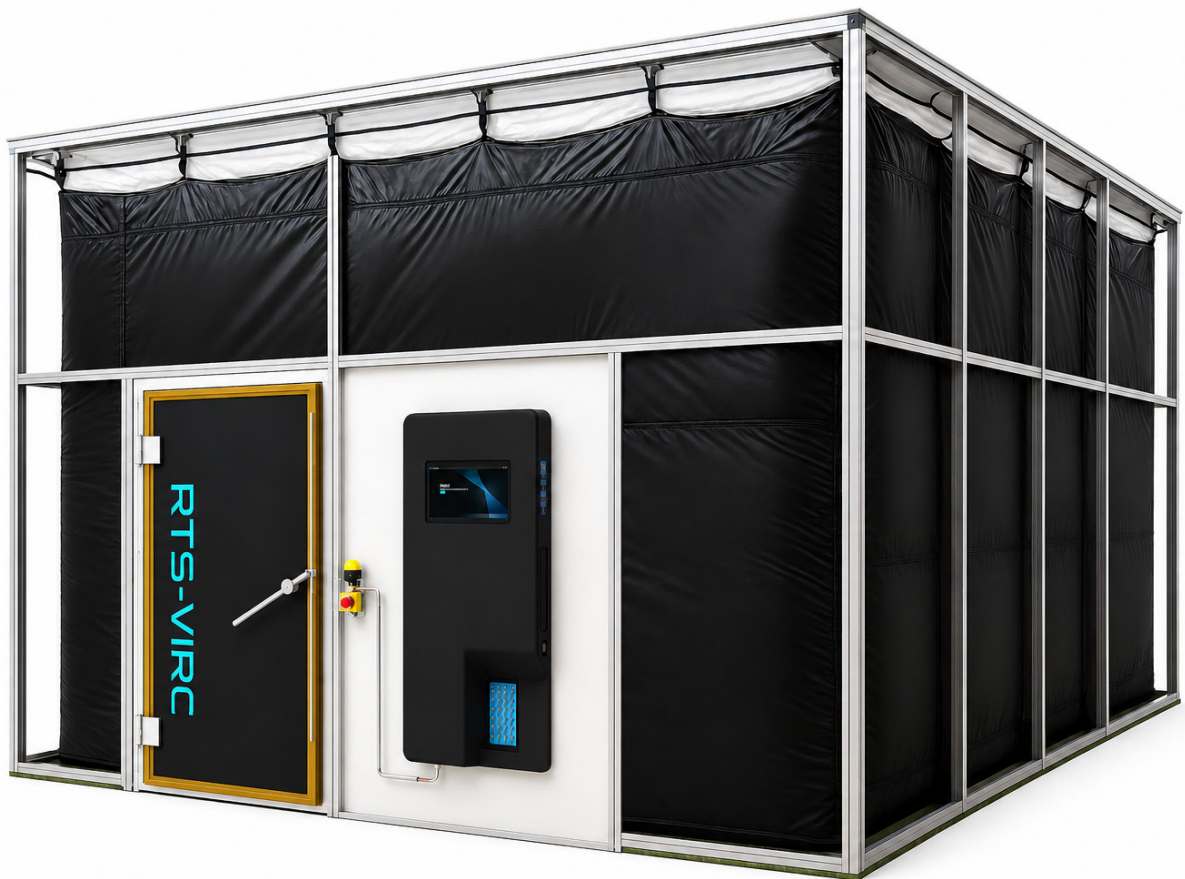




RTS-VIRC

REVERBERATION TEST SYSTEM



FOR YOUR LARGEST WIRELESS DEVICES

It has never been easier to verify large wireless devices over-the-air (OTA). RTS-VIRC is Bluetest's first reverberation test system based on Vibrating Intrinsic Reverberation Chamber (VIRC) technology, and it is designed to reduce the time you spend on measurements. Its large walk- or drive-in test volume is ideal for radio performance and EMC testing of full vehicles, automotive sub-systems and defense equipment, from 650 MHz to 18 GHz.

