



Technical Support

TECHNICAL NOTE

Technical Note TN-968-SR

TM8100 Mobile Radio Firmware v2.04 Upgrade Instructions

1 March 2005

Applicability

This Technical Note details the changes in the latest Firmware and PC Application and instructions on upgrading existing TM8100 radio Firmware to v02.04.00.07. Simply referred to as v2.04.

1. Firmware Changes

The following changes have been made in Firmware v2.04 and PC Application version 2.80.

Resolved Issues

- Resolved the issue found in the previous Firmware where setting 0.000Hz as a Receive frequency would cause the radio to error on Transmit. Raised as Focus 19396.
- The PC Application would crash when using languages other than English and Alt-A or Alt-R were used to add a channel. Raised as Focus 19230.
- Emergency audio source is now correctly associated. The emergency audio source path (e.g. Aux Mic.) setting was being overridden by the 'current' microphone (e.g. Fist Mic.) selection on transition to Emergency Transmit mode. Raised as TIMS 40548.
- The following GPIO lines are now checked at start-up for their current state. This is in addition to the functions added in Firmware v2.03. See TN-946-SR.
 - SEND NETWORK PRESET CALL (1...4)
 - SEND CHANNEL PRESET CALLThis ensures these functions respond to third-party operations or inputs. Previously external inputs would need to perform a change to be recognised. Raised as Focus 19360.
- Backlighting With Activity now responds to all PTT presses including those made by External inputs such as the Remote PTT Kit.
- Resolved an issue where a radio that had Rx_AUDIO set to Tap Out to R4, then attempted to enter THSD transparent mode, would crash. Raised as TIMS 40936.

First Production Serial Numbers

From radio serial number **(TBA)** all TM8100 radios built have Firmware v2.04.

Upgrading radios to v2.04

To upgrade existing TM8100 Firmware to v2.04:

- Upgrade the Calibration and PC Application versions to the latest versions. These are:
 - PC Application v2.80
 - Calibration Application v2.71
- Read and save the radio's personality (.m8p)
- Read and save the radio's calibration (.m8c)

In the PC application:

- Click on Tools > Download... > **Download**
- The radio will display "UP" and the Download Application will look for the saved location of the Firmware QMA1Fstd_02_04_00_07.s2
NOTE: Firmware files since v2.00 have also included the FPGA image file, and this will be downloaded automatically during this upgrade process.
- The following pop-up dialog box will appear:



To continue the Firmware upgrade:

- **Remove** the DC supply to the radio
- Wait 5 seconds
- Re-connect the DC supply
- Power-up the radio with the control head on/off button (if it has not already powered-up)
- The pop-up box will then disappear and the upgrade process will continue.

Once the Firmware and FPGA download is complete the radio will return to "Pr" mode

- Reprogram the saved personality back to the radio
- Reprogram the saved calibration back to the radio

The radio will now reset to normal operation.

NOTE: Failure to follow the DC removal process above will produce an "Error 59 – Protocol – unlock/erase flash block error" noted in the Download Application's Status bar leaving the radio Firmware un-changed.

2. Enhancements

- This Firmware release includes the implementation of up to 100 ID's. To allow easier access to all of these channels or groups the scroll rate has been adapted to suit. If either scroll channel change key is held for longer than 4 seconds the scroll repeat rate changes from 2 channels/sec. to 20 channels/sec.
- The TM8100 will now directly enter transmit mode (if allowed) and any PTT input is active at start-up. Raised as Focus 28715.
 - The TM8110 cannot display the Firmware version so the radio will directly enter transmit
 - The TM8115 will enter transmit after the Firmware version has scrolled on the display¹. The Firmware will be displayed as '02. 04. 00.'
 - The TM8105 will enter transmit after the Firmware version has scrolled (even though it does not have a display).
- Previously the TM8100 provided 9 possible CCDI volume steps. This has been increased to 25 steps. The CCDI commands are:
f04020074 set volume level Off (= 0)
f0402256D set volume to maximum level (=25)
- Encryption Status has been added to the output functions available on the Programmable I/O page. This produces an output indication that encryption has been activated either by the user pressing a programmed function key, or has selected an encrypted channel. The line will deactivate when the user turns off encryption, or an unencrypted channel is selected.

To enable a user to identify the channel they are on is encrypted (or not); set the I/O lines as per the suggestion below.

