

NARDA EMF MONITORS

AMB-8059



Continuous, remote monitoring and logging of electromagnetic fields

- ▲ **Interchangeable probes from 10 Hz to 40 GHz for low frequency & high frequency applications**
- ▲ **Multi-band probes for telecommunications monitoring**
- ▲ **Simultaneous monitoring of electric and magnetic fields**
- ▲ **Fully autonomous operation:**
 - Solar panel power supply
 - Built-in mobile modem
 - Automatic data transfer
 - Daily reports, warnings & alarm messages via SMS
 - On-board GPS
- ▲ **Easy integration into test environments and Web Based Applications**
- ▲ **Low weight, robust design, compact size for indoor and outdoor operations**



Area Monitor AMB-8059/03
with Solar Panel

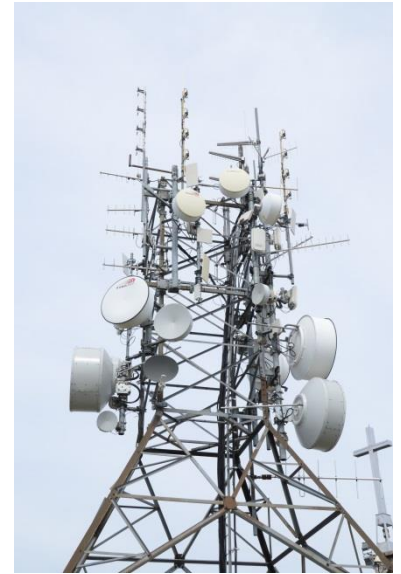
INTRODUCTION

Narda EMF Monitors are equipped with exclusive, state-of-the-art sensors having high sensitivity, accuracy and reliability. Their robust, uncluttered construction is perfect for long-term outdoor installation. The AMB-8059 handles applications from a few Hertz through to long wave and on up to high frequency microwave radiation using a selection of interchangeable probes for electric and magnetic fields.

Minimum outlay, maximum result

An EMF monitoring system is made up from a series of EMF monitors installed wherever the EMF presence needs to be assessed continuously or by long term observation. The EMF monitors store the data and report them using conventional mobile data communication at set time intervals to a central unit, e.g. PC or data server. The system size can range from a single location up to countrywide coverage. Narda EMF monitors combine all the features that are essential for this purpose: autonomy, outdoor usability, mobility, robustness, and low operating costs.

You can be certain to find the ideal solution for every area of application with Narda. And you can depend on its reliability, thanks to our decades of experience coupled with cutting edge technology, backed up by our own certified calibration laboratory.



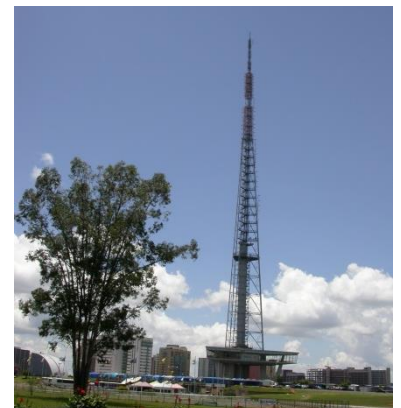
The AMB Series

Its broadband application is the optimum solution for technical superiority from a tight budget. Four models are available:



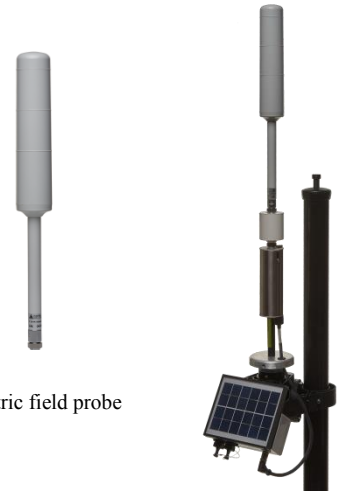
Unit designation	AMB-8059/03	AMB-8059/02	AMB-8059/01	AMB-8059/00
Solar panel (24/7) & back-up battery	✓		✓	
GSM modem	✓	✓		
GPS	✓	✓	✓	✓
Battery life 6–12 months (commercially available lithium battery)		✓		✓
Remote capabilities	✓	✓	✓	
Long-term measurement	●	○	●	○
Short-term measurement	●	●	●	●

