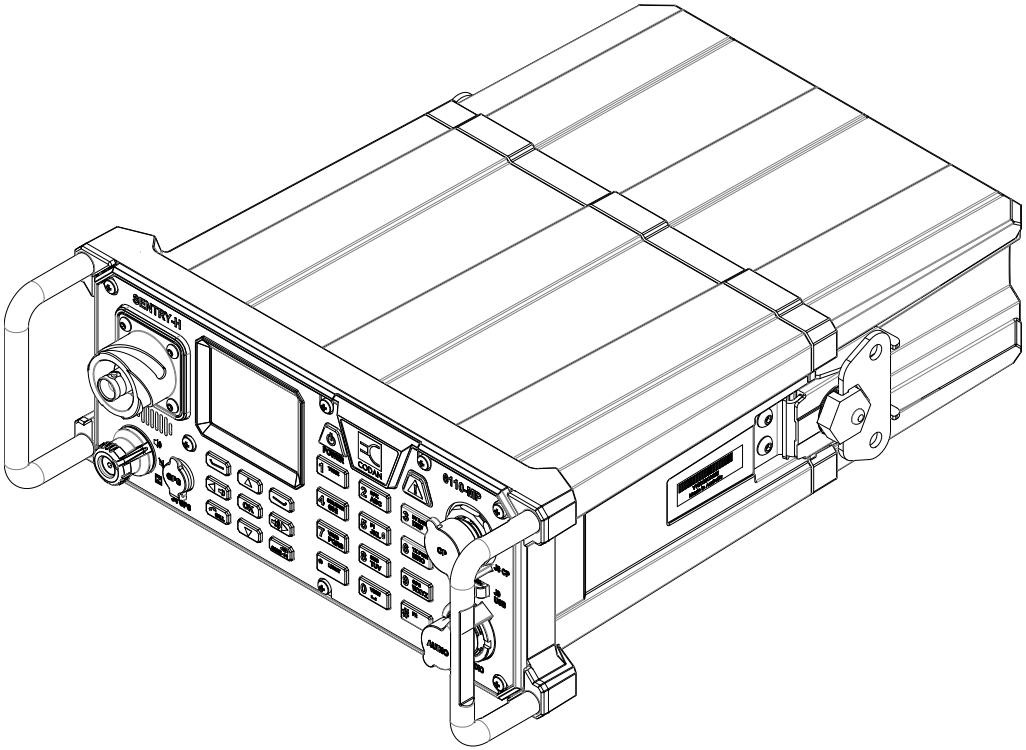
CODAN
COMMUNICATIONS

Sentry-H 6110-MP



OPERATOR GUIDE

Codan part number 15-04200-EN Issue 1, December, 2019.

Table of Contents

Charging and installing batteries

Check batteries

Before any deployment, it is vital to ensure that your batteries are fully charged and that you have a sufficient number of batteries for your mission.

Compatible batteries

The 6110-MP is recommended for use with the following batteries available from Codan.

Codan Part Number	Battery	Battery Chemistry	Rechargeable	Capacity
65-72015	BB-390B/U	Nickel Metal Hydride	Yes	9.8 amp hours
65-72013	BB2590	Lithium-ion	Yes	17.4 amp hours
65-72014	BB2590	Lithium-ion	Yes	20 amp hours
65-71005	BA-3590/U	Alkaline	No	15 amp hours

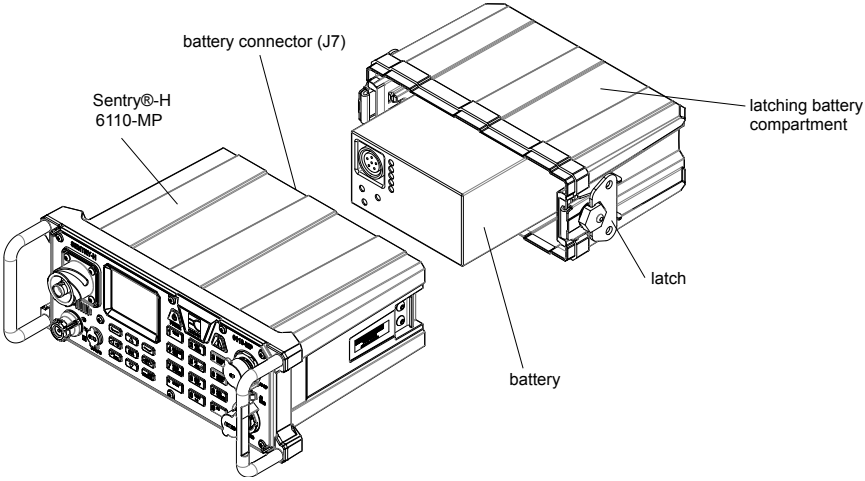
Field charging batteries

The Codan supplied BB-390B/U and BB2590 batteries are compatible with the MIL-STD Battery Charger Kit (Codan Part Number: 15-00585-00X). The MIL-STD Battery Charger Kit can be powered by several different AC or DC power sources, including a Solar Panel Power Supply (Codan Part Number: 15-00537-00X).

Inserting your battery into the radio

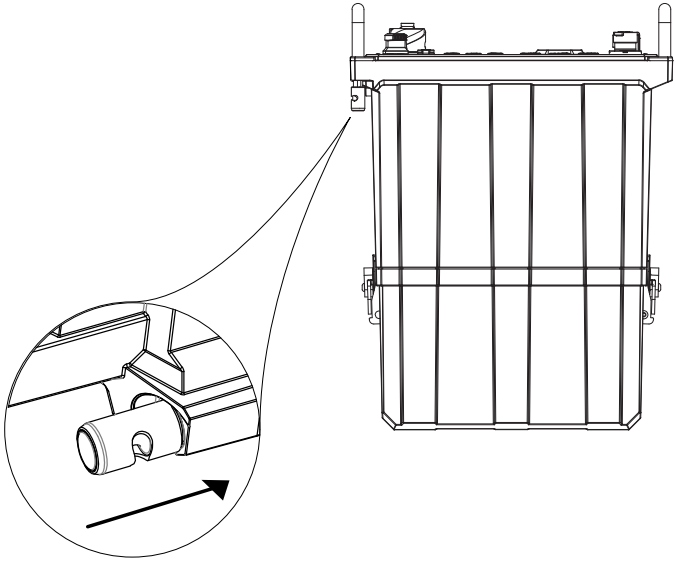
The battery is connected to the (J7) Connector located on the bottom of the radio and housed in a latching battery compartment. The image below shows the placement and alignment of the battery, battery compartment and radio.

> ⚠ **CAUTION:** To prevent damaging the 6110-MP and the battery, you must ensure that the battery is correctly aligned to the battery connector (J7) on the 6110-MP before attaching the latching battery compartment to the radio.

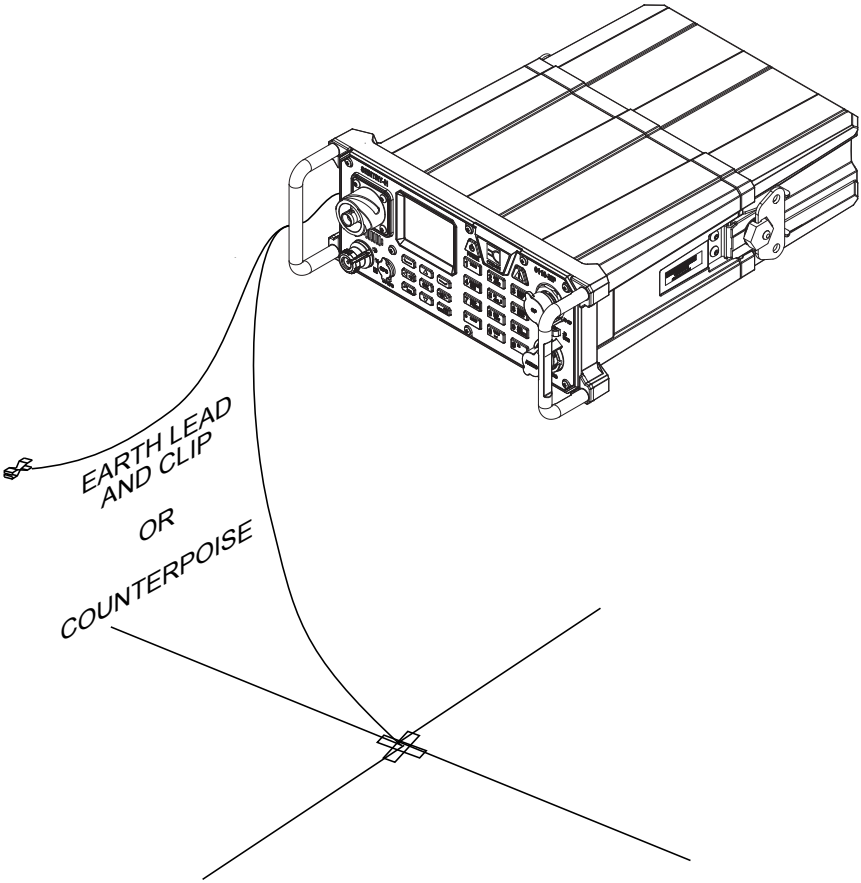


Attaching a ground wire to the radio

To ensure optimal radio performance, the radio will need to be suitably grounded by fixing the antenna to an adequate ground point or by connecting a counterpoise. The 6110-MP radio has a ground lug located underneath the left handle of the radio, connect the grounding kit (Codan Part Number: 15-60083) to the ground lug by pressing down on the lug to reveal the ground clip insertion slot.

