

UnifyVehicle System Manual

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Preface

Scope of Manual

This manual describes the UnifyVehicle applications platform and the modules that are available.

Alerts

Please follow exactly any instruction that appears in the text as an 'alert'. An alert provides necessary safety information as well as instruction in the proper use of the product. This manual uses the following types of alert:



This alert is used to warn about the risk of data loss or corruption.



This alert is used to highlight significant information that may be required to ensure procedures are performed correctly, or draw your attention to ways of doing things that can improve your efficiency or effectiveness.

Associated Documentation

UnifyVehicle Remote User's Guide (MNE-00022-XX)

UnifyVehicle Remote Online Help

UnifyVehicle Web Application Online Help

UnifyVehicle - Connecting for the First Time (402-00103-XX)

UnifyVehicle Upgrade Kits Installation Instructions (402-00104-XX)

Technical notes are published from time to time to describe applications for Tait products, to provide technical details not included in manuals, and to offer solutions for any problems that arise. Look for new or updated technical notes on the Tait technical support web site.

Publication Record

Issue	Publication Date	Description
1	September 2017	Release 1.0

1 Introducing UnifyVehicle

Tait UnifyVehicle provides an application platform that extends and augments the functionality of the DMR TM9300 and P25 TM9400 series mobile radios.

UnifyVehicle provides:

- a Linux Open Embedded operation system, with an ARM Cortex A8 processor (600MHz), 1GB Flash memory, 512MB DDR3 RAM, and an SD slot for upgradeable memory.
- WiFi capability: 2.4GHz/5GHz, IEEE 802.11b/g/n (maximum rate of 20Mb/s in the UnifyVehicle configuration)
- Ethernet connectivity (10/100BaseT Ethernet)
- Internal WiFi antenna option: suitable for in-vehicle, or short range operation only. Typical range of 4-10m around vehicle.
- External WiFi antenna option: two compliant antennas available (WiFi antenna and integrated multi-function antenna). Typical ranges:
 - Clear line-of-sight to vehicle: 60-100m
 - Obscured from vehicle by vegetation: 40-60m
 - Inside building, vehicle located directly outside: 20-30m
- DMR Tier 3 and P25 Trunked LMR network compatibility



Figure 1.1 UnifyVehicle 1.0 board fitted onto a TM9355 torso

UnifyVehicle comes factory fitted onto Tait DMR Tier 3 TM9300 and TM9400 series mobile radios, or can be retro-fitted to existing, compatible mobile radios. UnifyVehicle can be used with remote, or hand-held control heads.

1.1 UnifyVehicle Hardware

UnifyVehicle can be ordered factory fitted to a TM9300 or TM9400 mobile radio with a remote, or hand-held control head. Factory fitted UnifyVehicle radios are shipped with compatible firmware, and configured with the required UnifyVehicle specific settings.

1.1.1 Upgrade Kits

UnifyVehicle upgrade, or “retro-fit” kits, upgrade a compatible TM9300 or TM9400 mobile radio to a UnifyVehicle mobile radio. The table below shows the upgrade kits currently available.

- ⓘ UnifyVehicle only supports remote control head and hand-held control head installations. UnifyVehicle retro-fit kits can upgrade mobile radios installed with local control heads, however the end result will be a remote control head installation.

Table 1.1 UnifyVehicle Upgrade Kits

Upgrade Kit No.	Upgrades Radio Installed With..	Anetnna	PBA Version
T02-00024-0201	Remote control head	Internal	AAAA
T02-00024-0202	Remote control head	External	ABAA
T02-00024-0203	Local control head	Internal	AAAA
T02-00024-0204	Local control head	External	ABAA

For information on retro-fitting UnifyVehicle to existing, compatible mobile radios, refer to the UnifyVehicle Upgrade Kits Installation Instructions (402-00104-XX).

1.1.2 External Antennas

External WiFi antennas are available for compatible UnifyVehicle boards (R1.1 and later). These external antenna provide increased range and coverage.

- ⓘ Operational range and coverage are dependent the mounting location, connecting mobile device specification, and physical barriers between the external antenna and the connecting mobile device.

Single WiFi Antenna

This antenna is suitable in situations where only the WiFi capability of UnifyVehicle is required, and will increase the WiFi range around the vehicle. This antenna should be installed high on the vehicle, with a modest ground plane. This antenna operates in both the 2.4GHz and 5GHz bands.



