

ALSAS 10 Universal Integrated SAR Measurement System for compliance, dosimetry, HAC, antenna design

If you are a manufacturer of wireless devices, Lab, CAB/TCB/NB, government research or health facility, then the ALSAS 10U is your system of choice for SAR measurements up to 6 GHz.

ALSAS 10U is fast, easy to learn and use, reliable, and fully compliant with SAR measurement standards.

It is also the only SAR measurement system on the market today which has a dedicated HAC (Hearing Aid Compatibility) testing module.

COMPLIANT:

- fully compliant with SAR standards FCC, IEC, IEEE, CENELEC, etc.
- includes probe tilt functionality ("normalization")
- horizontal SAM phantoms
- various flat/body phantoms
- measure up to 6 GHz

FAST:

- up to 75% faster measurements

ACCURATE:

- easier, more accurate positioning of DUT
- only system with clear phantoms

EASY:

- easy to learn and to use
- smaller tissue volume – easy to clean
- many support and training options to choose from
- SAR Network available

OPEN:

- modular design
- 2D and 3D measurement
- open interface to modeling software (eg. REMCOM)
- multiple report output options



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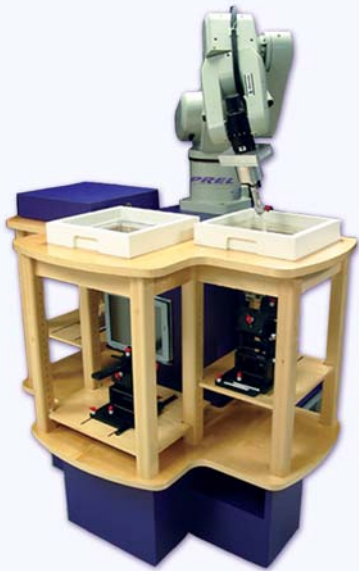
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APREL SAR Assessment System ALSAS 10 Universal

Compliant with IEEE 1528, IEC 62209, CENELEC EN50361, US FCC, and other national and international harmonized standards

ALSAS 10 UNIVERSAL



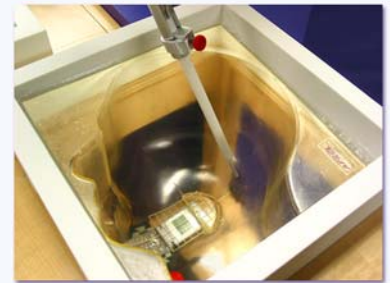
APREL Laboratories ALSAS 10U (APREL Laboratories SAR Assessment System - Universal) is fully optimized for the dosimetric evaluation of a broad range of wireless transceivers and antennas. It is **an easy-to-use** development and compliance tool, which provides excellent application flexibility as well as the **fastest fully-compliant measurements available today, up to 6 GHz**.

ALSAS has been developed with a strong engineering focus, and with custom modular software/hardware for the broadest range of applications, including dosimetry research and measurements in various Phantoms – **SAM Phantom**, UniPhantom™ (Universal Phantom), Universal Flat Phantom, and others.

ALSAS 10U has capability for **HAC (Hearing Aid Compatibility)** handset measurement available right now (optional module).

Free space E-Field measurements of mobile devices and base station antennas can also be executed using ALSAS 10U.

With the ALSAS Universal configuration, several phantoms and setups can be arranged around the system, phantoms are designed to be easy to move, require only **7-8 litres of tissue** simulation fluid (while achieving 15cm depth to comply with standards) and, using the specially-designed Phantom Storage Units, switching tissue simulants is easy and fast. ALSAS 10U is the only system with clear phantoms and positioning grids to allow much more clear and repeatable positioning of DUT (Device Under Test) for more precise measurements.



ALSAS 10U is **fully compliant with IEEE 1528, IEC 62209, CENELEC EN 50361** and related EN standards, **FCC OET Bulletin 65, Supplement C**, plus other national and regional standards. This includes **requirements for 30° tilt**, uncertainty analysis, and others.



The ALSAS-10U is the **fastest full-compliance system** on the market today – **75% faster** than the most common system (**ALSAS 10U takes 6.5 - 11 minutes with normalisation tilt**). Multiple user options (included) which allow mapping of phantoms, can further reduce measurement time. This makes ALSAS 10U an excellent choice for quality control applications in wireless manufacturing, as well as for compliance and for R&D.

Reports are generated automatically. Exporting of data to any software is easy, and XFDTD modeling software interface can be available as an option.

The ongoing commitment from APREL Laboratories to the field of SAR and dosimetric research and development will ensure that the ALSAS 10U measurement system or its future family members can be upgraded to accommodate changes within wireless technologies. Other ALSAS family members are also available, including a **desktop system for engineering**, and the **ALHACAS standalone HAC assessment system**. APREL has been awarded a **US patent for its IN-LINE production tester** (other patents pending). APREL Laboratories does carry out custom test system design for its clients.



