CFP

Innovator In Spectroscopy Equipment

SPECT2113

ANALYSIS

Radionuclide library:

NORM: ^{40}K, ^{232}Th, ^{nat}U
SNM: ^{233}U, ^{235}U, ^{27}Np, Pu
INDS: ^{152}Eu, ^{22}Na, ^{57}Co, ^{60}Co, ^{133}Ba, ^{137}Cs, ^{192}Ir, ^{204}Tl, ^{226}Ra, ^{241}Am
MED: ^{67}Ga, ^{51}Cr, ^{75}Se, ^{99m}Tc, ^{103}Pd, ^{111}In, ^{123}I, ^{125}I, ^{131}I, ^{201}Tl, ^{133}Xe

Specification

DRR: 0 to 200µSv/h
E. Range: 20-3000 keV
RES: 6.9% @137Cs
CV%: Meet ANSI N42.33-2006, CEI/IEC 1239

DIGITAL PORTABLE SPECTROMETER MODEL SPECT2113 (ANALYSIS)

C E

w w w . c f p . c o . i r

CATALOG

α β γ χ
SPECT
SPECTROMETER

FREE DOWNLOAD

DIGITAL PORTABLE SPECTROMETER
MODEL SPECT2113 (Analysis)

Features

- Built-in analysis software.
- Large full color 4.3-inch display.
- Extreme sensitivity to gamma-rays.
- Fast and accurate analysis procedure.
- Radioisotope library with 28 elements.
- Energy compensated scintillation survey meter
- KML output for GIS software (Optional).
- Geometry settings for increased accuracy.
- Audio output with the adjustable threshold.
- NaI(Tl) scintillator with high detection efficiency.
- Accurate analysis based on customized decision tree.
- Element category detection (NORM, Industrial, SNM and Medical).

- No radioactive sources required for proper operation.
- Integrated GPS module for absolute timing and localization of data.
- Continuous operation under severe environmental conditions.
- Automatic logging of scan data with GPS-referencing for further analysis.
- Auto-stabilizing in different environmental conditions.
- Recording and storing measurement and analysis results.
- Capability of connecting to PC over USB for data transfer.

FAST AND ACCURATE GAMMA ANALYSIS
BASED ON ANSI LIBRARY

Description

The SPECT2113-Analysis is a general purpose spectrometer and analyzer. The device is equipped with a high detection efficiency NaI(Tl) scintillator suitable for fast detection and analysis. SPECT2113-Analysis can be used in different applications such as exploration and mining, fast and accurate analysis tests, radiopharmaceutical analysis and inspection, homeland security inspections, secondary inspection at radiation portal monitors, environmental monitoring and protection, etc.

SPECT2113-Analysis is dust protected and can withstand streaming water which makes it a suitable option for different environmental conditions. The device is equipped with audible sound alarm corresponding to the environmental dose rate.

SPECT2113-Analysis comes with an embedded analysis software with 28-radioelement library. The library consists of different categories of elements including naturally occurring radioactive material (NORM), Industrial, Medical and special nuclear material (SNM). SPECT2113-Analysis can automatically determine the energy peaks in the acquired spectrum, and based on an intelligent hierarchical algorithm and decision tree, it determines the elements presented in the environment. The device comes with different options for source geometry which is then used for evaluating the radioactivity. SPECT2113-Analysis can also calculate the dose corresponding to each found element radioactivity.

The spectrometer can be stabilized in any environment including environment with naturally occurring radioactivity or environment containing different radioactive sources.

SPECT2113-Analysis supports two working modes, namely search mode and analysis mode. In the search mode, the device stores the measurements and results including dose rate, count rate, GPS info, analysis result, etc. in 1-second intervals. The resulting file has log extension. In the analysis modes, the user defines an analysis time (T) and repetition number (R) and the device accumulates the spectrum for the T seconds and evaluates the results for the acquired spectrum. This result is stored in a file with MCA extension which includes the spectrum data too. This procedure is repeated for R times.