Multi-Function Antenna

The shark fin style multi-function antenna is suitable for public safety (covert/overt), industrial and transport applications where an effective, compact and robust antenna is required. This antenna contains a 2.4GHz WiFi antenna, a 5GHz WiFi antenna and two cellular module antenna connections.



1.2 UnifyVehicle Configuration

UnifyVehicle Web Application

UnifyVehicle is configured using a web based application that is accessed by connecting UnifyVehicle to either a cabled or WLAN network and navigating via web browser, to an address specific to the UnifyVehicle installation.

There are two levels of access for the UnifyVehicle Web application:

- **Administrator access:** an Administrator user has full control of the Unify Vehicle Unit. They can upgrade firmware, configure all interfaces, download logs and audio recordings, trigger a factory reset or format the optional SD card. This user is intended to only be used for UnifyVehicle configuration.



Administrators do not have secure FTP (SFTP) or ssh access.

- **Audit access:** allows access to UnifyVehicle via the secure FTP protocol. This allows an audit user to view the logs and audio files captured by the audio recorder. Audit access does not allow the deletion of any files, the configuration of UnifyVehicle settings, or access to the Web application UI.

Refer to the UnifyVehicle Web Application Help for further details on how to configure UnifyVehicle.

Mobile Radio Configuration

If you are retro-fitting UnifyVehicle to an existing mobile radio, some radio configuration will be required. Refer to the UnifyVehicle Upgrade Kits Installation Instructions (402-00104-XX) for further details.

1.3 UnifyVehicle Modules

A number of modules or 'resident applications' are available for UnifyVehicle. The modules currently available are:



- UnifyVehicle Voice Recorder
- UnifyVehicle Remote application
- WiFi OTAP

2 Audio Recorder

UnifyVehicle has an on-board audio recorder that when enabled, records all audio that is transmitted from or received by the mobile radio. Continuous audio streams (i.e trunked radio call) are saved as a single *.wav file, while simplex audio will result in a separate *.wav file for each piece of audio transmitted or received. Files will be time-stamped when a time source is available, and will also have a unique ID that guarantees the files be in sequential order, even if an accurate time-stamp is unavailable. Call details, are saved in an associated text file, in *.JSON format.

Recorded audio can be accessed via secure FTP using audit access credentials, or can be downloaded from the UnifyVehicle Web Application.

The UnifyVehicle audio recorder can only be enabled if optional storage has been installed. Over 200 hours of recorded audio can be stored on the optional 32GB SD card. Once capacity is reached, the oldest files will be overwritten.

-  The audio recorder is not available for analog.
-  Refer to the UnifyVehicle Web Application Online Help for details on how configure and operate the UnifyVehicle Audio Recorder.

2.1 Configuration

The audio recorder can be enabled or disabled via the UnifyVehicle Web application. No further configuration is required.

2.2 Accessing Stored Audio Files

Audio files and call meta-data can be accessed via secure FTP, using the audit access credentials. Alternatively, the Administrator can download the last 20 recordings directly from the UnifyVehicle Web Application.

Files accessed through secure FTP are read only, ensuring that all data remains intact and unaltered.

Refer to the UnifyVehicle Web Application Help for details on how to configure the audit access credentials, and secure FTP access.

2.3 Deleting Stored Audio Files

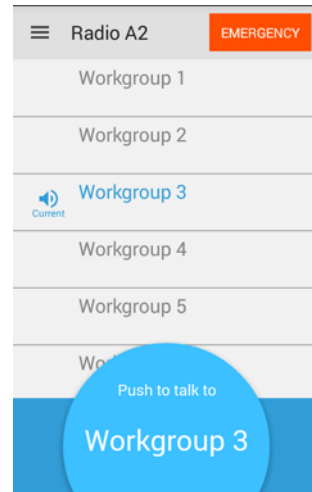
The only way to delete data captured by the audio recorder from the optional storage, is to format the optional storage card. This action can only be completed by the Administrator.

Refer to the UnifyVehicle Web Application Online Help for further details.

3 UnifyVehicle Remote Application

The UnifyVehicle Remote application allows users to connect their Android™ smartphone (Android version 4.0.3 and later) to UnifyVehicle mobile radio via WLAN. Once connected, the application enables users to make and receive group and emergency calls, and receive individual calls using their Android phone, over the radio network. This allows users to maintain LMR communications when outside of, and away from the vehicle.

Audio transmitted by the application will be captured by the UnifyVehicle audio recorder, if it is enabled.



