

Accessories

POSITIONING SYSTEM | AUDIO/VIDEO SYSTEM | SMOKE DETECTION SYSTEM
COMMUNICATION SYSTEM



Positioning any kind of EUT
EUT monitoring at its best
Failsafe smoke detection
Intercom for paging and calls

We bring more than 60 years experience in RF testing and measurement solutions when working with our partners in the design and implementation of our accessories for EMC and MW test sites. Cooperatively, we are proactive in our approach to present and future developments.

Purpose & Overview

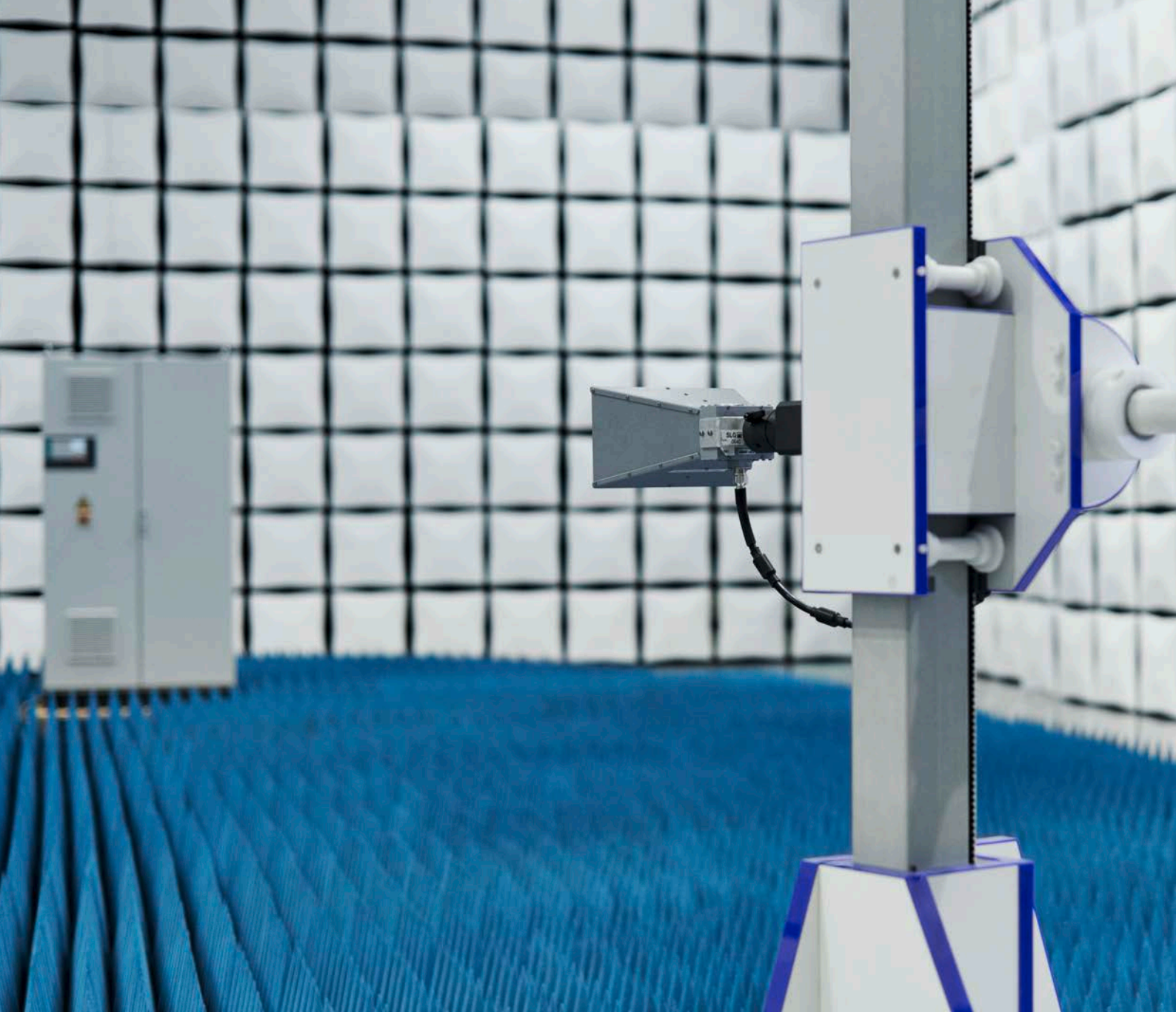
WHAT ARE THESE SOLUTIONS FOR?