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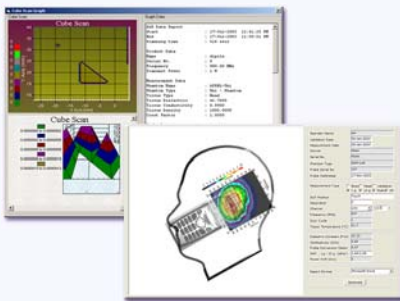
Applications

Use ALSAS 10U for SAR (Specific Absorption Rate), HAC (Handset Hearing Aid Compatibility), and other dosimetric or field measurements.

Predefined measurement procedures compliant with the guidelines of CENELEC, IEEE, IEC, FCC, etc. **Automatic detection for all SAR maxima.** As little as 6.5 to 11 min (with 30° tilt!) per device position measurement completion time, with no user interaction required during the measurement: area scan, evaluation of cube maximal search, fine cube measurements and device power drift measurement. Additional modules have been included within the software for advanced zoom scan analysis (enhances high frequency assessments above 3GHz), along with **Rapid-SAR point analysis** allowing full manipulation of the probe position controlled via the main user interface. System operation range: **to 6 GHz in tissue.**

Use ALSAS 10U for all analog and digital devices, including wideband, spread spectrum and pulsed systems, etc.:

- handsets,
- handhelds,
- WLAN,
- electronic article surveillance,
- accessories,
- cordless,
- wireless data,
- wireless access points,
- radio, etc.

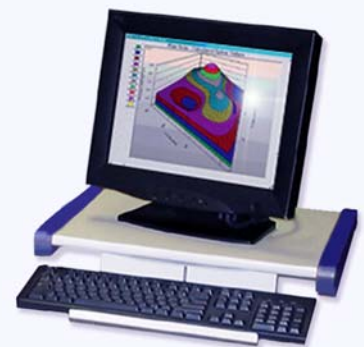


Field Scans

- Measurements along lines, planes, curved surfaces, volumes in free space or restricted volumes (phantoms).
 - Cube measurements with surface extrapolation and spatial SAR evaluation for 1g and/or 10g.
 - Time measurements (source power drift).
 - Probe rotation measurements (isotropy) and many others.
- Additional modules are available.

Visualisation and Reporting

- 2/3D isoline distribution, scatter graphics, polar graphics, vector representation.
- Device representation and phantom visualization in 2/3D graphics with measurement data overlaid.
- Freely configurable output graphic formats (including JPEG, BMP) with automatic title, data and legend generation.
- Measurement results delivered in Microsoft Word format for fast inclusion into engineering and compliance reports.
- Uncertainty analysis and budget calculated and reported. Physical measured points data can be exported for use in multiple software applications, including modeling software.



Parameter Handling

Multiple access levels (password protected) for parametric modifications/test scenarios. Any number of predefined settings (probes, phantoms, liquids, devices, measurement procedures, etc.) can be stored for future use within the user defined data-base.



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Major ALSAS 10 Universal System Components

Universal Workstation

The Universal Workstation is the platform for the ALSAS 10U system. It is designed to support the robot and its controller, test samples in holders, and up to 3 phantoms simultaneously. It is unique in that it allows the user to easily and quickly swap out phantoms in order to change sizes/shapes or change tissue simulants – or even to work in free space (eg. For HAC), by just removing a phantom. Phantoms are covered when not in use (cover from Phantom Storage Unit).

Easily installed and adjusted, the self-contained Workstation is ergonomic, and allows flexibility for positioning test devices or validation dipoles. The hardwood and engineered materials construction is both robust and attractive. The total weight of the system, including the workstation, is such that it is not necessary to specially reinforce standard shielded room floors (a requirement for heavy robots).



Phantoms and Phantom Storage Unit



ALSAS 10U is the only system providing clear phantoms, marked with grids for easy and repeatable test device positioning. All phantoms are optimized for lowest use of tissues (SAM requires only 7 litres of tissue simulant per side!). **All phantoms are solvent (DGBE) resistant.**

Easy and fast phantom setup with reference points predefined on phantoms. Standard available phantoms are:

- IEEE/IEC/CENELEC SAM left and right,
- UniPhantom™ Universal Phantom (anthropometric canonical head combined left- and right-in-one and flat validation phantom for 800MHz up, requires less than 8 litres of tissue stimulant),
- U-MED Medium Flat Phantom (fits into Universal Workstation pop-out),
- Universal Flat Phantom for lower frequencies, selected body, and base station antenna tests.

Custom phantoms are also available (upright, drive phantoms, special sizes, etc.).



Device Holder

The Device Positioner is designed to be robust in structure, providing accurate and precise positioning and stability during SAR or HAC measurements, and to be easy to use with minimum effort required to manipulate DUT's of all kinds during measurements. Novel DUT clamping mechanism allows proper gripping regardless of DUT size (up to capacity) and shape. The positioner can hold handsets – both clamshell and candybar, in any orientation – PDA's, small tablets, POS, etc. It can also hold small waveguides or other items. All devices "float" to essentially eliminate any possible loading of the device by the Positioner.