● more important ○ variable importance



Complete program for all requirements

Narda offers a wide range of different isotropic probes. These include quad-band probes for separating mobile telephone services as well as wideband measurement from 100 kHz to 40 GHz. Special probes are available for low frequency magnetic or electric fields from 10 Hz to 5 kHz. This means that emissions from high-voltage cables and transformer stations can be recorded. Further, it is possible to combine up to two probes, e.g. an electric and a magnetic field probe in the so-called "dual probe configuration".



Electric field probe



Magnetic field probe



Dual probe configuration
(without radome)

Applications – Narda Area Monitors Probes

Frequency range	100 kHz to 3 GHz	100 kHz to 7 GHz	300 kHz To 18 GHz	300 kHz To 40 GHz	10 Hz to 5 kHz	0.1-3000 MHz, 0.1-862 MHz, 933-3000 MHz	0.1-3000 MHz, GSM, UMTS (contact us)	0.1-7000 MHz, GSM, UMTS (contact us)	10 Hz to 5 kHz
Field type	E	E	E	E	E	E	E	E	H
Band type	Wide	Wide	Wide	Wide	Single	Tri	Quad	Quad	Single
Probe designation	EP-1B-01	EP-1B-03	EP-1B-05	EP-1B-06	EP-1B-04	EP-3B-01	EP-4B-01	EP-4B-02	HP-1B-01
Mobile communications	●	●	●	●		●	●	●	
Radio / TV broadcasting	●	●	●	●		●	●	●	
Directional radio		○	●	●		○	○	○	
Satellite communication			●	●					
Radar			○	○					
Industry	●	●			●				●
Railroads					●				●
Power lines					●				●
Transformers					●				●

● more important ○ variable importance

Simultaneous monitoring of electric and magnetic fields

Possible dual-probe configuration:

Probe combination		HP-1B-01 + EP-1B-04	HP-1B-01 + EP-1B-01	HP-1B-01 + EP-1B-03	HP-1B-01 + EP-1B-05	HP-1B-01 + EP-1B-06
Frequency range / field type	H	10 Hz to 5 kHz	10 Hz to 5 kHz	10 Hz to 5 kHz	10 Hz to 5 kHz	10 Hz to 5 kHz
	E	10 Hz to 5 kHz	100 kHz to 3 GHz	100 kHz to 7 GHz	300 kHz to 18 GHz	300 kHz to 40 GHz

SPECIFICATIONS

EP-1B-01 Electric Field Probe*	
Frequency range	100 kHz to 3 GHz
Measurement range	0.2 to 200 V/m (dynamic range > 60 dB)
Measurement resolution	0.01 V/m
Overload	600 V/m
Flatness @ 20 V/m	1– 200 MHz \pm 0.8 dB; 150 kHz - 3 GHz \pm 1.5 dB
Linearity	\pm 0.5 dB (0.5 to 100 V/m)
Anisotropy @ 6 V/m	\pm 0.8 dB @ 50 MHz (typical 0.6 dB)
H-Field rejection	> 20 dB
Temperature error	0.1 dB/°C
Size and weight	450 mm length, 55 mm \varnothing , 180 g

EP-1B-03 Electric Field Probe*	
Frequency range	100 kHz to 7 GHz
Measurement range	0.2 V/m – 200 V/m (dynamic range > 60 dB)
Measurement resolution	0.01 V/m
Overload	600 V/m
Flatness @ 20 V/m	3 MHz-200 MHz: \pm 0.8 dB; 0.15 MHz-3 GHz: \pm 1.5 dB ; 0.1 MHz-6 GHz: \pm 2 dB
Linearity	\pm 0.5 dB (0.5 to 100 V/m)
Anisotropy @ 6V/m	\pm 0.8 dB @ 50 MHz (typical 0.6 dB)
H field rejection	> 20 dB
Temperature error	0.1 dB/°C
Size and weight	450 mm x 55 mm \varnothing , 180 g