Our accessories include a positioning system, audio/video system, smoke detection system, and communication system. Besides the two key components (i.e. shielding and absorbers), which we directly control the R&D and manufacturing of, these are the principal parts of a complete turn-key solution, either for EMC and MW test sites or protected shielded areas.

Many of these accessories are available as products or systems on the commercial and consumer market, without the adaptation to the RF environment in which they are supposed to work. Our role as system integrator, from the beginning, has been to work cooperatively with our partners in the development of products and systems to suit your needs.

You are the ultimate benefactor of this mutual and continuous effort to enhance and further develop new solutions. Examples of our unrelenting efforts to improve systems are the TCP/IP controllable CCTV camera system, the high powered light source (HPLS), smoke detection system, and the unique positioning device for conical cut over-the-air (OTA) measurements.

One of our priorities is to ensure that all parts and components perform in a low RF noise environment.





Quality Management

QUALITY MEANS DOING IT RIGHT FROM THE VERY FIRST THOUGHT.

Our quality management ensures a most efficient quality control over products, management and organizational systems.

The organization ensures the availability of resources and information necessary to support the operation and monitoring of these processes. All relevant processes are defined in our management system. Through monitoring, analysis, and improvement, the highest quality and customer satisfaction is our target.

In an effort to improve our quality assurance systems, we ask our customers to provide an evaluation of our performance at the conclusion of each project. This feedback, coupled with input from the market and the Standards Committees, gives continuous enhancement to our systems and correction to any non-conformity found.

Product purchasing and sourcing is a priority in our role as system integrator, so much that it encompasses one of sixteen chapters in our quality management system. Key process figures are:

- audit & approval of suppliers
- evaluation of products by our technical team
- technical reporting on delivered products
- project related factory acceptance by the project manager.

In our commitment to quality solution designs, we work closely with our long time suppliers to ensure that our stringently designed specifications are met.

Quality is not only doing it right from the very beginning, but also delivering the right products in the expected quantity on the scheduled date at the right place. For a global solutions supplier these aspects are key. Each project is subject to a quarterly review of quality, cost, and delivery specifications.

Our ISO 9001 and ISO 14001 certification guarantees that our designs, products, and solutions will always meet the highest quality standards. It's our goal to provide you the very best of expertise, project management, and products. The main system components like shielding, absorbers etc. are manufactured by daughter companies or by our shareholders. This ensures a full control with regard to quality and delivery time.

POSITIONING SYSTEM

Measurement accuracy depends largely on the functional precision and the RF noise level of the positioning system. A wide range of positioning devices, turntables and antenna masts is available.

Turntables

EXTREMELY LOW PROFILE AND MAINTENANCE.

Because of its mechanical and electrical interfaces to the chamber floor, the turntable is the subsystem, which has the greatest influence on the NSA performance of the EMC Test Site. Therefore, it is traditionally under the technical control of the chamber supplier. Regardless of our customer's measurement conditions during testing, we work closely with our partners to control and reduce the RF noise level of our solutions.