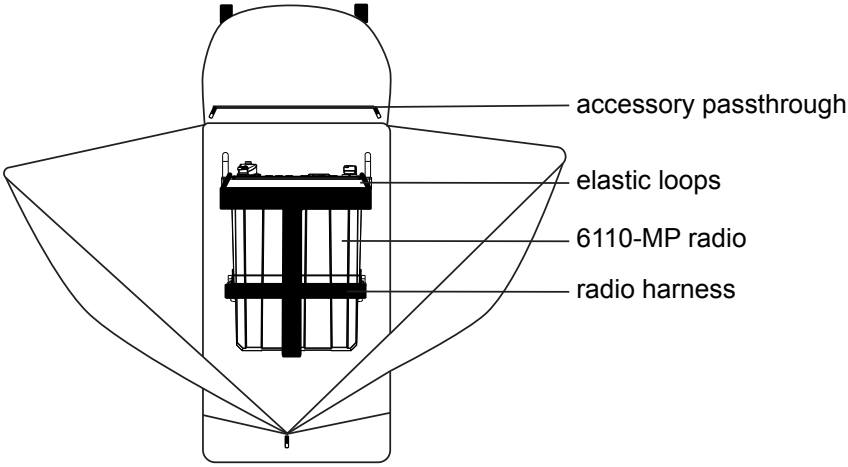


Connect the grounding wire or counterpoise lead to the grounding lug and deploy as suggested on the tactical antenna quick reference card.


EARTH LEAD
AND CLIP
OR
COUNTERPOISE

Inserting a 6110-MP into a backpack

All Codan supplied backpacks come with an adjustable harness that holds the radio firmly in position. The radio can be oriented so that the antenna port (J1) is located on either the right or left side of the backpack.



To insert the radio into the soft backpack:

1. Open the backpack to expose the harness.
2. Slide the radio into the harness with the front panel oriented to the top of the backpack.
3. Secure the radio with the adjustable harness.
4. Position the elastic loops over the handles.

Selecting and connecting your antenna

Selecting an antenna

It is crucial that you choose an antenna that meets your requirements. The table below provides an overview of Codan tactical antennas and the capabilities of each antenna over distance. Correct installation and positioning of your antenna is essential for quality HF communication.

> ❗ **WARNING:** This table provides an overview that is general in nature. Many factors can and will affect the capabilities of your antenna, including location, obstructions, time-of-day, weather and localised interference.

Tactical antenna	Codan Part Number	Communications distance			
		0 to 100 km	100 to 500 km	up to 2000 km	up to 5000 km
Tape Whip	15-00472	★	★		
3 m (10 ft) Collapsible Whip	15-00473	★★	★	★	
Long Wire	15-00476	★★★★	★★★	★★	
End-fed Broadband	15-00475	★★★★★	★★★★	★★★	
Broadband Dipole	15-00474	★★★★★	★★★★★	★★★★	★★★

Connecting your antenna

Your antenna is connected to the 6110-MP using the Antenna port (J1) on the front of the radio. Tunable antennas like the Tactical Whip antenna (Codan Part Number: 15-00473) and Tactical Long Wire (Codan Part Number: 15-00476) have a quick connect/release adaptor that connects to the antenna port (J1), the quick connect/release adaptor activates the internal tuner on the radio.

> **Note:** If the **Menu** > **User Data** > **Peripherals** > **Antenna Type** is not set to **Auto Detect**, the antenna adaptor will not automatically activate the internal tuner.

Once you have connected your antenna, it is recommended that you run a Channel Tune Test (page 12) to ensure that standing wave ratio (SWR) values are acceptable. This test is recommended for any antenna used, including supported broadband antennas.

> **Note:** The accessory pass-through located at the top of the Codan backpack allows the antenna cable or antenna whip to remain connected while the backpack is closed.

Testing your radio before deployment

Once assembled, the radio should be tested to ensure that everything is working correctly. The following tests should be run before the radio is deployed. Testing involves:

- running a diagnostic self-test; and
- measuring the standing wave ratio (SWR) of your channels; and
- carrying out station-to-station on-air testing.

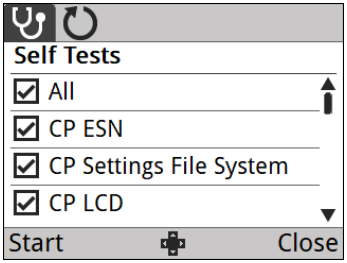
Running a Self Test

The Self Test allows the radio to run through a series of checks to ensure that the radio is operating. The CP LCD and CP Keys tests require your input in order to complete.

> **Note:** The self test will only test the control point that it was run from. If you have a 2320 handset connected to your radio, you should run the self test on both the front panel as well as the 2320 handset.

> **Note:** You can press **PTT** at any time to abort the self-test.

1. Switch on the Radio (page 15).
2. Press the # FUNC 2 key.
3. Select **Self Test Screen** from the **Function Select** screen.
4. Press (**Start**).



The radio will now run through all of the self tests listed on the Self Tests screen. As each test is completed, the test result will appear on the screen.

Passed	Failed	Manual
✓	⚠	(blank)

Manual tests are tests that require you to run the test manually.

5. The CP LCD test checks for any screen errors by displaying the colour and tone states of the screen, the screen displays White, Black, Red, Green and Blue in order. Press any key on the keypad to progress through this test.
6. The CP Keys test checks that key presses are being registered and that keys pressed to match the correct input received by the radio. Test each key on the keypad and confirm that the corresponding key displays on the screen. Leave the key last as it will end the test.

> ℹ **Note:** The key will not display on the screen when pressed during this test.

> ℹ **Note:** The **PTT** button is not included in this test, pressing PTT will abort all tests.

7. Once the tests have completed, a summary report will display the results. Review any failed test results and address them before deployment.

Measuring the Standing Wave Ratio (SWR) of your channels

The 6110-MP radio measures the forward and reflected power between the radio and the antenna. The measured power ratio is called the Standing Wave Ratio or SWR. To ensure correct installation, the power and SWR assessment should be performed with the radio with any antenna you intend on using when deployed.

SWR Results can vary based on several circumstances, including the characteristics of the antenna, the quality of the connection to ground, the frequency used, and the proximity of the antenna to other objects. The table below shows the communication quality you are likely to achieve with a given SWR value.

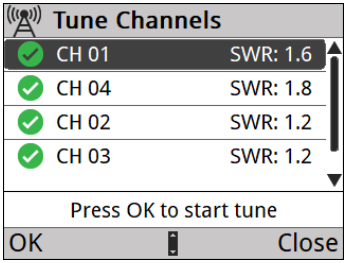
SWR Measurement	Icon	Description
Less than 3.0		Good
Between 3.0 and 5.0		Poor
Greater than 5.0		Unlikely to be able to communicate on this channel

Tuning Scanned Channels

To tune your currently scanned channels:

1. *Hold* the 1 TUNE key for 2 seconds.
2. Press the OK key to start tuning.

   As each channel is tested, it will display an SWR value for each channel. An icon will appear that indicates if SWR value is at an acceptable level for transmission on the channel.
3. Review each channel for a good SWR reading, address any poor SWR readings before deployment.

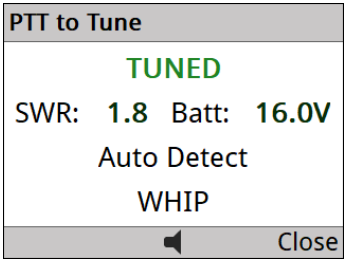


Tuning a channel or frequency

Individual channels and frequencies can also be tested for their SWR value.

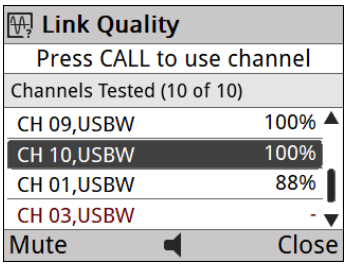
To tune a single channel or frequency:

1. Select the channel or frequency you want to test from the Channel or Scratch Mode on the Operational screen (page 19).
2. Press the 1 TUNE key.
3. Press the Push-To-Talk (PTT) button on the H-250 or 2320 handset (page 23).
4. Check the SWR value and address any problems before deployment.



On-air testing

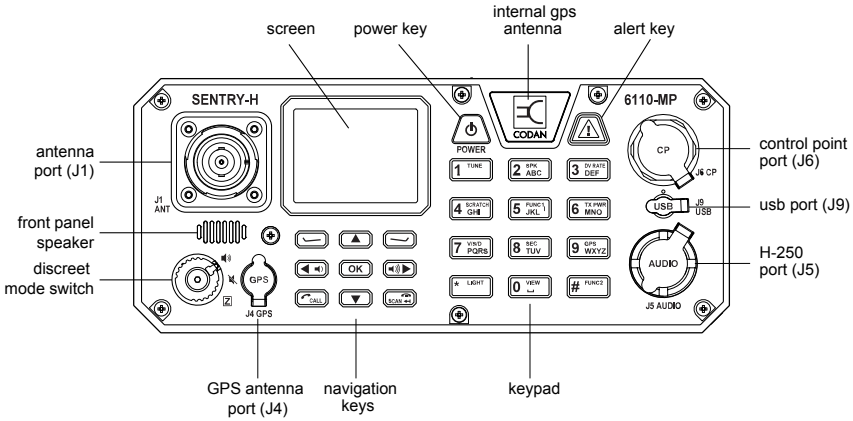
On-air testing gives a better indication of antenna operation, particularly if the operator is familiar with the signal strengths usually received within a network. The Channel Test call (page 39) can be used to identify the best channel between two stations. A test call between two closely positioned stations should return call quality results close to 100%. The Channel Test call type can be made as a 2G or 3G ALE Point-to-Point Call (page 43) or as a Selcall call (page 49)



As well as testing signal quality, making a Selective call (page 39) to other stations in your network will allow you to test other features of your radio like Digital Voice, Encryption and Frequency Hopping. All of which should be tested before deploying your radio into the field. Speak to your HF Network Administrator to resolve any critical issues you are experiencing before deploying your radio into the field.

