

AT6101DR Spectrometer



Radiation background measurement and no-sampling radiometry



Radionuclide Identification:
¹³⁴Cs, ¹³⁷Cs, ¹³¹I, ⁴⁰K, ²²⁶Ra, ²³²Th

Applications

- Radioecological monitoring of environment
- Radiation monitoring during decontamination operations
- Geological survey
- Radioactive waste monitoring
- Construction material and products radiation monitoring of natural radionuclide content
- Dosimetry survey of ground and facilities, radioactive mapping

Features

- Wireless communication between detection device and hand-held PC (Tablet PC) at distance up to 10 m
- Automatic thickness determination of soil layer contaminated by ¹³⁷Cs and ¹³⁴Cs radionuclides
- Instant detection of near background dose rate level increase
- Automatic LED stabilisation and measurement path temperature compensation
- Setting up procedure and parameter check using check sample that contains KCl salt with naturally occurring radionuclide ⁴⁰K
- Expert mode for detailed instrument spectrum analysis with automatic sample radionuclide content identification
- Records and stores in non-volatile memory up to 140,000 measured instrument spectra
- All measurement data can be transferred to PC for further detailed processing by dedicated GARM software
- Display of measurement results with GPS-referencing (for Tablet PC version)
- Measurement result display in: Bq/kg (¹³⁴Cs, ¹³⁷Cs, ¹³¹I, ⁴⁰K, ²²⁶Ra, ²³²Th), ppm (²²⁶Ra, ²³²Th), % (⁴⁰K)

Multifunction portable spectrometer's scope of use:

- Content determination of ⁴⁰K, ²²⁶Ra, ²³²Th natural radionuclides
- Measurement of surface and specific activity of artificial radionuclides ¹³⁴Cs and ¹³⁷Cs in soil and under soil with in situ measurement geometry (in places of natural occurrence without preliminary sampling) with automatic thickness determination of soil layer contaminated by radionuclides
- Measurement of specific activity of ¹³⁷Cs, ¹³⁴Cs, ¹³¹I in water, foodstuffs, agricultural and forestry products
- Identification of radionuclides
- Measurement of ambient gamma radiation dose equivalent rate on objects of radiation monitoring

No sampling is necessary for all measurements.

Internal GPS-receiver provides measurement data geo-referencing function.



Detection device in a shock-resistant, dust-and-moisture-proof container registers gamma radiation of controlled radionuclides.

Detection device sends spectrometric data to hand-held PC (Tablet PC) by wireless communication channel for displaying on screen.

Instrumental spectra processing algorithm in hand-held PC (Tablet PC) software is capable to display radioisotope composition data as specific or surface activity of certain radionuclides or their concentration, specific effective activity of natural radionuclides.

Version with Tablet PC can display measurement results with GPS-referencing.

Ambient gamma radiation dose equivalent rate value in inspection point is determined by instrument spectrum analysis with "spectrum-dose" operational function.

Radioactive anomalies are searched in integral count rate measurement mode.



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INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR MEASUREMENTS AND RADIATION MONITORING

