

Technical Note TN-2879c-SR

TM9300 and TP9300 DMR Firmware v2.22.02

TM8200, TM9300, TP9300 Programming App v2.22.0.18

Tx9000 Calibration Application v2.30.8.322

14 May 2019

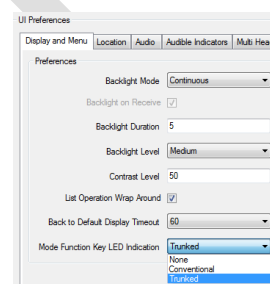
This Technical Note applies to Cadence Release **DMR-1903 (R19.1)**. Firmware **v2.22.02.0042** for the TM9300 DMR mobile radios and TP9300 DMR portable radios is supported by:

- TM8200/TM9300/TP9300 Programming Application **v2.22.0.18** (or later)
- Tx9000 Calibration Application **v2.30.8.322** (or later)
- EnableFleet **v3.4.5** (or later)

New Features

• JIRA-TRM-37644: 'Change Mode' LED Indicator

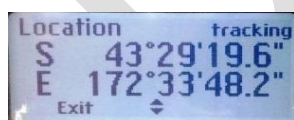
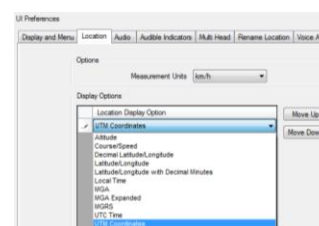
Between FW v2.14.03 and FW v2.20.04 Function Key(s) assigned with the action 'Change Mode' on the TM9300 mobiles displayed the LED 'on' when in Trunked Mode as a differentiator to Conventional Mode. This is now user configurable. The LED behavior can be configured in Global > UI Preferences > Display and Menu > 'Mode Function Key LED Indication' to None, Trunked or Conventional



• Remedy WO 30981, WO 32378, WO 32416, INC 25466: New Location Display Options

The 'Own Location' display options has been expanded to include the following:

- Latitude / Longitude (as previously provided)
- Latitude / Longitude with Decimal-Minutes
- Decimal Latitude / Longitude



Latitude/Longitude



Latitude/Longitude with Decimal Minutes

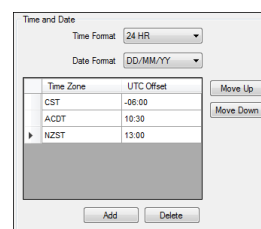


Decimal Latitude/Longitude

- Altitude (in meters above or below mean sea level)
- Local Time

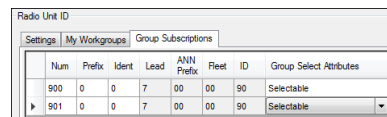
This displays as a Timezone Offset from UTC as defined in Global > UI Preferences > Display and Menu.

Note: See how this can also provide a partial solution to TPD2 portable Real Time Clock in TN-2880



- **Remedy INC 26178: Selectable Workgroups on the TM9315**

Previously the TM9315 2-digit head entry-level mobile could list Group ID's as presets and make outgoing group calls, but will now also automatically 'subscribe' to that same current preset group if they are defined as 'Selectable' in Trunked > Radio Unit ID > Group Subscriptions and will accept incoming calls from that group ID. This aligns it with the TP9300 portable and also TM9300 with high-tier heads



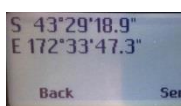
Num	Prefix	Ident	Lead	ANN Prefix	Fleet ID	Group Select Attributes
900	0	0	7	00	00	Selectable
901	0	0	7	00	00	Selectable

- **Remedy WO 4871: Send Own Location radio-to-radio**

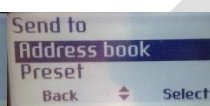
If the DMR radio is configured in Tier-2 and/or Tier-3 to send text messages, then when viewing the radios 'Own Location'^(a) the RSK will display 'Text' and pressing this will create a text message and enter the SDM screen^(b) then define an end-user to forward the current location to^{(c)(d)}. A receiving radio displays this^(e) where 'Fm: 205' was the sending Unit ID



