

URT Software-defined Toolkits

ACCELERATE YOUR RF SIGNAL TESTING

**Sirius, XM, AM/FM, DAB/DAB+/DMB, HD Radio (IBOC),
GPS, TMC-RDS, and RDS/RDBS**

FULL SUITE OF RF SIGNAL GENERATORS

To solve all your radio and navigation test needs, Avera's software-defined Universal Receiver Tester (URT) toolkits generate perfect analog and digital radio signals for the most common worldwide standards like Sirius, XM, AM/FM, HD Radio and GPS. Without expanding your hardware footprint or having to juggle different instruments, you can generate any signal you need via the handy URT console, accelerating your RF product testing.

With our URT signal generator toolkits at your fingertips, you can quickly access signal and test libraries, set up and take measurements, save user-defined configurations, use the URT APIs to accelerate test-plan development and to automate validation and manufacturing tests, including from within NI TestStand. And with the URT's 2-channel Audio Analyzer, signal-quality analysis is straightforward, further improving testing productivity.

INDUSTRY-STANDARD RF PROTOCOLS

As RF test experts, Avera works closely with various industry leaders such as iBiquity Digital Corporation and Sirius XM Radio Inc. – including achieving protocol certifications – and is in sync with standards bodies to ensure our toolkits cover the latest versions and revisions.

RF STUDIO PLAYER AND DRIVEVIEW

With the RF Studio Player option you can view and manage your recordings of real-world signals and impairments. For in-depth analysis, the RF Studio Player features Spectrum, Histogram, and Noise views, and the DriveView option enables you to play back the entire recording environment with video, audio and location (NMEA) data, showing RF recording route maps and GNSS satellite positions.

URT Software-defined Toolkits

Sirius

Certified for TA Part One and manufacturing of the SDARS system, the **Sirius Software** toolkit enables real-time generation of RF test signals from Sirius data files provided by Sirius XM Radio Inc. It supports signal generation for both satellite and terrestrial transmission, as well as Sirius Overlay. In addition, power and Carrier-to-Noise (C/N) can all be individually adjusted for greater flexibility.

This toolkit is well suited for both manual and automated testing. In manual use, the intuitive interface enables the user to recall test files and view their content. The audio services in all channels are described and the Program Associated Data (for example, song name and category) can also be displayed).

Frequencies

- SAT.: 2322.293 MHz, 2330.207 MHz
- TERR.: 2326.25 MHz

Carrier-to-Noise Range

- 4 to 25 dB

AM/FM

The **AM/FM Software** toolkit takes advantage of the latest processor instructions set to perform real-time digital signal processing (DSP) on the URT controller. In normal conditions, AM or FM signals are modulated then sent to the vector signal generator, where a 16-bit D/A converter provides an RF signal of the highest quality. The modulation of single tone or .WAV audio files makes this toolkit one of the most flexible instruments on the market.

AM

- Power setting units: dBm, dBμV, dBf
- Modulation range: 1% to 100%
- Modulation resolution: 0.01%

FM

- Mode: Stereo, L=R, L only, R only, L=R, Mono
- Pre-emphasis: OFF, 25 μs, 50 μs, 75 μs

Modulation Range

- Main deviation: 0 to 100 kHz (std 70 kHz)
- Pilot deviation: 0 to 100 kHz (std 6 kHz)

DAB/DAB+/DMB

The **DAB ETI Modulator Software** toolkit modulates ETI files stored on the controller's hard disk. Files may be from the toolkit's DAB/DAB+/DMB library or be custom encrypted files generated by DenMux, a DAB encoder/multiplexer. This toolkit can also generate standard ETI files in the NI G.703 format.

Specifications/Support

- EN 300 401, EU 147, EN 300 799, ETI (NI)
- All four transmission modes (I, II, III, IV)
- All frequencies on Band III and L-Band

DAB ETI Modulator Software Toolkit

- Displays Ensemble label and protection level of primary service
- Primary service content can be used for BER measurements
- Standard ETI files with audio tone available (no charge)
- Additive White Gaussian Noise (AWGN)

XM

Certified for TA Part One and manufacturing of the SDARS system, the **XM Software** toolkit enables real-time generation of RF test signals from XM data files provided by Sirius XM Radio Inc. It supports signal generation for both satellite and terrestrial transmission, as well as XM Overlay (XMH). In addition, power and Carrier-to-Noise (C/N) can all be adjusted.

This toolkit is well suited for both manual and automated testing. In manual use, the intuitive interface enables you to recall test files and view their content. The audio services in all channels are described and the Program Associated Data (for example, name and category) can also be displayed. The content description is stored in a text file that can be edited to provide additional details.

Since all files have a fixed duration, a counter provides elapsed time and total length of the file (expressed in seconds and/or frames).

Frequencies

- SAT.: 2333.465 MHz, 2335.305 MHz, 2342.205 MHz, 2344.045 MHz
- TERR.: 2337.490 MHz, 2340.020 MHz

Carrier-to-Noise Range

- 4 to 25 dB

HD Radio (IBOC)

This **HD Radio (IBOC) Software** toolkit enables repeatable, timely and cost-effective receiver testing. In addition, this software toolkit is perfectly suited for development, certification and manufacturing tests alike. HD Radio In-Band On-Channel (IBOC) test signals are generated from pre-modulated waveform files provided by iBiquity Digital Corporation.

Over 100 files containing both AM and FM IBOC signals can be played from the URT. The iBiquity files contain the required test files to accommodate all phases of test and product certification.

