

CORE-6 EMI Receiver

9 kHz – 6 GHz



Features:

- Frequency ranges: 9 kHz – 30 MHz and 30 MHz – 6 GHz
- Fully compliant acc. to CISPR 16-1-1
- Fast measurements by new digital design
- Integrated 20dB pre-amplifier
- Integrated pulse limiter up to 30 MHz
- Detectors: peak, quasi-peak, average, RMS, RMS-average, CISPR-average
- Automatic scan and manual mode
- USB and RS-232 interface
- Powerful software for full-automatic emission measurements including control of turntable and antenna masts
- Pre-programmed test runs acc. to CISPR standards



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CORE-6 EMI Receiver 9 kHz–6 GHz



Description

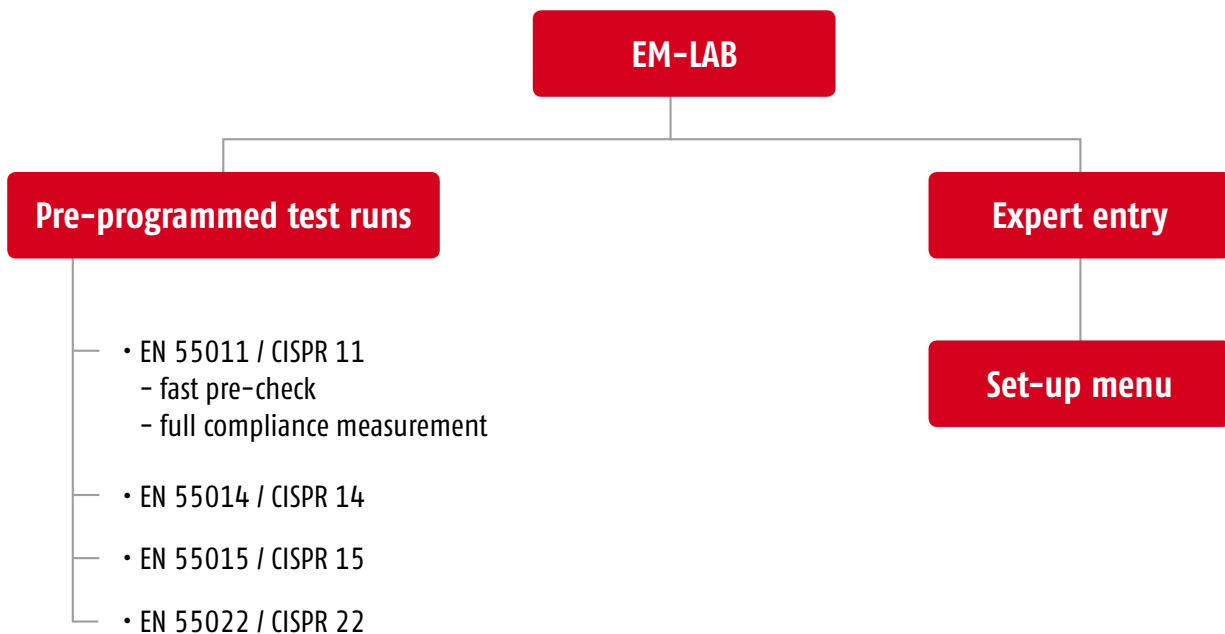
The "CORE-6" is a very compact (19", 1 RU), new digital EMI receiver which enables the user to make frequency-sweeps within a few seconds what saves hours of measuring time during developments.

The receiver is full-compliant acc. to CISPR 16-1-1 and includes all important detectors like peak, quasi-peak, average, RMS, RMS-average and CISPR-average. The powerful software "EM-LAB" allows very comfortable, pre-programmed test runs acc. to CISPR/EN-standards as well as an "Expert entry".

The preset test runs are intended for those engineers who don't carry out EMC tests every day and are therefore not aware of all requirements specified in the relevant standards. With help of EM-LAB you simply select your standard and start

the test run for a "fast pre-check" or for the final "full compliant measurement". Additionally professional EMC engineers have the possibility to use the "Expert entry" in which they can set their own parameters for limit-lines, correction factors, IF-bandwidth, detectors, measuring times, manual mode, frequency-lists, etc...

A 20dB pre-amplifier from 9 kHz to 6 GHz as well as a pulse-limiter for conducted EMI-measurements are already integrated in the CORE-6. The EMI receiver is available together with accessories like single or three-phase LISN's, voltage-probes, coupling networks, antennas, near-field-probes or the Van der Hoofden test-head. A frequency-extension up to 18 GHz (CORE-18) will be available in short.