Pin	Direction	Label	Action	Active	Debounce
AUX_GPIO4	Output	PIN_10	Encryption Status	Low	None
AUX_GPIO6	Input	PIN_9	Toggle F1 Key LED	Low	10

A link-short between Pins 9 and 10 of the Aux DB-15 plug will light the 'F1' LED whenever an encrypted channel is active. Be aware if the channel is then a member of a scan group it will 'beep' whenever the scan passes that channel.

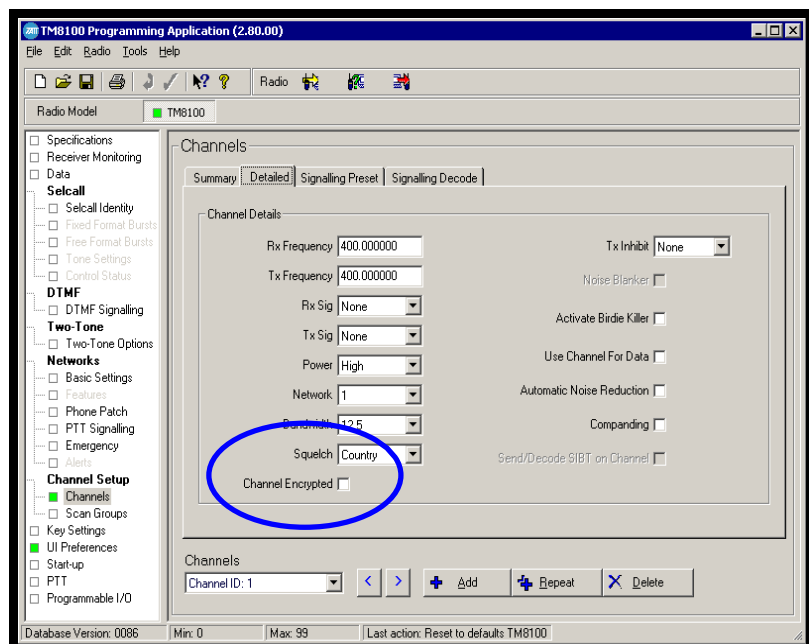
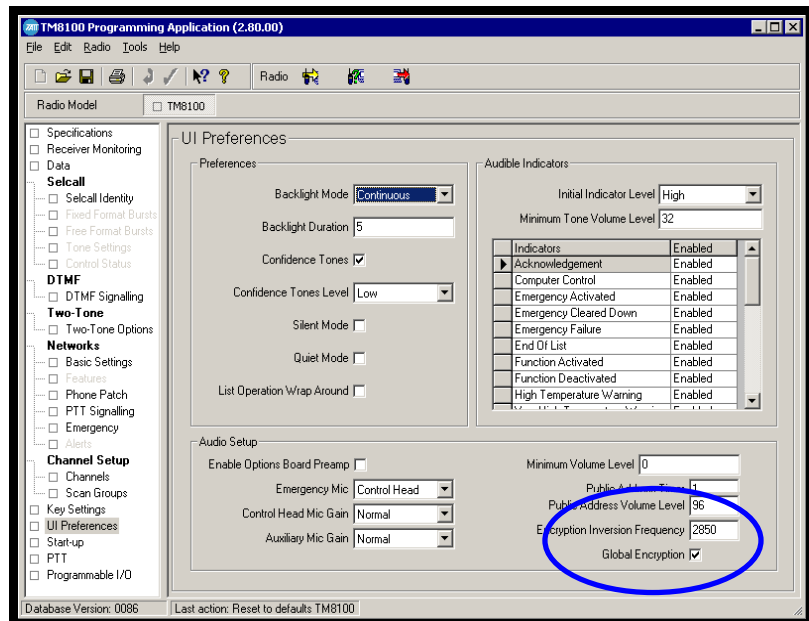
¹ From an off state, depress PTT, then power-up the radio.

Encryption on a Per-Channel Basis

Encryption (Voice Inversion) can now be enabled on a per-channel basis. To enable this operation, disable the Global Encryption tickbox on the UI Preferences page, and the Channel Encrypted tickbox(s) will be ungreyed on each Channel's Detailed tab. Raised as Focus 18371.

Encryption on a Global basis is default, and the radio will allow encryption (for all channels) to be controlled by a function key if also programmed. This was the previous implementation.

Encryption on a per-channel basis will enable Encryption on only those channels as they are selected, including when being Scanned. The user will no longer be able to disable Encryption for any channel in this mode.



