TADIRAN-Telematics Proprietary

RSC – 900

Technical Description

Proposed for

FCC Type Approval

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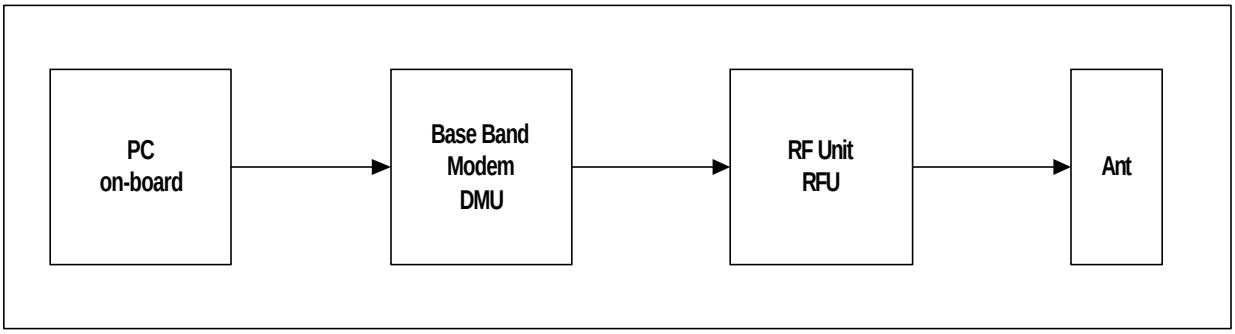
RSC -900
Technical Description

1. General.

This document describes TADIRAN TELEMATICS Road Side Communicator (RSC).
The commercial brand name of this product is: **RSC -900**.

2. RSC Description.

The Road Side Communicator (RSC) is a short-range wireless communication unit. The RSC is monitoring for VTU Backscattering RF Signal. The RSC senses When the VTU enters the RSC communication zone and starts the communication with the VTU.
After completion of the communication with the vehicle the RSC stores the received (uploaded) data and handles the delivery it to the Control & Report Center/ Data Management Center



RSC Block Diagram

2.1 PC On Board

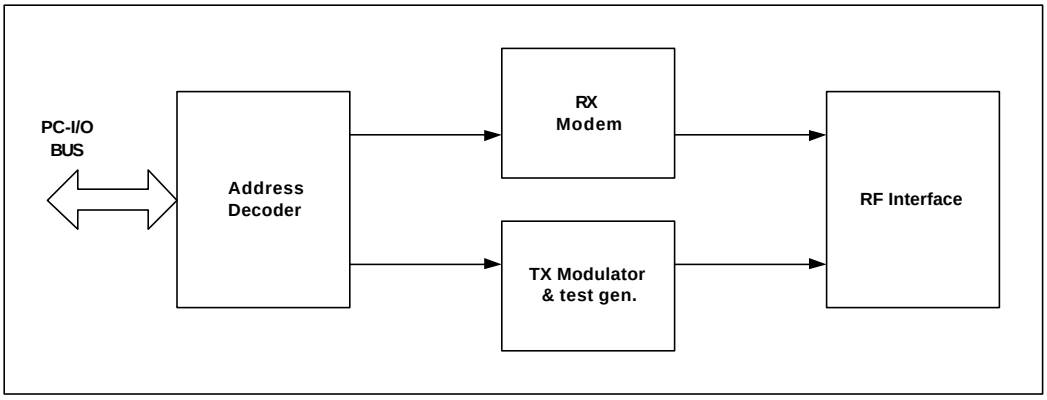
The CPU is a standard of-the-shelf item: SBC-456/E.