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Technical specifications		
Input	9 kHz – 30 MHz	30 MHz – 6 GHz
Frequency range	9 kHz – 30 MHz	30 MHz – 6 GHz
Resolution	0.1 Hz	100 Hz
Reference frequency	< 1 ppm	< 2 ppm
RF input	Z_{in} 50 Ω , BNC fem.	Z_{in} 50 Ω , N fem.
VSWR		
10 dB RF att.	< 1.2	< 1.2; < 2 above 1 GHz
0 dB RF att.	< 2	< 2 ; < 3 above 3 GHz
Attenuator	0 dB to 35 dB (5 dB steps)	0 dB to 55 dB (5 dB steps)
Pulse limiter	built-in, selectable	n. a.
Pre-amplifier gain	20 dB	20 dB, 15 dB above 1 GHz
Max input level (without equipment damage)		
Sinewave AC voltage Pulse		137 dBuV (1W)
Spectral density		97 dBuV/ MHz
Preselector	(six bandpass filters)	(Four tracking filters and two bandpass filters)
Frequency ranges	9 kHz to 150 kHz	30 MHz to 72 MHz
	150 kHz to 500 kHz	72 MHz to 173 MHz
	500 kHz to 3 MHz	173 MHz to 416 MHz
	3 MHz to 10 MHz	416 MHz to 1 GHz
	10 MHz to 20 MHz	1 GHz to 3 GHz
	20 MHz to 30 MHz	3 GHz to 6 GHz
IF bandwidth	3, 10, 30, 100, 300 kHz (3dB)	3, 10, 30, 100, 300 kHz (6dB)
	200 Hz – 9 kHz (CISPR 16-1-1)	120 kHz (CISPR 16-1-1)
	10, 100 Hz – 1, 10 kHz (MIL-STD-461) (Option)	1 MHz (B-imp)
Detectors	Peak, Quasi-peak, Average, RMS, RMS-average and CISPR-average	
Noise level		
		30 to 300 MHz < 10 dBuV (QP)
	9 to 150 kHz < 7 dBuV (QP)	(120 kHz BW) < 7 dBuV (AV)
Preselector ON	(200 Hz BW) < 0 dBuV (AV)	
Preamplifier OFF		300 to 3000 MHz < 13 dBuV (QP)
	0.15 to 30 MHz < 11 dBuV (QP)	(120 kHz BW) < 7 dBuV (AV)
	(9 kHz BW) < 5 dBuV (AV)	
		3000 to 6000 MHz < 15 dBuV (QP)
		(120 kHz BW) < 10 dBuV (AV)
		30 to 300 MHz < - 9 dBuV (AV)
	9 to 150 kHz < -8 dBuV (QP)	(120 kHz BW)
	(200 Hz BW) < -15 dBuV (AV)	
Preamplifier ON		300 to 3000 MHz < -7 dBuV (AV)
	0.15 to 30 MHz < -4 dBuV (QP)	(120 kHz BW)
	(9 kHz BW) < -10 dBuV (AV)	
		3000 to 6000 MHz < - 1 dBuV (AV)
		(120 kHz BW)
Spurious response	< 0 dBuV, < 10 dBuV above 150 kHz	< 10 dBuV, < 15 dBuV above 2 GHz
Measurement accuracy		30 to 1000 MHz \pm 1.0 dB
S/N > 20 dB	\pm 1.0 dB	1 to 3 GHz \pm 1.5 dB
		3 to 6 GHz \pm 2.0 dB
I/O interface	USB; RS-232; user port for accessories	
Operating temperature	0° to 40°	
Power supply	100 to 240 VAC – 50/60 Hz – 20 W	
Dimensions	standard EIA Rack unit (1RU) – 482 mm (19" w) x 45 mm (1.75" h) x 362 mm (14.3" d)	
Weight	5 kg	

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Pre-programmed test runs

The comfortable “pre-programmed test runs” are the fastest access to EMI-measurements. Just select your product standard from the list and start the measurement for conducted or radiated emission. Frequency-range, limit-lines, detector, automatic attenuation and other relevant settings are already pre-set in the software.

With the “Fast pre-check” you are getting an overview about the emission of your EUT in a few seconds by use of the “Peak-detector”. Select “Full compliance measurement” for example at the end of a new development, to make a test run with all settings acc. to your product standard.