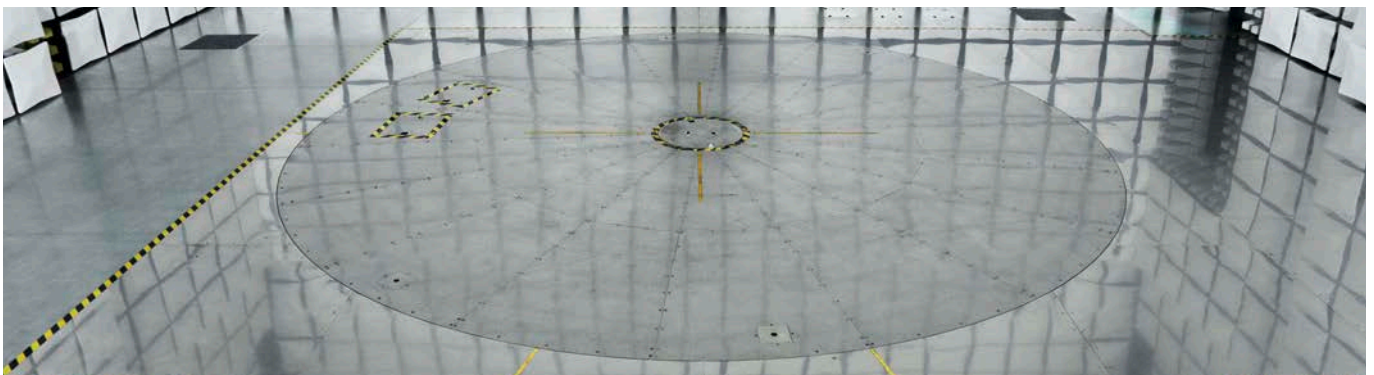
Our turntables are designed for integration to the type of chamber floor they are dedicated to, whether ground plane or absorber lined.

The WI type is designed for absorber lined floors in EMC chambers mostly lined with ferrite absorbers up to 500 kg (1,102 lb) EUT load. Because the ferrite absorbers are lying below the wooden top plate, the turntable is not flush with the surrounding floor. The SI type is for ground plane floors up to 1 t (2,205 lb) EUT load. For loads above 1 t (2,205 lb), which can only be tested on a ground plane floor, the DT type is available up to 20 t (44,092 lb). Both types for ground plane floor, SI and DT, are electrically bonded to and flush with the surrounding metallic floor.

The rugged, full metal construction shows the lowest profile on the market (e.g. an EUT load of 1 t (2,205 lb)), and requires only 142 mm (5.6 in). Very little maintenance is required. Under normal working conditions, the contact springs of the ground plane interface need to be changed once every two years.

All turntables have, at the center, a connection point that will be equipped with sockets, connectors and other interfaces. Special designs are available upon request. All our turntables can be controlled either manually or automatically by means of a controller.

In large anechoic chambers for vehicles, quite often a chassis dynamometer is integrated to the turntable, forming a unit supplied by the chassis dynamometer supplier.



TURNTABLES

Low maintenance cost is just one of the many features of our low profile turntables. Designed for excellence, the positioning accuracy is better than plus/minus 1°.

Turntable WI type

FOR FULLY ANECHOIC.

WI type turntables are for fully anechoic chambers and designed to be suitable for a ferrite covered floor, such as used in CDC type of chambers. The top plate is located above the homogeneous ferrite floor, which is interrupted for the drive axle and support rollers only. The adjustable speed is 0.5 – 2.0 rpm with a rotating angle $+400^{\circ}/-200^{\circ}$. The drive unit is shielded and shows radio interference typically 10 dB under EN 55022 Class B. The maximum EUT load is 500 kg (1,102 lb) with diameters from 1.2 m (3.9 ft) up to 2.0 m (6.6 ft) and the height of the wooden top plate is 130 mm (5.1 in) above the chamber floor. The power supply is 208 – 230 V AC, 50/60 Hz with maximum 2 A current consumption and the control via fiber optic lines.



Turntable SI type

FOR GROUND PLANE.

