



Shielding Box MSB

An overview of the systems from
MTS Systemtechnik GmbH

Individual EMC technology



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Designed and built in Germany.



// Content



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// High-frequency technology
// EMC technology
// CNC milling technology

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// About MTS Systemtechnik

Tailored solutions for high frequency technology, EMC, electronics and mechanical design

Our customers include developers and manufacturers of highly sensitive equipment in the mobile communications, telecommunications, aerospace, defence, medical, automotive and electronics sector. Our devices, systems and components are used worldwide by leading international companies.

For over 30 years, MTS Systemtechnik has stood for state-of-the-art technology, outstanding reliability, discretion, transparent processes and certified quality in accordance with DIN EN ISO 9001.

With around 50 employees, we develop and manufacture bespoke, high-quality devices, systems and components – Made in Germany – as well as customer-specific products.

Our electronic product range includes coaxial relays, attenuators, power splitters, systems for the distribution of LF, video and RF signals, RF matrices and assembled coaxial cables. Our expertise in solving complex switching and distribution tasks in the high-frequency range has made us a leading manufacturer of relay switching units, air interface emulators, power splitter units and matrices.

For the mobile radio and telecommunications industry, we supply customised shielding boxes, air interface emulators for a wide range of test scenarios, and smart antenna simulators.

With our modern CNC production centre, we manufacture customer-specific precision-milled parts for the aerospace, optical and high-frequency industries.

The distribution of coaxial connectors from IMS Connectors and the assembly of coaxial cables complete our product range.



Systems for the distribution of LF, video and RF signals in the fields of tele- and satellite communication and radio surveillance



Production of mechanical components for the aerospace, optical and high-frequency industries



Development and production of active and passive components for high-frequency technology

// Introduction

EMC-shielded boxes are essential for reliable testing of radio interfaces. Our RF-shielded boxes enable accurate and reproducible measurements whenever a shielded test environment is required.

In research and development laboratories, as well as in test, calibration and manufacturing processes for electronic products, a shielded environment is necessary to prevent spurious emissions and interference from unwanted radio signals.

Using the right equipment ensures an optimal test environment, saving considerable time and reducing costs.

These applications require an appropriate shielding box. We manufacture custom shielding boxes in various sizes, with special interfaces and/or a range of filter components, in our own mechanical milling centre and electronic production facility. Drawing on many years of technological know-how and expertise in the design and manufacture of shielding boxes, we implement requirements precisely and offer a high degree of flexibility in realisation.

MTS Systemtechnik GmbH also offers a wide range of standard EMC-shielded boxes. This enables us to provide suitable solutions for almost all applications requiring a defined RF environment. The extremely robust and high-quality design ensures a very long service life without compromising operability.

What is a shielding box?

At MTS, we define a shielded box as a metallic enclosure in which virtually no electromagnetic radiation is present (Faraday cage).

Why do you need such a box?

If you are developing, testing or comparing equipment in the field of radio transmission, you need a space that is as free as possible from external radio signals. This allows you to determine how your test object behaves under defined conditions. Nearby mobile phone base stations or your own in-house Wi-Fi network can significantly influence the results or even make measurements impossible.

What should be considered?

A metal box provides effective shielding over a wide frequency range. However, if you need to access or operate the system inside, interfaces are required – whether a USB interface for control, a viewing window or a mechanical operating option. This is where it becomes more complex, as radio waves can exploit every opportunity to penetrate the shielded, field-free area.

What does the MTS shielded box provide?

MTS Systemtechnik has been developing shielded boxes for over 30 years. They are manufactured in our in-house milling centres. Each box can be customised in size and equipment according to your specifications. We offer almost any type of interface, manipulation options, mounting brackets and other features, always keeping the shielding effectiveness of the overall system in mind.

// Description

Shielding Box example:



Shielding Box Interfaces

- // USB 3.1 interface (type A female, ESD & filtered (up to 16 VDC @ 1.5 A))
- // USB 3.2 interface (type C female, ESD & filtered (up to 20 VDC @ 5 A))
- // LAN interface (RJ45 8-pole female, 10 Gbit/s, filtered, PoE++ power passing compatible (up to 60 V @ 1.5 A))
- // M12 12p 1nF filter module (M12 plug/M12 socket (up to 30 VDC @ 1 A)
12-pole feed-through filter module with round plug, EMI filter (Pi filter with 1 nF))
- // RF-interface (N-socket, SMA-socket, TNC-socket, BNC-socket, ...)
- // Mains voltage supply (230 V AC, socket country-specific)
- // DC Voltage connectors (+VDC, -VDC), 2x banana sockets 4mm, with 2x 3 nF
Pi-filter (max. 48 V DC, max. 16 A) without reverse polarity protection
- // Optical interface (FC/PC 2.2 mm)
- // Fibre-optic interfaces (ST/ST, FSMA/FSMA)
- // 3,5 mm 4-pole phone jack (CTIA standard)

