narda Safety Test Solutions®
an L3 Communications Company

MULTI-BAND EMF AREA MONITOR

AMB-8057-03/G

Continuous, remote monitoring and logging of electromagnetic fields

- Discrimination of GSM and UMTS contributions to total EMF values
- Electric field monitoring up to 7 GHz
- Magnetic field monitoring up to 5 kHz
- Accurate and safe data measurement and storage
- GSM-CSD, GPRS-FTP and SMS remote communication
- Automatic data download to PC or FTP server
- Daily report by SMS
- Alarm messages to mobile phones
- Easy integration in systems for data collection and publishing
- Outdoor and indoor installation
- Self-powered by solar panel
- Lightweight, easy to install and relocate

Area Monitor AMB-8057-03/G

Preliminary data, subject to change

APPLICATIONS

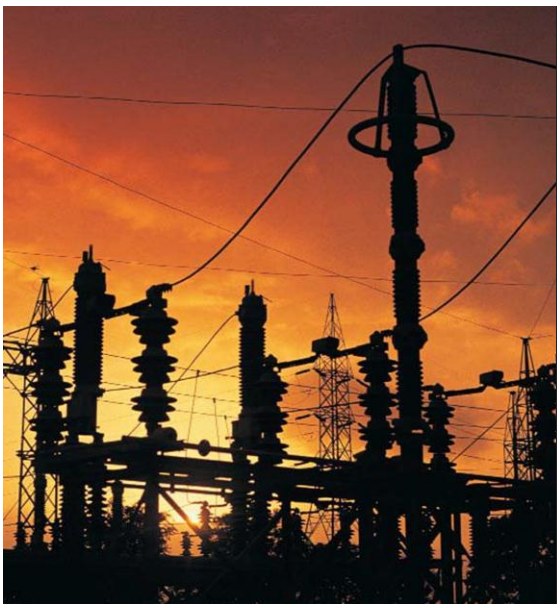
The Area Monitor AMB-8057-03/G provides the ultimate, reliable, and precise answer to continuous remote monitoring and logging of electric (E) or magnetic (H) fields generated by low and high frequency sources such as radio / TV, GSM, UMTS, transformer stations, power lines etc., as a means of assessing the long-term exposure of the population to potentially hazardous electromagnetic fields (EMF). Several AMB-8057-03/G Area Monitors connected to the base station through the GSM network can be used to build reliable monitoring systems to cover large geographical areas, including nationwide coverage.
The Area Monitor AMB-8057-03/G is weatherproof, lightweight and can be easily installed outdoors or indoors, using the pole and base designed for it. Thanks to its exceptionally low power consumption, the AMB-8057-03/G does not require any external power supply, being powered by its small size s o l a r panel and internal rechargeable battery for unlimited outdoor operation.

All-in-one concept
The single, small housing (112 mm max dia. x 780 mm length) contains:

- A high-sensitivity probe that measures the EM field along three axes
- A sophisticated data logger that stores the measured values, events (alarm signals, communications), and settings in non-volatile memory
- A dual-band GSM/GPRS modem for uploading data and remote control

Unique Features
The AMB-8057-03/G is designed to provide unique features, such as:

- Correct measurements regardless of the EM field source direction
- Excellent accuracy and repeatability of measurements
- Simultaneous measurement in all frequency bands
- Easy to calibrate field probes



Wide range of digital probes

AMB8057-03/G utilizes the new generation of multiband, three-axis, replaceable digital probes.

Multiband – Several probe models are available to best fit applications ranging from low frequency magnetic field monitoring in the proximity of power stations and power lines, through to the monitoring of fields generated by modern communication services like wireless data communication.

The high level of attention paid to the subject of electromagnetic field pollution on the part of many public administrations continues to stimulate our company into providing even more sophisticated probes to meet special requirements such as double field monitoring (electric + magnetic) for low frequency applications, as well as “service discriminating” multiband probes for monitoring the electric field activity generated by mobile communication installations (BTS).

Multiband probes like the EP-3B-01 allow discrimination between the fields generated by different services, such as broadcast transmissions and mobile communications.

