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EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer



Precision Instruments, Skyray Elaborates

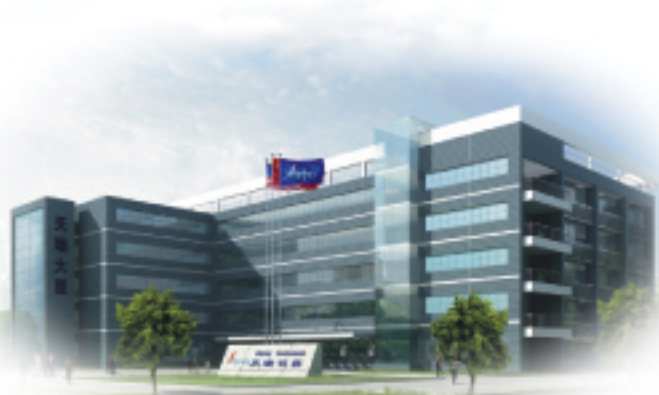


EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

Skyray Skyray Instrument

Company Profile



Established in 1992, Skyray Instrument Inc specializes in the development, manufacture, sales and support of X-ray Fluorescence Spectrometers. XRF technology is characterized as rapid, accurate and non-destructive. XRF analyzers can be used in areas requiring elemental analysis from Na to U, e.g., electronic and electric appliances (RoHS), jewelries and ornaments (precious metals, plating thickness), toy safety (EN71-3), building materials (cement, glass, ceramic), metallurgy (steel, non-ferrous metals), petroleum (trace elements S, Pb, etc), chemistry, geography, commodity inspection, quality control and even human body trace elements analysis. Up to now Skyray has won two World's No.1 titles: No. 1 in Sales Amount and No. 1 in Product Categories.

EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

The 3rd and 4th generation of Handheld X-ray Fluorescence Spectrometers i.e. EDX-Pocket-III and EDX-Pocket-IV are to be put on the market soon. They are improved on basis of the 2nd generation. They have the features of more functions, better accuracy and simpler operation. Their introduction makes on-site elemental analysis practical and feasible.



EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

Application Fields:



EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

Specifications:

- Working principle: XRF analysis using X-ray fluorescence Spectrometry
- Measurable elements: Ti-Bi
- Detector: advanced electric-cooling Si-PIN semiconductor X-ray detector with high performance and high energy resolution
- Excitation source: mini 40kV/50µA X-ray tube, Ag anode
- Data display: high definition and high resolution PDA (Personal Digital Assistant), Windows CE operating system, Bluetooth communication, personal data handling and e-mail sending.
- Data storage: Large capacity SD card and SD card reader enable the data to store on PC and print out
- Power supply: operating time of two fully-charged Lithium batteries is 8 hours
- Weight: 1.35 kg
- Overall size: 260×25×25mm (L×H×W)
- Ambient environment: temperature -20℃-50℃; humidity <85%
- Safety: both PDA and software operations require passwords. Unauthorized people are not allowed to operate.
- Standard accessories: shock, pressure & water-proof carrying case with padlocks, 110v/220v general-purpose charger, large capacity SD memory card, SD card reader, two 4000mAh Lithium batteries, Lithium battery charger, PDA accessories, lab test stand (optional), etc.

EDX-Pocket-III

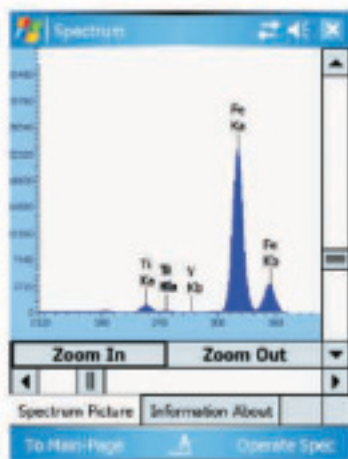
Handheld X-ray Fluorescence Spectrometer

Main characteristics:

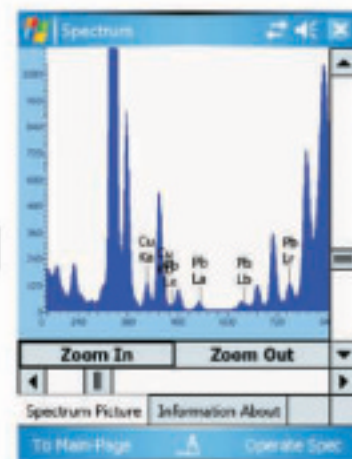
- The instrument is small, light and portable, providing rapid and non-destructive analysis of the tested samples on the site.
- Figurative interface, flexible software operation, intuitive spectrum display and definite results
- Several working curves are provided in the software, which can even be edited and renewed upon test requirements.
- Optional GPS helps locate the tested sample when mining or surveying in the field.
- SD card with super large capacity is available. There is no limit of data storage.
- Attractive design and comfortable feel when held in hand
- The carrying case has high strength and high sealing capacity, drop and shock proof as well.
- Faster analysis and better accuracy, delivering lab-quality results
- Measurable elements: Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Mo, Sn, Hf, Ta, W, Re, Pb, Bi, Se, Sb, Pb, Au and Hg
- Application fields: RoHS screening; full-element analysis; analyzing alloy steel, stainless steel, tool steel, Chrome-Molybdenum Steel, Nickel alloy, Cobalt alloy, Nickel-Cobalt heat-resistant alloy, Titanium alloy, Copper alloy, Bronze, Zinc alloy and Tungsten alloy; Grade identification of light Aluminum and Magnesium alloys by measuring other alloy elements.

EDX Pocket III Test Example and Analysis

An Introduction to Minerals Analysis



▲ Vanadium-Iron sample GBW07224



▲ Sediment sample GBW07318



Element	Intensity	Content
Cr	5.11	0.0243
Fe	355.955	11.9
Mn	9.909124	0.0007
Cu	9.690593	0.0011
Zn	48.669674	0.0365
Ba	8.81	0.076
Pb	5.78	0.0066
V	4.865	0.029
Zr	27.215	0.0524
As	1.505	0.00329

▲ Measurement results

● There is a wide range of samples in the geographic and mineral industries: rocks, soil, sediment, ores, etc. They have complicated compositions and require rapid and accurate qualitative and quantitative analysis on the site or in the field. Besides, if tests are to be carried out before large-scale production, they must produce results as quickly as possible. Therefore, two features are ascribed to this industry: sample complexity and measurement rapidness.

The major compositions of the ores are Fe, Ba, Zr, and Ca.

EDX Pocket III Application fields

An Introduction to Minerals Analysis

EDX Pocket III Handheld X-ray Fluorescence Spectrometer features rapid identification of mineral categories, auto qualitative and quantitative analysis of multi elements, different test options, free and unlimited adding of test modes and in-built intensity correction mode correcting deviation caused by different geometric shapes or uneven structural density. It is widely used in geography, metallurgy, rare earth, petroleum, environment monitoring, non-ferrous metals, food, agriculture, research institutes, colleges and mining enterprises.



▲ Ore tail analysis



▲ Crude ore and ore concentrates analysis



▲ In-field minerals exploration and survey

Applied to:

- Mineral exploration and survey
- In-situ inspection of rocks, soil, sediments and ores
- Drawing of atlas of mineral resources
- Analysis of crude ore, ore concentrates and tails in washing process
- Determination of grade of ores during the purchase of crude ores and ore concentrate
- In-field measurement of archeology

EDX-Pocket-III

Handheld X-ray Fluorescence Spectrometer

Skyray Skyray Instrument

EDX-Pocket Features

- ◆ Same performance and reliability as the bench-top spectrometers due to combined use of low-power integrated mini X-ray tube and large area Be-window electric-cooling Si-Pin detector with the former having low power consumption but high excitation efficiency.
- ◆ Small, light and convenient for work in the field. Anytime and anywhere on-site or in-situ analysis.
- ◆ High resolution PDA(640*480), coupled with mini multi-channel analyzer in Bluetooth communication, keeps the measurement data in hands under any circumstances.
- ◆ Adapt to rapid analysis in handheld mode or long time precise test in stand mode.
- ◆ The instrument is proof against water and dust and operable in high temperature and high humidity surroundings. Besides, the design of the protective case consists with that of the military supplies: moisture, shock and pressure proof.
- ◆ Professional software designed for tests of mineral elements characterized by high sensitivity, short measurement time, simple operation and low requirements of operators.
- ◆ Rapid identification of mineral categories, auto qualitative and quantitative analysis of multi elements, different test options, free and unlimited adding of test modes and in-built intensity correction mode correcting deviation caused by different geometric shapes or uneven structural density.
- ◆ One battery's operating time of 4 hours and three batteries in supply guarantees us the test in any time and at any place. Solar or car charger is optional.