MULTIPATH ENVIRONMENT

Bluetest, with over 25 years of experience in reverberation chamber technology development, has partnered with V Technical Textiles to develop a semi-rigid vibrating intrinsic reverberation chamber, making it possible to test very large devices under test (DUT) at a reasonable cost.

The RTS-VIRC vibrating intrinsic reverberation chamber consists of a rigid panel for floor, door and computer unit, and reflecting fabric walls. The moving walls and other stirring mechanisms create a Rayleigh-faded, rich isotropic multipath (RIMP) environment inside the chamber. This environment is very well suited for antenna and radio performance evaluation of modern multi-antenna (MIMO) devices.

The multipath environment is created by the chamber itself, so no channel emulator or other external equipment is needed

RADIO MEASUREMENTS

The measurements are done using a vector network analyzer or radio communication tester connected to one or several of the chamber measurement antennas. The entire measurement system is controlled by the integrated Bluetest measurement server. Typical measurements include :

- Antenna Efficiency
- MIMO/Diversity gain
- Total Radiated Power (TRP)
- Total Isotropic Sensitivity (TIS) using Bluetest's Q-TIS algorithm
- Data Throughput vs received power

READY FOR LTE-ADVANCED AND 5G NEW RADIO (NR)

LTE-Advanced and 5G NR make it possible to communicate with a device on multiple LTE and/or 5G NR carriers simultaneously. At the same time the number of streams on one

carrier is increased by going from 2x2 MIMO to 4x4 MIMO. This significantly changes the test conditions and requirements on the OTA environment.

Bluetest's RTS-VIRC can be configured with up to 16 measurement antennas for maximum flexibility and support for the latest LTE and 5G standards. SISO measurements such as TRP and TIS benefit from the same rich multipath and fading environment as MIMO measurements. Moving from SISO to MIMO evaluation of LTE or 5G NR devices typically only requires connecting a few additional cables between the chamber and the radio communication tester.

LARGE TEST VOLUME

The RTS-VIRC is built for the largest wireless devices on the market. The chamber is available in custom sizes to match your DUT and site (see Example Chamber Sizes), with options available to fit an entire vehicle.

Vehicles are simply driven into the chamber, and a heavy-duty turntable rated for up to 500 kg is available for sub-systems and smaller equipment. This makes the RTS-VIRC a one-stop test solution for full vehicles, defense equipment, automotive sub-systems and car antennas.

EASY ENTRY – RELIABLE SHIELDING

For large DUTs, drawstrings in one wall are used to lift that side of the chamber. When the chamber wall is lifted, devices can easily be loaded or unloaded from the chamber, as the chamber floor sits flush with the external floor. To avoid disturbing the shielding seal of the wall to the floor after loading a large DUT, the RTS-VIRC has a personnel door for easy entry. The personnel door can also be used for loading and unloading smaller DUTs.

RTS-VIRC Applications

- Whole vehicle testing
- Automotive sub-systems and antennas
- Defense vehicles and equipment
- EMC radiated emissions and immunity testing
- Measurements from 650 MHz to 18 GHz
- Live person measurements

EMC TESTING

Reverberation chambers are a well-established method for EMC testing. The stirred field exposes the complete vehicle or sub-system from all directions and polarizations at the same time without repositioning the DUT. With the optional high-power (HP) switch, field strengths up to 200 V/m can be generated for radiated immunity testing. Radio performance and EMC testing of automotive and defense equipment can thereby be combined in the same chamber, following the reverberation chamber method described in IEC 61000-4-21, ISO 11452-11 and ISO 11451-5.