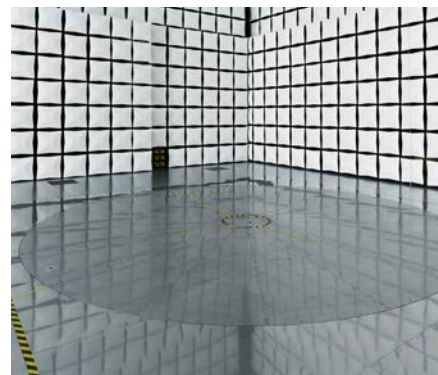
SI type turntables are for semi-anechoic chambers and designed for a metallic floor, such as used in 3 m SAC type chambers. The stainless steel top plate is flush and electrically bonded with the surrounding floor. The adjustable speed is 0.5 – 2.0 rpm with a rotating angle $+400^{\circ}/-200^{\circ}$. The drive unit is shielded and shows radio interference typically 10 dB under EN 55022 Class B. The maximum EUT load is 1 t (2,205 lb) with diameters from 1.2 m (3.9 ft) up to 2.0 m (6.6 ft). The maximum height of the metallic top plate is only 142 mm (5.6 in) above the shielding floor increasing the chamber's inner height. The power supply is 208 – 230 V AC, 50/60 Hz with maximum 2 A current consumption and the control via fiber optic lines.



Turntable DT type

FOR HEAVY LOADS.

DT type turntables are for semi-anechoic chambers and designed for heavy loads, such as used in 10 m vehicle SAC type chambers. The stainless steel top plate is flush and electrically bonded with the surrounding floor. The adjustable speed is 0.2 – 1.0 rpm with a rotating angle $\pm 200^{\circ}$. The drive unit is shielded and shows radio interference typically 10 dB under EN 55022 Class B. The maximum EUT load is 20 t (44,092 lb) with diameters from 2.0 m (6.6 ft) up to 8.0 m (26.2 ft). The maximum height of the metallic top plate is only 1.1 m (3.6 ft) above the shielding floor increasing the chamber's inner height. The power supply is 400 V AC, 50/60 Hz with maximum 32 A current consumption and the control via fiber optic lines.



ANTENNA MAST – CONTROLLER

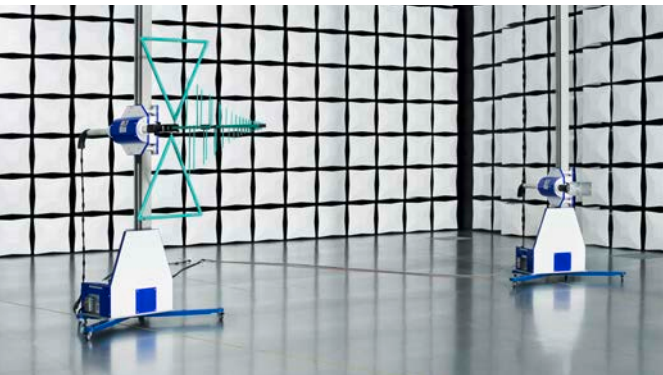
Our antenna masts provide long term polarization accuracy due to the pneumatic rotary actuator. The high transfer rate and touch screen display, make our controller the most innovative on the market.

Antenna mast

FOR ANY KIND OF ANTENNA.

The range of antenna masts and stands we supply in our solutions is from an economical manual antenna stand (MAS) to an electrically driven tilt antenna mast (TAM) with 6.0 m (19.7 ft) height. All models are built with non-metallic materials, with the exception of the basic plate and drive unit, both placed maximum 0.3 m (11.8 in) above floor level. The drive unit is shielded and shows radio interference typically 10 dB under EN 55022 Class B. To avoid any elevation error the antennas rotate on their axis during polarization. Below is the typical data of the antenna mast CAM 4.0.

Feature	Figures
Antenna height	max. 4.0 m
Total mast height	4.4 m
Material	PVC + fiber glass
Mast section	60 mm x 60 mm
Base (L x W)	0.8 m x 0.6 m
Antenna weight m	max. 8 kg
Positioning speed	4 to 15 cm/sec. adjust.
Positioning accuracy	+/-1 cm
Polarization drive	pneumatic
Power supply	115 V, max. 2 A



Controller

CONTROL UP TO EIGHT DEVICES.