Expert entry

With the “expert entry” you have full access to all possible settings of the CORE-6. Create your own limit-lines, insert antenna factors and correction factors, set your frequency-range, select different detectors and different measuring times, control turn-tables and antenna masts,

use the “manual-”, “spectrum-”, or “sweep mode”, create frequency-tables ...

The “EM-LAB” control software offers all possibilities to do professional emission measurements.

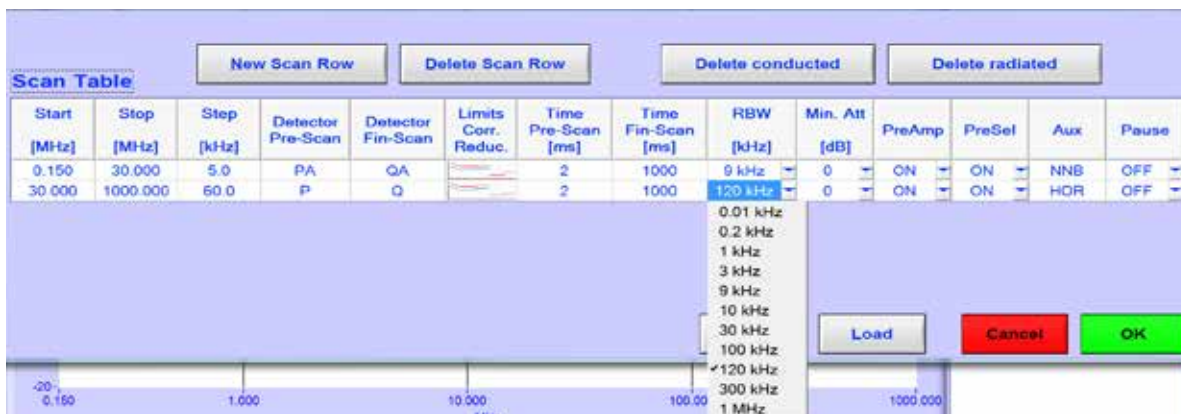
Set-up menu

In the set-up menu you may create your own “Scan-tables”, which can be stored and loaded on request. Standard settings for tests acc. to EN/CISPR product standards are

already stored in the software and can be simply loaded via the “Pre-programmed test runs” entry.

A scan-table does define

- Start-, stop-frequency
- Frequency-steps
- Detectors for pre-scan and final-scan
- Hold time for pre-scan and final-scan
- Resolution bandwidth
- Attenuators
- Pre-amplifier ON/OFF
- Pre-selection ON/OFF
- Auxiliary equipment, like LISN, antenna ...
- Limit lines and correction factors



Scan set-up

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Detector selection

Detectors can be defined via a scan-table or manually in the "Detector-selection-menu". It is possible to select different detectors for the "Pre-scan" and for the "Final-scan" in order to reduce measuring time.

Pre-Scan	Final-Scan	Data-Reduction	
<input checked="" type="checkbox"/> PEAK	<input type="checkbox"/> PEAK	Acceptance level <input type="text" value="3"/> dB	<input type="button" value="OK"/>
<input type="checkbox"/> QPEAK	<input checked="" type="checkbox"/> QPEAK	Range <input type="text" value="5"/>	<input type="button" value="Cancel"/>
<input checked="" type="checkbox"/> AVERAGE	<input checked="" type="checkbox"/> AVERAGE	Max value <input type="text" value="20"/>	
<input type="checkbox"/> RMS	<input type="checkbox"/> RMS	Verify immediately <input type="checkbox"/>	
<input type="checkbox"/> RMS-AVG	<input type="checkbox"/> RMS-AVG		
<input type="checkbox"/> C-AVG	<input type="checkbox"/> C-AVG		
1. Limit file	c:\EM-LAB\Limits\EN55011B-QP_V.lim		
2. Limit file	c:\EM-LAB\Limits\EN55011B-AV_V.lim		
LISN	c:\EM-LAB\Corrections\C2-16.ako		
Antenna			
Cable correction	c:\EM-LAB\Corrections\test.kko		
Gain / attenuation			
Correlation			

Detector selection

Correction factors

Correction factors for antennas, cables, voltage probes, etc. can easily be created over the relevant frequency-band. Simply insert the frequency and correction value in a list; in parallel you can see the "correction curve" in a

diagram. These correction factors have to be created once and can simply be loaded for measurement runs or are already stored in scan tables.