Front panel and screen overview

The Sentry-H 6110-MP front panel



Switching the radio on and off

Switching on

Press the key.

Switching off

Hold the key for 2 seconds.

Screen layout overview

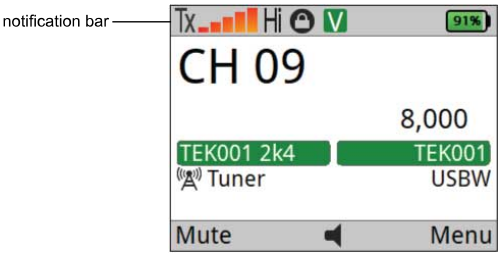
The 6110-MP display enables you to view information about your radio as well as allowing you to perform most of the radio's functions efficiently. Each screen is split into three main sections, a notification bar, a menu bar and a work area.

The notification/title/tab bar

The notification, title or tab bar is located at the top of the screen and is used to display useful information based on the current screen being displayed.

Notification bar

The notification bar is shown on the Operational screen (page 19), it displays the state of several of the radios key functions.

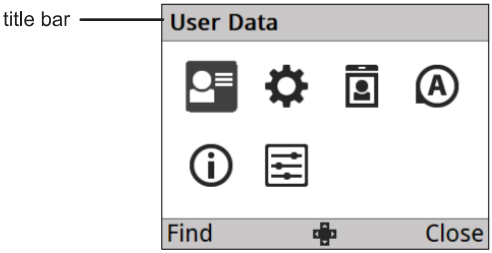


Some common notification bar icons include:

- Call type indicator , and for example.
- Battery or .
- Mute type indicator, refer to the Select mute type (page 26) table for details of the various mute states.
- Scanning .
- Transmission power Hi, MED, and Lo.
- Receive/Transmit Tx and Rx indicator.
- Rx/Tx level indicator and .
- Missed Calls .

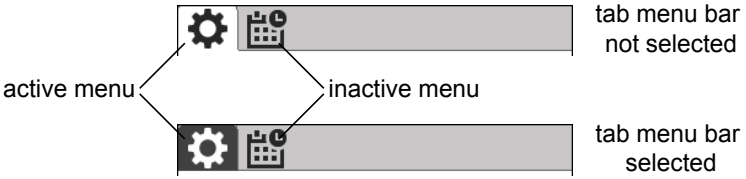
Title bar

The title bar is shown on the menu screen (page 20), it displays the current menu or sub-menu title.



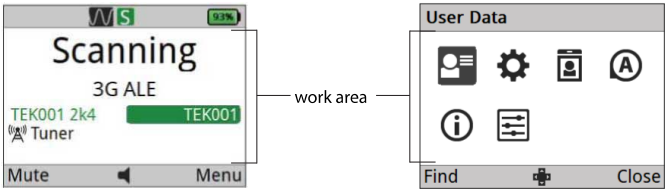
Tab bar

The tab bar is a variant of the title bar. It is used to group menu items that are related, for example, grouping **Time and Date** settings. When a tab bar is selected, you can use the  and  navigation keys to cycle through the tabs. You can then use the  and  keys to navigate into the menu.



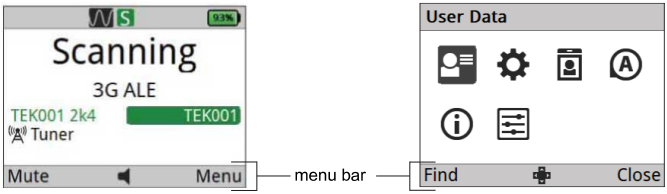
The work area

The work area is displayed below the notification bar and is the main work area of any screen. On the operational screen (page 19) displays important information about the state of the radio. On the menu screen (page 20), the work area displays menu items or settings.



The menu bar

The menu bar is displayed at the bottom of the screen and displays context for the software keys and .



The menu also displays several contextual icons, including:

- Volume/Speaker mode indicator .
- Numeral input is available 123 .
- Alpha Numeric input is available Abc .
- Left/Right navigation is available .

- Up/Down navigation is available .
- Up/Down/Left/Right navigation is available .

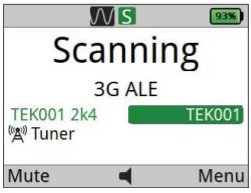
Screens overview

There are several key screens that make up the 6110-MP user interface, being aware of each screen type is essential to successfully operating the radio.

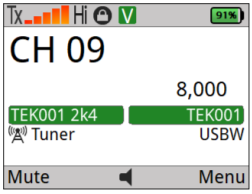
The Operational screen

The operational screen displays information relating to the three main operating modes of the radio. When in Scanning mode (page 34), the radio is monitoring any configured HF network channels for incoming calls made to your radio. When in Channel mode (page 34), the radio will monitor a single channel and will listen for incoming calls or voice transmissions depending on the mute type selected. The channel selected will be displayed on the Operational screen. When in Scratch mode (page 35), the radio can be tuned to transmit and receive on an arbitrary frequency.

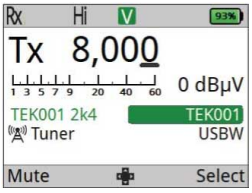
Scanning Mode



Channel Mode

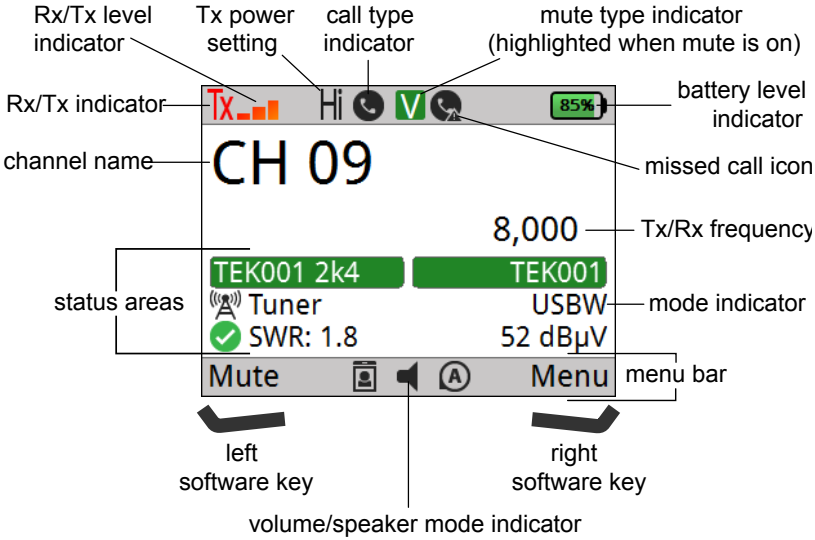


Scratch Mode



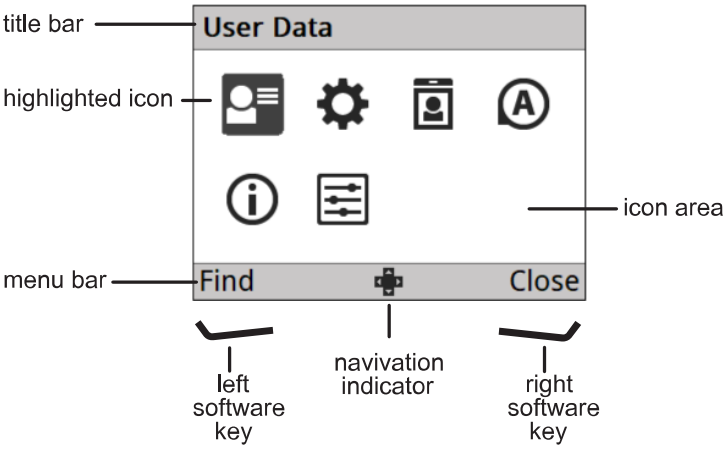
Elements of the Operational screen

Note: Depending on your access level and the current setup of the radio, some menu items may not appear where shown. Contact your HF Network Administrator for more information.



The Menu screen

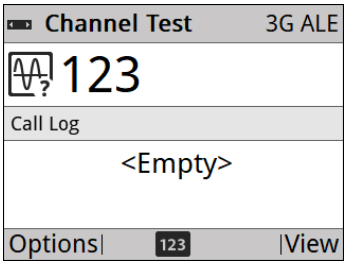
The menu screen displays all user and system-level configurations for the radio, provides information about the radio and allows access to advanced views and administrator login on the radio.



You can access the menu screen by pressing  from the Operational screen (page 19) when in Scanning or Channel mode.

The Call screen

The Call screen is displayed when making a call to a station. It contains information about the call type, HF network in use.



You can access the call screen by pressing  from the Operational screen (page 19).