The range of controllers we supply in our solutions is from an economical one device and one axis of motion controller (SCU) to the high-end eight device controller (NCD). All controllers allow the operation in manual, semi-automatic, and remote control mode via IEEE 488.2 (GPIB bus) or other optional interfaces. Drivers for the most common EMC test software, (e.g. Nexio, R&S, TDK RF Solutions and TESEQ) are available. Below is the data of the most recent development for EMC Test Sites, the NCD.

Feature	Figures
Data interface	IEEE 488 and Ethernet
Device interface	via fiber optic cable
Transfer rate	Real time 100 Mbit/s
Display	TFT touch screen display
Voltage	100 V/240 V AC
Current	approx. 20 W
Fuse	T 125 mA, 250 V
Size	19" Rack mount, 427 x 87 x 300 (mm)
Weight	approx. 8 kg
Temperature	5°C – 40°C



OTHER COMPONENTS

Low reflection positioning devices and EUT tables provide enhanced measurement accuracy. A mobile chassis dynamometer suits your anechoic chamber for multipurpose testing.

EUT table

REDUCES REFLECTIONS.

The CISPR 16-1-4, § 5.5 describes the attempt to reduce the overall measurement uncertainties by controlling the table influence. We are addressing this requirement by implementing low reflection EUT tables into our solutions, an example of which is described below. The table is fabricated from non-conductive material with a very low dielectric constant ϵ' (epsilon) and has a removable tabletop.

The typical data for the tabletop are:

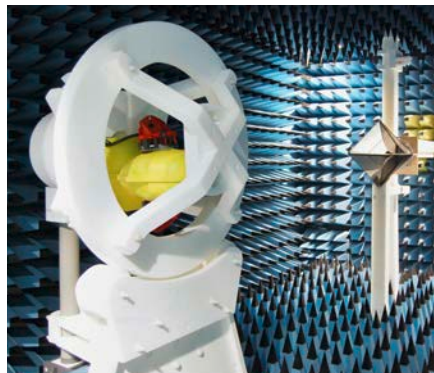
- 1.5 m x 1.0 m (4.9 ft x 3.3 ft)
- Height 0.8 m (2.6 ft)
- Maximum load 100 kg (220 lb)
- Tabletop is made of synthetic resin bonded paper
- The dielectric constant at 1 MHz is approx. 1.6
- Table structure is made of Styrofoam
- The dielectric constant at 1 MHz is approx. 1.2



Positioning device

URNS YOUR EUT.

Over-the-air (OTA) measurements on wireless devices (e.g. cell phones) or for equipment with wireless access points (e.g. notebooks) require low ripple values in the quiet zone (QZ) of the anechoic chamber, challenging the reflection properties of the positioning device. Our turn device “Albatross Projects Head Positioner” (APHP) is especially designed for such measurements. Different sized EUT can be mounted on the mounting bracket made of Rohacell hard foam. The APHP is usually mounted onto a turntable to have both 360° vertical and horizontal rotations for conical cut measurements. The measurement height is fixed; standard height is 1.5 m (4.9 ft) above floor level. Other heights are available upon request.

