

# AT6101DR Spectrometer



**Radiation background measurement and no-sampling radiometry**



**Radionuclide Identification:**  
 $^{134}\text{Cs}$ ,  $^{137}\text{Cs}$ ,  $^{131}\text{I}$ ,  $^{40}\text{K}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$

## 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  $^{137}\text{Cs}$  and  $^{134}\text{Cs}$  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  $^{40}\text{K}$
- 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 ( $^{134}\text{Cs}$ ,  $^{137}\text{Cs}$ ,  $^{131}\text{I}$ ,  $^{40}\text{K}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$ ),  
 ppm ( $^{226}\text{Ra}$ ,  $^{232}\text{Th}$ ),  
 % ( $^{40}\text{K}$ )

Multifunction portable spectrometer's scope of use:

- Content determination of  $^{40}\text{K}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  natural radionuclides
- Measurement of surface and specific activity of artificial radionuclides  $^{134}\text{Cs}$  and  $^{137}\text{Cs}$  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  $^{137}\text{Cs}$ ,  $^{134}\text{Cs}$ ,  $^{131}\text{I}$  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

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## Specification

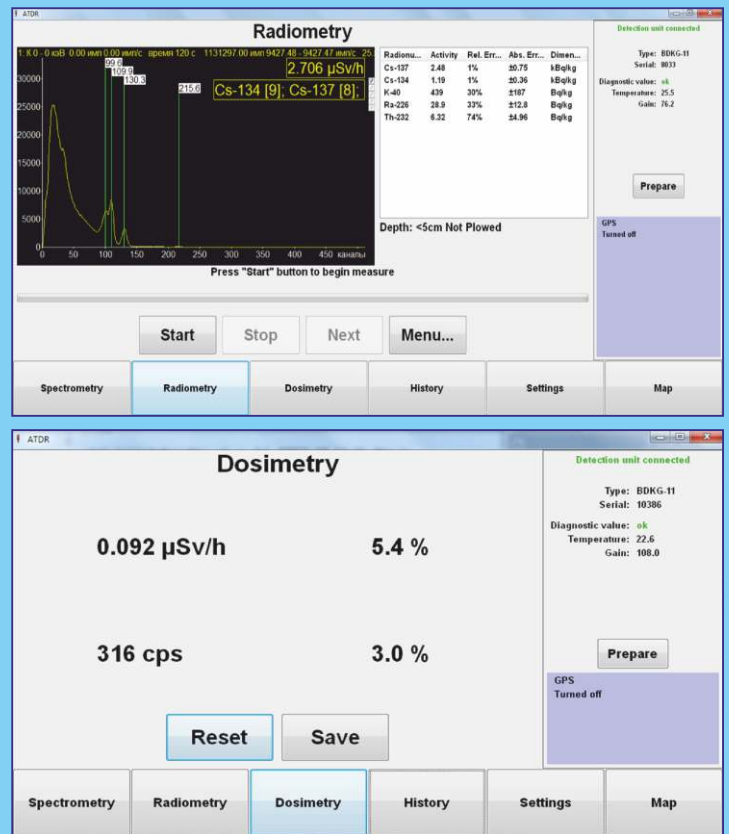
<b>Gamma radiation detector</b>	Scintillator NaI(Tl) Ø63x63 mm
<b>Energy range</b>	50 keV...3 MeV
<b>Activity measurement range</b>	
<i>Geometry: 2π</i>	
Surface activity of <sup>134</sup> Cs and <sup>137</sup> Cs	4 – 3700 kBq/m <sup>2</sup> (0.1 – 100 Ci/km <sup>2</sup> )
Specific activity of <sup>134</sup> Cs and <sup>137</sup> Cs by in situ method	50 – 10 <sup>6</sup> Bq/kg
Specific effective activity of <sup>40</sup> K, <sup>226</sup> Ra, <sup>232</sup> Th	100 – 10 <sup>4</sup> Bq/kg
<i>Geometry: 4π</i>	
Specific activity of <sup>134</sup> Cs and <sup>137</sup> Cs	50 – 10 <sup>6</sup> Bq/kg
Specific activity of <sup>131</sup> I	30 – 10 <sup>6</sup> Bq/kg
Specific effective activity of <sup>40</sup> K, <sup>226</sup> Ra, <sup>232</sup> Th	50 – 10 <sup>4</sup> Bq/kg
<b>Intrinsic relative error of monitored radionuclide concentration measurement</b>	±20% max.
<b>Typical resolution at 662 keV (<sup>137</sup>Cs)</b>	8%
<b>Maximum input statistical load</b>	≥5·10 <sup>4</sup> s <sup>-1</sup>
<b>Number of ADC channels</b>	1024
<b>Ambient gamma radiation dose equivalent rate measuring range</b>	0.01 – 130 μSv/h
<b>Intrinsic relative error of ambient gamma radiation dose equivalent rate measurement</b>	±20% max.
<b>Sensitivity to gamma radiation</b>	
<sup>241</sup> Am	11600 cps/μSv·h <sup>-1</sup>
<sup>137</sup> Cs	2200 cps/μSv·h <sup>-1</sup>
<sup>60</sup> Co	1200 cps/μSv·h <sup>-1</sup>
<b>Response time for dose rate change from 0.1 to 1 μSv/h (accuracy error ≤±10%)</b>	<2 s
<b>Integral nonlinearity</b>	±1% max.
<b>Operation mode set up time</b>	1 min
<b>Continuous work time in normal conditions</b>	≥9 h
<b>Measurement instability during continuous service</b>	≤1%
<b>Burn-up life</b>	≥100 Sv
<b>Protection class</b>	IP67
<b>PC Interface</b>	USB
<b>Operating temperature range</b>	-20°C...+50°C
<b>Relative humidity with air temperature ≤35°C without condensation</b>	≤95%
<b>Overall dimensions, weight</b>	
Detection device	Ø130x500 mm, 4.5 kg
Hand-held PC	4.7"
Tablet PC	7" / 10"

Design and specifications are subject to change without notice

## "ATDR mobile" Software Main operation modes (HPC)



## "ATDR" Software Main operation modes (Tablet PC)



Spectrometer meets Safety standard requirements:  
IEC 61010-1:2001  
EMC requirements:  
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.

Spectrometer has the pattern approval certificates of Republic of Belarus, Russian Federation, Kazakhstan, Uzbekistan, Azerbaijan.



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