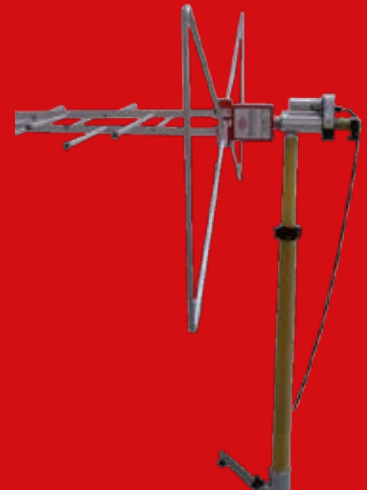
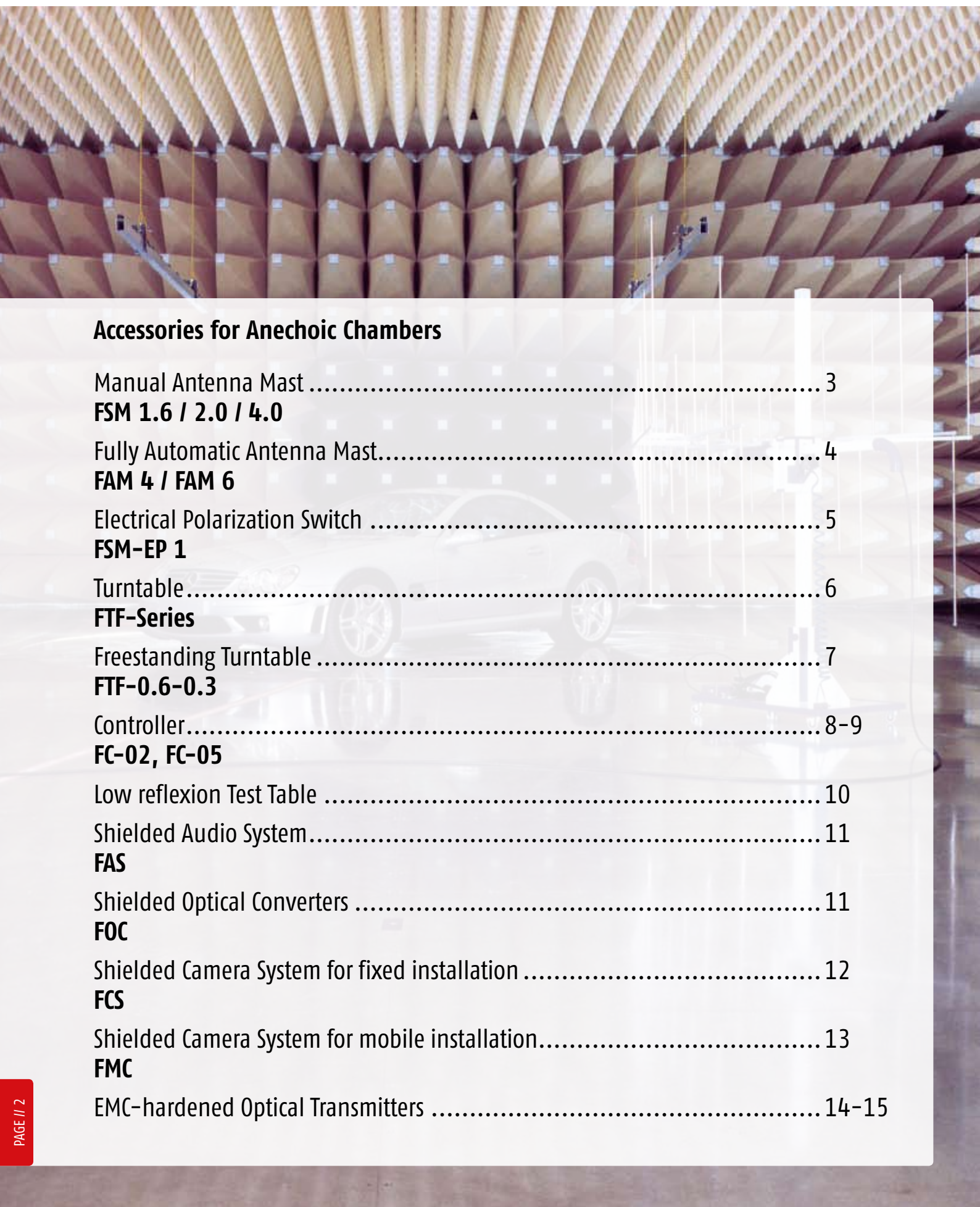


ACCESSORIES FOR ANECHOIC CHAMBERS, OATS AND SHIELDED ROOMS

Antenna masts, Turntables, Testtables, Controller,
Shielded audio system, Shielded optical converter,
Shielded camera system



FRANKONIA



Accessories for Anechoic Chambers

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Description FSM-1.6 / FSM-2.0

The height level of the double telescopic antenna masts FSM-1.6 and FSM-2.0 can be manually adjusted from 0.9 / 1.2 m to 1.6 / 2.0 m (depending on the model) . The height setting is made within a few seconds. In order to avoid unwanted reflexions the mast rods are made of fibre glass. A collapsible tripod provides a secure stand and easy adaption to uneven ground. The perpendicular mast adjustment is simplified with a spirit level mounted at the tripod. A rotatable spider fixes the tripod legs for easy movement within seconds by one person only. Antennas can be mounted directly on the 3/8" male thread or by the use of adapters for double stacked antennas. Automatic change of the antenna polarization is possible by means of our electrical polarization switch, type FSM-EP1 (please find a detailed description on page 5)



Technical specifications	FSM-1.6	FSM-2.0
Height range	0.9 – 1.6 m	1.2 – 2.0 m
Antenna or adapter mount	3/8" male	
Material mast	fibre glass	
Recommended adapters	MAS, MAD	
Weight	6 kg	7 kg
Dimensions for transport (L x W x H)	1.0 x 0.3 x 0.3 m	1.2 x 0.3 x 0.3 m