As well as the 100kHz – 7GHz wideband measurement function, low and high frequency bands have been implemented to allow additional measurements in the 100 kHz – 862 MHz “low” band, mainly used by radio / TV broadcasting services, and the 933 MHz – 3 GHz “high” band, which includes mobile communications. The EP-4B-01 probe offers more detailed frequency band discrimination by providing additional frequency bands specially tailored for monitoring mobile communications frequencies such as the 900, 1800, and 2100 MHz bands specific to GSM, DTS, and UMTS mobile transmissions as well as the overall 100 kHz – 7 GHz wide band.

Single band probes are available for making wideband measurements on ELF 10

Hz – 5 kHz, and, using the latest EP-1B-03 probe, from 100 kHz – 7 GHz to include wireless data services.

Three-axis – All AMB8057-03/G probes make three-axis measurements, providing an isotropic response. The measurement values for the three orthogonal axes are internally processed to yield the isotropic result, which is output digitally for each frequency band.

Digital – AMB8057-03/G probes include on board circuitry such as multiple A/D converters, a microcontroller, and calibration data memory that produce measurement results in digital form, which are not changed by any additional processing performed by the main unit.

Replaceable – Probes can easily be replaced by the user to meet differing monitoring application requirements and for periodic calibration.

Electric field probe

Magnetic field probe

Flexible communication

Electromagnetic field monitoring networks utilize remote units like the AMB8057-03/G for installation in “sensitive” locations such as schools, hospitals, residential areas, etc., that are close to sources of electromagnetic fields.
It should be possible to install remote units practically anywhere. Other important considerations in addition to providing accurate measurement results are facilities for self-powering and flexible communications.
The AMB8057-03/G is self-powered from a solar panel and does not require any external power supply. Furthermore, its large capacity internal memory means that data can be acquired and retained over very long time periods, so that monitoring activities are possible even in locations where no communications service is available. The AMB8057-03/G features several different modes of communication to cover any specific need.

RS232 local communication – With direct connection to the controller PC, local communication not only allows preliminary settings and tests to be made before remote installation but also enables periodic downloading of data where no wireless communication service is available or desirable.
The data storage capacity of the AMB8057-03/G means that users can download results even after a long period of monitoring activity (up to several months, depending on the station settings) without any need to access the station more frequently.
The serial connection can be used to transmit commands, as described in the documentation provided, to set specific parameters, query station status information, and execute specific actions immediately.

SMS remote messaging – AMB8057-03-03/G is equipped with an internal GSM/GPRS modem.
Automatic SMS functionality can be activated to inform users immediately of any abnormal situation, such as the measured field exceeding thresholds preset by the user, or the need to download results to avoid overwriting old data where no download has been performed for a long time, or notification of temperature, probe or case open alarms. The messages are sent to up to 10 mobile phones. A “daily report” can also be activated. This sends information about the highest field value and lowest station battery voltage by SMS each day.
SMS communication can additionally be used to send query or setting commands to a remote station using the same commands that can be transmitted using the local RS232 connection.
Downloading data blocks is not available in SMS mode for the obvious reason of allowed message size.

Remote CSD communication via the GSM modem – Many mobile communication service providers offer CSD (circuit switched data) communication mode.
To make use of CSD communications, the AMB8057-03-03/G remote station must be equipped with a user SIM card enabled for CSD communication mode.
CSD allows remote communication via the GSM network in dial-up mode, which means that the controller PC, equipped with a modem, calls the station by dialling its data telephone number to establish a direct connection. The remote station can be set to automatically download all the measurement results acquired since the last download.
The CSD remote connection allows the remote station configuration to be set in real time.
Remote stations configured for CSD communication can be set to automatically generate a call to the controller PC at pre-programmed times and to download the results automatically without any intervention from the user.
Besides scheduled automatic calls, CSD mode also allows automatic calls when alarm events occur.