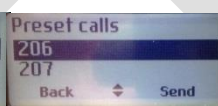
(a) Location Display



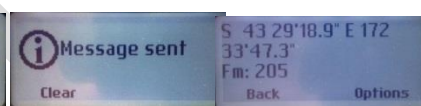
(b) SDM messaging screen



(c) Select relevant list



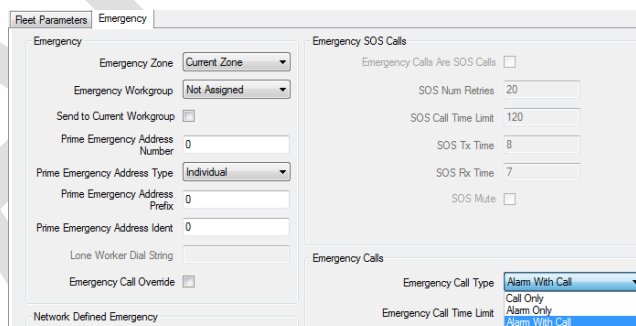
(d) Select receiver Unit ID



(e) SDM on the receiving radio

- **Remedy WO 21519, 21520: Capacity Max. Network Emergency Alert**

Emergency alerts can now be sent using DMR Std Tier-3 Emergency alert status and emergency termination. This can be sent on emergency activation on its own, or followed by a voice call as defined by the dropdown options in Trunked > Fleet Parameters > Emergency



Fleet Parameters Emergency

Emergency Zone: **Current Zone**

Emergency Workgroup: **Not Assigned**

Send to Current Workgroup: ☐

Prime Emergency Address Number: **0**

Prime Emergency Address Type: **Individual**

Prime Emergency Address Prefix: **0**

Prime Emergency Address Ident: **0**

Lone Worker Dial String: **0**

Emergency Call Override: ☐

Network Defined Emergency: **0**

Emergency SOS Calls

Emergency Calls Are SOS Calls: ☐

SOS Num Retries: **20**

SOS Call Time Limit: **120**

SOS Tx Time: **8**

SOS Rx Time: **7**

SOS Mute: ☐

Emergency Calls

Emergency Call Type: **Alarm With Call**

Emergency Call Time Limit: **Alarm Only**

- **Remedy WO 21518: Capacity Max. Network Talkgroup Subscription**

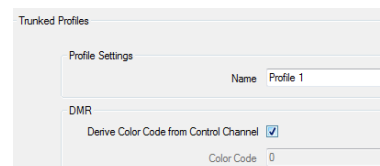
DMR standards-based Single and multi-group talkgroup subscription is now supported. Talkgroup attachment is not yet supported

- **JIRA-TRM-38124: Denied Voice Transmission on Capacity Max. Networks**

A check for the AT bit during voice calls is now ignored on Tier-3 which will stop voice transmissions from being denied on some Capacity Max systems

- **Remedy WO 24798: Tier-3 Control Channel Color Code**

Added support in DMR Tier-3 Trunked Networks for the terminal to 'Derive Color Code from Control Channel' and then use this for all activity on the site including payload channels



Trunked Profiles

Profile Settings

Name: **Profile 1**

DMR

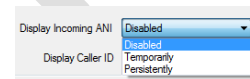
Derive Color Code from Control Channel: ☒

Color Code: **0**

- **Remedy WO 32517: DMR Workgroup selection behavior**
A new tickbox Trunked > Trunked UI > General > Use Current Zone for Set Workgroup sets whether the 'Set workgroup' menu item shows the user a list of all workgroups, or only those valid for the current zone. If the optional Assignment name is set, this will be displayed instead of the Workgroup name. There was a disparity of group names when viewing groups in 'Scroll Workgroup' or in Menu's 'Set Workgroup'
- **TP9300 and TP9400 Bluetooth 2.1 Wireless PTT:**
This has been successfully tested with the Savox BT-Com, Savox BTR-155, and Aina Speaker/microphones
- **TP9300 and TP9400 Bluetooth 4**
In addition to supporting Bluetooth 2.1, the TPD2 (TPDB3-xx) Portable Hardware variants of TP9300 and TP9400 include the CC2564 Bluetooth module and from this Cadence also support Bluetooth 4 in HSP, HFP and SPP profiles