Adjusting screen brightness, auto-dim time and theme

To suit your operational needs, the screen brightness and auto-dim time, which automatically dims the screen when not in use can be adjusted. The radio can also be switched between light and dark themes.

Change the screen brightness

The screen brightness can be changed to low, medium or high.

> **Note:** You can turn off the screen and key lighting entirely by activating discreet mode.

To change the screen brightness:

1. Press the  key.
2. Scroll to the brightness level you require and press the  key.

3. Press (**Save**) to save the setting.

Set Auto Dim Time

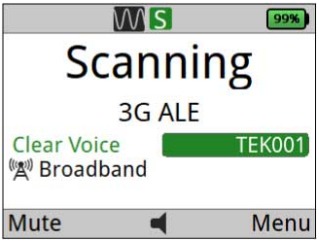
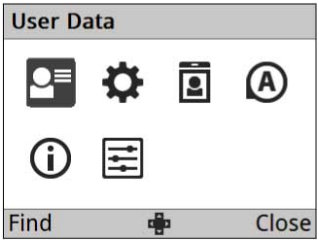
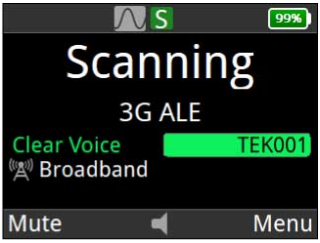
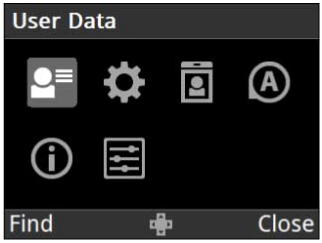
To change the number of seconds of no input before the screen is automatically dimmed:

1. Press the * LIGHT key.
2. Press to navigate to the **Set Auto Dim Time** tab, then press .
3. Enter the auto dim-time (in seconds), from 5 to 1200 seconds (20 min).
4. Press (**Save**) to save the change.

Select the next available theme

To switch between a **Military Light** and **Military Dark** theme:

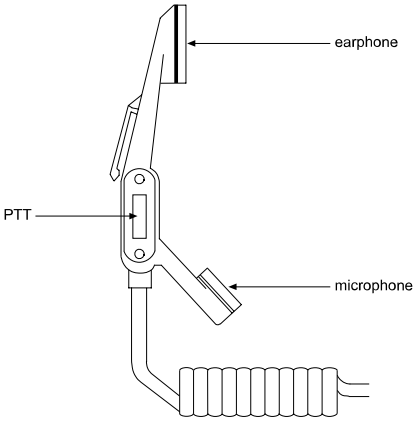
1. *Hold* the * LIGHT key.

Theme	Channel screen	Menu screen
Military Light (Default)		
Military Dark		

Handsets

The H-250 Handset

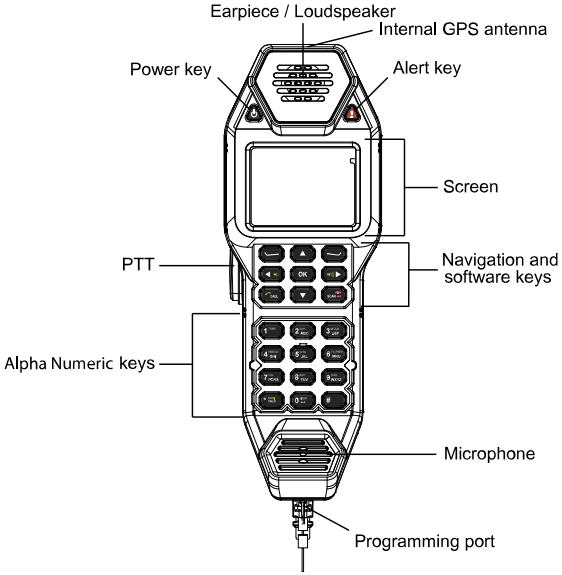
The 6110-MP radio supports standard audio accessories with U-229 type connectors. The handset is a standard issue, lightweight, tactical H-250/U type, with built-in earphone, noise-cancelling microphone, and PTT (Push To Talk) button. It is connected to the H-250 Audio port (J5) on the front panel of the radio.



The 2320 Handset

The 2320 handset meets MIL-STD-810G environmental standards for shock, vibration, dust, humidity and IP67 for water and immersion. With an internal microphone and earphone/speaker, and cradle, the smart handset is designed to provide extended operation and control of the 6110-MP radio.

> **Note:** The 2320 handset and the front panel user interfaces are independent of one another.



Speaker and mute

Change the speaker volume

The 6110-MP has a front speaker that outputs both received audio as well as system tones. You can adjust the speaker volume using the volume keys on the front panel. Use the  key to increase the speaker volume and  to decrease the volume when you are on the channel screen.

> **Note:** Volume adjustment will affect all connected control points and H-250 audio accessories, for example, increasing the volume on a 2320 handset will also increase the volume on the front panel speaker and H-250 handset.

Muting receive audio

When the 6110-MP is set to a channel or is scanning channels, and mute is switched off, you hear on-air signals on each channel. If you do not want to listen to this, you can silence the radio by switching on mute.

You can set the mute to switch off when a voice signal or any other calling activity is detected (voice mute **V**), or only when a call addressed to your station is received (selective mute **S**). Your choice of voice or selective mute depends on whether or not you have to detect voice signals, and how much noise and traffic you want to hear. When digital voice is active, and scanning is switched off or paused, you can also set the mute to switch off only when a secure or clear digital voice signal is detected (digital voice mute **D**). The voice signal is output to the front panel speaker, an H-250 audio accessory or a connected 2320 handset.

> **Note:** The current mute state is set across all connected control points or H-250 audio accessories.

Select mute type

Mute type	Icon	Description
Voice	V	Mute is opened when speech is detected on a channel in all supported modes and when receiving a call addressed to the radio.
Selective	S	Mute is opened when a call addressed to you is detected
Digital	D	Mute is opened when digital voice is detected

To select the next mute type, from the channel screen:

1. Press the 7 V/S/D PQRS key.

Opening and closing mute

The mute can be opened (sound on) and closed (sound off) from the Operational screen

Note: By default, mute is automatically closed after 5 seconds of inactivity.

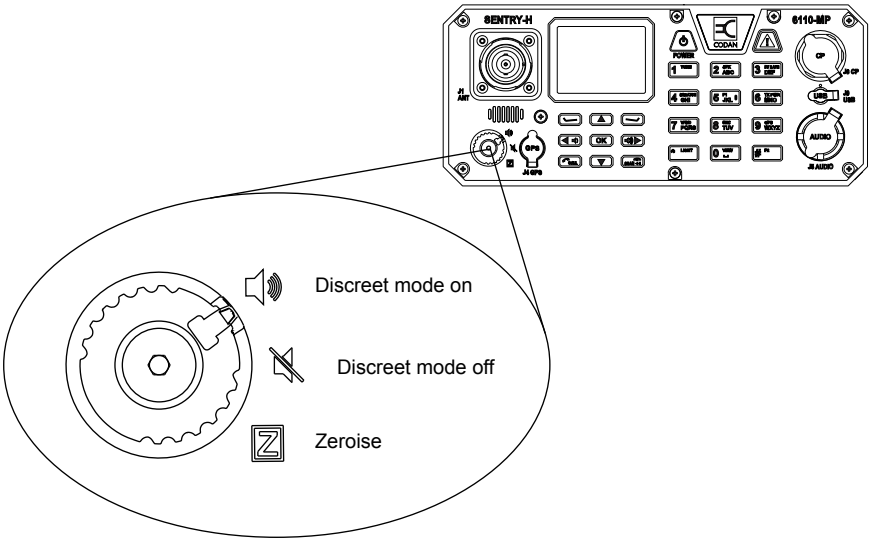
Note: Opening and closing mute will affect all connected control points and H-250 audio accessories.

1. Press (**Mute**) to toggle mute open/closed.

Discreet mode and zeroise

Discreet mode switch

The discreet mode switch allows the operator to control audio and light emissions from the radio, that is to say, that all of the speakers and backlighting on the device turn off when in discreet mode, allowing the device to operate with reduced sound and light signature.



The discreet mode switch can also be configured to zeroise (erase) or lock the radio to prevent unauthorised access to the unit when compromised. By default, the zeroise function is set to prompt the user with erase or lock options.

Turning Discreet mode on and off

Turning on discreet mode ensures that the radio will operate without emitting light or sound.

> ❗ **WARNING:** If the **H-250 Discreet Mode Override** audio option is **enabled**, the audio will still be emitted from any audio device connected to the H-250 (J5) port. Contact your HF Network Administrator for more information.

To turn on discreet mode:

1. Set the discreet mode switch to 

To turn off discreet mode:

1. Set the discreet mode switch to 

Zeroise the radio

There are two actions that the Zeroise function can execute on the radio. The lock action will turn the radio off and will force the operator to enter the Administrator PIN when the radio starts up again. The erase action will erase all user configurations, returning the radio to its factory state, it will then turn the radio off.

⚠ **CAUTION:** Locking the radio requires the operator to enter the Admin PIN before the radio unlocks. The User PIN will not unlock the radio once it has been locked.

❗ **WARNING:** A zeroised (erased) radio contains no configuration once erased; this includes channels, stations, encryption and hopping keys, and settings. You are no longer able to use the radio effectively.

❗ **WARNING:** You have 5 seconds to undo this action once initiated, pull the discreet mode switch outward and turn left to return the switch to the Discrete Mode Active position to abort the action.

