# MONA-EPR

MONA-EPR is the customized, self-contained spectroscopic in-situ gamma detector for RN emergency preparedness and response. It is designed to measure and analyze online and continuously the gamma spectra under extreme environmental conditions. MONA-EPR is based on the well-established SARA for environmental monitoring and can detect even minor changes of the composition of the nuclear spectra in the environment. This significantly improves the recognition and identification of artificial isotopes. It is designed for vehicle operation as well as for backpack outdoor use, even in harsh environments. The NaI(Tl)-based scintillation detector provides the necessary energy resolution under a wide range of operation conditions. The integrated embedded Linux-PC enables online isotope identification and versatile data exchange through several interfaces. The standardized ANSI N42.42 protocol allows for manifold data exchange. Analysis results are presented on the local display. In addition, MONA-EPR transmits the measured data automatically to the monitoring center in real time. An integrated web server facilitates additional data access using a web browser. It measures the total and nuclide specific gamma dose rate in units of the ambient dose equivalent rate H*(10). The instrument comes optionally with a tablet PC or Notebook equipped with NMC, which can show the tracks on a map, exchange data and can perform offline spectrum re-analysis.

FEATURES

- Fast detection of very low artificial radiation
- Online spectrum analysis and isotope identification
- Local daylight readable display
- Four tracking modes: None, Real, Test, Maintenance
- Standardized data protocol ANSI N42.42-2012
- Operation under harsh environmental conditions
- Integrated GPS, integrated battery
- Rugged case, operation with gloves possible
- Easy and quick set up
- Detector verification supported automatically with optional test set
- **LTE cellular network** (4G/3G/2G)
- **GNSS (GPS, GLONASS)**
- **Integrated LTE and GPS antenna** (optionally external)
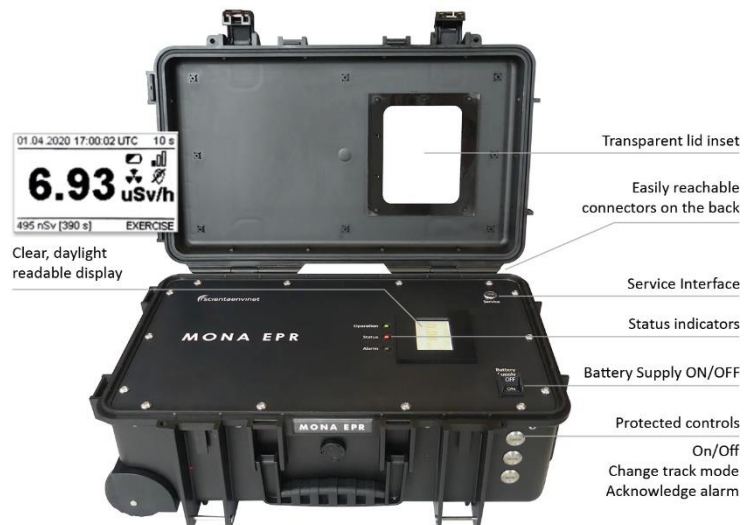
FUNCTIONS

- **Track plotting capability with optional tablet / notebook**
- **Easy to use Web-UI for field teams (fire-brigade, police)**
- **Nuclide specific and total dose rate evaluation**
- **Nuclide identification**
- **Extended dose rate range with additional GM detector**
- **Audiovisual Alarming capability**
- **Autonomous operation for 24-48 h** (depending on configuration and usage scenario)
- Freely configurable nuclide library
- Data access and parameter setting with web browser
- Characteristic limits of peak/nuclide analysis according ISO11929
- Integrated WiFi
- Nonvolatile memory
- **Real time monitoring in NMC monitoring center**
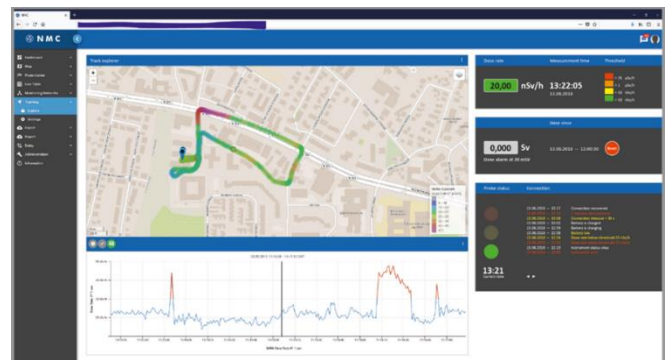
RADIOLOGICAL PERFORMANCE SPECIFICATION

	MONA-E01-L4VD-TG	MONA-E03-L4VD-TG
Detector	NaI(Tl) with PMT, 1.5" x 1.5"	NaI(Tl) with PMT, 3.0" x 3.0"
Dose rate range[1]	0.001...400 µSv/h	0.001...100 µSv/h
Sensitivity[1]	60'000 (total) / 9'500 (photopeak) cpm/µSv/h	250'000 (total) / 70'000 (photopeak) cpm/µSv/h
Accuracy[1]	+/-10%	+/-10%
FWHM[1] (guar.)	typ. 6.5 % (<7.8 %)	typ. 6.6 % (<7.8 %)
Energy range	30...3000 keV, in 2048 channels	
Intrinsic background	<5 nSv/h	

OPTIONAL RADIOLOGICAL RANGE EXTENSIONS:

	Geiger-Müller-Tube (MONA-500-T)	HD-Spectroscopy CeBr$_3$ (MONA-500-H)
Dose rate range[1]	0.04...1000 mSv/h	0.05...100 mSv/h
Accuracy[1]	+/-15%	+/-15%
Sensitivity[1]	7.15 cpm / µSv/h	1650 (total) / 125 (photopeak) cpm / µSv/h
Intrinsic background	< 270 nSv/h	Negligible
Energy range	50...1250 keV	30...3000 keV, typ. 7% resolution

ENVIRONMENTAL SPECIFICATION

	Detector
Operation temperature	-40...+60 °C / -40...+140 °F
LTE transmission	-30...+60 °C / -22...+140 °F
Protection class	IP66 / IP65 (open lid)
Humidity	0...95%

ELECTRICAL SPECIFICATION

	Detector
Battery capacity & operation time[2]	153 Wh (24h operation) 95 Wh optional for easier transport (14h)
Supply voltage	7...30 V (230V AC adapter included)
EMC	EN55022:2006+A1:2007+A2:2010 Class B EN55024:1998+A1:2001+A2:2003

SIZE AND WEIGHT

	Detector
Dimensions	57 cm x 36 cm x 23 cm
Weight	11.4 kg (1.5") / 12.8 kg (3.0")
Operator interfaces	Display, control panel, LEDs, audio alarm
Humidity	0...95%

DATA INTERFACES

	Detector
Communication	Ethernet 100 Mbit/s RS232 (Service) WiFi (for tracking with tablet) LTE (for direct connection with network center) (external antenna optionally)
Protocols	HTTP, FTP, MODBUS, OpenVPN, SSH

ACCESSORIES

For detection unit:

Carrying straps:	MONA-800-E310
Test-set (Cs-137, ~300 kBq):	MONA-800-E100

Optional control unit with NMC:

Laptop (rugged):	MONA-200-R
Tablet (rugged):	MONA-200-TR

[1] Cs-137

[2] Dependent on local condition and setup

Technical contents are subject to change without notice!

scientaenvinet