Problems Fixed in Radio Firmware v2.22.01

- **Remedy WO 19180: Changes to Selcall ANI Displayed Duration**
The duration a decoded Selcall ANI appears is now configurable in Conventional > Features > Features > Display Incoming ANI. The options are Disabled where nothing appears, Temporarily where ANI appears for about 10-seconds and Permanently requiring the user to clear the ANI manually
- **Remedy INC 22396: 16 entry maximum in the My Workgroups table**
Determination of the number of groups allowed to be configured for subscription and affiliation has been improved. Also, an option to allow/disallow a group to be included in the affiliation request to the TSCC has been added so more control over limiting inclusion of permanent groups in affiliation requests that the TSCC may already know about or for groups specific to a single site where affiliation may not be required to receive calls on that group
- **Remedy INC 25668: Tier-2 Emergency allowed other talkgroup traffic**
In Emergency mode on a DMR Tier-2 channel the radio will no longer unmute to audio for other calls too
- **JIRA-TRM-38986: Bluetooth Rx audio tone heard while Transmitting**
There is no longer a low-level audible tone heard from the Bluetooth received audio signal when the radio was transmitting Bluetooth Tx audio. This was only occasionally occurring in the TP9300 in Analog Conventional or MPT1327 modes
- **JIRA-TRM-38627: System error on MPT1327**
Removed an internal timing control from MPT1327 hunt channel selection as it was unduly slowing down this process and in rare cases causing the radio to system error due to the time taken



- **JIRA-TRM-38730: External PTT used the call setup configuration of Mic PTT**
External PTTs were using Global > PTT > Mic PTT > PTT Press Call Setup rather than their own setting. This setting determines for instance whether pressing the PTT results in a Trunked call being setup. This is now corrected
- **JIRA-TRM-38451: Voice Annunciation was not working on Channel 'Number' (0)**
The radio now treats a channel ID of '0' as valid for voice annunciations
- **JIRA-TRM-36413: DMR Tier-3 Scroll icons visible with queued calls**
When a missed call is displayed with single unanswered call queueing in Trunked mode, the scroll keys now behave as per their settings for idle display and will not appear if unnecessary
- **JIRA-TRM-38352: DMR Tier-3 Noise blanker**
Noise blanking in Tier-3 mode was not following the PC App tickbox Trunked > Network Settings > Trunked Channels > DMR Noise Blanker setting. This has been corrected
- **JIRA-TRM-36551: CCDI for "Allow external channel change option" didn't work**
Fixed the ability for the radio to change channel during Emergency callout if enabled – so long as there is at least one callout remaining
- **JIRA-TRM-38868: DMR Tier-3 scan group Ordering**
If the scan group labels have been ordered by label in the PC App the radio will now correctly find the label for the scan group ID
- **JIRA-TRM-38842: Dual Head not always changing mode and may system error**
Sync messages had stopped being sent from the control heads in FW v2.17 and that meant under certain conditions (especially dual head) odd behavior occurred such as a late powering head did not join the TM9300 system
- **JIRA-TRM-36437: Leading '0' shown in hours for queued call**
When viewing the time in 12-hour format the radio no longer displays a leading '0' for hours 1 to 9. When setting the time, the leading '0' is still used
- **JIRA-TRM-38598: Trunked RSSI menu item missing if disabled in Conventional**
The menu option for RSSI under display settings in DMR or MPT Trunked mode is no longer removed when Conventional mode does not display the RSSI indication
- **JIRA-TRM-38596: Non channel related icons were blanked during channel change**
When scrolling through Channels the icons that do not relate to channel functionality are no longer blanked while the channel is selected. This applies to icons such as silent operation, Bluetooth headset etc.
- **JIRA-TRM-35331: DMR Tier-2 Channel and Network preset calls with Function Keys**
For Channel Preset Calls this option will call an Address book entry listed in the Channels > DMR Preset Calls tab. For Network Preset Calls this option will send one of the DMR preset calls specified in Networks > Network Preset Calls