EP-1B-05 Electric Field Probe*	
Frequency range	300 kHz to 18 GHz
Measurement range	0.5 V/m – 800 V/m (dynamic range > 64 dB)
Measurement resolution	0.01 V/m
Overload	1200 V/m
Flatness @ 6 V/m	1 MHz - 1 GHz: \pm 1,5 dB; 1 GHz - 12 GHz: \pm 3 dB; 12 GHz - 18 GHz: \pm 4 dB
Linearity	\pm 0.5 dB (\pm 0.3 typ.) (1.2 V/m to 200 V/m) @ 200 MHz
Anisotropy @ 6V/m	\pm 0.8 dB @ 200 MHz (typical 0.5 dB @ 930 and 1800 MHz)
H field rejection	> 20 dB
Temperature error	0.02 dB/°C
Size and weight	450 mm x 55 mm \varnothing , 200 g

EP-1B-06 Electric Field Probe*	
Frequency range	300 kHz to 40 GHz
Measurement range	0.5 V/m – 800 V/m (dynamic range > 64 dB)
Measurement resolution	0.01 V/m
Overload	1200 V/m
Flatness @ 6 V/m	1 MHz - 1 GHz: \pm 1.5 dB; 1 GHz - 12 GHz: \pm 3 dB; 12 GHz - 23 GHz: \pm 4 dB; 23 GHz - 40 GHz \pm 5 dB
Linearity	\pm 0.5 dB (\pm 0.3 typ.) (1.2 V/m to 200 V/m) @200 MHz
Anisotropy @ 6V/m	\pm 0.8 dB @ 200 MHz (typical 0.5 dB @ 930 and 1800 MHz)
H field rejection	> 20 dB
Temperature error	0.02 dB/°C
Size and weight	450 mm x 55 mm \varnothing , 200 g

EP-1B-04 Electric Field Probe*	
Frequency range	10 Hz to 5 kHz
Measurement range and overload	5 V/m to 20 kV/m (dynamic range > 72 dB); overload: > 30 kV/m
Measurement resolution	0.1 V/m
Flatness @ 100 V/m (40 Hz – 1 kHz)	1 dB (typical 0.5 dB)
Anisotropy	0.5 dB @ 50 Hz, 100 V/m
H field rejection	> 20 dB
Size and weight	77 mm x 53 mm Ø, 110 g

EP-3B-01 Tri-Band Electric Field Probe*			
Frequency range	Wideband: 0.1- 3000 MHz	Low pass: 0.1 - 862 MHz	High pass: 933 - 3000 MHz
Measurement resolution	0.01 V/m		
Measurement range	0.2 to 200 V/m (dynamic range > 60 dB)		
Overload	600 V/m		
Flatness @ 20 V/m	1-200 MHz ± 0.8 dB 150 kHz-3 GHz ± 1.5 dB	1-200 MHz±0.8 dB 150 kHz-862 MHz±1.5 dB	933-3000 MHz ± 1.5dB
Linearity	± 0.5 dB (0.5 to 100 V/m)	± 0.5 dB (0.5 to 100 V/m)	± 0.5 dB (0.5 to 100 V/m)
Anisotropy @ 6 V/m	± 0.8 dB @ 50 MHz (typical 0.6 dB)		± 0.8dB @ 1 GHz(typical 0.6 dB)
Out of band attenuation	Not applicable	933 MHz-3 GHz > 23 dB (ref. to 50 MHz)	0,1 – 862 MHz > 23 dB (ref. to 1 GHz)
H field rejection	> 20 dB		
Temperature error	0.1 dB/°C		
Size and weight	450 mm x 55 mm Ø, 180 g		