Specifications

Input(s)
Power Jack
19V (2A) DC adaptor
USB
5V DC for PC communication

Output(s)
USB
5V DC for PC communication

Control(s)
Power
Power push button to turn PC on or off
Function Key

Four push button function keys (thumb activated)

Indicator(s)
power
Power on indicator
Battery status in 3 color (red, orange, green)
Ring
Green ring

Sound Alarm
Audio via miniature speaker
Variable audio threshold set point
Audio voice proportional to the count rate

Light Alarm
Main menu: Red blinking text box
Graph menu: Graph color change

Display
Large Full Color Graphic LCD
4.3", 800 x 480 pixels
Easily view log files with no need to connect to a computer

Analysis Library
Naturally occurring radioactive material (NORM)
K-40, Th-232, U-238
Special nuclear material (SNM)
Np-237, Pu-238, Pu-240, U-233, U-235
Industrial radioactive materials
Am-241, Ba-133, Co-57, Co-60, Cs-137, Eu-152, Ir-192, Na-22, Ra-226,
Medical radioactive materials
Cr-51, Ga-60, I-123, I-125, I-131, In-111, Pd-103, Se-75, Tc99m, Tl-204, Xe-133

Performance
Energy resolution
<7.5% FWHM @ 662 KeV – Typ. <7%
Count Rate
Maximum 250,000 CPS

Readout	
Search Mode	Count rate, GPS information, Analysis result, Dose rate, etc.
Analysis mode	Spectrum, Hardware parameters, Count rate, GPS information, Analysis result, Dose rate, etc.

Gamma Sensitivity
0.5 nSv/h CPS

Energy Range
20 - 3000 KeV

Internal Sampling
20 /second

Coefficient of Variation (CV)
3.80% @ 150 CPS
1.94% @ 500 CPS
1.23% @ 1500 CPS
0.50% @ 5000 CPS

0.49% @ 15000 CPS	
Detector	
gamma	
NaI(Tl), 2" x 2" (∅ x H) cylindrical	
PMT	
14-pin 10-stage PMTs	
Data Acquisition and Analysis	
OS (Interface software)	
Built in Windows 7 or higher versions	
Software	
SPECT2113 (SOFTWARE)	
Measurement/Spectrum	
High Voltage	
0-1200V, Positive, 12 Bit resolution	
Energy Calibration	
Auto calibration	
Linear calibration	
Auto-stabilization	
ADC	
Channels	
12bit in 4096Ch @20MHz FRQ	
Conversion time	
50nsec	
Digital Signal Processing	
12-bit and 20 MHz ADC	
CSP with gain:10 – 150mV/pC (selectable)	
Amplifier coarse gain: (x1 to x150) in 15 step	
Amplifier fine gain: (0 - x2) in 65536 step	
Integration time (0 to 0.819ms) @80MHz in 0-65536 step	
Trigger threshold software adjustment (0 to 100% scale) in 1024 step	
Software fine tuning of the Pole-Zero cancellation	
Software gain stabilization	
Pile-up rejection and Live Time correction	
Baseline restorer with programmable averaging	
Battery	
Standard	
Internal battery pack module (6 cell Li-ion)	
Rechargeable Life: over 6-7 hours at 20°C in full performance	
At least 500 times at more than and 80% of the initial capacity	
Around 5 years or at least 2000 charging cycles	
Backup	
Backup battery pack kit (4 cell Li-ion)	
Life: over 5-6 hours at 20°C in full performance	
Device	
11-12 hour Standard and backup battery life	
Memory	
Huge 40GB SSD	
Storage unlimited Total Count, Scan, Assay, plus full spectrum in 32bit × 4096	

Certificate	
CE	
Compliant to IEC 61010-1:2010	

This Certificate of Compliance can be checked for validity at https://cfp.co.ir/download.ashx?file=Digital-Portable-Spectrometer-SPECT2113-CE.pdf

Application

- Core scanning.
- Laboratory analysis.
- Emergency situations.
- Dose rate measurement.
- Radioactive waste control.
- Customs and border control.
- Scientific Research activities.
- Accurate inspection of lading.
- Nuclear medicine and industry.
- Safe disposal of nuclear waste.
- Unattended/Remote Monitoring.
- Healthcare.
- Environmental waste monitoring.
- Port and Border Law Enforcement.
- Radiation monitoring and mapping.
- Geological and raw material survey
- Artificial radiation sources identification.
- Radiation monitoring in building industry.
- Exploration of different radioactive materials.
- Determination of radioactivity and dose rate of different elements.
- Construction material and products feature measurements.