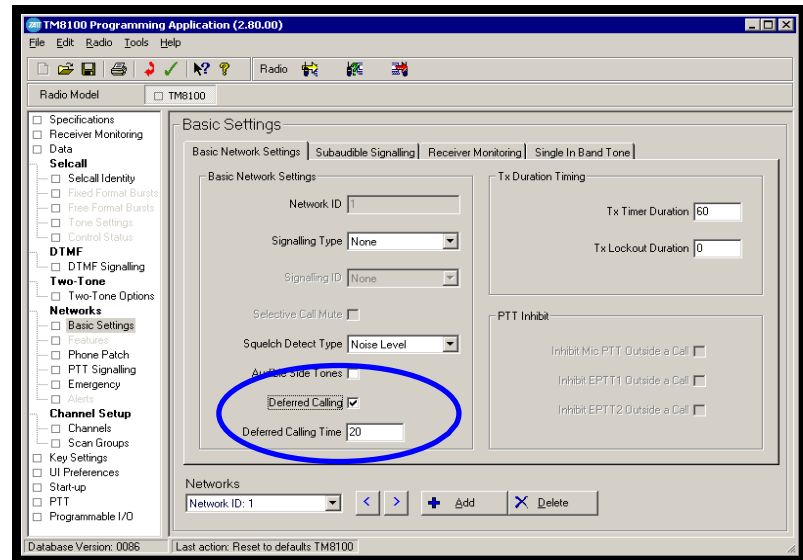
Deferred Calling

If Deferred Calling is enabled, unsuccessful Selcall or DTMF sequence transmissions will automatically retry after a random period between 500ms and 5seconds.

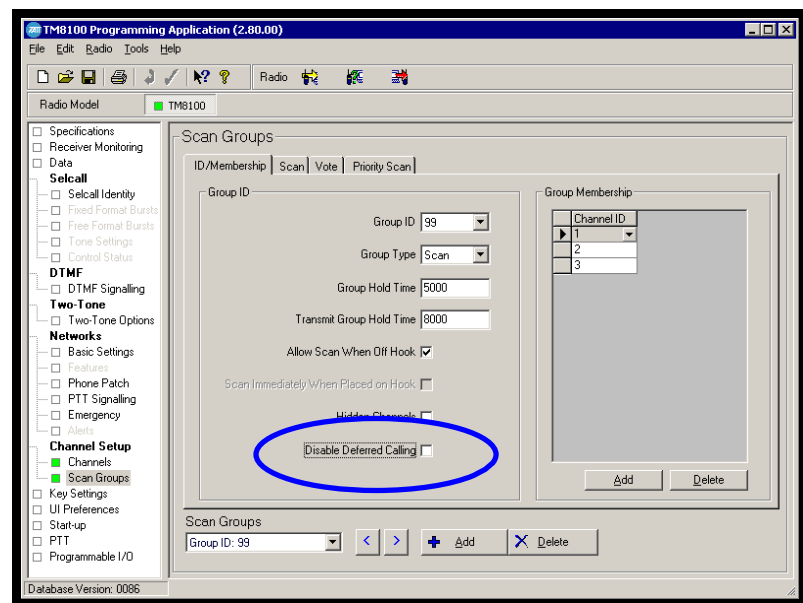
It will continue doing this until:

- The transmission succeeds or
- The nominated Deferred Calling Time expires or
- There is a user input action (including any key-press).

Raised as Focus 18459.



If Deferred Calling functionality is not desired when Scanning the Scan Groups > ID/Membership tab has the tickbox Disable Deferred Calling to disable this.