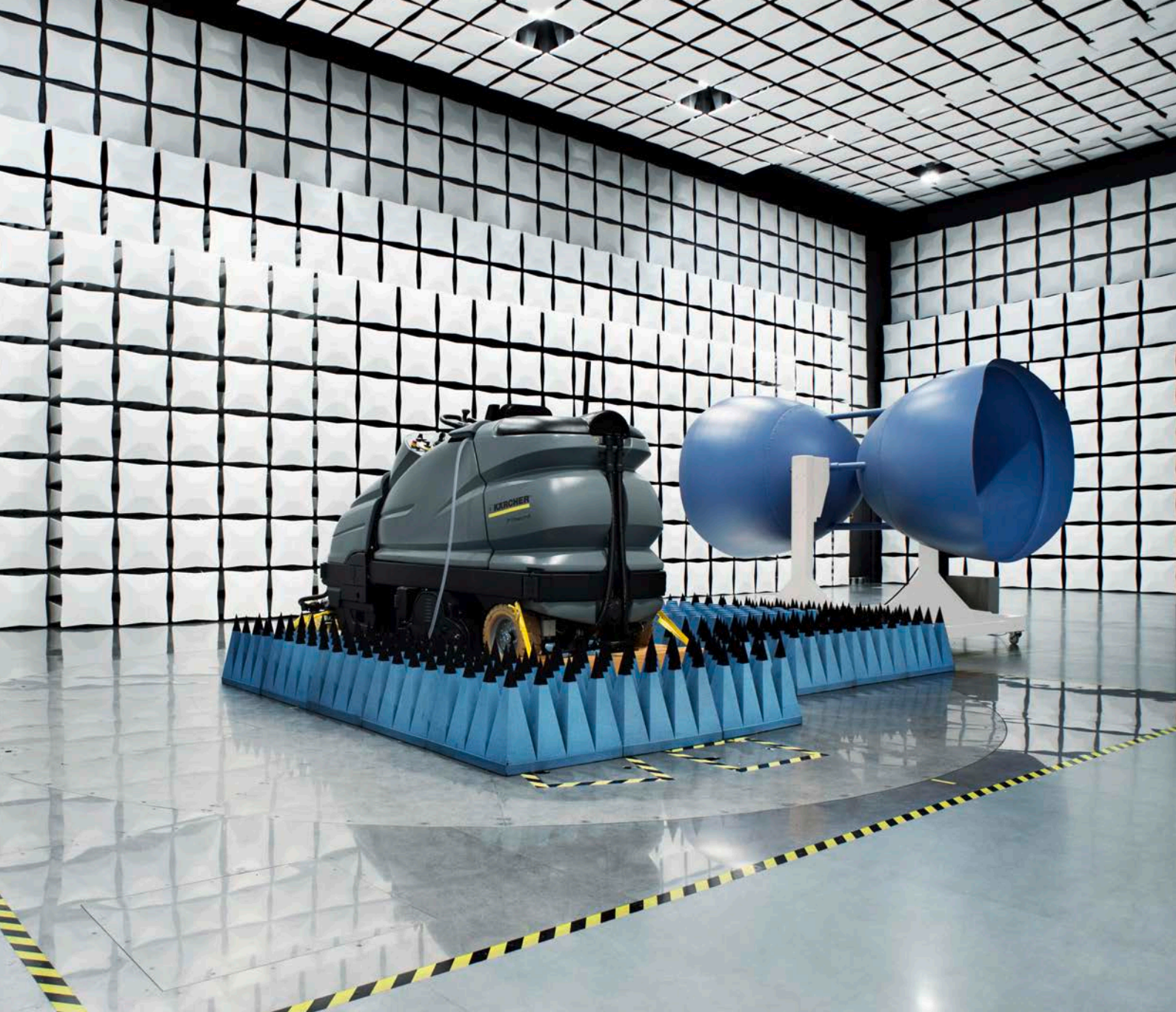


Chassis Dynamometer

SIMULATES ROAD.

Vehicle testing often requires chassis dynamometers (CDM) for various testing purposes on different types of vehicles, such as all-terrain and all-wheel drive vehicles. We have gained a lot of know-how in our 25 years of building EMC chambers for the global automotive industry and we work with top CDM manufacturers from all over the world. This experience is the most important factor in the successful integration of CDM enabling vehicle testing in a classic CISPR measurement chamber.





AUDIO/VIDEO SYSTEM

True state-of-the-art EMC Test Sites include audio/video systems for security and monitoring of the EUT measurement process.