To lock or zeroise (erase) the radio:

1. Turn the discreet mode switch to the **Active**
2. Pull the switch outward then turn to the right to the **Zeroise** position to initiate the action.
3. Select the desired activity if prompted.

Secure communications

Secure mode is a macro that toggles two optional features of the 6110-MP radio, digital voice and voice/data encryption. By default, the secure macro will:

- activate and deactivate AES-256 encrypted digital voice and data; or
- if encryption is not available, activate and deactivate digital voice if available; or
- activate CES-128 encryption if available.

Digital Voice

When enabled on your radio, the Standard Digital Bundle (Codan Part Number: 15-10624) enables Digital Voice. Digital Voice overcomes the potential poor voice quality that comes as a result of atmospheric effects and interference from other equipment and transmissions. Digital Voice brings clarity to voice communications over HF by removing the background noise that is typical with an analogue signal. Check with your HF Network Administrator to find out if Digital Voice is enabled on your radio.

Encryption

When enabled on your radio, encryption allows you to send secure digital voice and data over HF using a shared key. Two types of encryption are available, AES-256, which comes with the Advanced Digital Bundle (Codan Part Number: 15-10625) and CES-128 (Codan Part Number: 15-10642-000). Check with your HF Network Administrator to find out if encryption is enabled on your radio.

Switching Secure on and off

DV and encryption are toggled on and off using the same key. To toggle Secure on and off:

- From the operational screen, press 

to toggle digital voice/encryption

Selecting a secure key

The selection of a secure key is only available when the AES-256 or CES-128 Sales Option has been enabled.

To select a secure key, from the channel screen:

- *Hold* the 8 SEC TUV key to navigate to the **secure info** screen.
- Navigate to the **Select Key Index** option and press ◀ or ▶ to select the key you want to activate.
- Press ⌐ to **Activate** the key change.

Selecting the Digital Voice rate

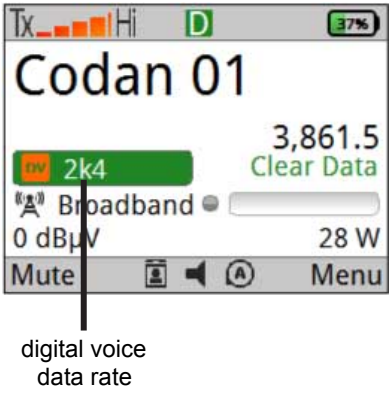
The **Digital Voice rate** or **DV rate** is the bitrate of vocoder used for the digital voice transmission. Higher vocoder rates will result in a more natural-sounding voice signal at the receiving station, but it requires better channel conditions than the lower rates. A lower vocoder rate will result in greater processing artefacts at the receiving station but can operate in very poor channel conditions. The range of vocoder rates are available to enable the operator to choose the best rate for best voice quality versus channel condition

The digital voice rate is shown in status area 1 of the channel screen. The Digital Voice Rate can be changed during voice calls.

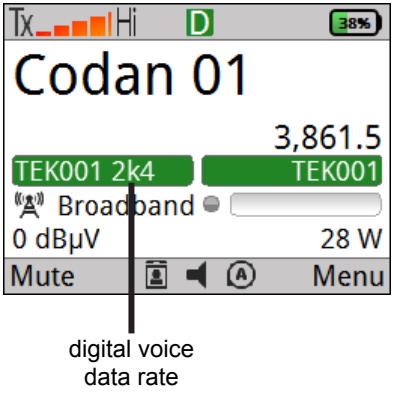
To change the DV Rate, from the channel screen:

- Press the 3 DV RATE DEF key. The DV current rate will display in status area 1. Repeat this process until you have cycled through to the bitrate you desire.

Active clear digital voice (in Tx)



Active encrypted digital voice (in Tx)



Frequency hopping

Codan's Frequency Hopping capability (Codan Part Number: 15-10629-000) uses GPS timing to synchronise radios accurately. The 6110-MP radio may require a GPS antenna (Codan Part Number: 78-01253) connected to the radio's GPS antenna port (J4) to get GPS time synchronisation.

> ℹ **Note:** To use Frequency Hopping your radio must have both the **Hop** and **Hop Info** macros assigned to a key, typically 
>
> .

To turn Frequency Hopping on and off:

1. Press the key, to which the **Hop** macro is assigned.

To select the Frequency Hopping plan:

1. Press and hold the key, to which the **Hop Info** macro is assigned.
2. Navigate to the **Select Plan** menu item, then press  or  to select the plan.
3. Press  to save the change and **Activate** hopping.

> ℹ **Note:** Closing the screen will not save the changes.

Entering and editing text

Entering text with a USB keyboard

A Ruggedised USB Keyboard (Codan Part Number: 78-11005) can be connected to the USB port on the front of the radio (J9), a standard USB A (female) to 2320 USB adaptor cable (Codan Part Number: 08-07436-001) is required. In addition to text entry, navigation of the radios user interface can be achieved using a keyboard.

Key	Function
F1	 Left Software key
F2	 Right Software key
F3	**CALL** key
F4	**SCAN** key
F9	 Alert key
F10	 Power key
Space	When in editing mode, inserts a space When not in editing mode, acts as the **PTT button**
Ctrl + A	Selects all text in the focused field
Ctrl + C	Copies the selected text
Ctrl + X	Cuts the selected text
Ctrl + V	Pastes the copied text
Shift + ←	Selects the character on the left side of the cursor
Shift + →	Selects the character on the right side of the cursor
Ctrl + Y	Redo
Ctrl + Z	Undo
Enter	Sends the message when applicable, otherwise inserts a new line if allowed

Key	Function
Ctrl + Enter	Inserts a new line if allowed
Ctrl + Shift	Opens the Select Input Language Screen when applicable
Alt + *	Opens the special characters popup when applicable

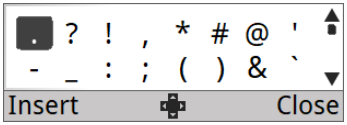
Entering a special character with the keypad

You can enter special characters in messages, names, stations, and in addresses of stations that you call.

The * LIGHT key may be used to enter the global ALL address syntax (@?@) or special 2G ALE addressing characters easily.

To enter a special character in an address, message or station:

1. *Hold* the * LIGHT key to see the available special characters.



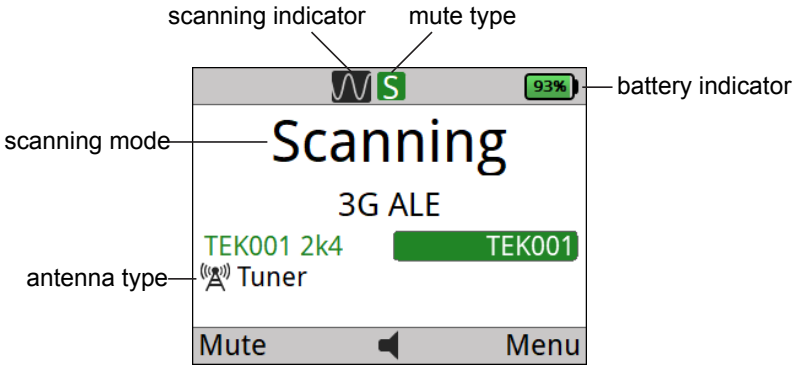
2. Navigate to the character you require using the navigation keys, then press (**Insert**).

Scanning, channel and scratch modes

The operational screen displays information relating to the three main operating modes of the radio desribed below.

Scanning mode

The 6110-MP is capable of scanning multiple channels for incoming calls or voice transmissions (see Select mute type (page 26) for details on selecting the types of transmissions that the radio will interrupt scanning for), the radio will then lock onto that channel until the transmission has ended and the scan pause has timed out or until the incoming call has ended or timed out.



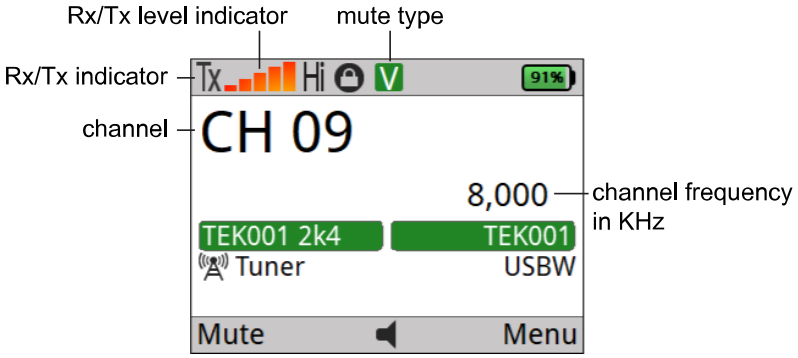
To toggle Channel Scanning on and off:

1. Press the SCAN key from the Channel Screen.

   The icon will appear on the Channel Screen when the radio is Scanning.

Channel mode

The radio is capable of fixed channel communication without the need to establish a network call. Fixed channel operation allows for voice transmission in both clear and digital voice and can be used in conjunction with encryption and frequency hopping.



To select a fixed channel:

1. If you are in a menu screen, press **PTT** to exit to the operational screen.
2. If the radio is scanning, press SCAN to switch off scanning.

> **Note:** If the scan indicator icon is shown in the notification bar (page 16), press SCAN to turn off scanning.

