
- Priority Group Scanning
- Background groups.
- Single key press to access up to 5 TMO and 5 DMO groups.
- Telephone and Radio user Address Book.
- Call History with Missed Call alerts.
- Late Entry.
- Transmit Inhibit (TXI) with on/off Status messaging.

Notes:

1. *Connector protector' must be enabled in customisation. An antenna, a battery and either an accessory or the STP RAC cover must be fitted*.
2. *STP9000 & STP9100 series only*
3. *Availability is subject to export licence.*

4. *Selected Micro SD card must be rated to operate throughout the temperature range you will use your STP9000/9100.*
5. *Available only for STP9000 series*
6. *STP9100/STP9200 does not support text entry with Chinese language/ Limited to address book entries only*
7. *The STP9100/STP9200 is limited to address book entries only*

FEATURE SUMMARY

The table below is a summary of the features available with the STP9000 family of hand-portable radios.

Feature	STP9000	STP9100	STP9200
RF & AUDIO			
RF power	1.8W	1.8W	1.8W
Audio power	>1W	>1W	>1W
Full Duplex noise reduction circuitry	Yes	Yes	Yes
Large front facing loudspeaker (45mm diameter)	Yes	Yes	Yes
RUGGED DESIGN			
IP rating	IP67	IP67	IP67
Rugged alloy chassis	Yes	Yes	Yes
Marine harden - Salt water/Salt fog protection	Yes	Yes	Yes
Shock, drop & vibration to ETS 300 019	Yes	Yes	Yes
USER INTERFACE			
262K colour Transflective TFT display	Yes	Yes	No
Monochrome Transflective display	No	No	Yes
Choice of three user interface presentations (Compatibility, Grid & List modes)	Yes	Yes	Yes
Twist and Zoom	Yes	Yes	No
Haptics	Yes	Yes	No
Tri Colour Status LED	Yes	Yes	Yes
Missed event LED	Yes	Yes	Yes
Key pad	Full	Reduced	Reduced
Context keys	2	2	0
Customisable soft keys (excluding Alarm & context keys)	16	4	9

Feature	STP9000	STP9100	STP9200
Multi language support (ISO 8859-1, ISO 8859-5 character set. Simplified Chinese, Traditional Chinese, Korean, and Arabic)	Yes (including key mat)	Yes (common keymat)	Yes (common keymat)
Number of soft keys via SASI™	upto1024	upto1024	upto1024
USER SAFETY			
Emergency button	Yes	Yes	Yes
Wake-up on alarm	Yes	Yes	Yes
GPS	Yes	Yes	Yes
Lone worker	Yes	Yes	Yes
STProtect	Yes	Yes	No
DMO Repeater	Yes	Yes	Yes
SMART TECHNOLOGY			
Micro SD card (4GB)	Yes	Yes	No
RFID	Yes	Yes	Yes
Bluetooth	Yes	Yes	No
Twist and Zoom	Yes	Yes	No
Haptics	Yes	Yes	No
Performance monitoring	Yes	Yes	Yes
SECURITY			
Air Interface encryption algorithms TEA1,2,3 & 4 supported.	Yes	Yes	Yes
TETRA TMO Security Classes supported - Class 1 (clear), Class 2 (SCK), Class 3 (DCK, CCK & GCK)	Yes	Yes	Yes
Smart card	Yes	Yes	Yes
E2EE supported	AES128 and AES256	AES128 and AES256	AES128
Tamper protected	Yes	Yes	No

ACCESSORIES

The STP9000 family of hand-portable TETRA radios can be securely and easily worn in many positions. All audio accessories are connected to the side RAC and all data and charging accessories are connected to the bottom FAC, or by Bluetooth.

The RAC provides a lockable connector securely fastening rugged audio accessories which cannot be detached accidentally or maliciously, thus preventing the loss of contact or vital information.

A comprehensive range of accessories is available including:

- Personal Rapid Charger
- Rapid Vehicle DC Charger
- 1+1 Desktop Charger
- 6+6 Desktop Charger
- Multi-way Charger supporting 12 or 24 standalone batteries

- Wide Range of Antennas
- Stud and Belt Attachments

- Rugged Belt Clip
- Rugged and Soft Leather Cases
- Basic IP55 Remote Speaker Microphone
- Advanced Remote Speaker Microphone with Integral Antenna

- Personal GSM style Hands-Free Kit
- Personal Ear Pieces
- Feature-rich Car Kit
- [ITU-T V.24] and [ITU-T V.28] RS232 serial data and programming lead
- USB 2.0 (Full Speed device 12Mb/s) data and programming lead
- Sepura Radio Manager for programming.
- End to End Encryption Key Management Tools.

