

thinkRF libtrf API Release Notes v1.9.0

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1 Introduction

thinkRF's libtrf API is a multi-platform API library that can be used for interfacing with existing generation thinkRF RTSA devices (R5xx0) and will be maintained into the future to support interfacing with future thinkRF devices. In addition, the API supports and will be evolved to increasingly provide sophisticated signal processing capabilities that can be easily integrated into end-user application code.

The libtrf library is currently released as builds for Microsoft Windows 64-bit (.h/.dll/.lib) and Linux (.h/.so) for both x86_64 (Intel/AMD) and aarch64 (ARM v8+) targets. The interface is presented as undecorated 'C' compatible with the C99 (ISO/IEC 9899:1999) and later standards.

This document describes the release information of libtrf API software version 1.9.0. Refer to the companion 'libtrf API Reference Manual' document for full libtrf and its usage details.

Important Note: *If your RTSA has firmware v1.7.0/1.7.1 for R55x0 or v1.2.0/1.2.1 for R57x0, it is **critical** that you should update it to the latest to use libtrf's spectrum capture in v1.5.4 or higher.*

1.1 Supported Devices

The versions of libtrf currently released support all thinkRF's RTSA products:

- R55x0/R57x0 products (408/418/427 models)
- R6000 products – Ethernet and USB connection

2 New Features

The following new features and capabilities were added. Refer to the Reference Manual for full details.

1. **Spur-mitigation** implemented for R5xx0. Added Sweep stream flag parameter TRFSpurReject. When this is asserted on a spectrum stream, a single spectrum reconstruction will utilize two sweeps with different start frequencies to eliminate systemic spurs.
2. Added alarms processor (also known as **Spectrum Masking**), providing mechanisms for trapping spectrum excursions over defined or trained thresholds.
3. Added **V/m** to available spectrum units (antenna table required).
4. Added equalizer table implementation for Field Strength Mode usage.
5. Added **multilQ capture capability**.

Code examples have been updated to include the new features and provide the best way to learn how to use them.

3 Enhancements

The following other changes were made:

1. Maximum resolution bandwidth increased to 10MHz.
2. General optimization of capture and spectrum reconstruction for all platforms.
3. Optimized compensation for Antenna tables, benefitting equalization tables.
4. GPIO switching for R6000 now can occur at arbitrary frequencies, not the nearest 100MHz step.
5. GNSS nanosecond timestamp (when available) applied to frames.
6. Added TRFPLLSource control for GNSS.
7. Ensure spectrum files are written in mW units, allowing unit modification on file loading for playback.

4 Fixed Defects

The following issues were fixed:

1. Mismatch between VBW and RBW programming resolved.
2. IFBW flattening operation corrected.

3. Time and date now track correctly in the presence of rapid parameter polling.
4. Reported location (GNSS) defaults to NaN lat/lon/alt when unavailable.
5. Occasional SIGSEGV on linux systems associated with libUSB shut-down races eliminated.

5 Known Issues and Limitations

The following are the known limitations or other issues present since libtrf version 1.4.0:

1. Initial spectrum of narrow-band IQ capture (12.5kHz) on R5x, R6x displays sinc-type distortion (IQ stream -> IQToSpectrumProcessor).

Contact Us

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