- **JIRA-TRM-37455: CoAP status and text messages failing**
 Under certain conditions, a group call could be received just as a channel change was being processed. The call was accepted in this case rather than being rejected since a channel change was in progress but the Group UI could be left on the UI display. A fix for this ensures the radio does not get stuck at Group UI
- **JIRA-TRM-37458: K5 Transmit power between 805.925MHz and 806MHz**
 This transmit power restriction for the itinerant band between 805.925MHz and 806MHz has been removed, so the Firmware control that forced the RF output to Very Low regardless has been disabled
- **JIRA-TRM-38894: OTAP Firmware upgrades failing**
 Several issues were fixed that may cause OTAP failures on both Firmware and datafile upgrades. One fix was specific to TPDB4-xx Portable Hardware where every second Firmware OTAP would always fail due to checksum error. Another fix was for a system error that sometimes occurred during a Firmware patch resulting in rollback because, at shutdown the UI expected an idle window but in programming, test and keyload modes the main window is a popup.
- **JIRA-TRM-34002: Vocoder 1031 tone tests using CCTM**
 CCTM command 710 20 has been added to transmit the 1031 pattern.
 This alternates a Tx standard (1031 voice plus mobile sync) slot with an idle slot
 The following Rx1031 command sequence below is used by the factory:

 - 710 16 *Direct-mode Rx 1031 in Rx standard slot with Tx v52 in reverse channel slot to exercise fast TDMA transceiver switching*
 - 705 0
 - 705 1 *Reports the BER reading. Repeat these to report another reading*
 - 710 0 *Stops the test pattern and exits TDMA mode*

The only change to the Rx processing is that the BER is now reported out the Mic port when a high-tier head is connected to a mobile torso. Previously it used the Aux port which is not CCTM standard. The Rx sync type should be a mobile sync.
 It does not matter if the currently selected channel in CCTM is Analog or DMR as the 710 command puts the radio into TDMA
- **JIRA-TRM-38447: Terminal will process embedded Alias as location in DMR Tier-2**
 Added extra validations on processing embedded GNSS Location messages in DMR Tier-2 as the FID was not being checked
- **JIRA-TRM-38617: Turned off invalid scroll icons**
 The Scroll icon(s) no longer appear when at the top or bottom of a menu or list when 'List operation wrap around' is disabled
- **JIRA-TRM-38790: Audible tones in Stealth False Power Down**
 The TM9300 radio no longer plays audio tones during emergency false power down

- **JIRA-TRM-38758: Corrected SDM entry keypress tones**
When entering characters in Conventional SDM's an invalid keypress tone will now be given when the message is at maximum length, it previously played valid tones
- **JIRA-TRM-38886: Geo-fencing actions were sometimes not actioned**
For example after actioning a Trunked zone change and then very soon entering another region the 'entering region status messages' was not sent.
Two problems were discovered:
(a) after the first action, subsequent actions within the region were ignored
(b) on queuing an action for processing, if it is identical to the last queued but unprocessed, the new action was being dropped

Problem Fixed in Radio Firmware v2.22.02

- **JIRA-TRM-38882: TM9300 HHCH RSSI 'Value' now correctly right-aligns on the screen**
Previously with this enabled it would push some of the RSSI Number value beyond the HHCH screen edge (see right). This was not noted with the Large Control Head or TP9300 displays