All accessories are supported on STP9000, STP9100 and STP9200 series. Details of all accessories available for use with the STP9000 family of hand-portable radios are provided in the STP Accessories bulletin SB-P-08-4094

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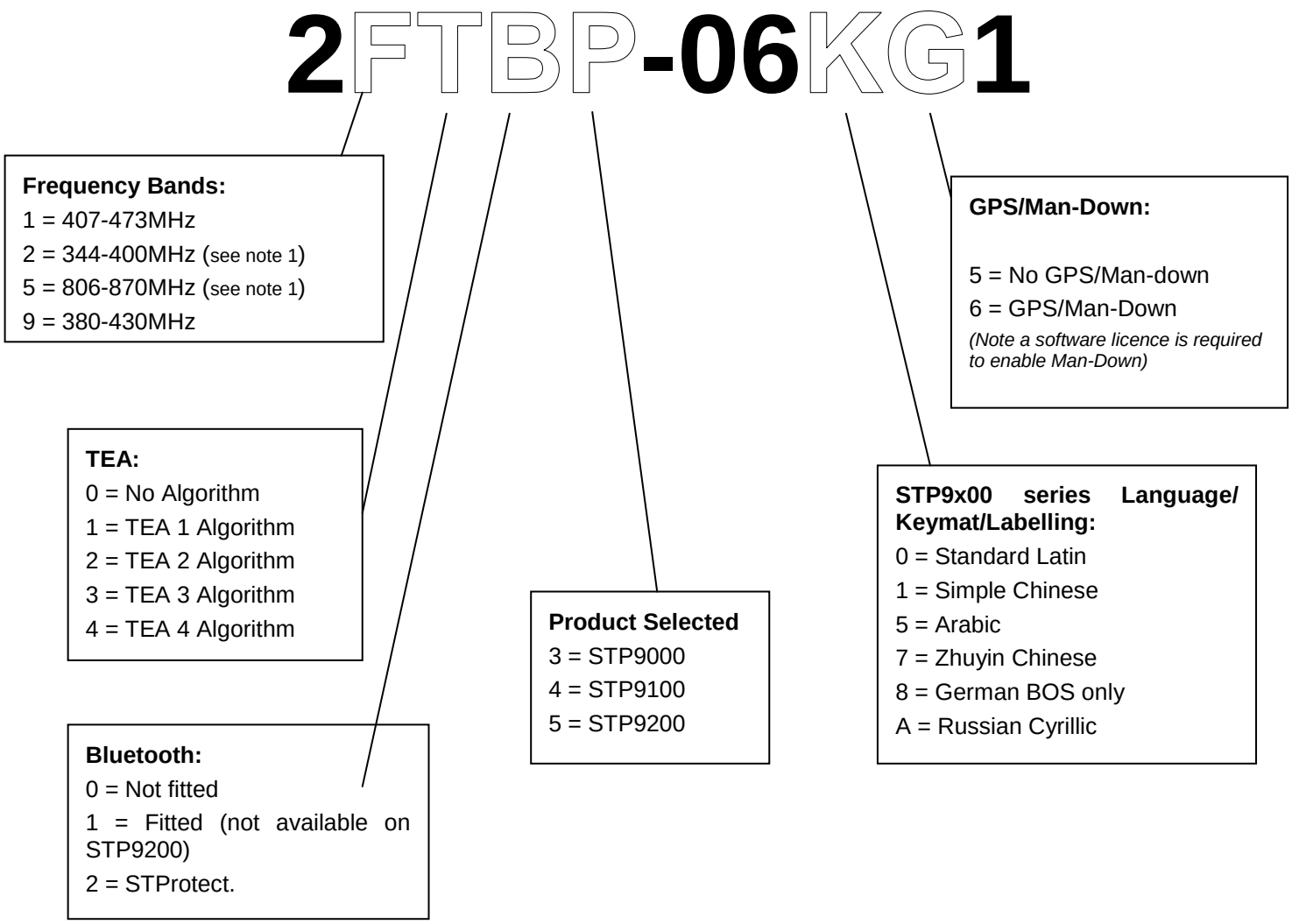
STP9000 FAMILY ORDERING CODE

Please use the following guide when ordering your radio



Examples:

29213–06051 = 380-430MHz, STP9000 series (STP9038), TEA2, Bluetooth, Latin keymat, GPS disabled

21004–06A61 = 407-473MHz, STP9100 series (STP9140), no TEA, no Bluetooth, Russian Cyrillic keymat, GPS enabled

29205–06761 = 380-430MHz, STP9200 series (STP9238), TEA2, no Bluetooth, Zhuyin Chinese language, GPS enabled

Notes:

1) These frequency band variants are not available until July 2014

NOTICE

CONTACT DETAILS

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