EP-4B-01 Quad-Band Electric Field Probe*				
Frequency range	Wideband 0.1 - 3000 MHz	EGSM 900 925 - 960 MHz	EGSM 1800 1805 - 1880 MHz	UMTS 2110 - 2170 MHz
Meas. range	0.2 to 200 V/m	0.03 to 30 V/m	0.03 to 30 V/m	0.03 to 30 V/m
Meas. resolution	0.01 V/m			
CW damage level	300V/m			
Flatness @ 6 V/m	1-200 MHz ± 0.8 dB 150 kHz-3 GHz ± 1.5 dB	925-960 MHz +0.5/-2.5 dB	1805 – 1880 MHz +0.5/-2.5 dB	2110 – 2170 MHz +0.5/-2.5 dB
Linearity	± 0.5 dB (0.5 to 100 V/m)	± 0.5 dB (0.06 to 20 V/m)	± 0.5 dB (0.06 to 20 V/m)	± 0.5 dB (0.06 to 20 V/m)
Anisotropy	± 0.8 dB @ 50 MHz, 3 V/m (typical 0.6 dB)	± 0.8 dB@ 942.5 MHz, 3 V/m (typical 0.6 dB)	± 0.8 dB@ 1842.5 MHz, 3 V/m (typical 0.6 dB)	± 0.8 dB@ 2140 MHz, 3 V/m (typical 0.6 dB)
Out of band attenuation	Not applicable	Rejection to 1842 MHz(GSM): 25 dB to 2140 MHz(UMTS):25 dB	Rejection to 942 MHz(GSM): 15 dB to 2140 MHz(UMTS): 13 dB	Rejection to 942 MHz(GSM): 17dB to 1842 MHz(GSM): 10 dB
Centre frequency drift	Not applicable	40 °C – 50 °C = ± 100kHz -20 °C – 40 °C = ± 100 kHz/°C		
H field rejection	> 20 dB			
Temperature error	0 °C – 50 °C = ± 0.3 dB		-20 °C – 0 °C = -0.1 dB/°C	
Size and weight	450 mm x 55 mm Ø, 210 g			

EP-4B-02 Quad-Band Electric Field Probe*				
Frequency range	Wideband 0.1 - 7000 MHz	EGSM 900 925 - 960 MHz	EGSM 1800 1805 - 1880 MHz	UMTS 2110 - 2170 MHz
Meas. range	0.2 to 200 V/m	0.03 to 30 V/m	0.03 to 30 V/m	0.03 to 30 V/m
Meas. resolution	0.01 V/m			
Dynamic range	>60 dB			
Flatness @ 6 V/m	3-200 MHz ± 1.5 dB 150 kHz-3 GHz ± 2 dB 0.1 MHz – 7 GHz ± 3 dB	925 - 960 MHz +0.5 / -2.5 dB	1805 -1880 MHz +0.5 / -2.5 dB	2110 - 2170 MHz +0.5 / -2.5 dB
Linearity	± 0.5 dB (0.5 to 100 V/m)	± 0.5 dB (0.1 to 20 V/m)	± 0.5 dB (0.1 to 20 V/m)	± 0.5 dB (0.1 to 20 V/m)
Anisotropy	± 0.8 dB@ 50 MHz, 3 V/m (typical 0.6 dB)	± 0.8 dB@ 942.5 MHz, 3 V/m (typical 0.6 dB)	± 0.8 dB@ 1842.5 MHz, 3 V/m (typical 0.6 dB)	± 0.8 dB@ 2140 MHz, 3 V/m (typical 0.6 dB)
Out of band attenuation	Not applicable	Rejection to 1842 MHz(GSM): 25 dB to 2140 MHz(UMTS):25dB	Rejection to 942 MHz(GSM): 15 dB to 2140 MHz(UMTS):13dB	Rejection to 942 MHz(GSM): 17dB to 1842 MHz(GSM):10 dB
Centre frequency drift	Not applicable	40 °C – 60 °C = ± 100 kHz -20 °C – 40 °C = - 100 kHz / °C		
H field rejection	> 20 dB			
Temperature error	0 °C – 50 °C = ± 0.3 dB		-20 °C – 0 °C = -0.1 dB/°C	
Size and weight	450 mm x 55 mm Ø, 210 g			