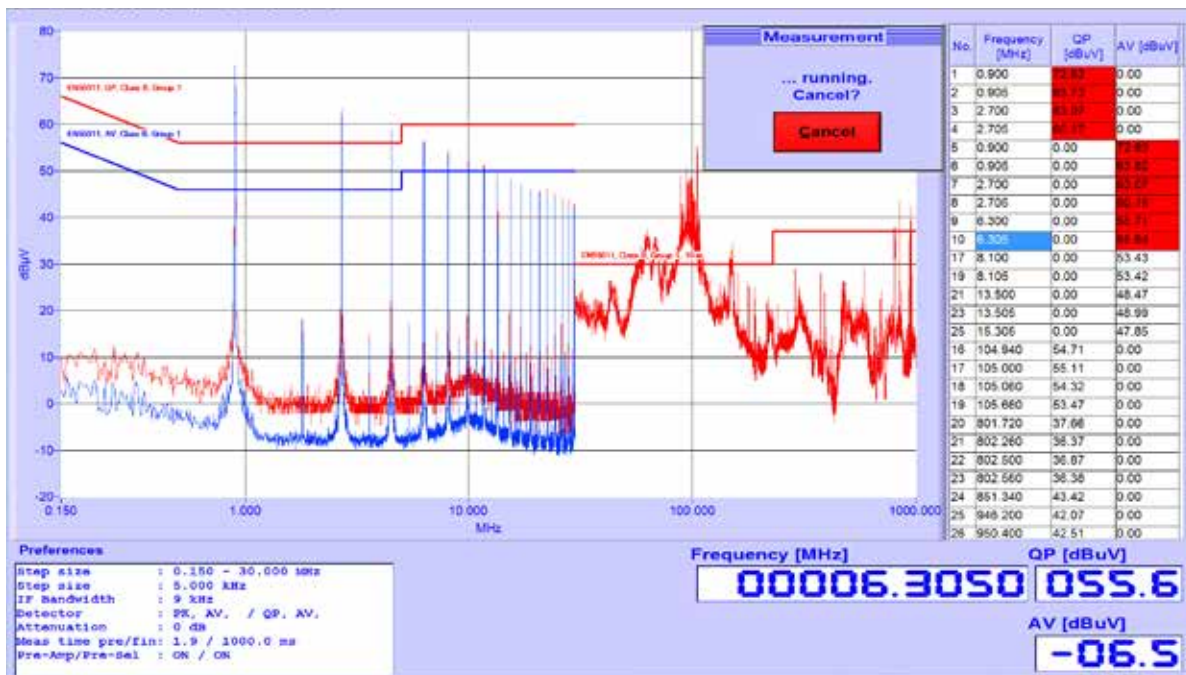
Antenna correction

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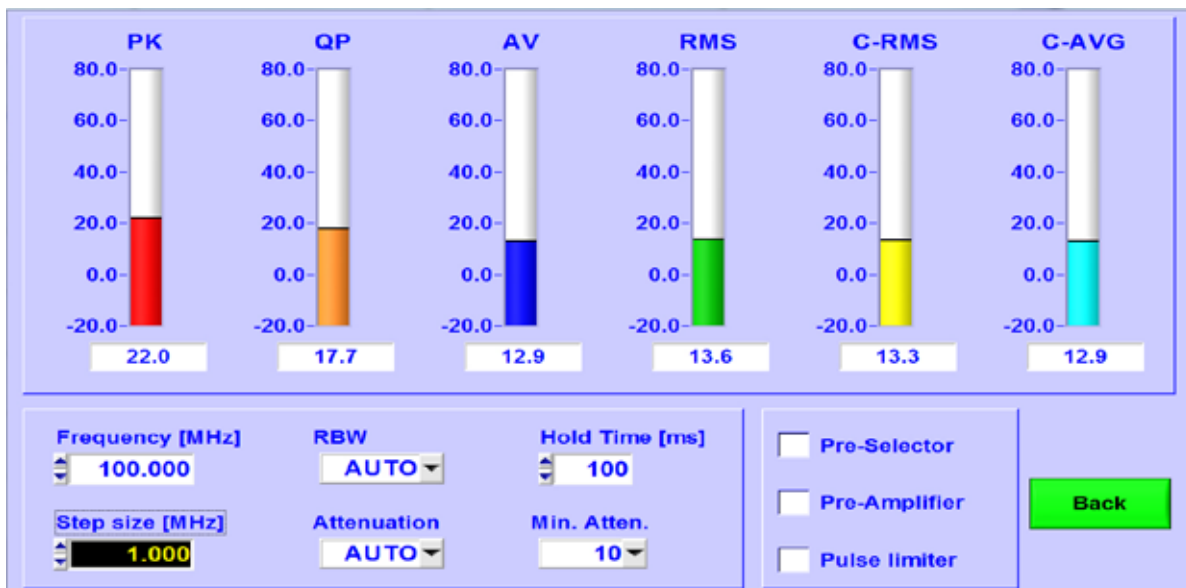
Measurement run (pre-scan and final scan)

