Theory of operation

- **E.U.T:**

- The M317 provides Original Equipment Manufacturers (OEMs) and Telematics Service Providers (TSP's) with a rugged and versatile vehicle-centric mobile-computing platform for a variety of Mobile Resource Management (MRM) applications.
- The M317 platform supports the Google AndroidTM 4 operating system.
- The M317 offers a comprehensive development environment for independent application programming and system integration.
- The M317 device architecture provides a solid and cost-effective design by simplifying maintenance tasks, significantly extending product life expectancy, and lowering the total cost of ownership (TCO).
- The M317's Base Model configuration contains the standard set of features and functions of the MDT (Mobile Data Terminal). There is a range of optional extensions, add-ons and accessories to enhance the M317's capabilities, serving advanced fleet management solutions.
- The M317's ruggedness is able to withstand the rough commercial automotive environment, including operation in a wide temperature range, vibrations, and shock.
- Using the external vehicle diagnostic and cellular communication accessory devices, the M317 platform supports the functionality of a fully integrated and standalone, fleet management solution.

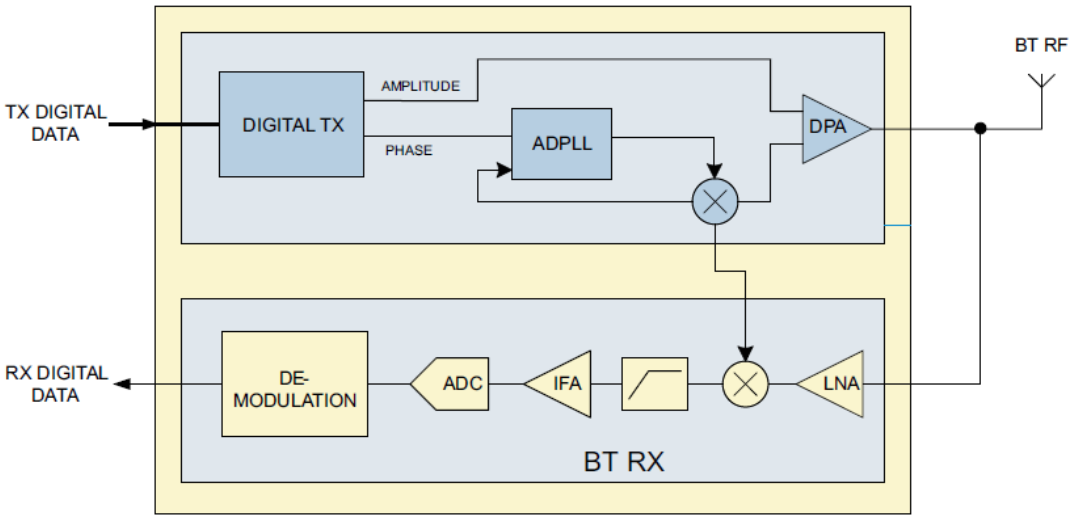
- WiFi/BT Transmitter:

WG7311 is a WiFi/ Bluetooth SiP (system in package) module that support standards:

- WiFi: 802.11b/g/n 2.4 GHz mode
- Bluetooth 1.1, 1.2, 2.0+EDR and 2.1+EDR, 3.0 and 4.0

WG7311 BT Function Digital Radio Processor (DRP)

The WG7311 uses 5th-generation TI Bluetooth technology, with new features and improved radio performance.



Receiver

The receiver uses near-zero-IF architecture to convert the RF signal to baseband data. Received signal from the external antenna is input to a single-ended LNA (low-noise amplifier).

This signal is then passed to a mixer which down-converts the signal to IF, followed by a filter and amplifier. The signal is then quantized by a sigma-delta ADC. The quantized signal is further processed to reduce the interference level.

The demodulator digitally down-converts the signal to zero IF and recovers the data stream by an adaptive-decision mechanism. The demodulator includes EDR processing with state-of-the-art performance. It includes a maximum-likelihood sequence estimator (MLSE) for improved performance of basic-rate GFSK sensitivity, and adaptive equalization to enhance EDR modulation.

Transmitter

The transmitter is an all-digital sigma-delta PLL (ADPLL) based, with a digitally controlled oscillator (DCO) at 2.4GHz as the RF frequency clock.

The modulation is achieved by directly modulating the digital PLL. The power amplifier is also digitally controlled.

The transmitter uses Polar-Modulation technique. While the phase-modulated control word is being fed to the ADPLL, the amplitude-modulated controlled word is fed to the class-E amplifier to generate a BT standard compliant RF signal.