Shielding Box Options

- // Flexible wire mesh with one or more touch screen operating stylus
- // Mobile attachment
- // RF absorber lining
- // Ferrite absorber
- // Ventilation (integrated honeycomb vent + fan)
- // Locking for padlocks
- // Shielded window
- // ESD lining
- // Pneumatic feedthrough
- // Brass tube (waveguide)
- // Inside shelf plate
- // 19" rack integration
- // Shielded gloves



MSB-0100 Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Ergonomic user positioning thanks to front-side opening.
- // Usable for frequencies from 500 MHz to 6000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, etc.
- // Easy operation of test samples directly through the integrated flexible wire mesh.
- // Highest safety standards through increased slip resistance and a gas strut cover holder.
- // Standard accessories included: flexible wire mesh, solid cover, mobile phone holder.
- // *Internal capacity for DUT: approx. 40 x 25 x 13 cm (W x D x H).*



MSB-2000 Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 500 MHz to 6000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, etc.
- // Easy operation of test samples directly through the integrated flexible wire mesh.
- // Weight-optimised structure improves mobility.
- // Standard accessories included: flexible wire mesh, solid cover, mobile phone holder.
- // *Internal capacity for DUT: approx. 40 x 25 x 11 cm (W x D x H).*

Shielding Box, MSB-0300 Series:



MSB-0300 Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 500 MHz to 6000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, etc.
- // Easy operation of test samples directly through the integrated flexible wire mesh.
- // Weight-optimised structure improves mobility.
- // Standard accessories included: flexible wire mesh, solid cover, mobile phone holder.
- // Internal capacity for DUT: approx. 65 x 45 x 17 cm (W x D x H).

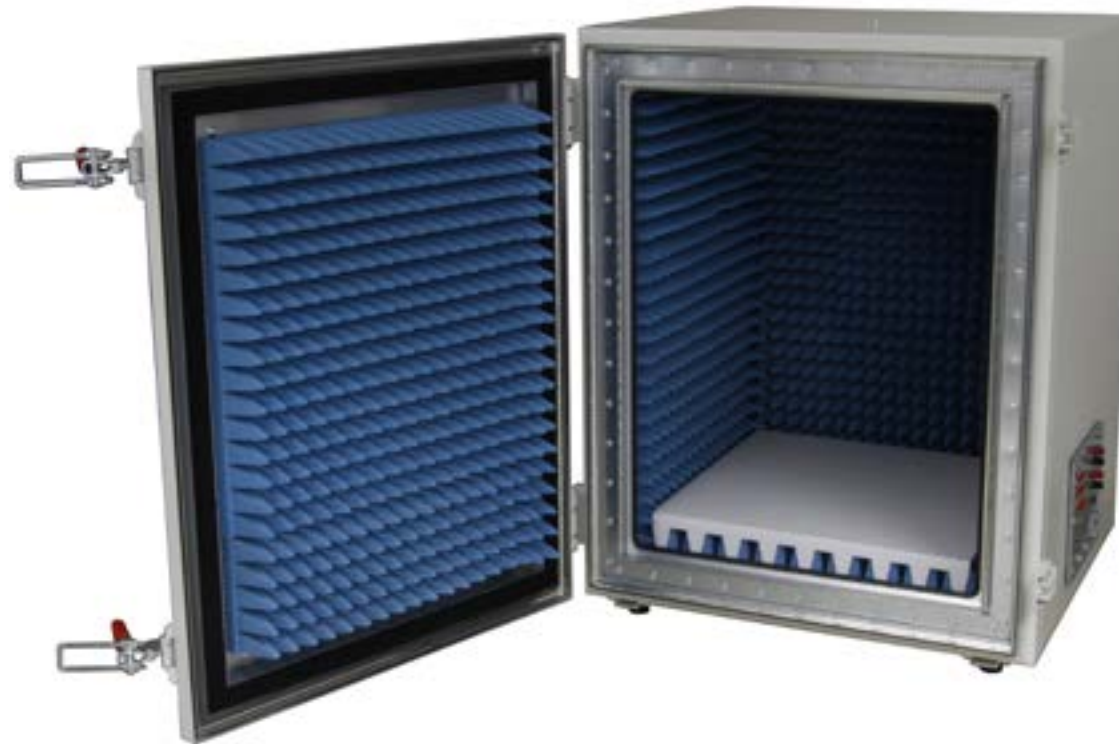
Shielding Box, MSB-0400 Series:



MSB-0400 Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 500 MHz to 6000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, IoT, etc.
- // Weight-optimised structure improves mobility.
- // Standard accessories included: Absorber lining inside.
- // Internal capacity for DUT: approx. 59 x 44 x 39 cm or 48 x 33 x 28 cm (W x D x H), depending on absorber size; other sizes on request.