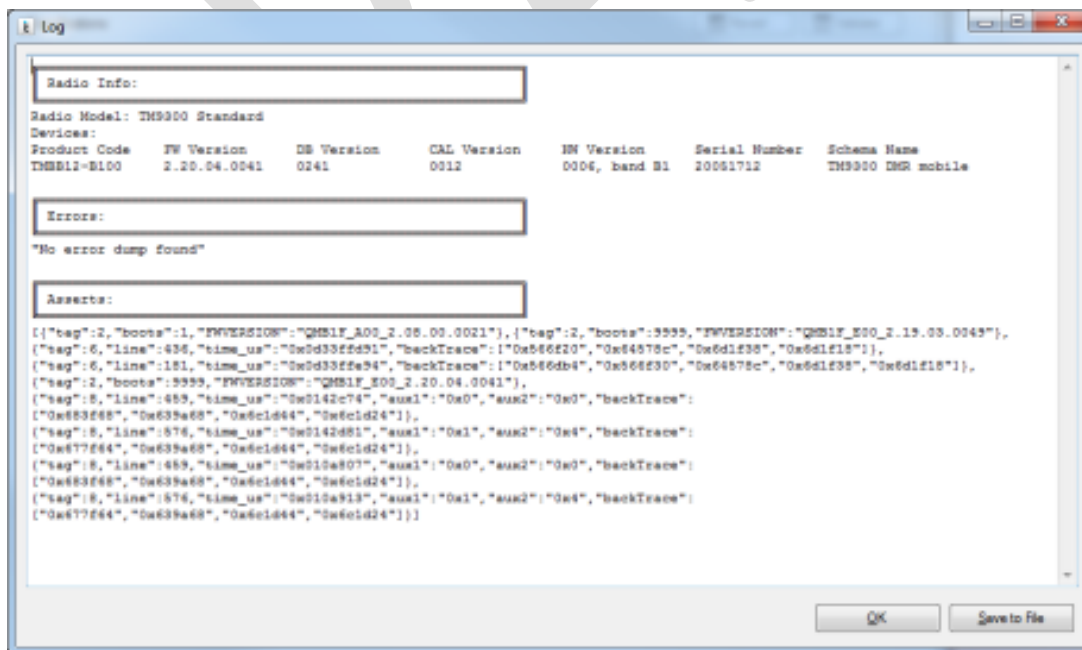
Known Problems or Limitations

- JIRA-TRM-35530: If DMR Tier-2 is configured with call queuing disabled and CCDI disabled, SDMs are discarded, but the sender is told that receipt was successful
- JIRA-TRM-35565: When queue is full of SDMs, further messages are acknowledged as successful, but discarded
- JIRA-TRM-35482: The maximum transmit time from External PTT does not follow the PTT programmed maximum values
- JIRA-TRM-34041: DTMF freeform dialing is not subject to the Tx Timer Duration
- JIRA-TRM-35649: Geofencing will not change modes if the radio is in a call
- JIRA-TRM-35568: Display text briefly disappears when pressing LSK if it is configured for zones but that option is invalid
- JIRA-TRM-35535: Radio doesn't respond to the NACK_resp for DMR Tier-2 Call Alert
- JIRA-TRM-34048: DMR Tier-2: With 'PTT Phone Patch Dialing' ticked, the radio will allow 'Phone Patch Call Dialing' even though that option is unticked
- JIRA-TRM-34060: DMR Tier-2: With 'freeform dialing' DTMF or sending a 'buffered DTMF' sequence, the monitor icon is displayed
- JIRA-TRM-34054: 'No dialing on this channel' is accompanied by a valid key-press beep
- JIRA-TRM-33982: Radio not starting up on default Start-up option Group with a hard reset
- JIRA-TRM-34030: In trunked mode, dialing '*0*nnn' when statuses are not being used as dispatcher requests is not rejected
- JIRA-TRM-33336: Hunting sampled channel list reset on returning from payload channel
- JIRA-TRM-34018: DMR Tier-3 displays 'Busy' when attempting to send a Status ID which has 'Rx Processing' disabled on the receiving radio