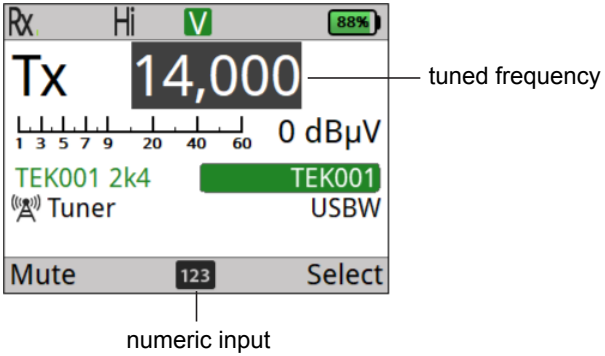
3. Press ▲ or ▼ to scroll to the channel that you want to use.

   The channel is selected.

> **Note:** The channel mute will be temporarily open while navigating channels. See Muting receive audio (page 25) for more information about Channel mute.

Scratch mode

Scratch or fixed frequency mode tunes the 6110-MP receiver and transmitter to a fixed arbitrary frequency. Scratch mode allows for voice transmission in both clear and digital voice and can be used in conjunction with encryption and frequency hopping.



To enter Scratch mode:

1. Ensure that the radio is in Channel mode (page 34).
2. Press the 4 SCRATCH GHI key to enter Scratch mode.

Selecting a fixed frequency

To select a fixed frequency in Scratch mode:

1. Press the (**Select**) key until the numeric input 123 icon is displayed in the Menu bar (page 18)
2. Use the keypad to enter the frequency you want to tune.
3. Press to change.

> **Note:** You can also use the navigation keys to change the frequency.

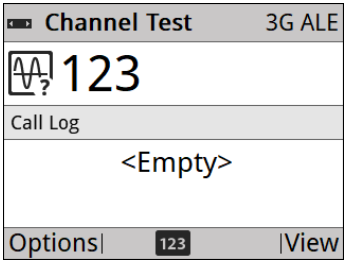
HF networks

An HF Network in the context of your radio is a call system with associated scan tables and several settings to control privacy and call establishment. The Sentry-H 6110-MP radio supports 2G ALE, 3G ALE and Codan Selcall call systems.

FEATURE	SELCALL	2G ALE (CALM)	3G ALE
Incoming call detection	FAST	FASTER	FASTEST
Caller Identification	X	X	X
Station dialling	X	X	X
Call termination detection		X	X
Automatic channel selection		X	X
Synchronised channel scanning			X
Voice message capability			X

View and change HF network

There may be several HF networks are available on your radio, and you may, at some point, need to change the network that you are using. The current HF network appears in the top right corner of the CALL screen.



Note: The radio will automatically use appropriate call systems when scanning multiple HF networks.

To set or change the HF network:

1. Press CALL.
2. Press (**Options**).
3. Select **HF Networks**.
4. Select the desired HF network from the list.
5. Press OK.

Call types

The 6110-MP is capable of making and receiving various call types; additional call types are available through the installation of optional accessories. Refer to the Operator Manual of your accessory for information on its features.

Call Type	Icon	Network	Description
ALE Sounding		2G/3G ALE	Update the Link Quality Assessment (LQA) of your station on other radios in your network.
Channel Test		ALL	Test the signal quality between two stations.
Alert		ALL	Make an alert call.
Get Position		ALL	Request GPS position of the remote station that is configured to respond to this call type.
Get Status		ALL	Request diagnostic information from a station that is configured to respond to this call type.
Message		ALL	Send a text message call.
Phone		ALL	Relay a phone call to a Codan HF station with a Codan Telephone Interconnect.
Selective		ALL	A selective call is a voice call.
Send Position		ALL	Send your GPS position to another station.
SMS		ALL	Send an SMS text message using SprintNet.
Voice Message		3G ALE	Send a recorded audio message over a 3G ALE network.

2G ALE special address calls

Call Type	Icon	Description
ALL		An ALL call may be made to all stations that are tuned to or scanning the same frequency in a 2G ALE/CALM HF network. The ALL address syntax may be used with the Alert, Message, Phone, Selective, or Send Position call type.
ANY		An ANY call may be made to all stations that are tuned to or scanning the same frequency in a 2G ALE/CALM HF network. The ANY address syntax may be used with the Alert, Message, Phone, Selective, or Send Position call type.
Group		A Group Selective call may be made to specific stations that are tuned to or scanning the same frequency in a 2G ALE/CALM HF network. The Group Selective address syntax may be used with the Alert, Message, Phone, Selective, or Send Position call type.
NET		A NET call may be made to a single NET address. Many stations may be programmed to recognise this address when tuned to or scanning the same frequency in a 2G ALE/CALM HF network. A station may be a member of a NET or may have the NET programmed in its profile without being a member of the NET. A NET address may be used with the Alert, Message, NET, Phone, Selective, or Send Position call type.
Wildcard		A Wildcard call may be made to all stations that are tuned to or scanning the same frequency in a 2G ALE/CALM HF network. The Wildcard address syntax may be used with the Alert, Message, Phone, Selective, or Send Position call type.

3G ALE group and broadcast calls

Call type	Icon	Description
Group call		A 3G ALE Group call enables multiple stations to be grouped as a single address. Groups are defined in the 3G ALE HF network configuration.
Broadcast call		A 3G ALE Broadcast call is a call made to all stations on your 3G ALE HF network that are configured to accept broadcast calls. Entering the address 1023 starts the call.

Answering and ending a call

Answering a call

1. Press the PTT button to answer a call.

Ending a call

To end a call:

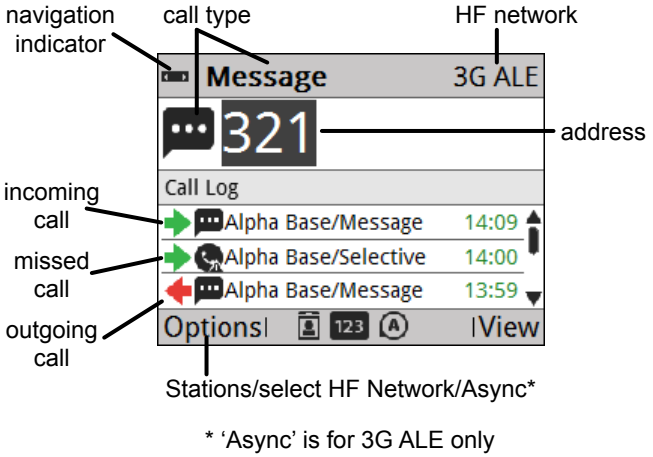
1. Press the 

key to end a call.

Making a 2G or 3G ALE call

Point-to-Point call

A point-to-point call is a general term used to describe a transmission between two radios. There are several types of calls you can make using your radio. Refer to the call types (page 39) for more information about the types of calls that are available.



* 'Async' is for 3G ALE only

To start a 2G or 3G ALE call:

1. Press the CALL key.
2. Select a call type using the ◀ and ▶ keys.
3. Enter the address of the station you are calling.
4. Press the CALL key.
5. Enter a text message or select a menu item if prompted.
6. Press CALL to begin the call.

Making 2G ALE special address calls

Note: Press the * LIGHT key to enter the **?**, **comma (,)** and **@** symbols when entering special addresses.

To start a call:

1. Press the CALL key.
2. Select a call type using the  and  keys.
3. Press the  key, scroll to **ALE** and press  .
4. Enter the address of the stations you want to call.
5. Press the CALL key.
6. Enter a text message or select a menu item if prompted.
7. Press CALL to begin the call.

2G ALE special address syntax

The Wildcard special address syntax is used to address calls to multiple stations within a 2G ALE HF network. The table below provides examples of the types of

Note: The **?**, **comma (,)**, and **@** characters are entered using the * LIGHT key.

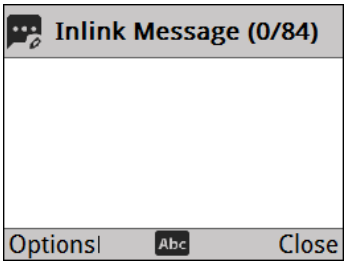
ALE address syntax	Call sent
@?@	A global ALL call to all listening stations
@A@	A selective ALL call to listening stations that have an ***A*** as the last character of their self address (***A*** may be any specified upper-case letter or number), for example, ***TNAA***, ***EANBA***, ***1NCA***, ***23A***
@@?	A global ANY call to all listening stations
@@A	A selective ANY call to listening stations that have an ***A*** as the last character of their self address (***A*** may be any specified upper-case letter or number), for example, ***TNAA***, ***EANBA***, ***1NCA***, ***23A***
@AB	A double selective ANY call to listening stations that have ***AB*** as the last two characters of their self address (***A*** and ***B*** may be any specified upper-case letter or number), for example, ***BAAB***, ***14BAB***, ***Q2CAB***, ***1AB***<
@A?	A double selective wildcard ANY call to listening stations that have an ***A*** as the second to last character of their self address (***A*** may be any specified upper-case letter or number) and any upper-case letter or number as the last character, for example, ***USAM***, ***19MA0***, **-ENA9**, ****3DAZ***
ABC,JK3MN,PQR (example only)	A Group Selective call to the stations specifically addressed
NET address	A NET call to all stations with that NET programmed in **NETs**
???	A Wildcard call to listening stations that have a self address matching the length of the sent address and with any upper-case letter or number as each of the characters, for example, ***SAM***, ***NAA***, ***234***, ***3AZ***
A?B? (example only)	A selective Wildcard call to listening stations that have a self address matching the length of the sent address with ***A*** and ***B*** as the first and third characters respectively (***A*** and ***B*** may be any specified upper-case letter or number), and with any upper-case letter or number in the second and last characters (in this case), for example, ***A2BM***, ***ADB1***, ***AZBE***, ***A3B8***

In-link messaging

In-link messages can be sent while on a 2G ALE selective or alert call.