Technical specifications	FSM-4.0
Height scan	with manual winch
Height scanning range	0.4 – 4.15 m
Required time for complete height scan	< 8 s
Required time for mast assembly	< 2 min
Antenna mount	22 mm with index ring
Mast material	fibre glass
Tripod material	zinc-plated steel
As costet option	fibre glass
Maximum antenna weight	5 kg
Total weight	13 kg
Tripod leg circuit diameter	2.06 m
Dimensions for the transport (L x W x H)	1.17 x 0.3 x 0.3 m

Description FSM-4.0

The main applications of FSM-4.0 are emission measurements, where frequent height scans are required. Level adjustment from 0.4 m to 4.15 m can easily be done by using the manual winch. The mast can be set up and disassembled without any tools within 2 minutes. The FSM-4.0 tripod is suitable for both stationary and mobile applications. Thanks to its small transport dimensions it can be stored without problems even in small cars. The antennas are mounted with their 22 mm tube directly to the support. The polarization is fixed with an indexing ring for both, vertical and horizontal polarization without tools. There is no additional adapter needed to fix antennas with 22 mm tubes. Each of the three spider legs can be adjusted individually for a coarse level adjustment on uneven or inclined mounting surfaces.

Fully Automatic Antenna Mast – FAM

Electrical Polarization Switch – FSM-EP1

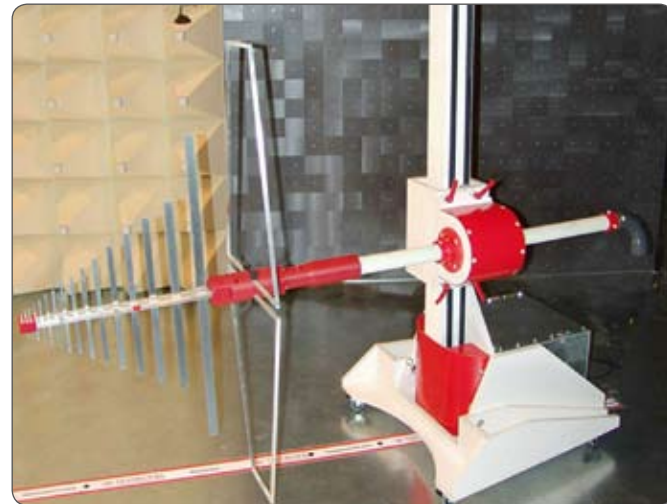
Turntables – FTM-Series

for flush mounted installations in anechoic chambers

Description

Frankonia's innovative range of positioning devices is entirely compatible with the EMC chamber environment.

Using a new optical communication bus, the system provides the possibility to control up to 15 devices along a single duplex fibre optic.

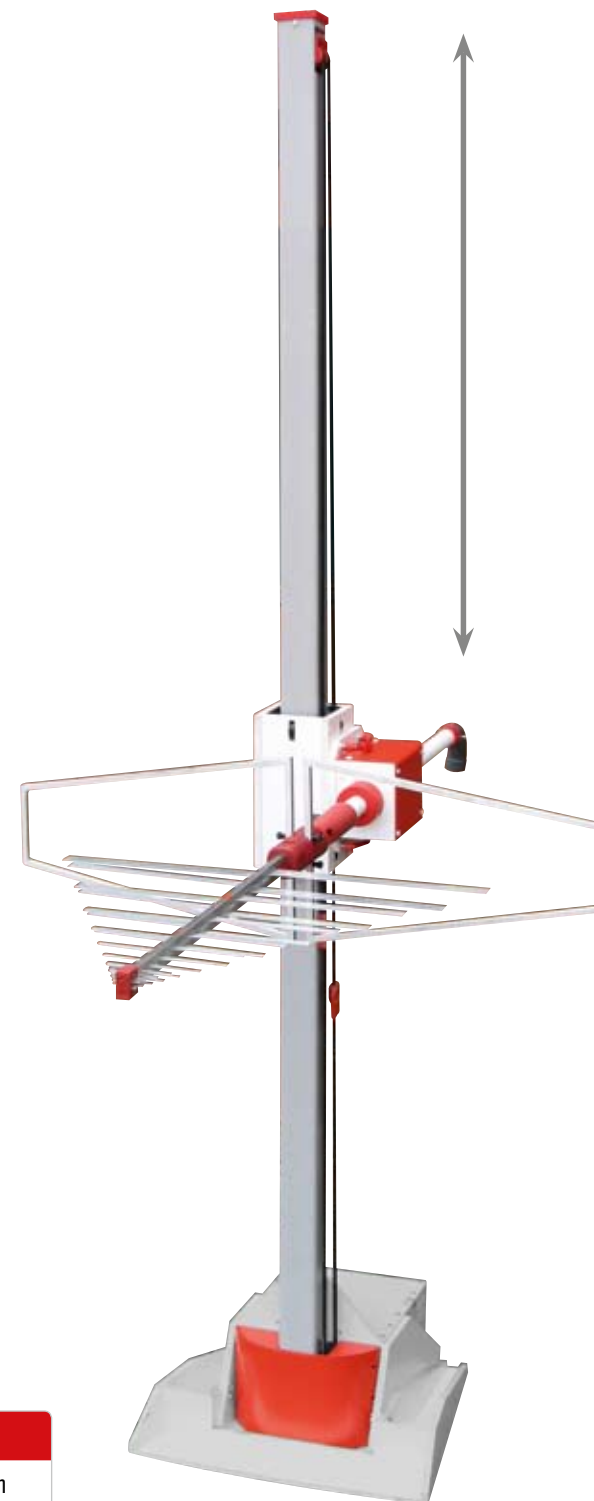


FAM 4 – Antenna Mast Detail

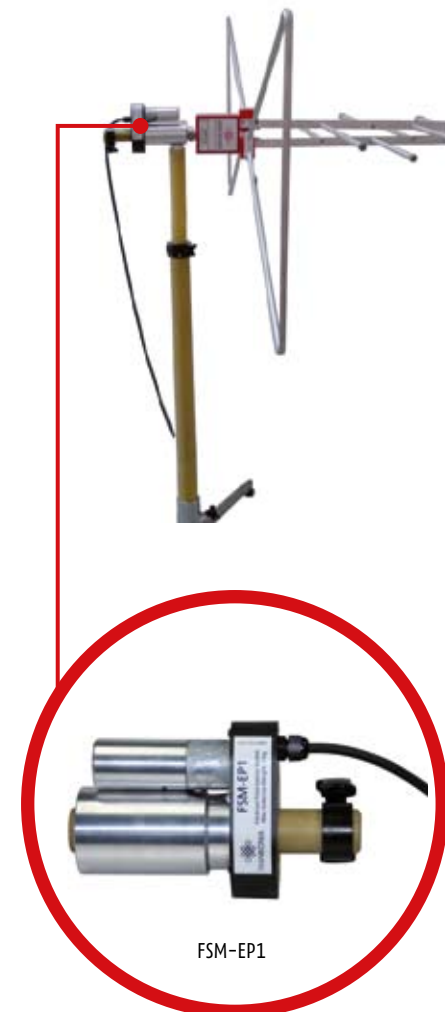
Main characteristics:

- Vertical accuracy 5 mm
- Resolution 1 mm
- Polarization accuracy 0.2°
- 30 step adjustable vertical speed from 0.01 m/s to 0.50 m/s
- Fully automatic calculation of acceleration and deceleration ramps according to the weight of the antenna
- Manual tilting +/- 5°
- Mast positioning from 1.00 m to 4.00 m / 6.00 m
- Low noise, completely shielded hardware
- Frankonia optic communication bus
- Remote-controlled by controller type FC-02

Technical specifications	FAM 4	FAM 6
Antenna height	1.0 m - 4.0 m	1.0 m - 6.0 m
Max. antenna weight (incl. adapter)	12 kg	
Counterbalance	2 x 3 kg (depending on used antenna type)	
Polarization time	0.01 m/s - 0.50 m/s	
Dimensions (L x W x H)	760 mm x 800 mm x 4,200 mm	
Weight	95 kg	
Power supply	230V, 50/60 Hz, 4A	



Available Sizes	
FAM 4	Frankonia Antenna Mast for 4.0 m height scan
FAM 6	Frankonia Antenna Mast for 6.0 m height scan



FSM-EP1

Main characteristics FSM-EP1

- Electrical polarization swivel adapter for remote controlled change of antenna polarization
- Compatible with all antenna masts with 3/8" thread (i. e. our type FSM)
- Power supply is provided by new series of Frankonia turntables, e.g. FTF-0.6-0.3 or by optional available power supply unit

Technical specifications	FSM-EP1
Antenna tube fixture	22 mm
Max. antenna weight	5 kg
Mast mount	3/8" female
Power supply	12 VDC ± 25%, 150mA provided by our new turntable series or by optional available power supply unit 5m shielded cable Neutrik cable connector NC3FXX
Recommended accessory	FSM-1.6 or any tripod with 3/8" thread

FTM-Turntables with electrical contact to the ground plane of semi-anechoic chambers or with intermediate table for fully-anechoic chambers

Frankonia offers a wide range of turntables which are fully compliant with the EMC chamber environment. The turntables are available in different sizes and with different options.

Details:

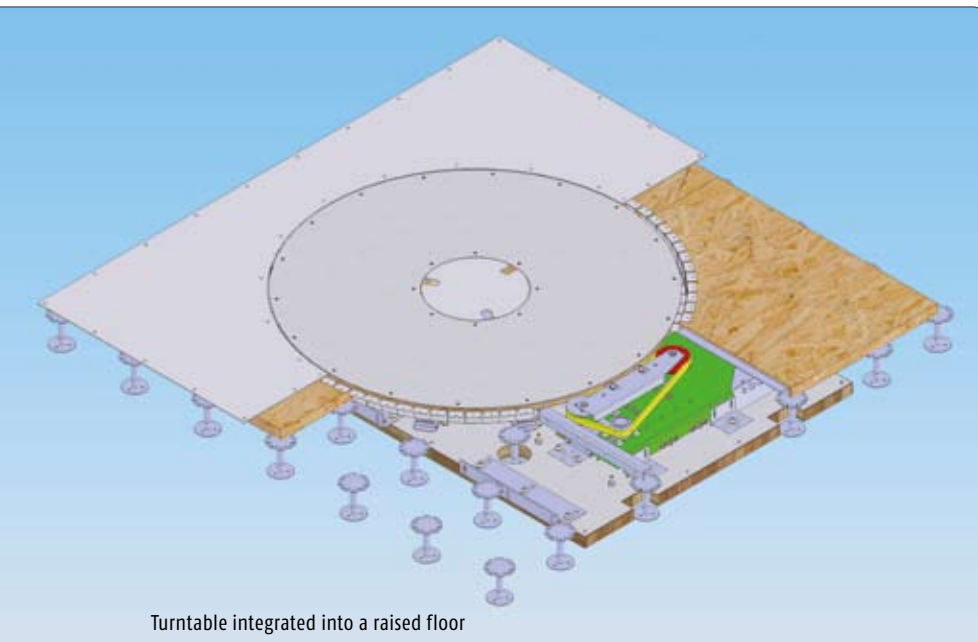
- Fully automated speed variation
- Automatic reference research
- Offset possibility
- Adjustable software limits
- Frankonia high conductivity grounding-ring
- Frankonia optical communication bus



Turntables – FTM-Series

for flush mounted installations in anechoic chambers

Freestanding Turntable – FTF-0.6-0.3



Turntable integrated into a raised floor

Technical specifications

Diameter	1.20 m - 10.00m
Load	500 kg - 60 tons

Main characteristics

Accuracy	0.1°
Resolution	0.1°
Speed	Adjustable in 30 steps (12°/s - 0.5°/s)"

Accessories

Protective covers for apertures. The central panel is (min. Ø 360 mm) available for any cables and connectors.

Options like fully integrated rotating connection panels or rotating exhaust system available on request.



General

The FTF-0.6-0.3 is a freestanding turntable for use in anechoic chambers. Although the FTF-0.6-0.3 is the smallest model of Frankonia's turntable product range, it has numerous remarkable high end features. Due to the use of a multi turn absolute encoder the position of the turntable is always known – this is the end of any initialization run. The optical output is the simplest solution to add a further device, e.g. an antenna mast. The electric polarization unit FSM-EP1 is available as an accessory for the manual antenna masts FSM. Just connect the FSM-EP1 to the FTF-0.6-0.3. The supply is already integrated.