Electrical, Mechanical and Environmental

Power required	
Standard version +19V (2A) DC adaptor	
Physical	
Dimensions	package style: 450 x 350 x 200 mm (L x W x H)
	spectrometer: 278 x 147 x 166 mm (L x W x H)
Weight	without batteries: 1.9 kg
	with batteries: 2.81 kg
	Shipping: 10 kg (Hard case package)
Storage temperature	-20°C to 50°C
Operating temperature	-20°C to 50°C.
Relative Humidity	RH levels of up to 93% at an ambient temperature of 35 °C
Mechanical	Unit: mm
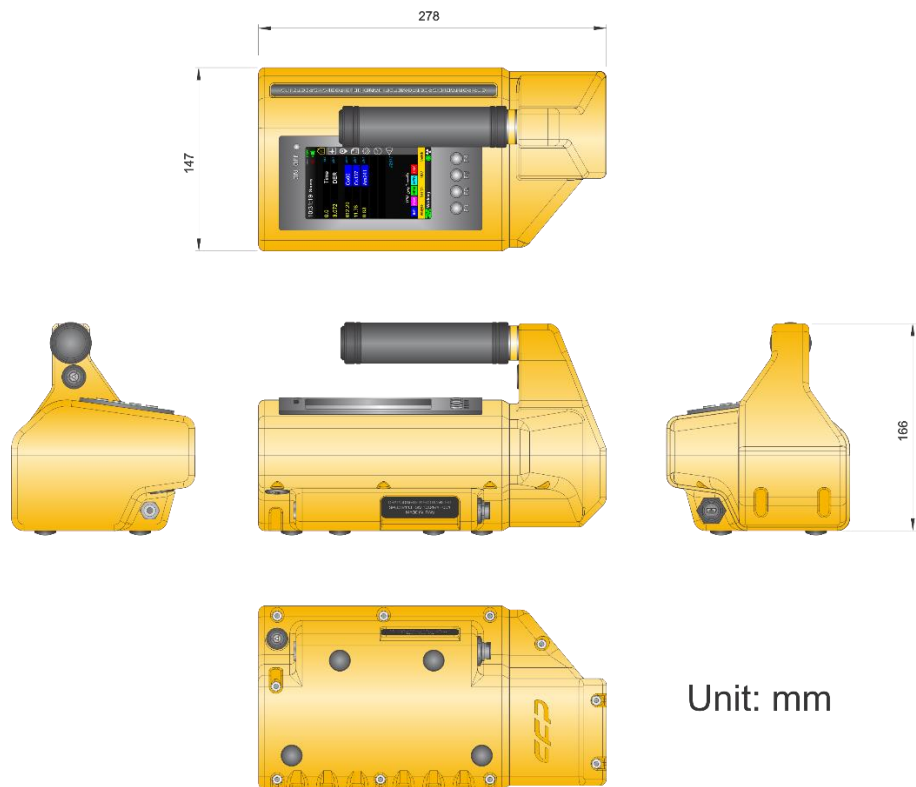
SPECT2113-Analysis-Mechanical.

Software and user interface

Device GUI

SPECT2113-Analysis can be used standalone using the companion 4.3-inch display. Some of the panels of the device GUI are mentioned below.

Figure 1: MAIN panel: Presenting analysis results, total rate, date, time, working mode, battery, alarm, GPS status and element result with appropriate color including industrial group (IND), special nuclear material (SNM), naturally occurring radioactive material (NRM), Medical (MED) and Unknown (UNK).

Figure 2: Graph panel: Presenting real-time gamma spectrum data with peak position marking in the first mode and the second mode showing survey data graph with threshold level (Figure 3).

Figure 4: GPS panel: GPS status with speed.

Figure 5: LOG panel: Visualize files and folders in the device storage.

Figure 6: Setting panel: Analysis, survey and device settings with device description.

Figure 7: Date/Time panel: Adjusting date and time with auto update option via GPS data.