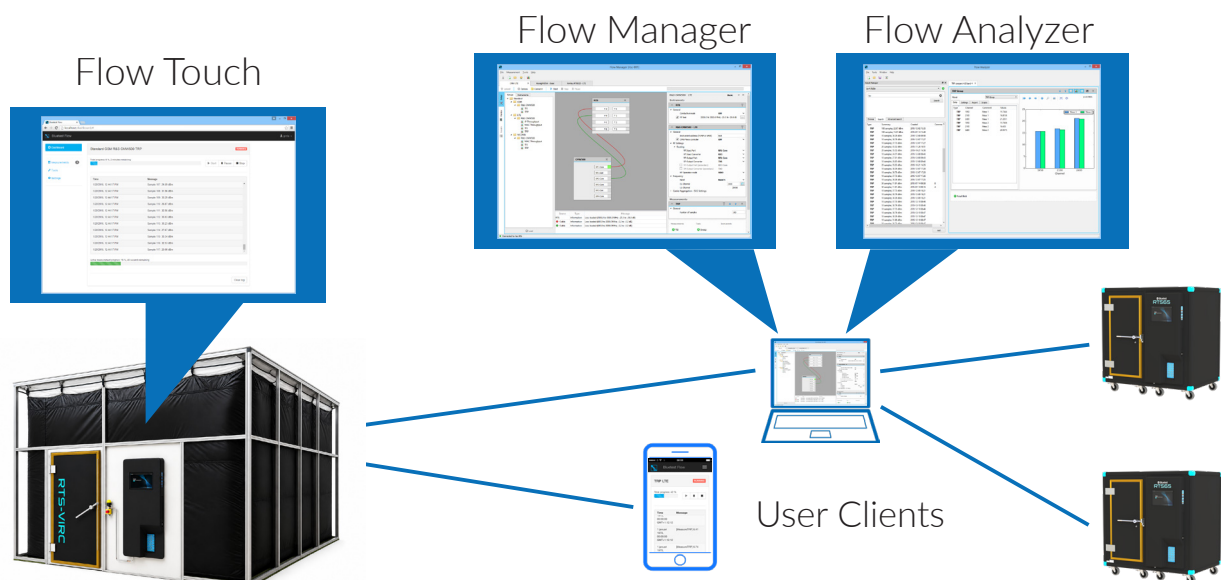
DUT INTERFACING

The chamber design supports multiple DUT power and communication interface options. If not operated on battery, the device can be powered with AC power, DC power, or through a USB charger interface. Ethernet, USB and RS-232 interfaces enable wired communication with the device. DUT interfaces are available with or without the optional turntable. Up to 4 interfaces can be mounted in the turntable.

WIRELESS FORMATS

Whether you need support for Bluetooth, WLAN, 2G, 3G, 4G LTE, NB-IoT or the latest 5G NR standards, we cover the whole range of wireless communication and the most commonly used communication testers, vector network analyzers, and spectrum analyzers.





BLUETEST FLOW SOFTWARE PLATFORM

The RTS-VIRC comes with a measurement and analysis software platform: *Bluetest Flow*. This integrated test environment offers functionality for testing complex wireless solutions. It builds upon years of research and development expertise. Already well proven measurement methods and algorithms are included in the Flow platform. The Flow platform consists of *Flow Manager*, *Flow Analyzer* and *Flow Touch*.

FLEXIBLE SYSTEM MANAGEMENT

All measurements are executed by the built-in Flow measurement server. There is no need to be concerned about incompatible computers or conflicting programs causing time consuming troubleshooting. Measurement configuration is done remotely with Bluetest Flow Manager installed on any regular office PC. It provides in-depth measurement configuration and setup while retaining direct chamber control. Flow Touch is available on the built-in touch screen or any mobile device with a web browser. It allows you to start, stop and monitor measurements from anywhere.

EASY OR ADVANCED – IT IS UP TO YOU

Flow Manager combined with Flow Touch gives you all the functionality you need for your OTA measurements whether

it is basic or advanced. Get started fast with predefined setup settings according to standard bodies or operator specifications. Intelligent parameters are implemented so that ranges and dependencies are corrected automatically. In Flow Manager, you visually setup the measurements by connecting the cables and instruments, just like you do it in reality. The user interface supports a simplified view for the new user and an advanced view with access to more parameter settings for experienced users.

BATCH MEASUREMENTS – THE TIME SAVER

For the engineer with a long list of mixed measurements it is possible to run all of them in one go. You can mix your measurements as you want. Combine measurement types, wireless standards and

even instruments. Create batch measurements with TRP, TIS, and then TRP again with another communication tester.