FTM x - y → x: turntable diameter in meter
y: turntable load capacity in tons

Our current product range covers: FTM 1.20 - 0.30 capacity (1.20 m - 300 kg) up to FTM 10 - 60 (10 m - 60 tons)

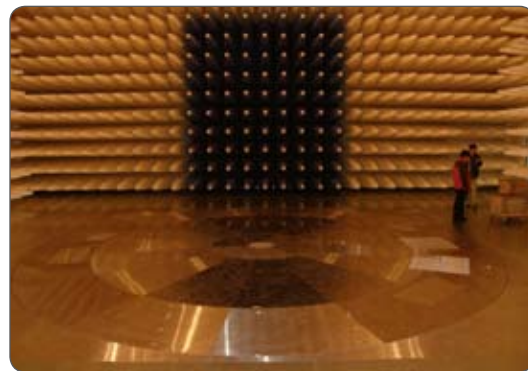
Communication interfaces

The FTM/FTD series can be controlled by several Frankonia controllers.

FC-02 / FC-05	Automatic controller with GPIB IEEE 488.2 interface
FSOFT	Software for computer control using RS 232 interface



Rotating connection panel



Turntable



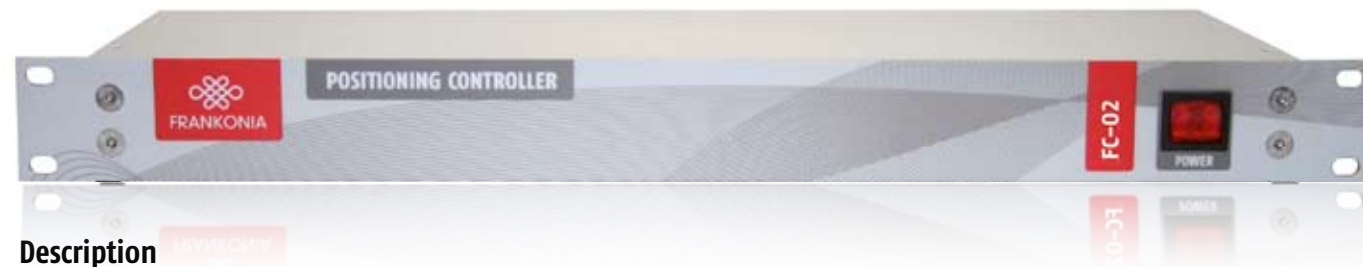
Rotating exhaust system

Main characteristics

- Stepper motor with integrated closed loop positioning control and multi turn absolute encoder
- Optical INPUT for connection to positioning controller or computer via fibre optic cables
- Optical OUTPUT for connection to further device e.g. antenna mast
- USB-port (for on-site operation)
- Central aperture Ø 55 mm for EUT supply
- Shielded supply for electric polarization unit FSM-EP1

Technical specifications

Diameter	0.6 m or 0.8 m
Weight capacity	300 kg
Height	160 mm incl. (adjustable stand) 152 mm (without stand)
RPM	1/15 to 2 (30 steps)
Angle of rotation	± 360°
Positioning accuracy	better ± 0.5°
Interfaces	Optical input (remote), F-SMA Optical output (additional device), F-SMA USB (on-site), USB-B 3-pole socket (supply of electric polarization unit FSM-EP1)
Power supply	100 - 240 VAC; 50 / 60 Hz
Weight	39 kg
Accessories	Application software, USB-optical converter, 10 m optical fibre, power supply cable, USB cable



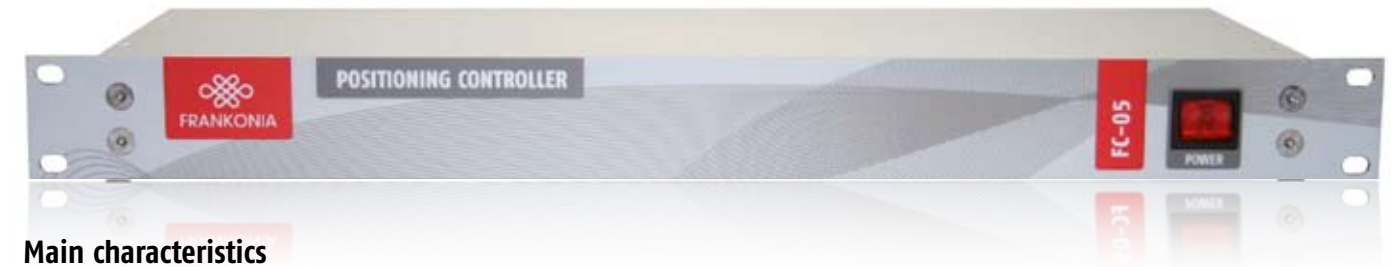
Description

Frankonia developed a complete range of controllers offering very simple control of our positioning devices. In its basic version our controller FC-02 is able to control a turntable and 2 antenna masts (FAM 4 or FAM 6). The communication with the devices is made along a duplex optic fibre (optical bus).

Main characteristics

- Able to control up to 15 devices
- Resolution 0.1°
- Frankonia optic bus system FSMA 660 nm
- Standard programming language SCPI
- Remote interface GPIB (IEE 488.2) and serial port RS232
- Flash memory (possibility to upgrade the firmware via the RS232 port)

Technical specifications	
Rack	19" 1U
Weight	2.5 kg
Dimensions (L x W x H)	482.6 mm x 172 mm x 44.3 mm
Power Supply	115 / 230 V – 50 Hz / 60Hz
Frequency	50 Hz / 60 Hz