Frequency related specifications:

- **CPU:** AMD 486DX5-133 SQFP.
- **Bus Interface:** ISA bus.
- **Memory:** Onboard two 72-pin SIMM sockets. Fast Page or EDO DRAM.
- **Enhanced IDE:** Supports Bus Master mode with data transfer rate 16.7MB/sec.
- **Parallel port:** One bi-directional parallel port. Supports SPP, ECP, and EPP modes.
- **Serial port:** One RS-232 and one RS-232/422/485 serial port. (16C550 equivalent).
- **Real Time Clock:** Dallas DS-12887A or equivalents.
- **Watchdog timer:** Software selectable time-out interval (2 sec. ~128 min., 1 sec./step)
- **Ethernet interface:** Onboard 10Base-T RJ-45 connector.

2.2 Base band modem – DMU

The DMU is the digital portion of the device.



DMU Block Diagram

Its only oscillator is a crystal oscillator of 28.8 MHz. All other frequencies of this module, are the derivatives of this basic frequency.

The basic 28.8 MHz frequency is the clock of the receiver programmable device.

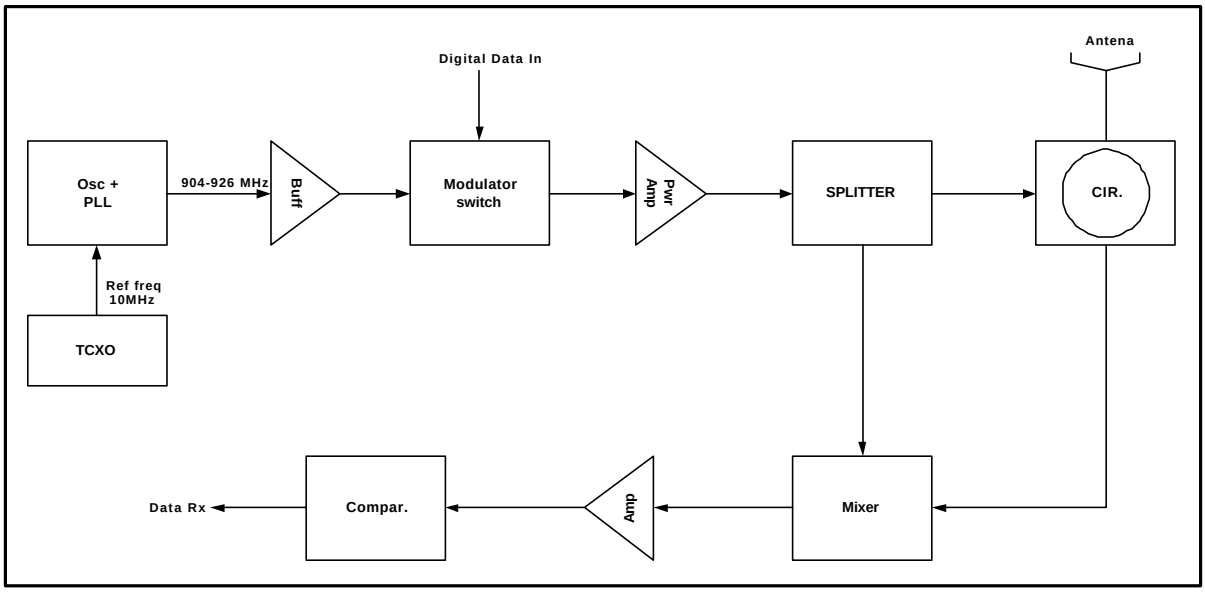
This device also divides the frequency by 6, to 4.8 MHz, which in turn is the clock for the transmitter programmable device.

The data rate of the bit stream is also a derivative of the main clock and is 150 Kbit/sec.

2.3 RF Part - RFU

The RFU is the RF portion of the device.

The unit is based on back scattering technology. The other unit (VTU), which is a digital device and does not containing any internal means of creating any RF signals, receives the emitted frequency, overlays its data on this frequency and reflects it back to the unit.
The reflected frequency or lack of it is interpreted as digital data.



RFU Block Diagram

It is based on a PLL component that incorporates the oscillator for 904 to 926 MHz. This unit is referenced to a 10MHz external frequency.

This frequency, after being buffered, is modulated with the incoming digital data through a switch. The output result of this stage is an ASK modulated digital data, which in turn is amplified by a power amplifier.