HP-1B-01 Magnetic Field Probe*	
Frequency range	10 Hz to 5 kHz
Measurement range and overload	50 nT to 200 µT (dynamic range >72 dB); overload: > 1 mT
Measurement resolution	1 nT
Flatness	40 Hz – 1 kHz, 1 dB (typical 0.6 dB)
Linearity	± 0.5 dB (200nT to 100µT)
Anisotropy	0.3 dB @ 50 Hz, 3 µT
E field rejection	> 20 dB
Size and weight	83 mm x 53 mm Ø, 110 g

(*) All probes include on board A/D conversion, calibration factors on E²PROM, and temperature sensor

AMB-8059 Multi-band EMF Area Monitor**Technical Specifications**

Frequency range	Depending on probe (see probe specifications)
Dynamic range	Depending on probe (see probe specifications)
Resolution	Depending on probe (see probe specifications)
Sensitivity	Depending on probe (see probe specifications)
Accuracy	Depending on probe (see probe specifications)
Measurement Units	V/m, kV/m, nT, μ T, mT. The unit shown depends on the probe connected
Field measured	Total field, average and Peak (MAX)
Sampling	1 measurement every 1 second

Measurement / acquisition functions

Memorization interval	30 seconds to 15 minutes
Internal memory	Over 128 MB
Max data storage capacity (before old data are replaced by new ones)	Over 364 days with 1 acquisition every minute
Data download	Manual Automatic managed by the unit at predefined timings ^{(1), (3)} Automatic by PC ^{(2), (3)} Automatic creation of a .TXT and .BMP file after download
Functions	AVG, RMS, maximum peak; daily report via SMS ⁽³⁾ Display and marking of data acquired during modem transmission ⁽³⁾
Field strength alarm	Two programmable field strength thresholds (warning and alarm) with automatic notice both of exceeding the limit and returning within the limits ⁽³⁾
Clock	Real time internal clock
Messages	SMS which can be sent to up to 10 mobile phones simultaneously ⁽³⁾
Sensor	Display of model and calibration date
Battery management	Every record includes Battery Voltage and Charge Current value
Temperature management	Every record includes Internal Temperature value
Humidity management	Every record includes Internal Humidity value
GPS coordinates	Programmable record

AMB-8059 Multi-band EMF Area Monitor**General Specifications**

GSM module	Quad-band (850, 900, 1800, 1900 MHz) GPRS ⁽³⁾
Field probes	Interchangeable, several models available, single and dual probe operation
Interfaces	RS232, USB, Ethernet, Micro SD Card; GSM/GPRS modem ⁽³⁾
Protection	Sensor to notify case opening
Other alarms	Protective case opening, internal overheat, internal humidity, low battery, battery overload (model AMB-8059/01 and AMB-8059/03 only), probe malfunction, field over limit.
Internal battery	AMB-8059/00 - AMB-8059/02: Non rechargeable primary battery, lithium SAFT LSH20, 3,6 V, 13 A/h AMB-8059/01 - AMB-8059/03: Lead, 4V, 2,5 A/h, rechargeable
Consumption	1 mA with GSM module off 20 mA with GSM module in stand-by state ⁽³⁾ 300 mA max with GSM module transmitting ⁽³⁾
External power	DC, 5 V, 1 A max (AMB-8059/01 and AMB-8059/03 only)
Operating time	AMB-8059/02: about 8 months @ 1min GSM module transmission per day and single probe operating mode (autonomy depends on probe and setting) ^{(4), (5)} AMB-8059/03: > 80 days in total darkness @ 1min GSM module transmission per day and single probe operating mode (autonomy depends on probe and setting) ^{(4), (5)} For best performance install solar panels in direct sunlight.
Recharging time	24 hours with external power unit (AMB-8059/01 and AMB-8059/03 only)
Auto test	Automatic
Compliance	European directives 89/336 and 73/23, CEI 211-6, CEI 211-7, ITU-T K.83
Ambient temperature	-20 °C / +55 °C
Dimensions	(WxDxH) 112 x 112 x 730 mm
Weight	AMB-8059/00 and AMB-8059/02: 1,2 kg (unit only); 6,5 kg (total weight including supports and base) AMB-8059/01 and AMB-8059/03: 2,4 kg (unit only); 7,7 kg (total weight including supports and base)
Environmental protection	IP55
Country of origin	Italy

Notes:

- (1): To the controller PC or to the user's FTP server depending on the preferred communication mode.
 (2): Directly from the station or from the user's FTP server depending on the preferred communication mode.
 (3): AMB-8059/02 and AMB-8059/03 only are equipped with GSM/GPRS modem.
 (4): AMB-8059/00 and AMB-8059/01 power autonomy is longer as they are not equipped with GSM/GPRS modem module.
 (5): Specifications depending on battery age, ambient temperature and GSM field coverage.