ANALYSIS & COMPARISON

The integrated result database collects all results in one place and enables easy and powerful search functions using Bluetest Flow Analyzer. Organize your results by adding metadata in the form of tags or additional DUT information. Combine results from different devices, wireless standards and measurement types, make customized comparison plots, and export everything into one single HTML report. The high-resolution chamber camera lets you document your measurement and attach the picture or video to the result. Your legacy files can also be imported into Flow Analyzer and the result database.

FLOW PLATFORM OVERVIEW

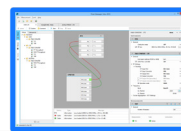
FLOW TOUCH

Flow Touch is a touch interface that can be used on any device with a web browser. Flow Touch allows you to control and monitor your measurements remotely. Start, stop and pause the measurements are just a few examples of the possibilities. Flow touch comes with the touch screen included in your RTS.



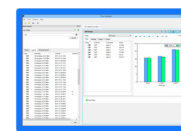
FLOW MANAGER

Flow Manager is the desktop client in which you configure your measurements. You set up your measurements, create batches and add multi-parameter sweeps. Define your measurements as you want whether you are a beginner or advanced user. You are guided in Flow Manager by the built in manual.



FLOW ANALYZER

Flow Analyzer is the result and data processing tool that gives you endless opportunities to plot your data as you want. Search in the built-in database and compare your measurements. Create your own design for plots and graphs, put them in a report format and export your results.



CALIBRATION

Calibration of the system is easily done by yourself in less than 15 minutes and is normally only performed when changing the chamber load or chamber configuration. Just like you reuse a measurement setup, you can reuse existing calibration data to minimize downtime.

SUPPORTING ACCESSORIES

Bluetest provides a wide range of smart accessories to improve and simplify the work with your measurements. Check out our website for more details.

MAINTENANCE

We will not leave you after the installation of your RTS-VIRC. System operation training is tailored to your level of experience and previous knowledge of our systems and software. Our after-installation services include, for example, measurement customizations, upgrades, and software and hardware maintenance plans. Our support and service solutions provide an upgrade path for both hardware and software platforms, ensuring that the capabilities of your RTS-VIRC stay ahead of tomorrow's wireless technologies.

TECHNICAL SPECIFICATIONS

Model	RTS-VIRC
Frequency Range	
Wireless communication tests	650 MHz - 8.4 GHz
EMC	LUF* to 18 GHz
Measurement Antennas	
650 MHz - 12 GHz	4, 8 or 16
1.7 GHz - 18 GHz	4, 8 or 16
Shielding	
650 MHz - 6 GHz	Typ. >95 dB
6 GHz - 18 GHz	Typ. >80 dB
Maximum field strength (EMC)	200 V/m with optional HP switch
Power Consumption	Typical 160-220 W (depending on installed options)
Weight (unloaded)	800 kg (1760 lb) (depending on installed options)
Personnel door opening (h x w)	2.1 m x 0.9 m
Turntable size	1.5 m (optional)
Max DUT size (w x d x h)	Scales with chamber size - see Example Chamber Sizes
Max DUT weight (on optional turntable)	Up to 500 kg

*LUF: Lowest usable frequency

EXAMPLE CHAMBER SIZES

Inner dimensions (w x d x h)	Max DUT size (w x d x h)
6×4×3.5 m 19.7×13.1×11.5 ft	3.5×2×3 m 13.1×9.8×9.8 ft
8×5×4 m 26.2×16.4×13.1 ft	5.5×3×3.5 m 18.0×9.8×11.5 ft
10×5×4 m 32.8×16.4×13.1 ft	7.5×3×3.5 m 24.6×9.8×11.5 ft

CONTACT US

 <https://bluetest.se>
 sales@bluetest.se
 +46 31 7786161
 **Bluetest AB**
Lindholmsallén 10
417 55 Gothenburg
Sweden



<https://bluetest.se>

BTD-26-004 Rev.A