Figure 8: Geometry panel: Point source @15cm, 10cm, 5cm, 0cm and an infinite source.
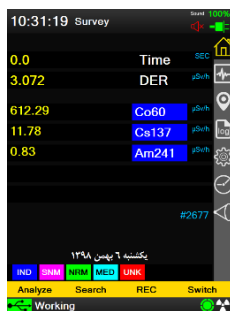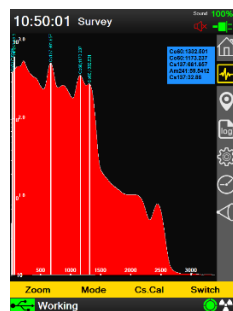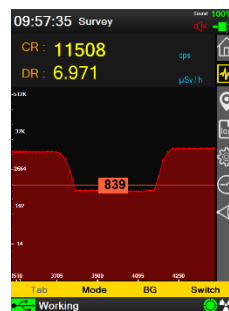
| Figure 1 | Figure 2 | Figure 3 | Figure 4 |

| Figure 5 | Figure 6 | Figure 7 | Figure 8 |
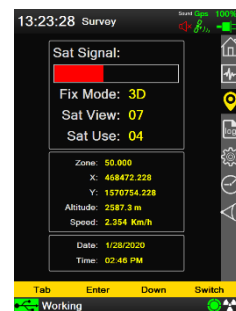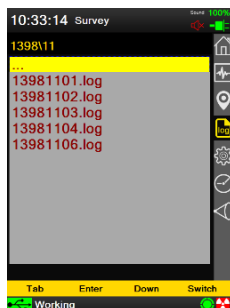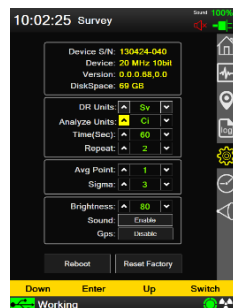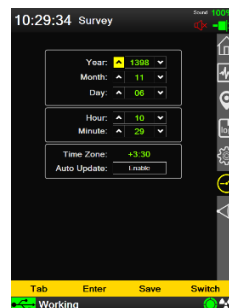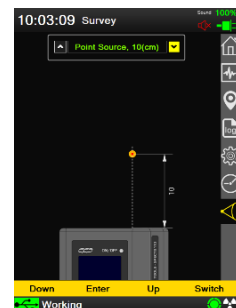
SPECT2113-Analysis GUI

PC software
SPECT2113-Analysis (SOFTWARE)
SPECT2113-Analysis is provided with utility software to download the data stored in internal memory. All the stored files including log, MCA and GPS related files can be transferred to the PC via USB. The program also gives graphical and numerical views of the data. The raw data (4096 channel) can also be transferred as a text file for further processing.
Input /Output (Using supplied CFP-Analysis software)
USB
Data Output formats
CSV, TXT, MCA, LOG

Software main window.

Graphical view of Cesium-137 spectrum.

Ordering info

Standard package includes

Part #	Image	Description
SPECT2113-Analysis		Portable digital spectrometer NaI(Tl) crystal 2"x2".
ACCE2113001		User guide CD (1 Pack).
ACCE2113003*		Guaranty (one year).
ACCE2113007		Hard case with foam inserted.
ACCE2113011		Car kit battery charger (1 pack).
ACCE2113012		Adaptor and charger.
ACCE2113015		Cable USB 2.0 (A) to Mini USB (B) Cable.

* We support our products and guarantee your satisfaction in the quality of our instruments by providing a complete one-year warranty covering any defect of workmanship, material, and/or design. If our products do not perform, we will provide complete repair and/or replacement. For guaranty conditions, please refer to device manual (SPECT2113-Analysis Manual).

Optional accessories and services

Part #	Image	Description
ACCE2113004		Installation.
ACCE2113005		Training.
ACCE2113006**		Re-Calibration (Interval) services. 1year factory maintenance suggested.
ACCE2113013		Battery charger (1 pack).
ACCE2113014		Backup battery.
ACCE2113016		Single-ended sealed mini USB cable, Type A Plug to Mini Type B Plug, 2m length.
ACCE2113017		USB to USB extenuation Cable 10,15, 20, 30 meters.
ACCE2113018		Remote reader Software.

** The proper maintenance & calibration of your instruments is critical to ensure proper performance & accuracy. for Re-calibration (Interval) services, please call with CFP company (021- 46045383).