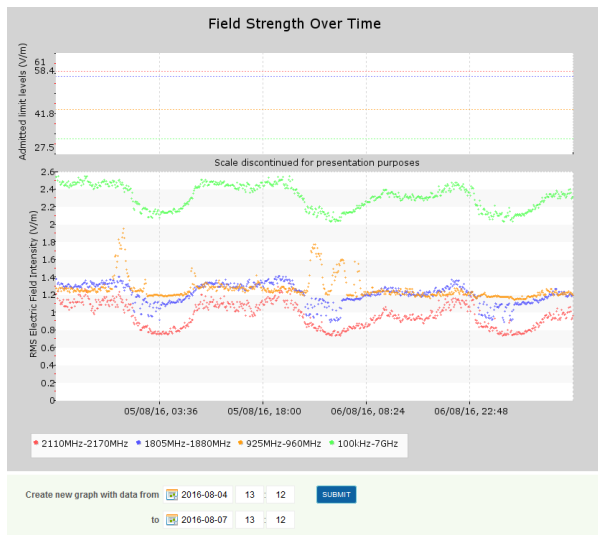
AMB-8059 PC control software

Main Functions and Requirements

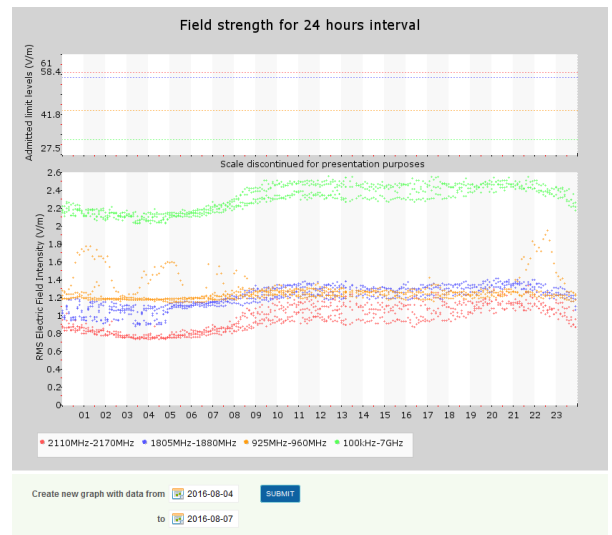
Main functions	Local and remote communication for AMB-8059 setup and data downloading
	Data display/analysis in graphical and table format
	Vertical and horizontal zoom, linear and logarithmic graphs, marker
	Data export
PC minimum requirements	Operating system: Windows XP, Vista, Windows 7
	Minimum display resolution: 1024x768
	Internet connection for FTP remote communication mode (ports 20 and 21 for FTP data communication must be open)
Line or GSM modem for CSD (Circuit Switched Data) remote communication mode	

AMB-8059 web based software available “EMF observatory” (contact us)

Main Functions

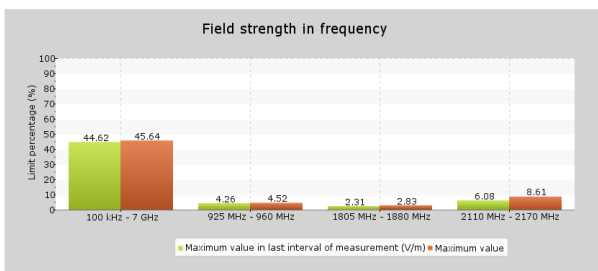


Field strength over time including national limits. Interval individually adjustable.