3.1 Installation

The UnifyVehicle Remote application is available for download from the Google Play™ store.

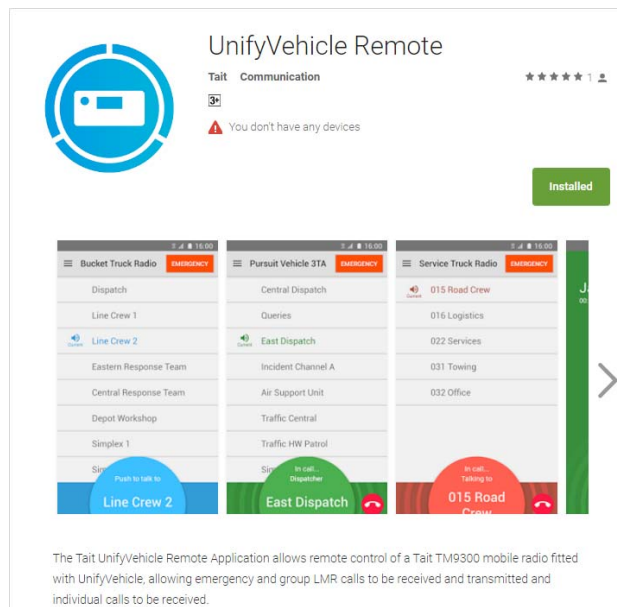



Figure 3.1 UnifyVehicle Google Play Store page

 An internet connection is required to access the Google Play store.

UnifyVehicle Remote currently supports the following Android devices and versions:

- Samsung J5 - Android 6.0
- Sonim XP7700 - Android 4.4

3.2 Configuration

The UnifyVehicle Remote application requires the Android device running the application to have Wi-Fi enabled. The UnifyVehicle installation that the Android device connects to, must also have its RTP Gateway enabled for UnifyVehicle Remote to work.

Refer to the UnifyVehicle Remote User's Guide (MNE-00022-XX) and the UnifyVehicle Web application Help for further details on how to configure UnifyVehicle and the UnifyVehicle Remote application.

3.3 Operation

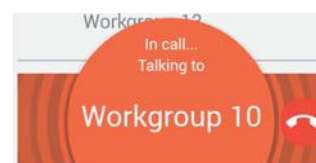
The UnifyVehicle Remote application makes use of the touchscreen capability of the Android device. The application features an on screen 'push-and-hold' PTT button, with all other features able to be selected or activated by tapping the screen.

Currently, a single Android phone can be connected to a UnifyVehicle mobile radio. This connection is made by selecting the radio from a list in the UnifyVehicle Remote application.

Once connected, the application provides the following LMR radio functionality on the user's smartphone:

Make and receive group calls

Group calls can be made by selecting a group and holding down the PTT to begin the call. When making or receiving calls, the PTT button will display the current state of the application.



Individual calls

Individual calls from other radios can be received, but not made by the application.

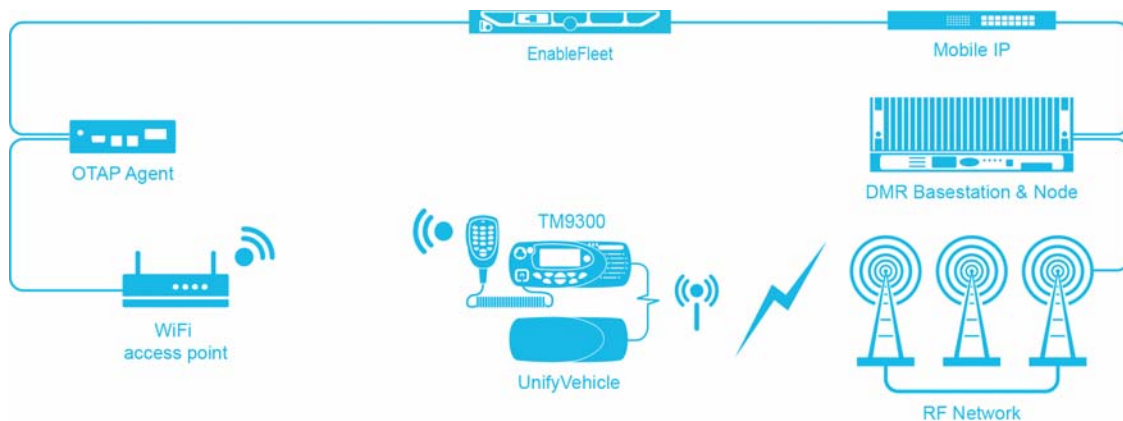
Emergency Calls

Users can activate an emergency using the application. Once activated, the behavior of the application is determined by the configuration of the UnifyVehicle mobile radio that you are connected to.