- JIRA-TRM-33114: 'Data message sent' displayed on screen occasionally
- JIRA-TRM-32981: BER Diagnostic 1031 discrepancy between FW v2.14 and v2.15
- JIRA-TRM-32908: No Red Tx LED on sending DMR Tier-2 Status
- JIRA-TRM-32076: Voice annunciation on mode change to trunked still works when not enabled on startup
- JIRA-TRM-32036: When '#48' is dialed but disabling of trunked call queuing is disallowed, the 'feature unavailable' tone is played twice
- JIRA-TRM-31860: Inconsistent behavior between Analog and DMR Tier-2 outputting SDM via CCDI, when queue is full
- JIRA-TRM-26178: GPS transmissions occur without a GPS fix regardless of the 'allow without GPS fix' setting

Problems Fixed and Enhancements in PC App v2.22.0.18

- **Remedy INC 16406, WO 15250: Simple Radio error log download tool**
Implemented a simple to use Error log Download from radio terminals.
 - Clicking Tools > Radio Error Log with a radio connected will pop-up the interrogation window
 - Read out the last logged error (CCTM 204 and 1204) along with the error asserts (CCTM 204 6)
 - Clear this last error (CCTM 203 and 1203) before restarting the radio
 - A new window with the downloaded error information appears
 - A 'Save to File' button loads the data into [.txt] file where can be forwarded if required



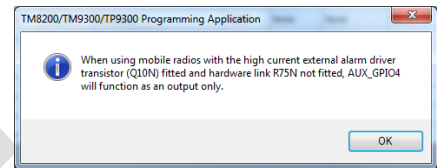
- **JIRA-APP-13273: Zone(s) listed when they should be hidden**

If a Zone has only hidden workgroups it is expected the Zone would also be hidden, but was instead offering hidden zone(s) that if selected returned 'No items in list' display to the user. This is now corrected with those Zones not displayed

- **Remedy WO 32616: Using AUX_GPIO4**

A pop-up box appears as a reminder if assigning any new actions on AUX_GPIO4 input.

Note: The high current transistor option is fitted as standard on all Harris branded TM9300/TM9400 torsos



- **Remedy WO 31115: FleetPro Spreadsheet programming**

Resolved an issue with duplicate fields such as 'Caller ID Burst' on a Tx9300 with FleetPro

- **JIRA-APP-13150: SDM Unicode Strings in DMR Tier-3**

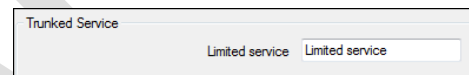
Implemented support for Unicode in Trunked > Data Parameters > SDM > Call String

- **Remedy WO 21503: The 'Call Alerts' option boxes moved**

The Call Alerts tickboxes have moved from Conventional > Basic Settings > DMR tab to the Conventional > Basic Settings > DMR Services tab as more appropriate for their actions

- **JIRA-APP-13433: Rename Limited Service option in Tier-3**

Added the ability to rename Tier-3 'Limited Service' UI text if desired in Trunked > Trunked UI > Rename Other. Audible alert changes in this mode will occur in a later Cadence

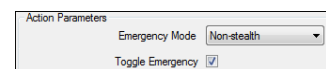


- **JIRA-APP-13441: 'Allow Affiliation' tickbox for Talkgroup Subscription in Tier-3**

This tickbox added to Trunked > Radio Unit ID > My Workgroups tab and Radio Unit ID > Group Subscription tab determines which ones are allowed to be sent in a Talkgroup Subscription request in Tier-3

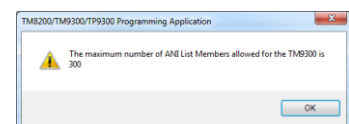
- **JIRA-APP-13481: Emergency Mode toggle**

TM9300 Emergency Mode Input action can be made a toggle with the new 'Toggle Emergency' tickbox in Programmable I/O > Digital