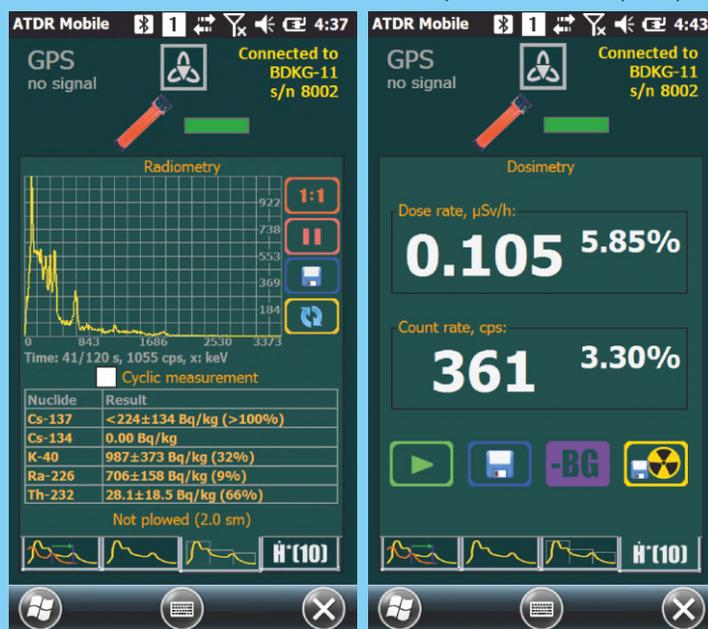
AT6101DR Spectrometer

Specification

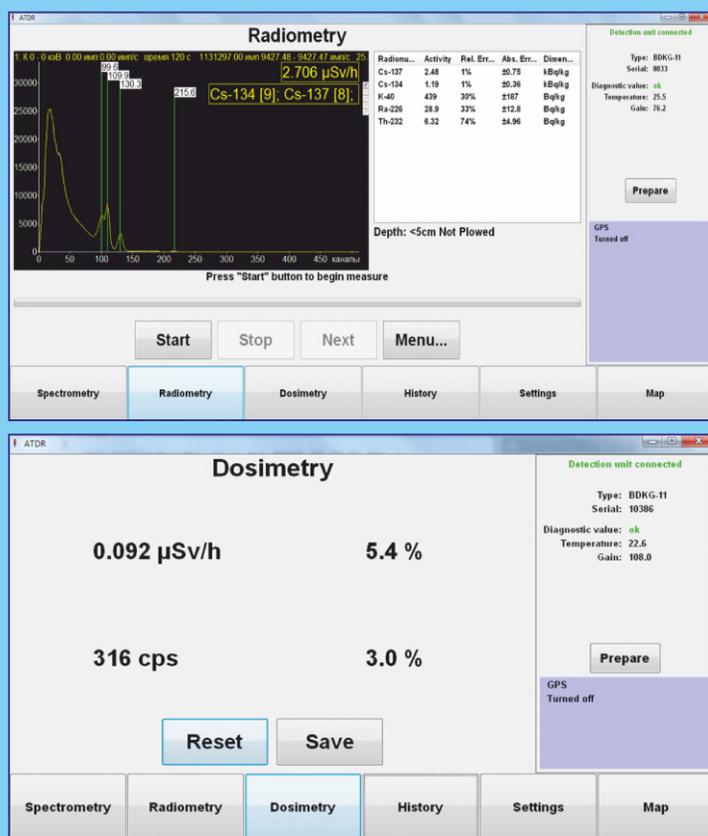
Gamma radiation detector	Scintillator NaI(Tl) Ø63x63 mm
Energy range	50 keV – 3 MeV
Activity measurement range	
<i>Geometry: 2π</i>	
Surface activity of ¹³⁴ Cs and ¹³⁷ Cs	4 – 3700 kBq/m ² (0.1 – 100 Ci/km ²)
Specific activity of ¹³⁴ Cs and ¹³⁷ Cs by in situ method	50 – 10 ⁶ Bq/kg
Specific effective activity of ⁴⁰ K, ²²⁶ Ra, ²³² Th	100 – 10 ⁴ Bq/kg
<i>Geometry: 4π</i>	
Specific activity of ¹³⁴ Cs and ¹³⁷ Cs	50 – 10 ⁶ Bq/kg
Specific activity of ¹³¹ I	30 – 10 ⁶ Bq/kg
Specific effective activity of ⁴⁰ K, ²²⁶ Ra, ²³² Th	50 – 10 ⁴ Bq/kg
Limit of intrinsic relative error of activity measurement	±20%
Typical resolution at 662 keV (¹³⁷Cs)	8%
Maximum input statistical load	≥5 · 10 ⁴ s ⁻¹
Number of ADC channels	1024
Ambient gamma radiation dose equivalent rate measuring range	0.03 – 130 μSv/h
Limit of intrinsic relative error of dose rate measurement	±20%
Typical sensitivity to gamma radiation	
²⁴¹ Am	11600 cps/(μSv·h ⁻¹)
¹³⁷ Cs	2200 cps/(μSv·h ⁻¹)
⁶⁰ Co	1200 cps/(μSv·h ⁻¹)
Response time for dose rate change from 0.1 to 1 μSv/h (accuracy error ±10%)	<2 s
Integral nonlinearity	±1% max.
Operation mode set up time	1 min
Continuous work time in normal conditions	≥9 h
Measurement instability during continuous service	≤1%
Burn-up life	≥100 Sv
Protection class	IP67
PC Interface	USB
Operating temperature range	-20°C to +50°C
Relative humidity with air temperature ≤35°C without condensation	≤95%
Overall dimensions, weight	
Detection device	Ø130x500 mm, 4.5 kg
Hand-held PC	4.7"
Tablet PC	10"

Design and specifications are subject to change without notice

"ATDR mobile" Software Main operation modes (HPC)



"ATDR" Software Main operation modes (Tablet PC)



The spectrometer complies with: GOST 27451-87, Safety requirements of IEC 61010-1:2010, EMC requirements of EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008, IEC 61000-4-4:2004, IEC 61000-4-5:2005, IEC 61000-4-6:2008, IEC 61000-4-11:2004



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