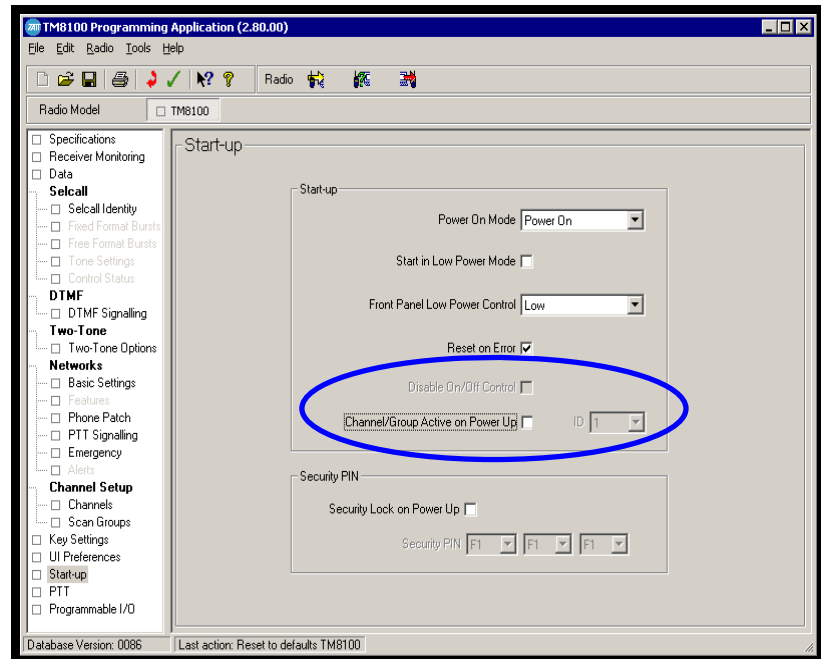


Start-Up Channel

Channel/Group Active on Power Up forces the radio to start-up on a specific Channel or Group regardless of last ID used before being powered-off (this will also occur if the radio resets due to a brown-out with heavy vehicle cranking).
NOTE: BCD inputs have a higher priority, and these will define the actual channel even if this option is enabled.

Once the tickbox is enabled the required channel or group can be picked from the drop-down ID list. Hidden channels will not appear.

Raised as Focus calls 18254 and 19123.



Maximum number of Channels

The maximum number of ID's available in each TM8100 model is defined below:

TM8115 – 2 digit display – 100 ID's; 0 to 99 inclusive. 10 of which can be groups, each group can have up to 24 members.

TM8110 – 1 digit display – 10 ID's; 0 to 9 inclusive. Each group can have up to 9 members.

TM8105 – Blank head – 100 ID's; 0 to 99 inclusive. These are available using BINARY selection from the Programmable I/O lines.

FFSK Lead-In Delay

The variable value for FFSK Lead-In Delay has been increased from 1200ms to 5100ms in-line with existing products such as the T2000-A75 and the Orca5000.

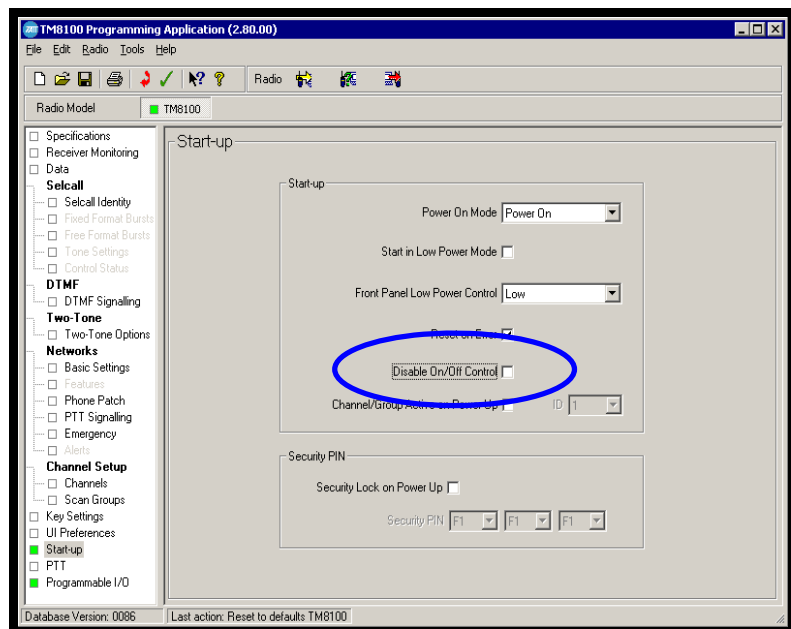
The FFSK Lead-In Delay field, found in Data > RF Modems, can be set from 20ms to 5100ms in 5ms steps.

Disable On/Off Control

The addition of the function Disable On/Off Control allows third-party systems (e.g.: Mobile Data Terminal) to control the TM8100 front panel on/off switch, removing the ability from the user.

This tick-box option only un-greys when the input AUX_GPI3 for Power Sense (Ignition) has been set. This I/O line then becomes the *only* way of controlling how the TM8100 is powered on or off. Raised as Focus 18044.