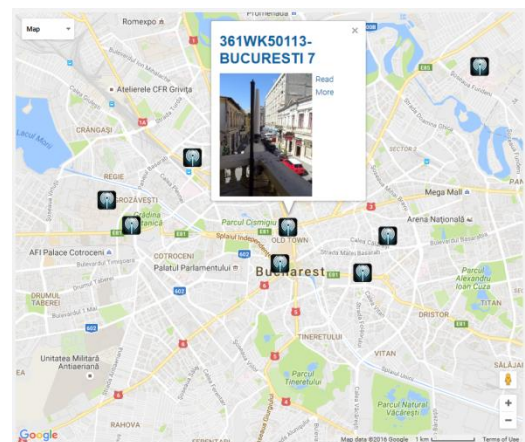


Field strength distribution for 24 h including national limits. Interval individually adjustable.

Frequency Range	Reference Threshold/Limit (V/m)	Electric field strength RMS (V/m)	Compared to Limit	Reference Threshold/Limit (W/m²)	Power density (W/m²)	Compared to Limit
100 kHz – 7 GHz (I)	27.5	12.27	44.62%	2.01	0.399345	19.867810%
925 MHz – 960 MHz (I)	41.8	1.78	4.26%	4.63	0.008404	0.181512%
1805 MHz – 1880 MHz (I)	58.4	1.35	2.31%	9.05	0.004834	0.053414%
2110 MHz – 2170 MHz (I)	61	3.71	6.08%	9.87	0.036510	0.369909%



Field strength in table format including comparison and national limits.



Installed EMF monitors selectable via web mapping.

ORDERING INFORMATION

AMB-8059	
Remote stations	
Area Monitor station powered by internal primary Li-Ion battery	AMB-8059/00
Area Monitor station powered by solar panel and back-up battery	AMB-8059/01
Area Monitor remote station with GSM/GPRS internal modem, powered by internal primary Li-Ion battery	AMB-8059/02
Area Monitor remote station with GSM/GPRS internal modem, powered by solar panel and back up battery	AMB-8059/03
Field probes	
Electric field probe 0.1 to 3000 MHz; 0.2 to 200 V/m	EP-1B-01
Electric field probe 0.1 to 7000 MHz; 0.2 to 200 V/m	EP-1B-03
Electric field probe 300 kHz to 18 GHz; 0.5 to 800 V/m	EP-1B-05
Electric field probe 300 kHz to 40 GHz; 0.5 to 800 V/m	EP-1B-06
Electric field probe 10 Hz to 5 kHz; 5 V/m to 20 kV/m	EP-1B-04
Tri-band electric field probe 0.1 to 3000 MHz / 0.1 to 862 MHz / 933 to 3000 MHz; 0.2 to 200 V/m	EP-3B-01
Quad-band electric field probe 0.1 to 3000 MHz; 0.2 to 200 V/m / 925 to 960 MHz / 1805 to 1880 MHz / 2110 to 2170 MHz, 0.03 to 30 V/m	EP-4B-01
Quad-band electric field probe 0.1 to 7000 MHz; 0.2 to 200 V/m / 925 to 960 MHz / 1805 to 1880 MHz / 2110 to 2170 MHz, 0.03 to 30 V/m	EP-4B-02
Magnetic field probe 10 Hz to 5 kHz; 50 nT to 200 µT	HP-1B-01
Optional accessories	
Metallic T-shaped base and Fiberglass mast (includes kit of screws, ties and 3 ballast bags)	AMB-8059-MAST
Cover extension for AMB-8059 dual probe configuration	8059-CE
Includes in delivery	
<ul style="list-style-type: none"> • Primary Li-ion battery (AMB-8059/00 and AMB-8059/02 only) • Power supply / Battery Charger (AMB-8059/01 and AMB-8059/03 only) • Assembled Solar Unit (AMB-8059/01 and AMB-8059/03 only) • Ethernet cable (AMB-8059/01 and AMB-8059/03 only) • USB cable, 1,8 m, USB(A)/USB(B) • Swivel joint for installation on AMB-8059-MAST • Operating Manual, Test & Calibration Certificates • AMB-8059-SW02 PC Software 	

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