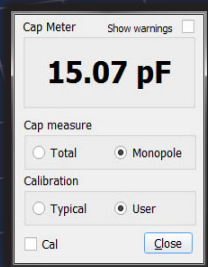


# FR4003

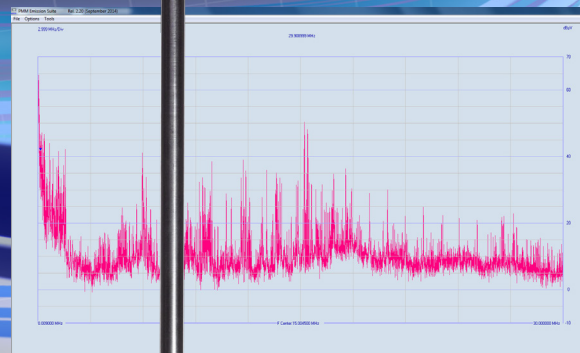
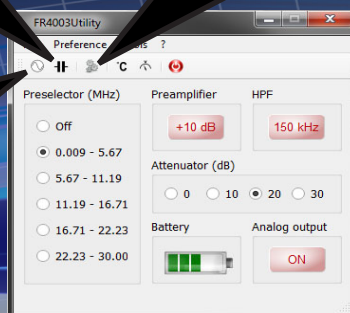
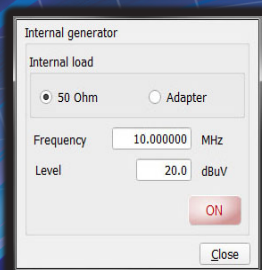
## Field Receiver



Start auto calibration

Receiver (ADC) Front End (BNC)

	Frequency (MHz)	Att.0 Voltmeter high Z (dB)	Att.0 Antenna (dB)	Att.10 Voltmeter high Z (dB)	Att.10 Antenna (dB)
1	0.009	2.68	-6.52	2.90	-6.4
2	0.01	2.70	-6.31	2.92	-6.4
3	0.02	2.69	-5.57	2.90	-5.4
4	0.05	2.69	-5.33	2.89	-5.4
5	0.08	2.71	-5.27	2.92	-5.4
6	0.1	2.71	-5.25	2.92	-5.4
7	0.15	2.72	-5.24	2.92	-5.4
8	0.2	2.70	-5.24	2.91	-5.4
9	0.5	2.70	-5.22	2.89	-5.4
10	0.8	2.69	-5.20	2.87	-5.4



## Main Features

- 9 kHz to 30 MHz frequency range
- Antenna CISPR 12, CISPR 16, CISPR 25, MIL-STD, DO-160 fully compliant
- Internal full CISPR 16-1-1 receiver
- Operates both swept and gapless FFT modes
- Very fast measuring time
- Embedded attenuator, preamplifier and preselectors
- Fiber optic serial link to 9010F series or directly to PC
- Grounding effectiveness auto-diagnostic capability
- On-board tracking generator and antenna CISPR adapter
- Automatic diagnostic and calibration
- Scattering free
- PC software
- RF front-end output
- On-board capacitance meter
- Plug-in rechargeable Li-ion battery



The FR4003 is the new gold standard in measuring electric fields up to 30 MHz. Thanks to its innovative approach it replaces traditional rod antennas and adds several benefits. It fully meets all MIL-STD and CISPR specifications for rod antennas and is also a fully-compliant CISPR 16-1-1 receiver with a fiber optic link that allows it to work as a stand-alone device (when connected to a PC) or in tandem with a PMM receiver. It fully meets all the standards in both swept and FFT mode, as selected by the user.

It is possible to switch the analog signal from the internal receiver to the analog output and connect it to any standard receiver by traditional coaxial cable, although this is not recommended due to scattering and other drawbacks typical of rod antennas.

The internal receiver structure features preselectors, attenuators and preamplifiers fully controlled either by the internal firmware or manually by the operator. Hence, a test set-up requires no additional receiver. An internal tracking generator allows a self-calibration procedure to guarantee optimum performance and accurate measurements. This tracking generator is part of an internal capacitance meter that is crucial not only for self-calibration, but also for verifying the grounding effectiveness of the antenna. The FR4003 can even become a field generator. In this case the antenna broadcasts the signal produced by the internal signal generator and can therefore be used to characterize environments or other receiving set-ups.

Standard PEMS controlling software is included with the FR4003. Thanks to its rechargeable and easily replaceable Li-ion battery, the FR4003 can work for several hours on its own and therefore with an unperturbed field.