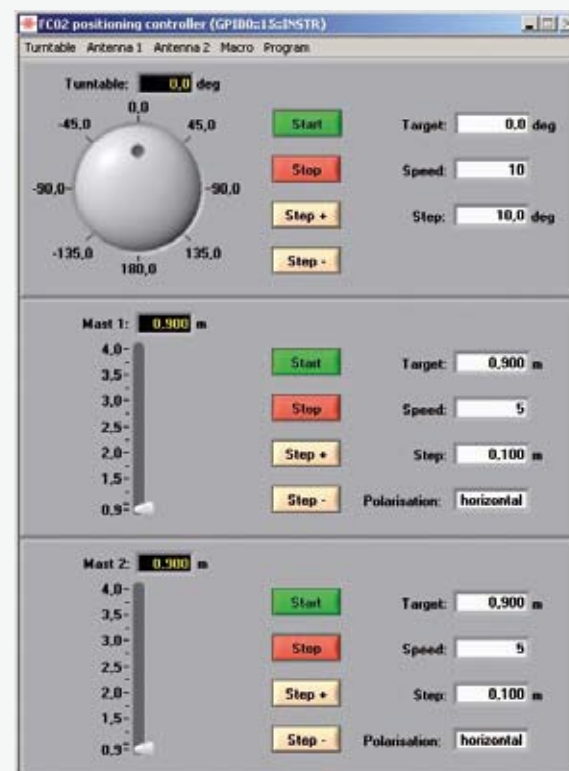


Main characteristics

- Multi-Device Positioning Controller for simultaneous operation of up to four different positioning units
- Compatible with all new Frankonia antenna towers, turntables and other positioning equipment
- Compatible with industry standard software
- IEEE 488 (GPIB) and USB interfaces

Technical specifications	
Standard Programming Languages	SCPI
Remote Interface	GPIB (IEEE 488.2) and USB
Optical input/output	660 nm, FSMA connectors
Solenoid valve (optional)	5 / 3 way operating pressure 3.0 – 8.0 bar
Power supply	100 – 240 VAC, 50 / 60 Hz
Dimensions (W x D x H)	482.6 x 172 x 44.3 mm
Weight	3.2 kg
Accessories included	power cord, application software, user manual

Application Software:



The application software of the FC-02 is running on Microsoft Windows®.

The Software has two main functions:

1. Real time display of each drive
2. Ability to control all devices via the optical bus

The software uses either the RS232 serial port or the GPIB interface for positioning information. It can be connected to the FC-02 controller for real time display or for controlling two antenna masts and one turntable.

Application Software:

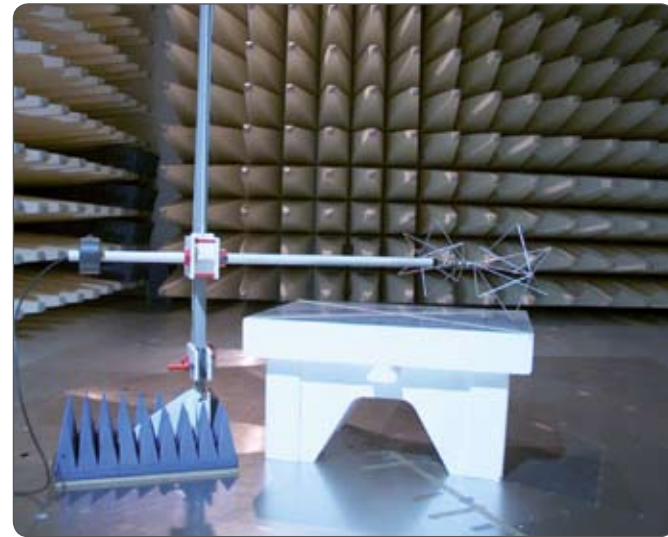
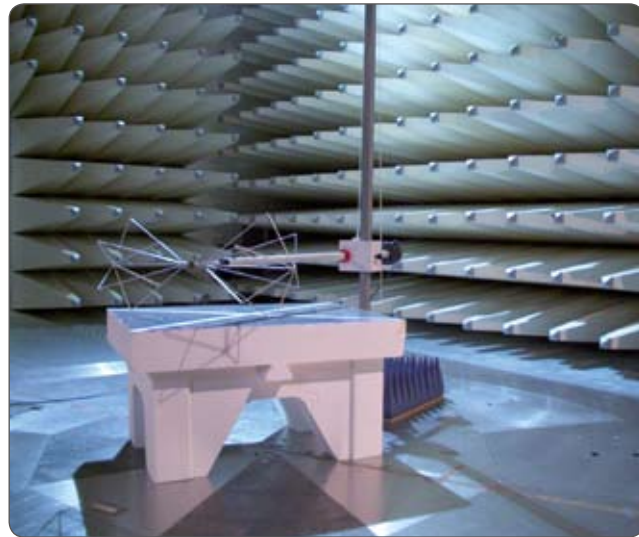


The application software of the FC-05 is running on Microsoft Windows®.

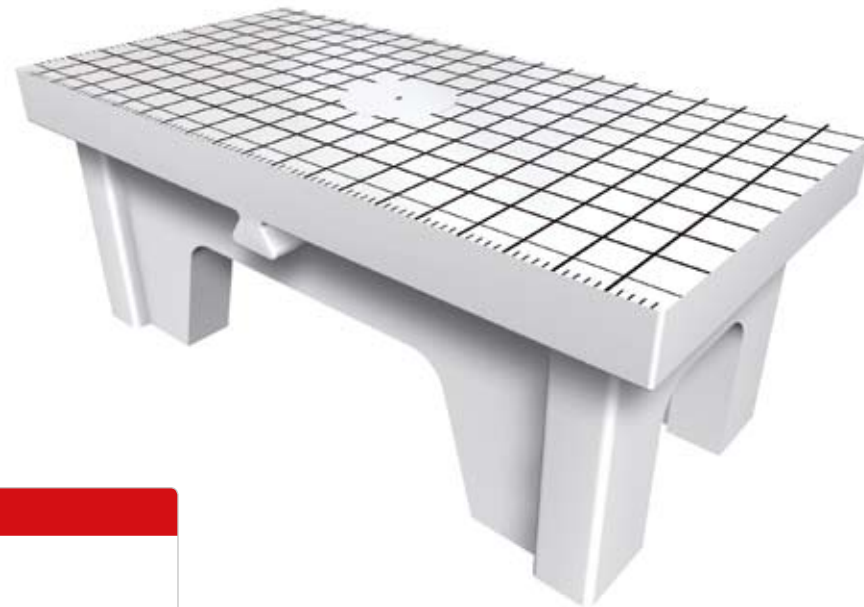
The Software has two main functions:

1. Real time display of each drive
2. Ability to control all devices via the optical bus

The software uses either the USB port or the GPIB interface for positioning information. It can be connected to the FC-05 controller for real time display or for controlling two antenna masts and one turntable.