4 WIFI OTAP

UnifyVehicle's WiFi capability can be used in conjunction with EnableFleet, to provide OTAP updates over WiFi. WiFi OTAP provides a fast and effective way of updating the configuration or firmware of the mobile radio, with no impact on the LMR network.

- ❗ WiFi OTAP cannot be used to upgrade the UnifyVehicle component of the mobile radio, or its applications..



4.1 WIFI OTAP Considerations

There are a number scenarios that should be considered with regard to configuring an EnableFleet system for WiFi OTAP.

WiFi OTAP can be used in conjunction with OTAP over the LMR network, however using a dual-agent setup with an OTAP Agent dedicated to WiFi OTAP is highly recommended.

Refer to the “OTAP over WiFi” technical note (TN-2634) for further details.

4.2 Configuring WIFI OTAP

Both UnifyVehicle mobile radios and EnableFleet need to be configured correctly to allow WiFi OTAP.

Refer to the “OTAP over WiFi” technical note (TN-2634) for details on how to configure your UnifyVehicle mobile radio and EnableFleet OTAP Agent, for WiFi OTAP.

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11.3. **ASSIGNMENTS AND SUBCONTRACTING.** Tait may assign its rights or subcontract its obligations under this Agreement, or encumber or sell its rights in any Software, without prior notice to, or consent of, Licensee.

11.4. **GOVERNING LAW.** This Agreement shall be subject to and construed in accordance with New Zealand law and disputes between the parties concerning the provisions hereof shall be determined by the New Zealand Courts of Law. Provided however Tait may at its election bring proceedings for breach of the terms hereof or for the enforcement of any judgment in relation to a breach of the terms hereof in any jurisdiction Tait considers fit for the purpose of ensuring compliance with the terms hereof or obtaining relief for breach of the terms hereof.

11.5. **THIRD-PARTY BENEFICIARIES.** This Agreement is entered into solely for the benefit of Tait and Licensee. No third party has the right to make any claim or assert any right under this Agreement, and no third party is deemed a beneficiary of this Agreement. Notwithstanding the foregoing, any licensor or supplier of third-party software included in the Software will be a direct and intended third-party beneficiary of this Agreement.

11.6. **SURVIVAL.** Sections 4, 5, 6.3, 7, 8, 9, 10, and 11 survive the termination of this Agreement.

11.7. **ORDER OF PRECEDENCE.** In the event of inconsistencies between this Agreement and any other Agreement between the parties, the parties agree that, with respect to the specific subject matter of this Agreement, this Agreement prevails.

11.8. **SECURITY.** Tait uses reasonable means in the design and writing of its own Software and the acquisition of third-party Software in order to limit Security Vulnerabilities. While no software can be guaranteed to be free from Security Vulnerabilities, if a Security Vulnerability is discovered, Tait will take the steps specified in Section 6 of this Agreement.

11.9. **EXPORT.** Licensee will not transfer,

directly or indirectly, any Designated Product, Documentation or Software furnished hereunder or the direct product of such Documentation or Software to any country for which New Zealand or any other applicable country requires an export license or other governmental approval without first obtaining such license or approval.

11.10. **SEVERABILITY.** In the event that any part or parts of this Agreement shall be held illegal or null and void by any court or administrative body of competent jurisdiction, such determination shall not affect the remaining terms which shall remain in full force and effect as if such part or parts held to be illegal or void had not been included in this Agreement. Tait may replace the invalid or unenforceable provision with a valid and enforceable provision that achieves the original intent and economic effect of this Agreement.

11.11. **CONSUMER GUARANTEES.** Licensee acknowledges that the licenses supplied in terms of this agreement are supplied to Licensee in business, and that the guarantees and other provisions of prevailing consumer protection legislation shall not apply.

11.12. **WHOLE AGREEMENT.** Licensee acknowledges that it has read this Agreement, understands it and agrees to be bound by its terms and conditions. Licensee also agrees that, subject only to the express terms of any other agreement between Tait and Licensee to the contrary, this is the complete and exclusive statement of the Agreement between it and Tait in relation to the Software. This Agreement supersedes any proposal or prior agreement, oral or written, and any other communications between Licensee and Tait relating to the Software and the Designated Products.