Built in 15° touch-to-tilt feature allows for fast repositioning of the DUT during touch-to-tilt transition. Each degree of freedom of movement (there are 8, including the Workstation shelf itself, and the azimuth and tilt) can be locked individually. Used in conjunction with APREL phantoms which are clear and have a clearly marked grid system, the Positioner allows precise and repeatable positioning.





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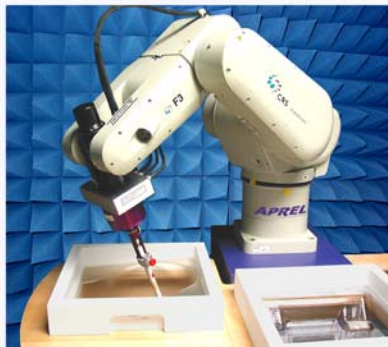
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Probes

Probes are the key to the performance of the ALSAS 10U. SAR measurements are carried out using a miniature immersible isotropic E-field probe. The probes are optimized for both performance and durability, and are resistant to chemical solvents (eg. DGBE). H-field probes are also available. APREL continues to carry out ongoing research into probe performance and optimization, as well as new probe technologies.



DAQ-PAQ and Probe Mounting and Boundary Detection System



The DAQ-PAQ is part of the unique architecture of the ALSAS 10U which enables speed, accuracy and precision in measurements. In this small box, which does not require battery changes, are housed **A/D convertor, amplifier, and data acquisition board – all proprietary, all optimized for speed**. The DAQ-PAQ communicates with the controller and the host. This design minimizes interference and simplifies both operation and maintenance. The DAQ-PAQ connects to the Probe Mounting and Boundary Detection System to control the positioning of the probe.

The Probe Mounting and Boundary Detection System (PMDPS) is designed to be accurate and precise, **to allow the probe to tilt (in order to remain normal to the phantom surface as is stipulated in IEEE 1528, IEC 62209 and other standards), to minimize uncertainty due to boundary effects, to provide fail-safe E-stop capability**, and finally to be robust for long-term usage. The PMDPS allows the probe to be held firmly in position, yet easily attached and detached by the operator.

Dipoles and System Validation

User defined system validation settings, with multiple zoom scan options (compliant with IEEE/CENELEC/IEC guidelines). Validation for other applications is available on a custom basis, utilizing XFDTD evaluations and electrical design.

SAR and HAC validation dipoles for frequency ranges up to 6 GHz are available, and may also be used for other applications. Dipoles have an integral sleeve holder and stand built-in, and are designed to fit on the Universal Workstation's adjustable shelves.



Training and Warranties

APREL Laboratories offer customers multiple training options, which have been developed for new and experienced engineers working within the field of SAR, whether or not they are users of the ALSAS system.

APREL offers various service and maintenance agreements, which allows the customer to have their systems regularly recalibrated and updated, as well as receive consultancy for SAR measurement problems via e-mail, web site or telephone.

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Additional Optional Components

Full range of system components includes validation dipoles for standard frequencies to 6 GHz, dielectric probe for tissue measurements, tissues, power meters, amplifiers, signal generators, as well as tissue manufacturing equipment, etc. APREL Laboratories, with its partners, offers services for full system integration, including shielding design and on-going training. A SAR Lab Network option is also available.

XFDTD numerical simulation software is available as an option.

System Certification

APREL Laboratories systems and components are certified by the Spectrum Sciences Institute. The calibration services are provided by NCL (National Calibration Laboratory) a division of APREL Inc.

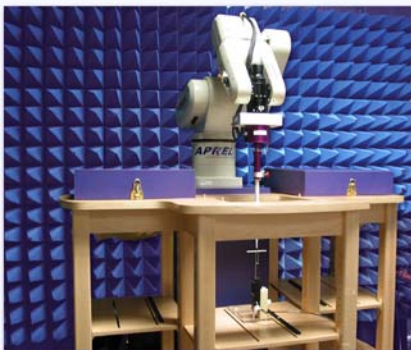


Custom Development

Custom instrumentation and integration are also available as well as specialized development in probe design, data acquisition, drive systems, in vitro test systems, specialized frequencies and production line test systems.

Standards Development and Technology Leadership

APREL Laboratories representatives are active and hold senior and executive positions in multiple international standards organizations, including IEC, IEEE, and others, and work closely with several national regulators, including the FCC. Through the IEC, we have a liaison with CENELEC, and informal links to other national standards exist.



This means that APREL's dosimetric measurement tools will remain at the forefront of technology for the benefit of our clients.

APREL Laboratories was founded in 1981 and provides consulting, subject matter expertise, research, accredited independent laboratory services, as well as SAR and HAC services, tools and training.

APREL is a member of the Spectrum Sciences Institute, a not-for-profit organization dedicated to research and education in the areas of wireless voice and data and which carries out training and multi-stakeholder research. SSI also sponsors specialized certification, training and research programs for SAR and for Hearing Aid Compatibility (HAC).

This is just a part of the ALSAS story!

For more information, please contact us by phone, email, or by visiting our web site at www.aprel.com!