# FR4003

## Field Receiver

### SPECIFICATIONS

<b>Frequency range</b>	9 kHz to 30 MHz	
<b>Resolution</b>	1 Hz	
<b>Frequency accuracy</b>	< 1 ppm	
<b>RF Input</b>	High impedance N fem.	
<b>Attenuator</b>	Built-in 0 dB to 30 dB (10 dB steps)	
<b>HPF</b>	Built-in 9 kHz or 150 kHz HPF (selectable)	
<b>Preamplifier</b>	Built-in 20 dB gain (selectable)	
<b>Max input level</b>	<b>BNC analog output</b> (1 dB compression point @ 1MHz) (SD spectral density)	<b>Internally processed signal</b> (SD spectral density with preselector ON)
100/104 cm rod (preamp OFF, Att 30 dB)	380 V/m CW 137 dB $\mu$ V/m/MHz SD	38 V/m CW 128 dB $\mu$ V/m/MHz SD
N input (50 $\Omega$ term., preamp OFF, Att 10 dB)	137 dB $\mu$ V CW 103 dB $\mu$ V/MHz SD	117 dB $\mu$ V CW 94 dB $\mu$ V/MHz SD
<b>Damage level</b>	500 V/m CW (Min. Att. 20 dB)	
<b>Noise level</b>	100/104 cm rod	N input (50 $\Omega$ term.)
Preamp ON, Att 0 dB, 10 kHz RBW	13 dB $\mu$ V/m PK 2 dB $\mu$ V/m AVG	-1 dB $\mu$ V PK -12 dB $\mu$ V AVG
Manual mode, tune 1 MHz	DANL -38 dB $\mu$ V/m(Hz)	DANL -52 dB $\mu$ V(Hz)
<b>Spurious response</b>	< -10 dB $\mu$ V (Att 0 dB, 50 $\Omega$ termination, AVG, hold time 10 ms, RBW auto)	
<b>Measurement accuracy</b>	9 kHz to 30 MHz $\pm$ 0,8 dB	
<b>Preselector</b>	Two bandpass filters: 9 kHz to 30 MHz	150 kHz to 30 MHz
	Five bandpass filters: 9 kHz to 5,67 MHz 11,19 MHz to 16,71 MHz 22,23 MHz to 30 MHz	5,67 MHz to 11,19 MHz 16,71 MHz to 22,23 MHz
<b>Internal receiver</b>	Fully digital. Operates both standalone and in conjunction with PMM 9010F receiver	
<b>IF bandwidth</b>	3, 10, 30, 100, 300 kHz	
6 dB bandwidth	200 Hz, 9 kHz ( CISPR 16-1-1) 1, 10 kHz (MIL-STD-461)	
<b>Level measuring time</b> (Hold time)	CISPR 16-1-1 as default 0,2 ms to 120 s	
<b>Detectors</b>	Peak, Quasi-Peak, Average, RMS, RMS-Average (Optional), C-Average Smart Detector function	
<b>Sweep time</b>	<b>FFT mode</b>	<b>Swept mode</b>
9 kHz to 150 kHz (RBW 200 Hz CISPR)	Analyzer hold time lowest 1,1s Receiver hold time 1s 7s	Analyzer hold time lowest 110s Receiver hold time 1s 1600s
10 kHz to 150 kHz (RBW 1 kHz MIL)	0,4s	6s
150 kHz to 30 MHz (RBW 9 kHz CISPR)	2,8s	23s
150 kHz to 30 MHz (RBW 10 kHz MIL)	2,8s	46s
<b>Antenna Factor</b>	At BNC auxiliary analog output 0 dB/m (Att 0 dB preamp ON) 50 $\Omega$ BNC fem.	
<b>Analog output</b>	Tracking & CW generator (for auto-calibration, capacitance meter and field source)	
<b>Internal generator</b>	Frequency range 9 kHz to 30 MHz Frequency resolution 1 Hz Level range 65 to 95 dB $\mu$ V Level resolution 1 dB Level accuracy 0,3 dB	
<b>Internal capacitance meter</b>	Range 0 to 100 pF Resolution 0,01 pF Calibration Automatic (calibration fixtures included)	
<b>Auto test</b>	Automatic at power on	
<b>Auto calibration</b>	Through internal generator and matching network	
<b>Fiber optic connection</b>	RP-02 series serial optical interface 115 kbaud 9010F series high speed optical interface	
<b>PC software</b>	PMM Emission Suite – PMM FR4003 Utility	
<b>Display units</b>	dBm, dB $\mu$ V, dB $\mu$ A, dBpW, dB $\mu$ V/m, dB $\mu$ A/m, dBpT	
With PMM Emission Suite SW	80 to 200 dB selectable dynamic range	
<b>Standard compliance</b>	CISPR 16-1-1, MIL-STD-461G fully compliant on-board receiver. CISPR 12, CISPR 25, MIL-STD-461G, DO-160 fully compliant rod antenna	
<b>FW updating</b>	Through USB optical link	
<b>Power supply</b>	7,4 V – 7,8 Ah Li-ion rechargeable & interchangeable battery (8h avg. operating time, 4h avg. charging time); 100 - 240 Vac / 50 – 60 Hz to 12 Vdc – 2,5 A universal adapter/charger	
<b>Operating temperature</b>	-10 °C to 60 °C	
<b>Storage temperature</b>	-30 °C to 75 °C	
<b>Operating humidity</b>	0 to 98% (without condensation)	
<b>Tripod support</b>	Threaded insert UNC 1/4"	
<b>Dimensions and weights (Overall W x H x D)</b>		
Receiver	134 x 84 x 285 mm	2,40 kg
Counterpoise	600 x 1,5 x 600 mm	4,15 kg
Rod ( $\varnothing$ 20 x 1000 mm)	$\varnothing$ 29 x 1020 mm	0,50 kg
Rod extension (40 mm)	$\varnothing$ 20 x 47 mm	0,05 kg
TOTAL (w rod ext.)	600 x 1122 x 600 mm	7,10 kg