The output of the power amplifier is fed into a splitter that transmits this data through a circulator into the antenna and simultaneously, serves as reference frequency to the mixer of a receiver.

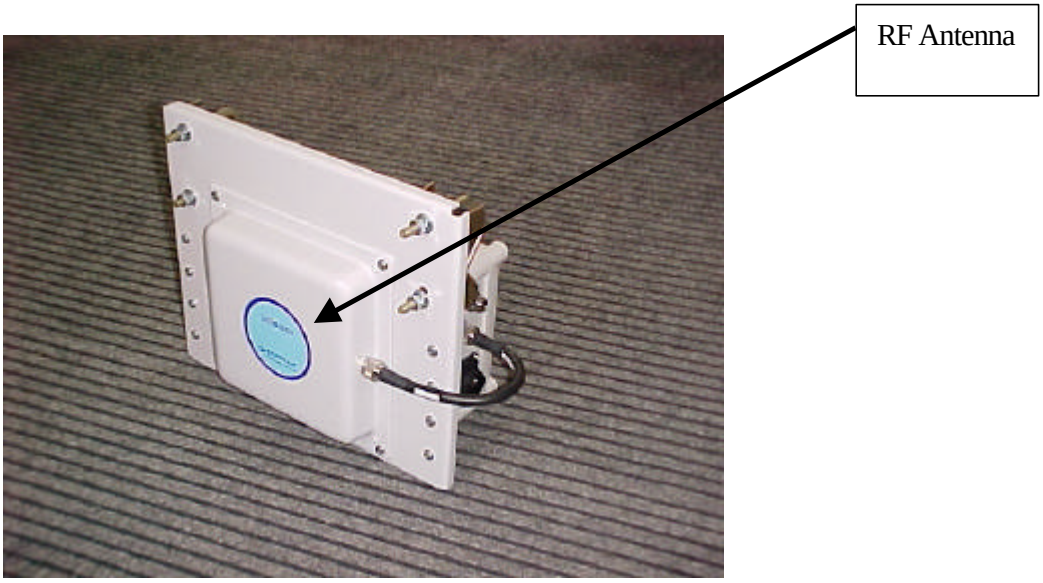
The splitter adds to the transmitted data CW pulses, so that in case that a receiver has received this data, it can superimpose the answer (ID) on these CW pulses.

The incoming data is then amplified and compared to valid levels, so that the received digital data will result at its output.

2.4 Antenna description

The RF antenna is an integral part of the RSC.

Frequency range MHz 900-930
Gain ..... 7.5 dbi
VSWR 50Ω 1.5
Horizontal beamwidth ..... 65°
Vertical beamwidth ..... 85°
Polarization ..... horizontal linear
Power max. 100Watt
Front to back ratio ..... <15 dB
Lighting protection ..... direct ground
Dimensions - W x D x H mm 202x202x34
Weight kg. 0.45
Wind load (200 km/h) N 137
Operating temperature ..... -40°C to +80°C
Connector type (Internal connection) N-female