- **Remedy INC 25620: Increased MDC1200 ANI list**

The maximum number of ANI List Members across all systems has been extended from 100 to 300



- **Remedy WO 21620: Binary Select range incorrect**

The configurable Values offered in Programmable I/O > Binary corrected to be (1 to 31) as (0) was invalid

- JIRA-APP-13303: Added tickbox for Control channel derived color code

- JIRA-APP-13314: Made changes for pending 'PTT over Cellular' support

- JIRA-APP-13331: Added (UTC Offset) Timezone support for the Tx9300
- JIRA-APP-13350: Added new Emergency Alert Call dropdown options for DMR Trunking
- JIRA-APP-13359: Added dropdown options for 'Mode' LED indicator
- JIRA-APP-13360: Changes for DMR Tier-3 Talkgroup subscription/attachment

This PC Application also installs Tait Firmware Upgrade Tool Application v1.30.0.84

PC App Online Help Changes

- JIRA-APP-13320: Help text for "Control Status Rx (Line 1 to 3)" now includes that it is supported in DMR Tier-2
- JIRA-APP-13385: Help text for "Status Update Confirmed" now mentions it applies only to statuses sent to individual ID's not talkgroups
- JIRA-APP-13387: Descriptions around "Workgroup Short Dialing" Help made and also links to the 'Trunking Call Strings' Online Help too
- JIRA-APP-13438: Updated Help text for RTC and timezones
- JIRA-APP-13493: DMR Tier-3 'Alias' Help text updated recommending these characters (a-z A-Z 0-9 – -) for interoperability as some AIS consoles silently refuse other characters
- JIRA-APP-13596: Significant updates of Help text for 'Prioritize Current Region' Geo-fence actions
- JIRA-APP-13598: Significant updates of Help text for 'Mode Preference' Geo-fence actions

Known Issues and Limitations in PC App v2.22.0.18

- JIRA-TRM-37706: Wireless PTT Online Help changes where the TP9300 will now support Wireless PTT is incomplete

Windows O/S Compatibility

The PC and Calibration Applications listed require Microsoft [.NET] framework v4.6.1 (or later) and these are tested as compatible with:

- Windows 7 (32 and 64 bit)
- Windows 8.1 (32 and 64 bit)
- Windows 10 (32 and 64 bit)

Windows XP, Vista and 8.0 are not supported.

A link to download [.NET] v4.6.1 is here:

<https://www.microsoft.com/en-nz/download/details.aspx?id=49982>

Calibration Application v2.30.8.322

- Implemented option to interrogate a radio's error with Tools > Radio Error Log (see this same capability provided by the PC Application on page 7)
- Various Parameter updates
- Fixed visual styles being lost when opening a datafile

First Serial Numbers

TM9300 Mobile Firmware v2.22.01	S/N 20665671
TP9300 Portable Firmware v2.22.01	S/N 26163482

Publication Information

Related Documentation	TN-2880 – Real Time Clock in TPD2 Hardware TN-2861-AN – TP9300 and TP9400 Platform Hardware Models TN-2823f-SR – DMR-1811 (R18.3) Cadence v2.20.04 TN-2768d-SR – EnableFleet v3.4.5			
Compliance Issues	None.			
Compatibility Issues	None.			
CSO Instruction	Inform all service staff and dealers of the released information.			
Confidentiality	Confidential – This message or document contains proprietary information intended only for the person(s) or organization(s) to whom it is addressed. All recipients are legally obliged to not disclose Tait technological or business information to any persons or organizations without the written permission of Tait.			
Distribution Level	Associate.			
Document History	Issue	Date	Description	Author
	-	1 April 2019	First release (Draft)	J James
	a	11 April 2019	Updated to commercial release FW v2.22.01	G Brenchley
	b	13 May 2019	First Serial Numbers FW v2.22.01	G Brenchley
	c	14 May 2019	FW v2.22.02 for HHCH RSSI Display fix	G Brenchley