Once the receiver settings have been made by loading a scan table, selecting a product standard or by manual settings it is possible to start the measurement. Usually the measurement starts with a pre-scan which shows the measuring results of the selected frequency band directly on the

screen. After the pre-scan it is possible to decide whether to continue with the final-scan or to stop. When starting the final scan a frequency-list will be created which shows the frequencies with the highest peaks and the value in dB μ V.

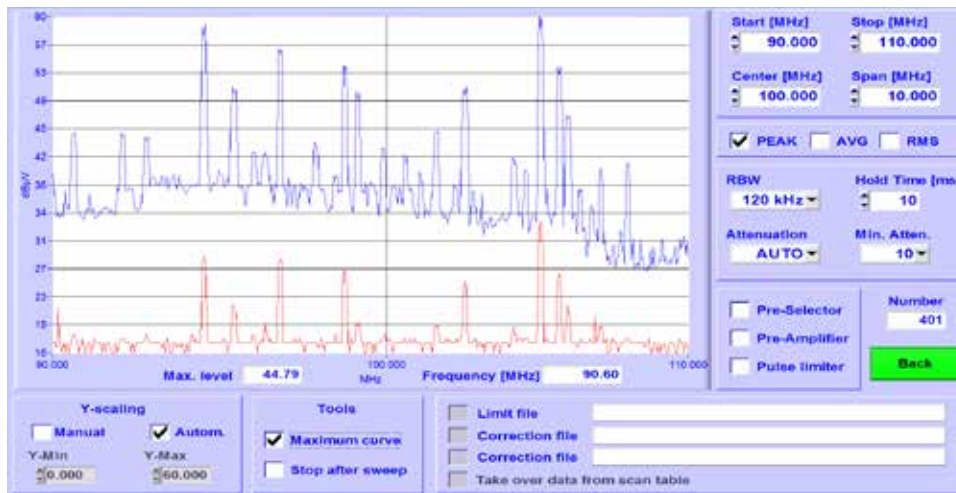


Measurement run



Manual measurement mode

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Spectrum analysis

Accessories

LISN

- Type C2-16, 9 kHz to 30 MHz, single-phase, 2 x 16A
- Type C4-32, 9 kHz to 30 MHz, three-phase, 4 x 32A

LISN C2-16



LISN C4-32



Near-field probe set

- Type NFS-100, consisting of
 - E-field probe 1 MHz – 500 MHz
 - H-field probe 1 MHz – 500 MHz

NFS-100



Antennas

- Type SAX-10, active rod-antenna for E-field measurements, 9 kHz to 30 MHz
- Type LAX-10, active loop-antenna for H-field measurements, 9 kHz to 30 MHz
- Type ALX-4000, broadband antenna, 25 MHz to 4 GHz
- Type MAX-9, double-stacked log.-per.-antenna, 700 MHz to 10.5 GHz
- Type HAX-6, broadband horn antenna, 500 MHz to 6 GHz
- Type HAX-18, broadband horn antenna, 800 MHz to 18 GHz
- Type HAX-40, broadband horn antenna, 14 GHz to 40 GHz
- Type LWL, Van Veen Loop antenna for magnetic-field measurements, 9 kHz to 30 MHz

Emission reference source

- Type RSE-1000, incl. calibration data for a full-compliance OATS for 3.0 m measuring distance in vertical and horizontal polarization, 30 MHz to 1000 MHz

Voltage probes

- Type VCP-1, 30 dB attenuation, 9 kHz – 30 MHz

Absorbing clamp

- Type ACF-01B, 30 MHz to 1000 MHz (CISPR 14)

Van der Hoofden test-head

- Type HTH-01 (IEC 62493)

Coupling networks acc. to EN 55015

- 150 kHz to 300 MHz, for different lines



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FRANKONIA

Frankonia EMC Test-Systems GmbH
Daimlerstraße 17, 91301 Forchheim
Germany

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

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