EMC and RF-measurements require that the used test table does not affect the measurements being taken. The EMC test tables from Frankonia are designed in accordance with CISPR 22 requirements. Frankonia's low dielectric constant, low reflexion tables are manufactured from a styrene polymer called Styropor ESP37. The table surfaces are clad in PVC while the grid surface allows accurate positioning of the EUT. The rectangular test tables are available in a wide range of sizes as stated below. The EMC test tables can support a EUT load of up to 200 kg.



Technical specifications	
Dimensions (L x W x H)	1.5 x 1.0 x 0.8 m 2.0 x 1.0 x 0.8 m 1.5 x 1.2 x 0.8 m 2.0 x 1.2 x 0.8 m 1.0 x 0.8 x 0.8 m
Material	Styropor ESP37
Max. load	200 kg
Color	light grey (RAL 7035)
Cover material	PVC

FAS 3.0 – SHIELDED AUDIO SYSTEM:

The Frankonia audio system FAS 3.0 is able to work and guarantee high quality communications in any strong environment during EMI or EMS tests. The FAS 3.0 system is made of passive components inside the chamber, so they are not affected by high field strengths and don't generate any emission according to CISPR22. Developed in collaboration with automotive EMC labs, this system passes successfully all the requirements. Based on high quality components the FAS 3.0 is a full duplex system and guarantees a frequency response closed to HiFi requirements. (Very sensible with a signal/rate > 89 dB and a distortion rate of 0.007 %). High power speakers are installed into the chamber.



Main characteristics:

- Avoids any interference problems
- Equipped with ultra low noise preamplifier, compressor, expander, feedback destroyer and several adjustable filters
- No batteries are necessary to operate the microphone
- Designed for continuous operation

FOC S – Frankonias Shielded Box for Optical Converters

Frankonia integrates any type of optical converters according to your request.

In order to avoid the generation of any additional noise when installing such equipments into a chamber, Frankonia delivers the part of optical converter into a shielded and filtered universal box located under the ground plane of the chamber.



For signals crossing the shielding where filters are not available:

- IEEE 488.2
- USB 1 or 2
- Ethernet 10-100-1000BT
- Fire Wire
- Keyboard, video, mouse of a computer
- HDMI
- DVI
- Etc



Shielded Camera System – FCS

for fixed installation

FCS – EMC SHIELDED CAMERA SYSTEM

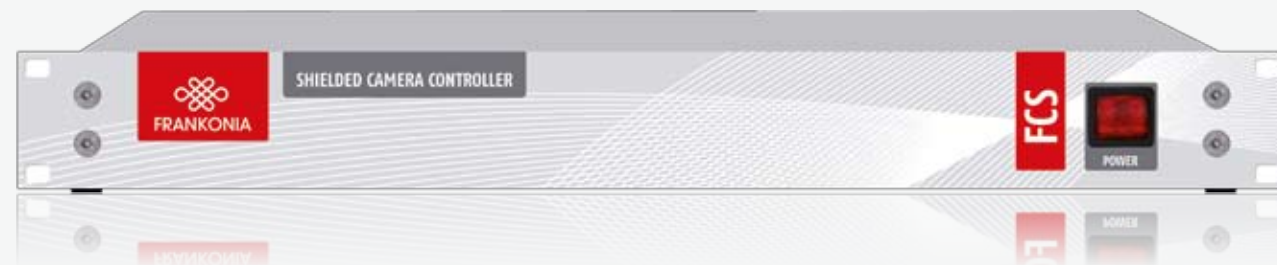
Shielded high quality CCTV dome, including pan, tilt and zoom FCS is ideal for any kind of shielded rooms and anechoic chambers. Using a single phase power supply, 1 multimode fibre optics with ST connectors, this CCTV equipment can be installed anywhere within your facility.

CCTV Main features:

- CCD color system (PAL)
- 460 lines
- Focal lens 1.4 – 64 mm, optic zoom 32 x
- Digital zoom 96x automatic continuation with optic zoom
- Automatic and manual iris and focus
- Sensitivity 0.05 lux
- Internal synchronization
- Automatic white balance
- S/N ratio > 46 dB
- Pan tilt speed and adjustable from 0.1° to 200° / second
- Tilt area 360°
- Pan area 90°
- Effective pixels 724 (H) x 582 (V)



Monitor and Controls:



The system is controlled by using a fully functional keyboard and a sensitive joystick.

All functions as pan, tilt and zoom can be directly controlled by the joystick.

The controller (1 x HU) is integrated in a low profile standard 19" rack.

FCS is delivered complete with a stainless steel case (200 x 200 x 300 mm).

The FCS is delivered with a 17" high quality and multi-input LCD monitor.

This professional versatile equipment guarantees the user 200 V/m immunity from 20 MHz up to 1 GHz according to ISO 11452-2 and from 1 GHz up to 18 GHz according to MIL STD 461E. Fully shielded, the FCS is compatible with CISPR22 emission requirements.

The FCS can be installed onto a shielded wall, integrated in the wall or ceiling absorbers or it can be fixed on the Frankonia designed internal wooden stand.

This compact system can be totally covered with either absorbers or tiles if required.



Mobile Camera – FMC

Shielded camera system for mobile installation

General description

The FMC can be used for optical and acoustical monitoring of devices under test during EMC measurements. The camera has an integrated microphone and a stereo line IN and can be set via an external setup LCD and eight buttons on the case or via remote control. With the optical transmission and the shielded case, the camera is well equipped for EMC tests.

Sophisticated control

The FMC offers full remote control possibilities available on the front panel of the controller. In order to facilitate the camera setup, all camera commands are also available on the rear side of the camera module. The display adjustment can be controlled on a removable mini LCD screen powered by the camera itself.