GPRS/FTP communication mode – Users can set the predefined communication mode of the AMB8057-03-03/G to CSD as well as FTP.
Stations set for FTP communication activate their modems at programmed times and access the user’s server for downloading results and checking for any requests to change settings via the GPRS network and the Internet.
After they have been set up initially, monitoring stations set to GPRS/FTP communication mode are completely independent as they download results regularly to the FTP server without any intervention from the user. There is no need for the user to ensure that a controller PC with application software is on line to receive calls from monitoring stations, as there is never any direct connection between the remote station and the controller PC.
The controller PC does not need a modem, as management of the system as well as the downloading of data to the controller PC is performed by accessing the FTP server.
The controller PC connected to the Internet can on demand or automatically at pre-programmed times access the server, download measurement results, and, if required, transmit a new configuration file.
GPRS/FTP reduces communication costs as GPRS data communication is charged on the basis of the very low volume of data transferred. Furthermore, there is no additional cost related to distance, as the FTP server can be accessed from anywhere that an Internet connection is available.

TECHNICAL SPECIFICATION

EP-4B-02 Electric Field Quad-Band Probe				
Frequency range	Wide band 0.1 to 7000 MHz	EGSM 900 Bandpass 925 to 960 MHz	EGSM 1800 Bandpass 1805 to 1880 MHz	UMTS Bandpass 2110 to 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	300 V/m			
Flatness @ 6 V/m	100 kHz to 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
Anisotropy	± 0.8 dB (typical 0.6 dB)	± 0.8 dB (typical 0.6 dB)	± 0.8 dB (typical 0.6 dB)	± 0.8 dB (typical 0.6 dB)
Out of band attenuation (typical)		Rejection to 1842 GSM = 25 dB to 2140 UMTS = 25	Rejection to 942 GSM = 15 dB to 2140 UMTS = 13 dB	Rejection to 942 GSM = 17 dB to 1842 GSM = 10 dB
Centre frequency drift	Not applicable	40 – 50 °C = ± 100kHz -20 – +40°C = ± 100 kHz / °C		
Linearity	<±2 dB			
H-field rejection	> 20 dB			
Temperature error	0 – 50 °C = ± 0.3 dB	-20 – 0 °C = -0.1 dB/°C		
Sensors size	55 mm			
Calibration	Performed in EA accredited laboratory: Accredia LAT nr. 008			
Calibration interval	2 years (recommended)			

CALIBRATION AND CERTIFICATION

Every Narda product comes with a standard certificate of calibration. Accredited calibration can be additionally provided on request.
Narda STS in Italy, as LAT n.008, is an accredited calibration laboratory for electromagnetic field strength at frequencies up to 18 GHz and for magnetic flux density up to 100 kHz as well as for other quantities such as frequency and RF power level.
Narda accredited certificates of calibration are therefore recognized internationally.

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

CERTIFICATO DI ACCREDITAMENTO
Accreditation Certificate

Accreditamento n° / *Accreditation n°*: **008** Rev. **08**

Si dichiara che / *We declare that*: **Narda Safety Test Solutions s.r.l.**
Sede Legale ed operativa:
Via Benessea, 29/B 17035 CISANO SUL NEVA (SV) - Italia

è conforme ai requisiti della norma: UNI CEI EN ISO/IEC 17025:2005 - Requisiti generali per la competenza dei laboratori di prova e di taratura

meets the requirements of the standard: *EN ISO/IEC 17025:2005 - General requirements for the competence of testing and calibration laboratories*

Quale / *as*: **Laboratorio di Taratura** / ***Calibration Laboratory***

L'accreditamento attesta che il Laboratorio ha la competenza per operare quale Centro di taratura ACCREDIA per le grandezze, i campi e le incertezze di misura riportati nella tabella allegata al presente certificato di accreditamento. Il presente certificato non è da ritenersi valido se non accompagnato dalla tabella allegata e può essere sospeso o revocato in qualsiasi momento nel caso di inadempienza accertata da parte di ACCREDIA. La validità dell'accreditamento può essere verificata sul sito WEB (www.accredia.it) o richiesta direttamente ai singoli Dipartimenti. Questo Laboratorio è accreditato in accordo alla norma internazionale UNI CEI EN ISO/IEC 17025:2005. L'accreditamento dimostra che il laboratorio possiede competenza tecnica per lo scopo definito e che opera secondo un sistema di gestione (si veda il comunicato congiunto ISO-ILAC-IAF del gennaio 2009).