To send an In-Link message during a Selective or Alert call:

1. Press CALL, the InLink Message screen is displayed.
2. Type your message.



3. Press (**Options**), scroll to **Call** and press OK to send the message.

3G ALE Group and Broadcast calls

3G ALE Group calls

> **Note:** The Voice Message call type is not a valid group call.

To make a 3G ALE group call:

1. Press the 

key.
2. Press the  key, scroll to **Groups**, then press the  key.
3. Press the  or  keys to select the call type you want to make.
4. Enter the group address or scroll through the group list.
5. Press the 

key to begin the call.

3G ALE Broadcast calls

> **Note:** The Voice Message call type is not a valid group call.

To make a 3G ALE group call:

1. Press the 

key.
2. Enter 1023 into the address field (1023 is the 3G ALE Broadcast Address).
3. Press the  or  keys to select the call type you want to make.
4. Press the 

key.
5. Enter a text message or select a menu item if prompted.
6. Press 

to begin the call.

Asynchronous calling

3G ALE HF networks rely on each station on the network having syncronised clocks. Time synchronisation is achieved by using the signals from GPS satellites. If a radio is unable to receive GPS signals, their clock will over time lose sync with the rest of the 3G ALE HF network and will not be able to receive 3G ALE calls. If the station you are calling is not answering your call, it may be that their radios clock is out of sync. An asynchronous call may allow you to make calls to a station that is in this operational state.

> **Note:** If you are unable to receive GPS signals on your radio, all calls that you make will be made using asynchronous calling.

> **Note:** If you are unable to get a GPS signal for an extended period, a TOD (Time of Day) Request call can be made to the TOD master station to syncronise your radio clock.

To make an asynchronous call:

1. Press the 

key.
2. Press  , then select **Async**.
3. Select a call type using the  and  keys.
4. Enter the address of the station you are calling.
5. Press the 

key.
6. Enter a text message or select a menu item if prompted.
7. Press 

to begin the call.

Making a Selcall call

To start a call:

1. Press the 

key.
2. Select a call type using the  and  keys.
3. Enter the address that you want to call.
4. Press the 

key.
5. Select a channel if prompted.
6. Press the 

key.
7. Enter a text message or select a menu item if prompted.
8. Press 

to begin the call.

Stations

Create a Station

Creating a station call allows you to assign an alias to an address for easier identification. Likely, your HF Network Administrator has already configured several key stations on your radio.

To create a new station; from the menu screen:

1. Navigate to  (**User Data**), then select  (**Stations**).
2. Press the  (**Add**).
3. Enter the name of the station using the keypad.
4. Press the  (**Add Call**) key.
5. Choose the network and call type you want to create for your contact.
6. Enter the address of the station.
7. Optional: Change the name for the call type.
8. Press the  (**Save**) key.

> **Note:** You can create several call types across multiple networks for your contact by pressing the  (**Options**) key and selecting the Add Call option.

.

Adding a Station from the Call History

To add a station from the **Call Log**, **Call History**, or **Last Heard Log**:

1. Hold the 

key to show the Stations and Station History screen.
2. Select the **Call History** tab.
3. Scroll up or down to find the call that you want to save.
4. Press Left Menu  (**Options**), scroll to **Save**, then press  (**Select**).

   You are informed if there is a matching station for the address in the call and asked whether or not you want to append this call to that station. If there is no matching station, you can create a new station.
5. Do one of the following:
   - If there is a matching station that you want to use, press  (**Yes**)
   - If you do not want to use the matching station, press  (**No**), create a new station, then edit the call as required.
   - If there are several matching stations, scroll to the station who you want to use, press , then edit the call as required.
   - If there is no matching station, edit the call as required.
6. Press  (**Save**) to save the information.
7. If the station does not exist, enter a name for the station, then press  (**Save**).

Viewing GPS Information

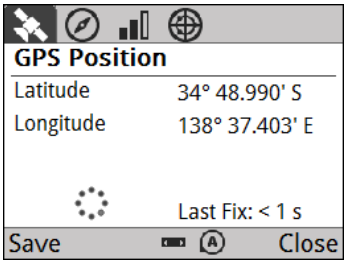
Obtaining your position

The GPS screen shows the GPS information obatined from a GPS receiver or latitude and longitude readings from a GPS receiver, or from **Settings** > **GPS** > **My Position**. Altitude and speed readings are hidden by default. The spinning circle shows that the GPS receiver is active, and the Last Fix reading shows the time lapse from the last receipt of valid GPS information.

> **Note:** The format of information on the GPS screen is defined by the **Settings** > **GPS** > **GPS Format Options** setting.

To view GPS information do ***one*** of the following:

- Press the 9 GPS WXYZ key; or
- From the main menu, select (**General**), then (**GPS**).



> **Note:** The Sentry-H 6110-MP radio uses two Global Navigation Satellite Systems (GNSS) to calculate position information with improved accuracy and reduced time for signal acquisition.

Distance and bearing

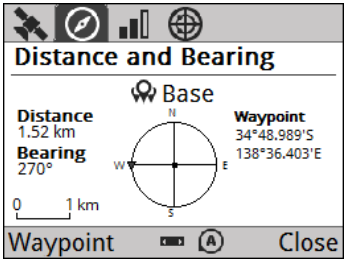
The Sentry-H 6110-MP radio calculates distance and bearing information between your GPS position and a waypoint. A waypoint is a collection of GPS information for a location. When you select a waypoint, the transceiver automatically calculates the distance and bearing from your current GPS information to the waypoint. This information is shown on the **Distance and Bearing** tab. Your GPS information may be from either the last fix from a GPS receiver or information entered into **Settings > GPS > My Position**.

The waypoint information may be derived from:

- a Get Position call or Send Position call in the Call History
- a Get Position call in Stations
- a selected waypoint

To view the Distance and Bearing tab:

1. Do ***one*** of the following:
   - Press the 9 GPS WXYZ key.
   - From the main menu, select (**General**), then (**GPS**).
2. Press to move to the **Distance and Bearing** tab.

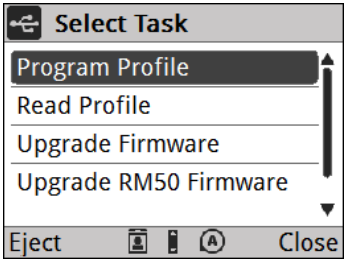


Update the radio profile with a USB thumb drive

> ⚠ **CAUTION:** An unconfigured radio is not capable of making calls.

The 6110-MP can be configured in the field using data stored on a USB drive supplied by your Radio Network Administrator. The drive can be pre-loaded with a radio configuration profile, a set of encryption keys and software updates.

To update or configure the radio:



1. Connect a USB memory stick to the J9 USB port using a USB Memory Stick Adaptor cable (Codan Part Number: 08-07436-001).
2. Select **Program Profile**.
3. Navigate to and select the profile you want to program onto the radio.

   > ⚠ **CAUTION:** Continuing with this process will overwrite the current profile stored on the radio. This action is not reversible. Select (**No**) to abort this action if you need to back up the existing radio profile first.

4. Select (**Yes**) when asked if you want to **Program the profile from file**.
5. Enter the Admin PIN if prompted.

   The profile is programmed into the radio.

6. Once the profile has been programmed into the radio, you may be asked to restart, press  (**Yes**) to restart.

Troubleshooting

General Troubleshooting

Below is a checklist for basic troubleshooting.

In the unlikely event you have any problems with your 6110-MP radio, check that:

- all connectors are dry and free from dirt
- all connections are sound
- the battery pack is connected to the radio and has some charge
- the selected antenna is appropriate for the distance over which you want to communicate
- the antenna is deployed correctly, oriented in a suitable direction, and connected to the radio
- the grounding system is adequate as per instructions provided with the antenna
- the antenna type on the channel screen matches the type of antenna you are using

If required, restart your radio to invoke self-testing. The self-test checks the memory, hardware, LCD and keys. If a serious fault is reported, contact your HF Network Administrator. Below is a table with some general tips on troubleshooting your radio.

Problem	Solution
The sound from the front panel speaker is muffled	Drain any moisture from the front panel of the radio by turning it front panel down.
Communications are not clear	Try another channel. Press PTT. If you are using a whip or long wire antenna, go to the menu screen, then select **User Data** > **Peripherals** > **Antenna Type**, check that the antenna selection icon is set to **Auto Detect** or **Always Tune**. If you are communicating over a short distance, try laying the whip horizontally for near vertical incident skywave operation. If you are communicating over a long distance, try selecting an antenna (page 8) with better performance for the distance you are trying to transmit.
I get an RF burn while transmitting	The radio is not adequately earthed. Attach an earth lead or counterpoise as per the instructions provided with the antenna.

Problem	Solution
GPS is not working	Ensure that the front panel of the radio, and hence the GPS antenna, is facing the sky so that it can receive signals from satellites. Alternatively, connect a GPS antenna to the GPS port (J4) and place the antenna so that it is facing the sky.
The 3G ALE link works in one direction only	The tune time is not set to the same value in all radios, or it is not set to the recommended time for the tuner.
You can hear the 3G ALE call transmission, but your radio does not respond	Check that the link protection mode, the network address, and the link protection key are set to the same corresponding value in all radios.
Called station does not reply	Try calling the station asynchronously (page 48) if using the 3G ALE network.
Tuning errors are received while using 3G ALE	Retune all of the channels in the 3G ALE scanning network (page 12). Avoid using any channels that have poor or failed SNR values.
Digital voice is not clear or sounds unnatural	Try selecting a lower digital voice rate (page 30), if you are using encryption, make sure you have matching secure keys (page 29) with the station you are communicating with.