Technical specifications

Camera

General data	22 x optical power zoom lens, auto focus function and manual adjustable, auto brightness function and manual adjustable, color PAL-system, NTSC available on request
Optical transmission	digital
Microphone	internal, mono (optional stereo)
Power supply	external
Case dimension	130 mm x 70 mm x 80 mm incl. connectors and switches, aluminium case
Weight	approx. 700 g
Mounting	1/4" tripod socket at case bottom, other threads available
Misc.:	remote control of all camera functions and pan-/tilt unit, setup display for easy adjustment of camera stereo line transmission, 3.5 mm plug, LED lights for short range illumination, different types of receivers available (one or more channels, VGA, OSD, switch matrix, etc.)

Optical fibre

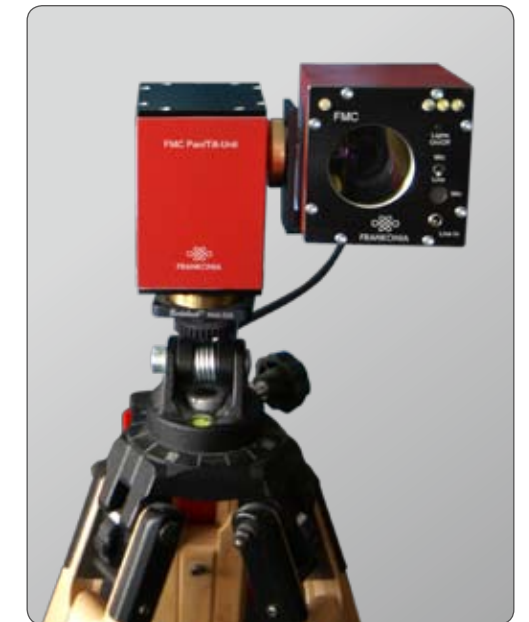
Connector / Type	FSMA / simplex-multimode fibre 62.5 / 125 µm
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External power supply

General data	NiMH-battery with 10 cells, 12 V, 4 Ah, approx. 10 h
Case dimensions	136 mm x 86 mm x 65 mm aluminium case with rubber protectors
Weight	approx. 1000 g

Included items

camera module, 2 pcs. battery packs and charger, set of cables and fibres, controller and power supply, mini LCD monitor, LCD monitor 17" and video audio cables



FMC including pan- / tilt unit



Battery pack, camera module and additional removable mini LCD monitor



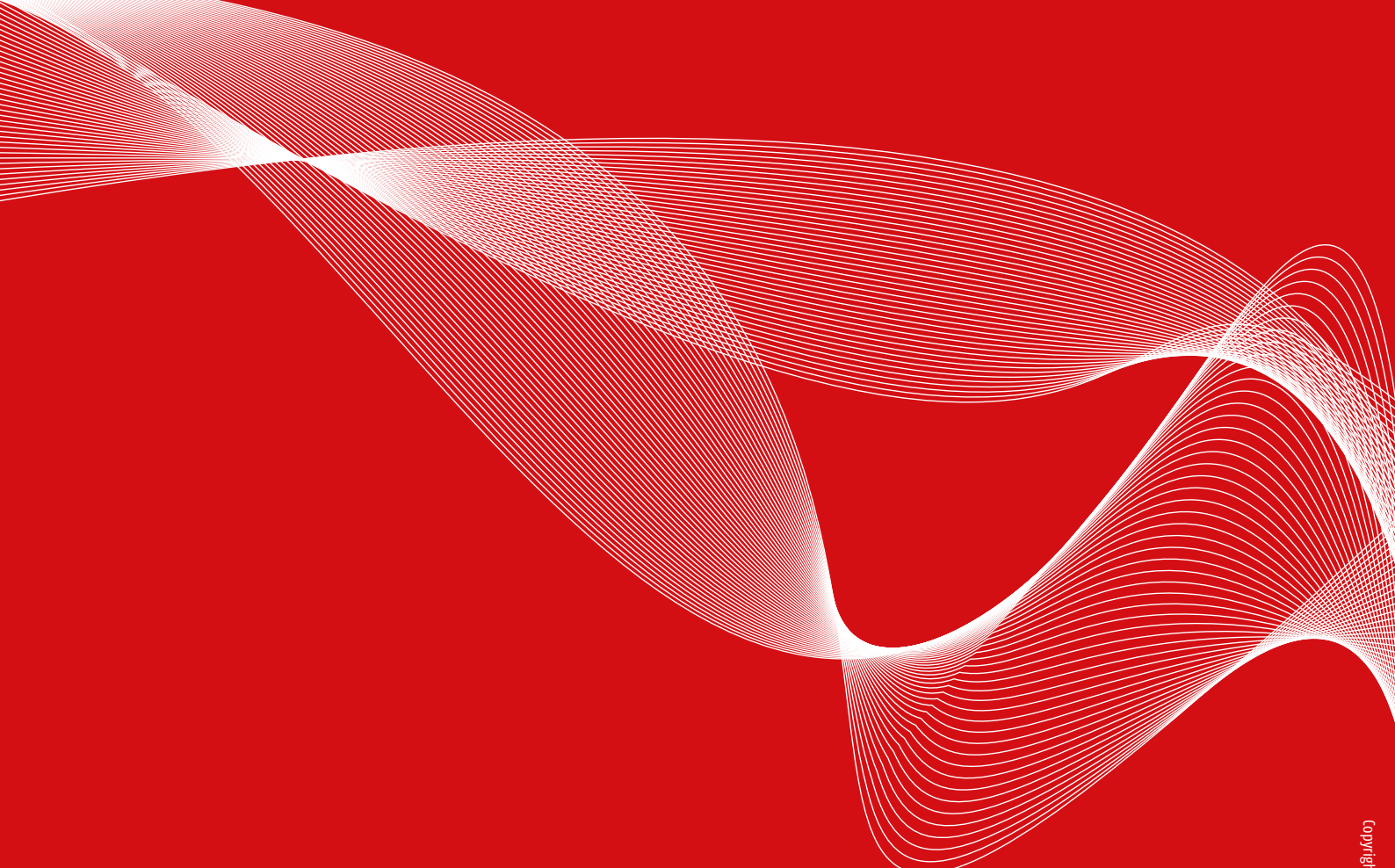
LWL-CANx2-HS

Description

EMC-hardened optical transmitters are necessary for the data transfer within or into RF-shielded rooms/anechoic chambers during emission measurements or radiated immunity tests. The optical data transmission ensure a save communication between inside/outside of a shielded room without any disturbances transferred via cables and without any influence to peripherals during radiated immunity tests. We offer optical transmitters for nearly any application.