3. Hopping sequence

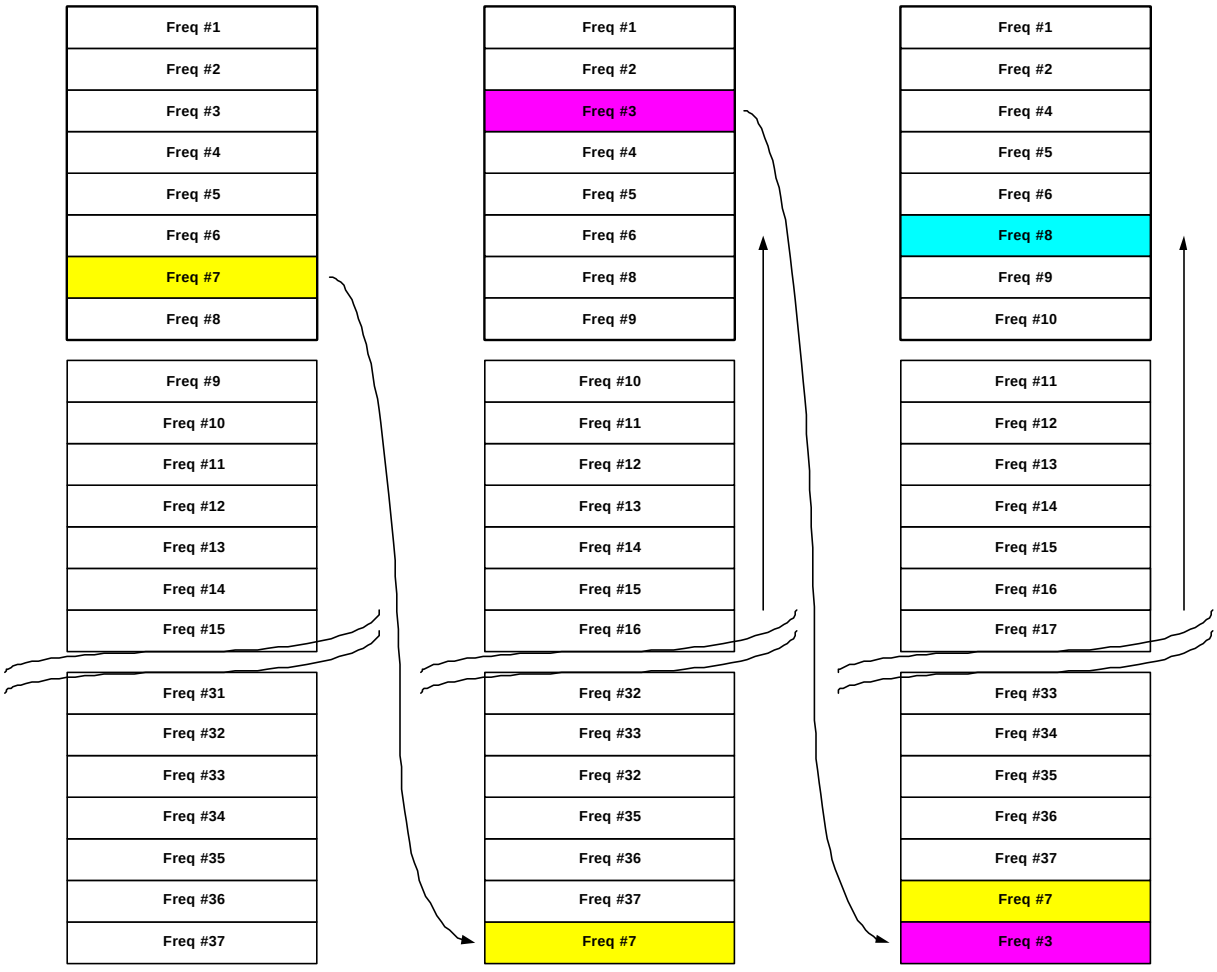
Algorithm

The hopping sequence is based on a frequency table of 37 frequencies: starts at 904.2MHz and ends at 925.8MHz with channel spacing of 600KHz.

One sequence is chosen quasi-randomly from the first 8 frequencies in the table.

After 32 transmissions, this frequency is dropped at the bottom of the 37-frequency list and the whole list is pushed 1 step upward.

Again, one sequence is chosen quasi-randomly from the first new 8 frequencies in the table and the sequence starts again.



4. Receiver Compliance Information

VTU

The VTU is the associated receiver device.

The VTU is working in a back scattering mode of operation. This means that the frequency emitted from the transmitter, is “reflected” back by the associated receiver.

Therefore, there is no need to synchronize between the transmitter and the associated receiver frequencies, since the receiver scatters back whatever the incoming frequency is. Being all- digital device, VTU does not posess any internal means of creating any RF signals.

Digital data is superimposed on this back scattering frequency in ASK.