Wide angle meets zooming

GENERAL VIEW OF THE TEST SITE AND DETAILS ON A DISPLAY.

Interior monitoring of the anechoic chamber and EUT has multiple purposes:

- Ensure specifications are met during emissions measurements
- Check for possible malfunctions and environmental susceptibilities of the EUT

To perform effectively, the CCTV camera must meet several criteria. The camera unit has to have a very low RF emission and must be immune to very high field strengths to avoid malfunctions of the camera system. The optical zoom lens is used to monitor both the antenna mast during height scanning and the EUT including any functional displays.

The standard system includes a camera, fiber optic cables, a controller (link to data sheet controller), and a monitor. Wall mounted and portable cameras and audio are available upon request. We offer a wide array of controllers including single or multiple camera systems (up to six per controller), as well as systems that include A/V transmission.

Most large organizations require LAN integration of the test site audio/video system.



We offer camera systems that can be accessed and controlled via TCP/IP. In this case, the camera or controller is provided with an Ethernet interface that is connected to the LAN. With the video control software, you may access the cameras from any location within the network. Multi-user access on a single camera is possible, such as Fire Department remote monitoring of the chamber during a fire alarm. Other advantages include easy image capturing to MPEG4 format and hard disk storage for test documentation.

SYSTEM COMPONENTS

Components should be interchangeable, compatible or be able to stand alone. Our components offer a high degree of flexibility and further upgrade possibilities.

Camera unit

THE GOLDEN EYE.

The camera unit is acting as the eye of the system. The immunity of the camera unit to field strengths of 200 V/m in the frequency range 10 kHz to 20 GHz (VG Standards) is achieved by the aid of fiber optics and a sophisticated RF-tight case. Our advanced camera units come encased in compact housing and may be customized in a variety of ways, such as the addition of an adapter for a non-metallic tripod to use in vehicle testing. All important functions such as zoom focus and pan/tilt movements can be remotely controlled.

The most important features are:

- Iris automatic/remote controllable
- Optical zoom lens 26x
- Digital zoom 12x
- Housing (Ø 100 mm x 190 mm)
- Automatic focus after position change
- Minimum object illumination 2 lux



Controllers

GIVING COMMANDS.

The controller is the "brain" of the system. The CCTV cameras we offer can be operated remotely. Control of the cameras, zoom, focus, pan/tilt and iris (option) is made by converting the optical signal to electrical signals. For most controllers there is the option to integrate an Ethernet interface and an option for a shielded intercom. The microphone can be integrated in the housing or a separate microphone can be used. If more than one camera is in use (e.g. one fixed and one mobile), multi-controllers allow controlling several cameras with one device. Up to six cameras can be connected to one multi-controller.



Accessories

THE SYSTEM'S HELPERS.

For a fully functioning system, different accessories are needed. Our accessories include:

- Pan/tilts
- Camera wall mounts (adapted to absorber length)
- Audio
- Tripods for portable cameras and audio
- Shielded power supplies
- Battery packs
- Head restraint adaptors (vehicle interior monitoring)
- Quad splitters (Feeds 4 cameras to 1 monitor)





SMOKE DETECTION SYSTEM

The smoke detection unit is located outside the chamber due to its sensitivity to high electromagnetic fields. A 40 GHz RF-tight feed-through connects the unit to the inside of the chamber.

Operating principles

HOW IT WORKS.

The unit draws air from the monitored area through a pipe system with defined sampling points, then passes it on to the detection unit where evaluation takes place. All system functions are continuously monitored by the detector box, including fault conditions such as ruptures or blockages of the air sampling unit. The ProSens – SL allows up to 64 sampling points. Fault LED indicators are on the power supply box and an LCD display within the detector box is a user-operated diagnostic tool which offers quick and easy service. Potential-free contacts are used for connection to a central fire detection unit (CFDU). This system has excellent response performance against all types of EN 54 test fires.