### Ordering information:

FR4003 Field Receiver  
Includes: 50 ohm to rod capacitance fixture for CISPR calibration, 15 pF fixture for capacitance meter calibration, MIL-STD 40 mm rod extension, 600x600 mm counterpoise, battery pack, AC adapter/charger, PC software, 10 m plastic fiber optic for PC, USB-fiber optic adapter, certificate of calibration, user's manual.

### Optional accessories:

BP-02 Li-ion battery pack  
9010/FO-20 High speed fiber optic cable (20 m)  
9010/FO-50 High speed fiber optic cable (50 m)  
9010/FO-100 High speed fiber optic cable (100 m)  
9010/RAV RMS-Avg detector  
Plastic fiber optic for PC (10 m)  
Plastic fiber optic for PC (20 m)  
Plastic fiber optic for PC (40 m)  
USB-fiber optic adapter  
TR-01A set  
Includes: TR01 60-180 cm wooden column extendable tripod, column strengthener, soft carrying case

## Related products

### Receivers

- 7010/01: EMI Receiver 9 kHz to 1 GHz
- 7010/02: EMI Receiver 9 kHz to 30 MHz
- 7010/03: EMI Receiver 9 kHz to 3 GHz
- ER8000/00 EMI Receiver 9 kHz to 30 MHz
- ER8000/01 EMI Receiver 9 kHz to 3 GHz
- ER9000/00 EMI Receiver 10 Hz to 30 MHz
- ER9000/01 EMI Receiver 10 Hz to 3 GHz
- 9010F: EMI Receiver 10 Hz to 30 MHz
- 9010/03P: EMI Receiver 10 Hz to 300 MHz
- 9010/30P: EMI Receiver 10 Hz to 3 GHz
- 9010/60P: EMI Receiver 10 Hz to 6 GHz
- 9030: EMI Receiver 30 MHz to 3 GHz
- 9060: EMI Receiver 30 MHz to 6 GHz
- 9180: EMI Receiver 6 GHz to 18 GHz

### Antennas

- BC-01: Biconical Antenna 30 to 200 MHz
- BL-01: Biconical Log Periodic Antenna 30 MHz to 6 GHz
- DR-01: Double-ridged horn Antenna 6 to 18 GHz
- LP-02: Log Periodic Antenna 200 MHz to 3 GHz
- LP-03: Log Periodic Antenna 800 MHz to 6 GHz
- LP-04: Log Periodic Antenna 200 MHz to 6 GHz
- VDH-01: Van der Hoofden Test Head 20 kHz to 10 MHz
- TR-01: Antenna Tripod
- Antenna Set AS-02 / AS-03 / AS-04 / AS-05 / AS-06 / AS-07 / AS-08
- RA-01: Rod Antenna 9 kHz to 30 MHz
- RA-01-HV: Rod Antenna 150 kHz to 30 MHz
- RA-01-MIL: Rod Antenna 9 kHz to 30 MHz

### LISNs/Probes

- L2-16B: single phase AMN, 16 A
- L3-32: 4 lines, 3-phase AMN, 32 A
- L3-64: 4 lines, 3-phase AMN, 63 A
- L3-64/690V: 4 lines, 3-phase AMN, 63 A
- L3-100: 4 lines, 3-phase AMN, 100 A
- L1-150M: single-path, 50 Ohm AMN, 150 A
- L1-150M1: single-path, 50 Ohm AMN, 150 A
- L1-500: single phase AMN, 500 A
- L3-500: 4 lines, 3-phase AMN, 500 A
- SBRF4: RF Switching Box
- SHC-1/1000: Voltage probe, 1000 Vac, 35 dB
- SHC-2/1000: Voltage probe, 1000 Vac, 30 dB



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