Accreditation attests that the Laboratory has the competence to operate as calibration Centre of ACCREDIA, for the physical quantities, the range and uncertainty of measurement reported in the table attached to the present accreditation certificate. The present certificate is valid only if associated to the annexed schedule, and can be suspend or withdrawn at any time in the event of non fulfilment as ascertained by ACCREDIA. The in force status of the accreditation may be checked in the WEB site (www.accredia.it) or on direct request to relevant Departments. This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009).

Data di 1ª emissione *1st issue date*	Data di modifica *Modification date*	Data di Scadenza *Expiring date*
1980-05-12	2010-11-17	2014-02-07

Il Direttore di Dipartimento / *The Department Director*
Il Presidente / *The President*
Il Direttore Generale / *The General Director*

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AMB-8057-3/G Multi-band EMF Area Monitor

General Specifications

Sampling time	Simultaneous measurement of all bands every 1 second
Overall anisotropy (EN50383)	<2,5 dB to 3 GHz; <3,5 to 6 GHz with probe EP-4B-02
Calibration	Performed in EA accredited laboratory: Accredia LAT nr. 008
Calibration interval	2 years (recommended)
Unit	V/m; % of limit; µT
Storing rate	6 minutes
EMF stored values	AVG or RMS, MAX value of each band and wideband
Average and Average time	Arithmetic or RMS; Average time 6 minutes
Max. logging before overwriting	30 days @ 6 min. storing rate; circular memory
Communication	FTP and CSD protocols via internal GSM/GPRS modem, Ethernet, serial link
Data download	FTP: automatic to server; CSD: automatic or manual to PC
SIM card type (not included)	Enabled for selected data transmission
GPS coordinates	Latitude, longitude, GMT logged in memory
Temperature and humidity sensors	Internal, logged in memory
External memory	SD card
Alarms	SMS and/or data download for: field over limit, memory full, open case, temperature, humidity, low battery, sensor failure, main unit failure
SMS	SMS to 10 mobile phones (daily report of max. EMF value, min. battery voltage)
Interface	RS232 - Jack connector; Ethernet
Power supply	Solar panel & Pb battery AC power supply and battery charger 100-240 VAC-50/60 Hz
Autonomy with battery only	> 15 days
Autonomy with solar panel	24 hours/365 days for PSH >= 2
Software upgrade	Remotely upgradable (FTP, CSD, Ethernet), RS232
Operating temperature	-10 °C to 55 °C
Humidity	<29g/m^3 93%
Wind speed	Max 150 km/h (unit must be installed according to instructions)
Protection grade	IP55
Dimensions and weight	Station: 112 x 780 mm (max diameter x height) -- 3 kg Base and mast: 600 x 600 x 2000 mm (w x d x h) -- 5.1 kg

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ORDERING INFORMATION

AMB-8057-03/G	
Area Monitor remote station with: - Internal modem GSM/GPRS - Solar panel and battery - Support base and mast - Quad-band electric field probe mod. EP-4B-02	
Other available field probes	
• Electric field probe 0.1 to 3000 MHz; 0.2 to 200 V/m	EP-1B-01
• 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
• Electric field probe 0.1 to 7000 MHz; 0.2 to 200 V/m	EP-1B-03
• 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
• Magnetic field probe 10 Hz to 5 kHz; 50 nT to 200 µT	HP-1B-01
• Electric field probe 10 Hz to 5 kHz; 5 V/m to 20 kV/m	EP-1B-04

Standard accessories

- RS232 cable, 2 m, DB9(m) - DB9(f)
- RS232 cable, Jack - DB9
- Ethernet cable
- Power supply / Battery Charger
- RS232 / USB adapter
- Operating Manual, Test & Calibration Certificates
- Rotating joint for installation on mast
- AMB-8057-SW02 PC Software

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