Frequencies

- AM: 250 kHz to 110 MHz
- FM: 250 kHz to 110 MHz

AM and FM

- Test files have different C/N for BER testing (consult iBiquity for details)

GPS (1-Channel)

The **1-Channel GPS Software L1 C/A** toolkit is one of the most flexible GPS signal generators on the market – perfect for verifying the operational integrity of installed GPS systems. This toolkit takes advantage of the latest processor instructions set to perform real-time digital signal processing (DSP) on the URT controller. The composite signal is generated internally and navigation data is formatted from a web-based Broadcast Ephemeris file, while Coarse Acquisition (C/A) codes are generated internally and frames are modulated in GPS-compliant Binary Phase-Shift Keying (BPSK).

Highlights

- GPS compliant with ICD200c
- Invalid C/A code transmission
- Doppler shift up to 4 kHz
- Easy Web-access for Ephemeris updates
- Full Almanac transmitted in 12.5 minutes

GPS (Constellation)

The **GPS L1 C/A Constellation Simulator** toolkit is the perfect tool for manufacturing test when you need an affordable and repeatable solution for the position First Fix test. This toolkit simulates the selected GPS satellite constellation for specific location and time data. A navigation system can then repeatedly lock to any arbitrary position, selected by the user.

Highlights

- GPS-compliant with ICD200d
- User-selectable receiver's initial worldwide location and speed
- Up to 24 hours of continuous simulation
- Satellite signal power control
- Easy Web access for updates of Almanac and Ephemeris files
- File formats are SEM (Almanac) and RINEX 2.0 (Ephemeris)

TMC-RDS

The **TMC Software** toolkit is the first TMC generator on the market specially designed for testing purposes. You can use the RDS (one-channel) toolkit to generate complete FM-RDS signals, and TMC frames are added to groups 3 and 8 of the RDS frames. The toolkit's architecture easily allows the user to configure the most common parameters from switches or pull-down menus. TMC parameters such as transmission characteristics, tuning information, single- or multi-group messages and the location's encryption parameters can all be configured from the intuitive interface.

Highlights

- TMC compliant with ISO 14819-1, -2, -3 and -6
- Supports RDS groups 3A and 8A
- Parameters imported from RDS: PI, PS, TP On/Off, PTY, Transmission Mode (basic or enhanced), Td, Ta, Tw
- Successive 8A group gap
- Supports AFI, LTN, SID, MGS
- Other TMC Network information: AF, MF, PI, PS, LTN, SID, MGS and PI list
- Event (type and category based), Duration, Location, Extent, Direction, Diversion

RDS/RDBS

The **RDS Software** toolkit takes advantage of the latest processor instructions set to perform real-time digital signal processing (DSP) on the URT controller. The composite signal is software-generated: the FM signal is modulated by a single-tone audio and the RDS signal is combined with the FM analog signal.

The **3-Channel RDS Software** toolkit can generate three completely independent FM-RDS channels from a single generator.

FM and Modulation

- Mode: Stereo, L=R, L only, R only, L=-R, Mono
- Pre-emphasis: OFF, 25 µs, 50 µs, 75 µs

Modulation Range

- Main deviation: 0 to 100 kHz (std 70 kHz)
- Pilot deviation: 0 to 100 kHz (std 6 kHz)
- RDS deviation: 0 to 100 kHz (std 2 kHz)

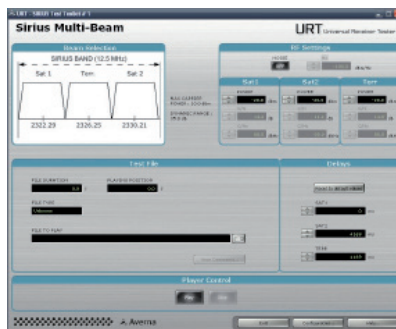
Specifications/Support

- Selectable supported groups: 0, 2, 4, 14
- PI (Program Identification)
- PS (Program Service) name
- TP (Traffic Program) on/off
- TA (Traffic Announcement) with On/Off and adjustable repetition rate
- PTY (Program Type)
- DI (Decoder Information)
- MS (Music/Speech)
- CT (Clock Time)
- RT (Radio Text): 64 symbols each on group A and 32 on group B
- AF (Alternative Frequencies): maximum of five lists with 25 frequencies each
- EON (Enhanced Other Networks): 8 PS with 5 EON AF lists each

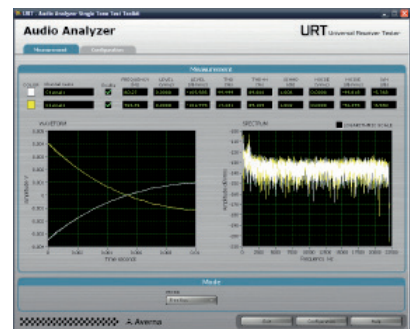
Radio, Navigation and Audio Toolkits



Get easy access to any toolkit from the handy console.

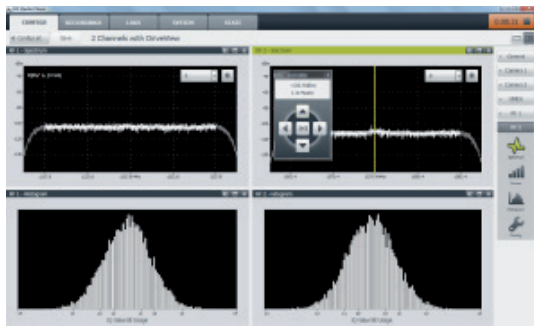


Each toolkit has all the features you need for precise, repeatable testing.



Measure signal-frequency quality with the 2-channel Audio Analyzer.

RF Studio Player and DriveView



RF Studio Player provides multiple signal views for in-depth analysis.



The DriveView option displays full recording environment data.

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