Shielding Box, MSB-0500 Series:



MSB-0500 Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 10 kHz to 8000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, etc.
- // An ergonomic position of the user is achieved by front side opening.
- // Additional full absorber lining and a 20mm polystyrene bottom panel.
- // Highest safety standards through increased slip resistance.
- // A wide range of supply and communication interfaces.
- // Internal capacity for DUT: approx. 65 x 70 x 80 cm (W x D x H), depending on absorber size; other sizes on request.

Shielding Box, MSB-0600 Series:



MSB-0600 Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 500 MHz to 6000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, IoT, etc.
- // Weight-optimised structure improves mobility.
- // Standard accessories included: Absorber lining inside.
- // Internal capacity for DUT: approx. 59 x 44 x 39 cm or 48 x 33 x 28 cm (W x D x H), depending on absorber size; other sizes on request.

Shielding Box, MSB-0700 Series:



MSB-0700 Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 10 kHz to 8000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, etc.
- // Air circulation is provided by the integrated fan and honeycomb vents.
- // Ergonomic user positioning thanks to front-side opening.
- // Additional full absorber lining for reduced interior reflections.
- // Highest safety standards through increased slip resistance and a gas strut cover holder.
- // A wide range of supply and communication interfaces.
- // Cover locking (via padlock).
- // Internal capacity for DUT: approx. 125 x 50 x 35 cm (W x D x H), depending on absorber size; other sizes on request.

Shielding Box, MSB 19" Series:



MSB 19" Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 10 kHz to 8000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, IoT, etc.
- // Air circulation is provided by the integrated fan and honeycomb vents.
- // Ergonomic user positioning thanks to front-side opening.
- // 19" rack-mount case from 5U upwards, with a front door.
- // Standard accessories: absorber lining inside available on request.
- // Cover locking (via padlock).
- // Integrated shelf available on request.
- // Internal capacity for DUT: approx. 41 x 30 x ..U (W x D x H), depending on absorber size; other sizes on request.

// Shielding Box Units MSBU

Shielding Box Unit, MSBU-6CA-4HU 19“:



MSBU 19“ Series

- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 10 kHz to 8000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, IoT, etc.
- // Ergonomic user positioning thanks to front-side opening.
- // 19” rack-mount case with 2, 3 or 4 U.
- // Internal capacity for DUT depends on the number of cabinets.



Shielding Box Unit, MSBU-3CA-HI 19“:



MSBU-HI 19“ Series

- // Highly isolating RF shielding chamber.
- // Shielding effectiveness: typ. 95dB.
- // Highest-quality materials for extended lifetime and a professional test appearance.
- // Economical solution for very high RF shielding levels and reproducible test scenarios, avoiding time-consuming and expensive laboratory tests.
- // Usable for frequencies from 10 kHz to 8000 MHz, such as GSM, DCS, DECT, UMTS, LTE, RFID, ZigBee, Bluetooth, WLAN, IoT, etc.
- // Ergonomic user positioning thanks to a front-side opening.
- // 19” rack-mount case with 3 U.
- // Internal capacity for DUT: 3 cabinets, each approx. 12 x 22 x 11 cm (W x D x H); other sizes are available on request.

Accessories and suitable systems

RF-Matrix FFO (full fan out)

Comprising dividers and semiconductor switches, the RF Matrix FFO can be used for a variety of applications, for example:

- Test automation in the mobile communications sector.
- Remote switching of measuring instruments and test equipment.
- Permanent switching of components such as amplifiers, filters, attenuators, etc., without rewiring.

Air Interface Emulations

Air interface emulators such as the Air Interface Adapter (AIAD) and Standard Coupling Field (SCF) from MTS Systemtechnik enable testing of mobile radio base stations and mobile stations in the lab via the air interface. Reproducible RF tests can be carried out independently of radio interference from the environment by using emulators, cables and shielding boxes. Engineers can efficiently emulate a wide range of specific wireless network handover scenarios. The MTS air interface emulators are designed for mobile-radio testing from 2G up to 5G FR1, but can also be used for Wi-Fi, Bluetooth and other radio technologies (e.g. TETRA).

SIMCard Switching Test Solution

This system supports the implementation of automated software tests on mobile devices that require SIM-card changes or roaming tests on mobile phones. With the Matrix SIM Switchbox (MSSB), up to 32 SIM cards can be automatically connected to up to four mobile devices.

Splitter/Combiner Units

Customised 19“ rack-mount units for splitting or combining RF signals in various configurations (x-IN to y-OUT).

Accessories and components

- // Coaxial Cable Assemblies - Customised
 - // Programmable Attenuators, Fixed Attenuators
 - // Directional Coupler, Hybrid Coupler, Termination
 - // Semiconductor Switch, Delay Line
 - // Wilkinson Power Divider, Resistive Signal Divider
 - // Small Signal Amplifiers
- and much more.