NOTE: It is recommended the Power Sense (Ignition) input line be operated as Active High. The line may also need a 3K3Ω 'bleed' resistor to ground if that input DC supply does not fall below 0.7V when inactive. Failure to fall to this level will mean the TM8100 remains 'on'.



Dual Busy Status Outputs

The TM8100 can now provide two BUSY STATUS outputs simultaneously. These can be assigned to any Programmable I/O outputs and each can also be configured differently. Raised as Focus 17349.

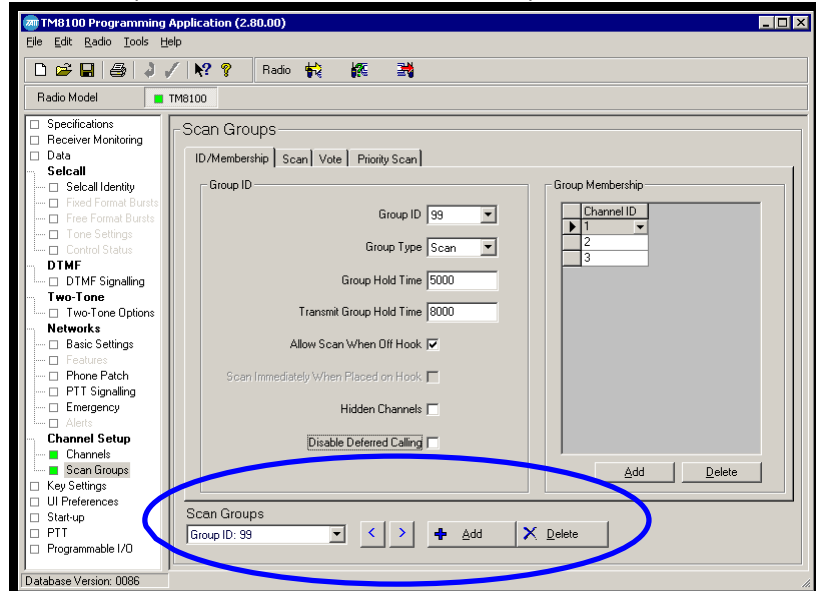
Setting Scan in pre-v2.04 Firmware

If the Firmware being used is older than v2.04 the radio **must** have a scan group with two members. This is required even if scan is not utilised by the user. The scan members are allowed to be duplications of the same ID if only one channel is programmed, for instance.

Scan Groups in the TM8115 (TM8110)

Scan Groups (up to 10 can be enabled) are added using the Add/Delete buttons at the bottom of the Scan Groups > ID/Membership tab. By default no Scan Groups are enabled, leaving all 100 (10) ID's free for Channel use.

As no Scan groups are enabled if none have been added, then this provides a solution to the request in Focus 16413.



NOTE: Scan Groups (if enabled) use an ID each. Groups can include up to 24 (9) members leaving up to 90 (9) ID's for channel use.

Only one group can be assigned and selected by the function keys.

Scan Group(s) can now be accessed from the Up/Down scroll keys; Groups are still identified by the amber LED indication when selected.

The table below shows what actions occur when the TM8100 exits Groups.

Exiting Groups	Group Active but no Captured Channels	Group Active and on a Captured Channel	Group Active after a Captured Channel
Scroll Keys exit to:	Next ID up or down from Group ID	Next ID up or down from Group ID	Next ID up or down from Group ID
Group assigned Function key exits to:	The ID active before entering Scan	That captured channel	The ID active before entering Scan

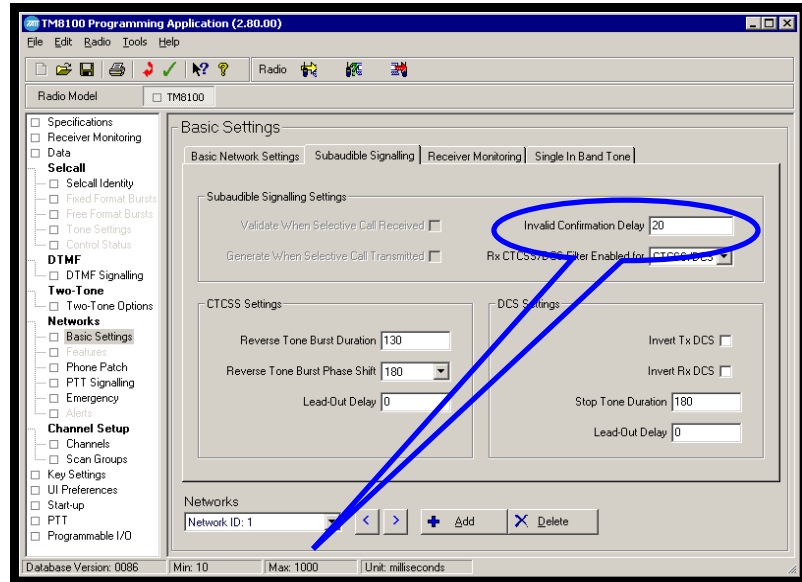
The Abbreviated Label on Scan Groups > Scan > Scan Group Display Indicator now appears as:

