

# **Technical/Operational Manual**

## **Wheelrite Tech300 Plus**

### **TPMS Diagnostic and Repair Tool**

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## **Introduction**

This document briefly describes the technical functionality of the Wheelrite Tech 300 Plus down to the level of block diagrams and software operation.

It is provided in support of FCC and IC approvals testing.

This information is provided under the confidentiality agreement.

This can be read in conjunction with a block diagram (provided separately).

## **Outline Functionality**

The product tests Tire Pressure Monitor (TPM) radio tags from a variety of suppliers. It is therefore a test tool, hand held, powered from a replaceable 9V battery.

These tire monitoring products transmit a RF data packet with data relating to pressures, temperatures etc at regular intervals once the host vehicle is moving.

To test a TPM with a stationary car, the product stimulates the TPM to force it to send its RF data packet.

This is achieved by transmission of a 125kHz signal by the tool.

Different TPMs need different 125kHz signals- these are 125kHz telegrams

Different TPMs transmit different RF signals.

Hence the user has to use the tool controls to select the correct telegram and select the correct decode routine. These are defined as select positions, or modes.

The user has to initiate the test and interpret/ respond to the tool's indicated results.

A USB interface allows download of the data after TPM testing by the tool emulating a 'memory stick'.

## **User Operation/ Interface**

The tool has 5 buttons and an OLED display.

The tool is powered up by pressing the lower button.

A menu structure (on the screen) is navigated using the up/down keys.

The enter key initiates the action, or navigates down the menu tree.

The esc key cancels the action, or navigates up the menu tree.

A buzzer confirms RF data receipt (cadenced) and with a long beep indicates a TPM failure.

## **Technical Operation/ Circuit Description**

Initiation of a test commences 2 phases of operation under control of the microprocessor.

### ***Phase 1***

Stimulation of a TPM is done using a low power transmitter running at a nominal 125kHz.

Depending upon the TPM to be tested (and hence the mode in which the tool is placed), this signal is either at standard power and unmodulated (i.e carrier) or at low power and on off keyed.

It might be for a fixed period of around 4 seconds, or continuous until a response is seen.

(subject to timeouts where it would be presumed no response is forthcoming)

The circuit provides for either enabling both or just one side of the H bridge drive antenna system to provide the two power levels.

The duration of the 125kHz is under processor control.

### ***Phase 2***

After stimulation of the TPM, the tool awaits a response from the TPM.

Depending upon the type of TPM, this could be AM or FM and either at 315.00MHz or 433.15MHz.

A receiver (marked in the diagram as RF circuit and detector) is enabled at the appropriate frequency and the decoded data fed to the processor for analysis.

Upon receipt of valid data, any low power 125kHz generation is ceased.

Upon receipt of valid data, results screens are displayed.

Data from the TPM is stored on the product.

A test could then be recommenced.

If no further testing is required, the tool would automatically power down and cease all functionality.

### ***Data Download***

After any test, detail of the data within the TPM's RF data packet can be downloaded via connection to a PC USB port and utilising any suitable file reading programme.

The data file is a maximum size of 128bytes.