Error messages

The table below contains several error messages that may be displayed by the radio as well as the steps needed to resolve them.

Error message	Resolution
Address is not valid Selcall address must be numeric with maximum length of 6	addresses must be a numerical value between 0 and 999999. Non-numerical values (letters A through S and special characters) are not valid.
Address required	No address has been entered on the call screen. To make a call enter an address for the station, group or special call you want to make.
At least one item must be selected	This setting requires at least one valid option selected.

Error message	Resolution
Call type **X** not valid for **Y** call system	You are attempting to create a contact or call a call type that is not compatible with the call system selected.
Call type is not allowed	This call type has been restricted on your radio.
Call type is not allowed and has been replaced with 'Prompt'	The call type you have selected for this contact is not available, the contact will prompt you to select a call type when selected.
Calling is not possible Handset version mismatch.	The firmware on the Handset control point does not match that of the radio. Upgrade the 2320 handset firmware to match the radio before attempting to use the radio.
Calling is not possible No HF networks are present	There are no HF networks configured on the radio. Contact your HF Network Administrator.
Cannot send voice message to group or broadcast address	Voice message calls can only be sent to other stations
GPS is unavailable	No GPS signal has been detected by the GPS receiver
Group members cannot be empty	At least 1 station address must be added to a group address
Hopping is not enabled	Hopping is not available on this radio
Incoming Call Error	There was an error receiving the incoming call addressed to your radio
Incorrect PIN	The pin entered is not correct
Invalid File	The file type selected is not compatible with the radio
Invalid group name	Group names must be alpha-numeric and between 3 and 15 characters in length
Invalid input	The key input is not valid on this screen.
Invalid network member name	Network member names must be alpha-numeric and between 3 and 15 characters in length

Error message	Resolution
Link lost, unable to send message	The data link to the remote station was lost. Check your antenna, re-tune (if using the internal tuner) and re-position if possible and try again.
Maximum number of users connected	No more than 4 control points can be connected to the radio simultaneously.
Message required	Blank text messages cannot be sent. Messages require at least 1 character.
Name is not unique	This name has been used for another entry
New PINs do not match	The pin and re-enter pin field do not match.
No channel for call on HF network ...	The selected HF network does not have a channel that it can make a call on. Either there are no channels available for this network or the channels do not have a valid mode set
No USB device connected	The connection to the USB device is lost. Check that the USB device is connected correctly and try again.
No voice or data key is set	No key has been set in the secure key index. press the secure macro key and navigate to Secure Key Index. Select a key and press Activate.
No voice or data keys programmed	No encryption keys exist for the current secure mode
Overwrite with current GPS position?	This action will overwrite the existing GPS coordinates with the coordinates detected by the GPS receiver
Phone number required	A telephone number entry is needed for this call type
PTT rejected Another PTT source is active	Another handset has pressed push-to-talk, the input on the current handset has been disabled
PTT rejected Rx-only frequency	The radio is set to receive only. Push-to-talk is not available
Rate selection not permitted	The selected digital voice rate is not permitted on this radio, select a different rate

Error message	Resolution
Record voice message timeout	The Voice Message screen has timed out. You will need to re-record your message
RM50 module not detected. Proceed anyway?	The radio does not detect an RM50 module. This may affect the outcome of the requested action.
RM50 power on failed	The RM50 module has failed to start up. Digital Voice, 2G/3G ALE data, and security is not available on this radio.
RM50 power on timeout	The RM50 module has failed boot within the timeout period. 2G/3G ALE data and security is not available on this radio.
Rx frequency is out of range	The HF band is between 1,600 kHz and 30,000 kHz, values outside of that range are not available on this radio
Screen closed due to remote update	The radio is being updated by another device, and the current screen has been closed to allow for this update.
Secure not supported while hopping is on	AES-256 Encryption is not available when hopping is on. Only CES-128 encryption is compatible with hopping
Settings conflict with sales options	The radio has been configured with settings that are incompatible with the features available on your radio. These settings will have no effect.
Start-up Error Please restart unit If error persists, please contact Codan	A start-up error has occurred. Hold the Power key for 2 seconds, then release to power down the radio, press the power key again to restart the radio. If the problem persists, contact your HF Network Administrator or Codan representative.
System busy	The selected action is not available as the radio is performing another action. Wait for the system to finish this action before trying again.
System initialising... Please try again	The selected action is not available while the radio is starting. Wait for the system to startup before trying again.
Time not valid	The time entered is not valid, the format is Hours minutes seconds

Error message	Resolution
Timeout	The current action has timed out. Try again
TOD Broadcast' is not allowed Transceiver is not the TOD Master for HF Network ...	This radio is not the Time of Day master of the current HF network. Only the master can broadcast the TOD to network members.
Unable to perform channel test with 3G ALE broadcast address	Channel tests can only be performed between stations, group and broadcast addresses are not available
Unable to perform channel test with ALE group address	Channel tests can only be performed between stations, group and broadcast addresses are not available
Unable to perform channel test with no address	Enter the station address that you want to test

Definitions

Standards and icons

Icon	Description
Note	the text may be of interest to you
CAUTION	proceed with caution as your actions may lead to loss of data, privacy or signal quality
WARNING	your actions may cause harm to yourself or the equipment

Acronyms and abbreviations

This term…	Means…
AES	advanced encryption standard
ALE	automatic link establishment
CALM	Codan automated link management
CP	Control Point
DC	direct current
ESN	electronic serial number
GPS	global positioning system
HF	high frequency
IF	intermediate frequency
LCD	liquid crystal display
LQA	link quality analysis
PTT	press-to-talk
RF	radio frequency
RFU	RF unit

This term…	Means…
Rx	receive, received
SMS	short message service
SWR	standing wave ratio
USB	Universal Serial Bus

Glossary

address

The HF radio equivalent of a telephone number. Your station self address is used by other stations to call you, and it is sent when you make calls to identify you as the caller. It is sometimes referred to as an address or a self ID.

Alert call

A call that enables you to trigger an alert tone at a specific station then speak to an operator there.

call

Relates to when a call system such as 2G or 3G ALE is used to alert a specific station or group of stations in an HF network to establish a voice or data communication link.

channel

A frequency and sideband programmed in the radio that is used to transmit and receive signals on air.

Channel Test call

A call that enables you to test the quality of channels in an HF network. A Channel Test call may be made in A 3G ALE and 2G ALE/CALM HF network to identify the best channel to use for a given station at a given time as well as update the LQA database.

counterpoise

A radial array or a grid network of metallic wires arranged horizontally around the base of an antenna to provide an effective earth plane.

frequency

The number of cycles per second of a radio wave, usually expressed in kilohertz.

handset

A held-held device that is used to control the functions of a radio. It most commonly consists of an earpiece, microphone and PTT button. A handset may also have a display and a keypad.

HF network

The part of the radio configuration that defines specific details for making calls using Codan Selcall, 2G ALE or 3G ALE.

macro

A set of instructions to automate a task you perform with the radio. When a macro is assigned to a key, the key can be used to execute the task quickly.

PTT button

The Press-to-talk button is located on the left side of the handset. This button switches the radio to transmit mode for analogue and digital voice communications, switch mute off temporarily. Push-to-talk can also cancel voice calls prior to the point where voice can be transmitted, cancel calls where data is being transmitted, and exit out of editable screens without saving changes.

RFU

The unit in a radio that modulates audio signals onto radio frequencies that can be transmitted on air, and that demodulates the radio frequencies it receives into audio signals.

standing wave ratio (SWR)

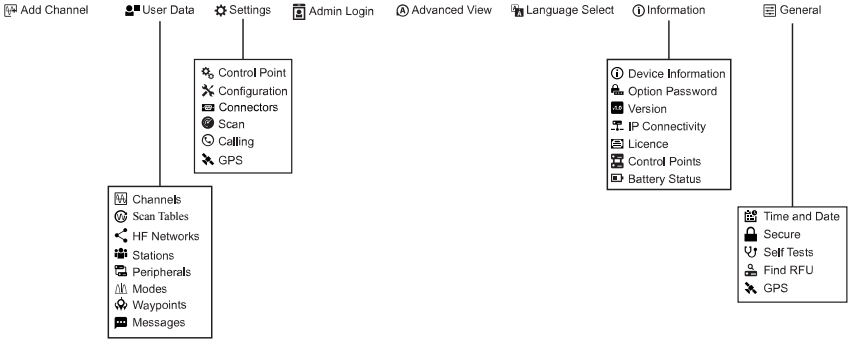
The ratio of maximum and minimum voltages on a transmission line of the starting wave resulting from the interaction of the forward and reflected waves. It is a measure of how well the antenna matches the radio output.

station

A radio in an HF network used for communications.

Menu Navigation

Menu Map



www.codancomms.com
ASIA PACIFIC (Head Office)

Codan Limited
2 Second Avenue
Technology Park
Mawson Lakes SA 5095
AUSTRALIA

T: +61 8 8305 0311
F: +61 8 8305 0411
E: support@codancomms.com