- TM8115 – “SC”
- TM8110 – “o” (looks like the bottom half of an eight).

3. PC Application Changes

Invalid Confirmation Delay

Invalid Confirmation Delay can now be adjusted between the values of 10 and 1000ms. The default is 20ms. Some older radios appear to have 0ms, which is invalid. Please ensure these are updated to at least 10ms. This value defines how long the signalling on the carrier has disappeared before the receiver closes the mute. Raised as Focus 17446.

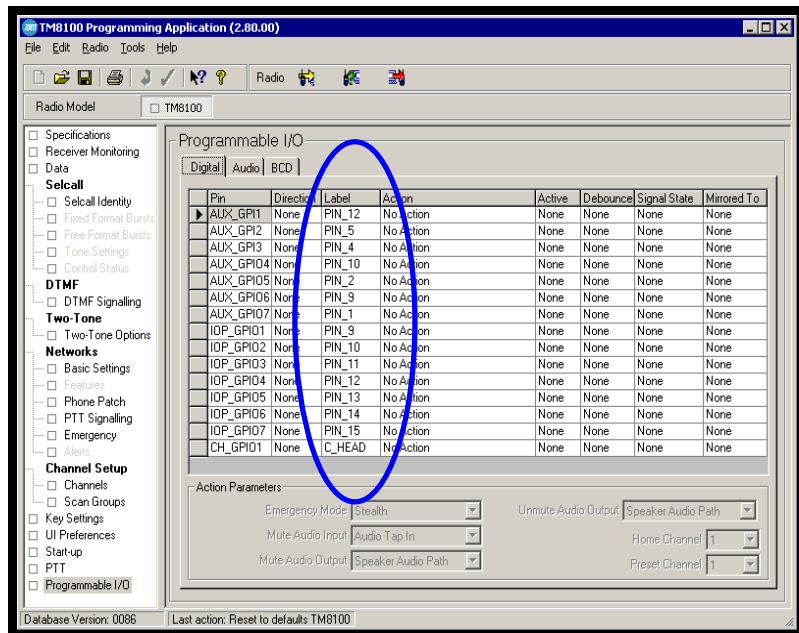


Programmable I/O default labels

These define the specific Pin on the respective connectors allowing easier interfacing. The AUX port is the rear DB-15, IOP is the 18-way MicroMatch on the main board and CH_GPIO1 is Pin 8 of the display heads' Microphone RJ-45 socket. These can still be re-labelled to any description as before but will revert to 'None' if the label is subsequently deleted. Raised as Focus 17495.

IOP Pins as they appear on the TMAA01-05 Options Extender Bd: DB-15(HD)

- IOP_GPIO1 = Pin 15
- IOP_GPIO2 = Pin 14
- IOP_GPIO3 = Pin 13
- IOP_GPIO4 = Pin 10
- IOP_GPIO5 = Pin 9
- IOP_GPIO6 = Pin 5
- IOP_GPIO7 = Pin 4



4. Calibration Application Changes

Calibration App Changes

There are no changes to the TM8000 Calibration Application at this time. The current Calibration Application is v2.71.00.09.

NOTE: If a TM8100 requires re-calibration it is important to temporarily remove programmed settings - through the PC Application > Programmable I/O - for any audio Tap-In's or Tap-out's. Depending on configuration these may inhibit the radio's audio path and consequently fail calibration testing.

Compliance Issues

None.

CSO Instruction

Please inform all technical staff and dealers of the updates to the PC Application, Calibration Application and enhancements to radio Firmware available for the TM8100 mobile radio.

5. Issuing Authority

Name and Position of Issuing Officer

Graham Brenchley
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Document History

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