Technical specifications	
LWL-D8	Optical 8-channel digital transmission (optional bi-directional), adjustable threshold
LWL-dAV	digital optical transmission of analogue AV-signals, optional miniature camera connectable
LWL-dAV-R	Receiver for digital optical transmission of analogue AV-signals
LWL-dAV-R-Rf	Receiver for digital optical transmission of analogue AV-signals with TV-RF-output
LWL-dAV-T	Transmitter for digital optical transmission of analogue AV-signals
LWL-D-HS	Optical 1 to 4 channels high speed digital signal transmission, up to 30 MHz, 3.3 V tp + 5 V adjustable
LWL-F2V-100	Exchanger frequency signal => Voltage signal; 4 frequency ranges selectable up to 100 kHz
LWL-Heat	Temperature monitoring with optical output, -50 °C to + 500 °C, (optionally -200 °C to 1200 °C)
LWL-LVDS-SM_	20-1 20-channel LVDS-switching matrix, up to 2 Gbit/s
LWL-1394	Optical fire wire transmission, up to 400 Mbit/s (optionally: up to 800 Mbit/s)
LWL-232-HS	Optical RS232-transmission, up to 115 kbit/s (optionally up to 1 Mbit/s)
LWL-485	Optical RS485-transmission, up to 1 Mbit/s
LWL-CANx2-HS	Optical 2-channel CAN-HS (high speed)-transmission , up to 1 Mbit/s
LWL-CAN-HS	Optical 1-channel CAN-HS (high speed)-transmission, up to 1 Mbit/s
LWL-CAN-LS	Optical 1-channel CAN-LS (low speed)-transmission, bis 125 kbit/s
LWL-CAN-SW	Optical 1-channel CAN-SW (single wire)-transmission, up to 33 kbit/s (100 kbit/s)
LWL-CML	Optical transmission of Video-signals (chip set: MAX 9259/9260), up to 2.5 Gbit/s
LWL-Flex	Optical transmission of Flexray-signals, up to 10 Mbit/s
LWLK	Optical transmission of Kline-signals (ISO 9141), min. 30 kbit/s
LWL-LAN	Optical transmission of Ethernet-signals (10 / 100 Mbit/s)
LWL-LIN	Optical transmission of LIN-signals, up to 20 kbit/s
LWL-LVDS-1-ds	Optical transmission of single-channel LVDS-signals (chip set: DS90UR124/241), up to 1.5 Gbit/s

Technical specifications	
LWL-LVDS-1-ds-LIN	Combination of LWL-VDS-1-ds and LWL-LIN
LWL-LVDS-4	Optical 1 to 4-channel transmission of independent LVDS-signals, up to 1.5 Gbit/s, DC-balanced
LWL-LVDS	Optical 3+1 Clk channel transmission of LVDS-signals, DC/Non-DC-balanced, Single-channel
LWL-PSI5	Optical transmission of PSI5-signals, up to 200 kbit/s, sync-, parallel-, or serial-bus
LWL-Quad	Optical 1 to 4-channel transmission, up to 1 Mbit/s Quadrature-signals (optionally bi-directional)
LWL-SENT	Optical transmission of SENT-Signals, up to 1 MHz, integrated sensor supply 5V
LWL-SENT-2-d	Optical 2-channel transmission of SENT-signals, up to 1 MHz, sync, integrated sensor supply 5 V
LWL-SPI	Optical transmission of SPI-signals, up to 1 Mbit/s, integrated sensor supply 3,3 V / 5 V
LWL-SPI-hs	Optical transmission of SPI-signals, up to 10 Mbit/s, integrated sensor supply 3,3 V / 5 V
LWL-SSI	Optical transmission of SSI-signals, up to 1 Mbit/s
LWL-TTL	Optical 16-channel transmission of TTL-signals, (optionally bi-directional), up to 100 kHz, 3.3 V / 5 V
LWL-UART-d	Optical transmission of bi-directional UART-signals (Rx+Tx), up to 20 kbit/s
LWL-USB2.0	Optical transmission of USB2.0-signals, up to 480 Mbit/s
LWL-U1-8	Optical transmission of analogue signals, min. 8 bit resolution, up to 50 MHz
LWL-U1-12-20k	Optical transmission of 1-channel analogue signals, without external power supply, up to 20 kHz
LWL-U1-14	Optical transmission of 1-channel analogue signals min. 10 bit resolution, up to 10 MHz
LWL-U1-14-30	Optical transmission of 1-channel analogue signals, min. 10 bit resolution, up to 30 MHz, +/- 1V input
LWL-U1-14i	Optical transmission of 1-channel analogue signals, min. 10 bit resolution, up to 10 MHz, additional range of gain: 100 / 1000 with 100 kHz
LWL-U2-8	Optical 2-2-channel transmission for analogue signals, min. 8 bit resolution, up to 20 MHz
LWL-U2-12	Optical 2-channel transmission of analogue signals, min. 10 bit resolution, up to 10 MHz
LWL-U2-14-1M	Optical 2-channel transmission for analogue signals, min. 10 bit resolution, up to 1 MHz
LWL-U8-12	Optical 8-channel transmission of analogue signals, min. 10 bit resolution, up to 1 MHz
LWL-U16-12	Optical 1.16-channel transmission of analogue signals, min. 10 bit resolution, up to 100 kHz; x = number of channels



FRANKONIA

Frankonia EMC Test-Systems GmbH

Daimlerstraße 17, 91301 Forchheim
Germany

Web. www.frankonia-emv.com
Mail. sales@frankonia-emv.com

Tel. +49 (0) 91 91 / 73 666 - 0
Fax. +49 (0) 91 91 / 73 666 - 20

Frankonia GmbH

Industriestraße 16, 91180 Heideck
Germany

Web. www.frankoniagroup.com
Mail. info@frankoniagroup.com

Tel.: +49 (0) 91 77 / 98 - 500
Fax. +49 (0) 91 77 / 98 - 520