System components

WORKING PARTS.

The smoke detection system consists of several components integrated on the RF-tight mounting board connected to the shielding wall. The FC1002 Terminal Box provides the terminals for the central fire station or for triggering other signal and/or alarm devices. The detector unit ProSens – SL evaluates the air samples and produces an alarm signal when smoke is detected. The detector modules can be set to different sensitivities up to 0.05% obscuration/m. The air sampling detection is by means of the high-powered light source technology (HPLS). The flashing light gives a visible signal when the alarm is activated, while the siren gives an audible signal.

HPLS advantages

HIGHEST SENSITIVITY.

In the 80s, the LED offered sensitivity down to 0.3 % obscuration which was later increased by Xenon lamps to 0.01 %. In the 90s, the upcoming laser technology brought the obscuration/m level to 0.005 % which is now surpassed by the HPLS with 0.001 %. The high power light source (HPLS) being the most advanced detection technology, offers several key benefits. The excellent light spectrum is the most suitable for fire detection and makes the system up to 2,000 times more sensitive than traditional smoke detectors. The consistent quality of detection eliminates the typical sources of false alarms. Another decisive advantage is the large temperature range from –40°C to +60°C ensuring reliable function even under rough climatic conditions.



COMMUNICATION SYSTEM

Our communication system is an advanced solution suitable for many applications and designed to meet the growing needs for internal and external communication in organizations.

System layout

THE OVERALL PICTURE.

The internal exchange is digital, providing superb sound quality. There is a comprehensive range of master stations, industrial and substations. For added reliability a “star” network is recommended.

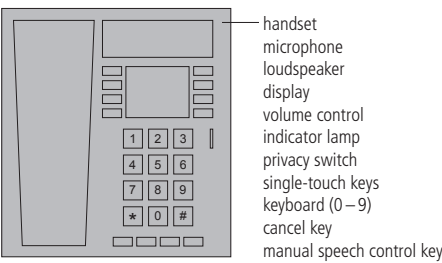
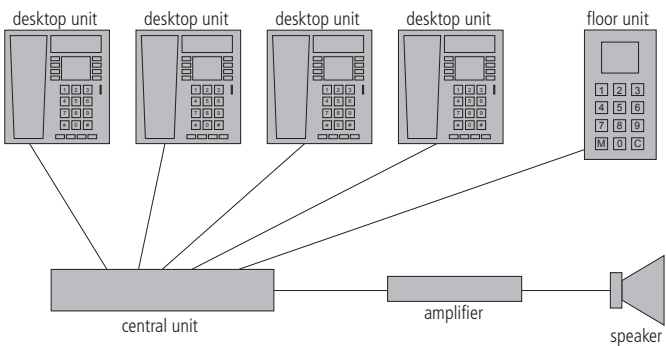
The system is supplied with a station number plan and a set of standard functions that are ready for use with auto load of a default system. Easy programming from a PC allows you to customize the system to suit your own requirements. The Alpha Com system has a basic building block which contains modules for power, ventilation and circuit boards. This can be mounted into a standard 19” rack, or it can be delivered as a floor-standing cabinet. A fully equipped basic building block can handle up to 138 subscribers. Several exchanges can further be linked using the Alpha Net feature. The Alpha Net gives a high level of feature integration. Once the system layout is finalized the lines entering the shielded areas need to be protected by signal line filters.

Intercom Station

THE CENTER OF YOUR NETWORK.

Stations using the Alpha Com system are often called intercom stations. A variety of stations are available such as the analog Flush Master station with its single touch keys, alphanumeric display, caller ID, online support, and directory service. The IP Flush Master station features a high contrast backlit display and connects directly to the IP network resulting in easy deployment at any distance.

Designed for CCoIP®, the station offers a set of critical communication features such as integrated firewall, group call, call priority and over-ride. This enables the delivery of instant, efficient, and secure voice and data services in an IP environment.



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