Configurations

- ◆ PDA
- ◆ Si-PIN semiconductor detector
- ◆ Amplifier circuit
- ◆ X-ray tube and high and low power supplies
- ◆ Professional minerals analyzing software in PDA version
- ◆ Support to Handheld Spectrometer (optional)
- ◆ Backup battery and adapter (AC and DC)
- ◆ Sample cup and manual press
- ◆ Protective case



Main Application Fields

- ◆ Mineral exploration and survey.
- ◆ In-situ inspection of rocks, soil, sediments and ores.
- ◆ Drawing of atlas of mineral resources.
- ◆ Analysis of crude ore, ore concentrates and tails in washing process.
- ◆ Determination of grade of ores during the purchase of crude ores and ore concentrates.
- ◆ On-site analysis in hydrologic survey and archeology.

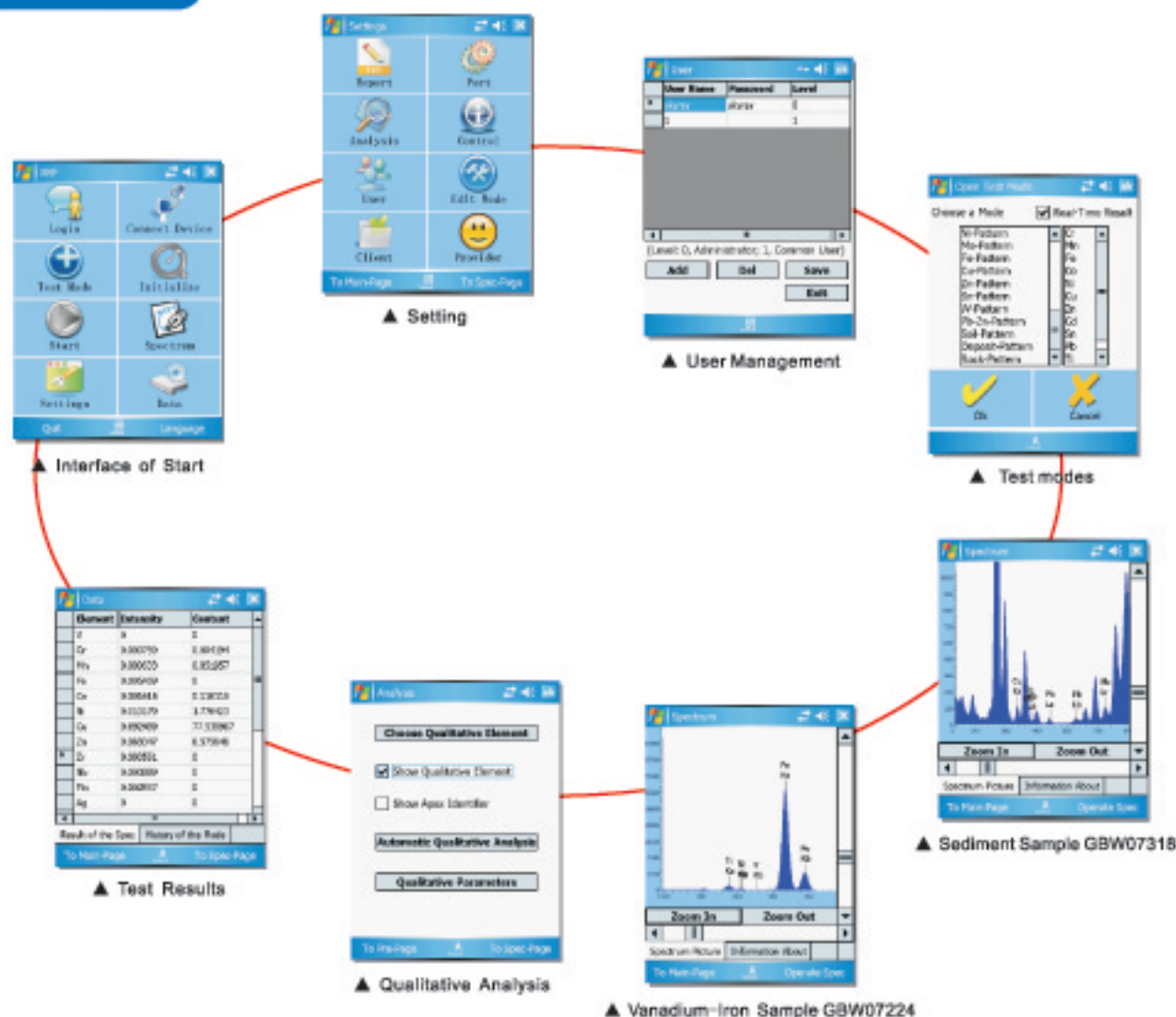


▲ On-site Inspection

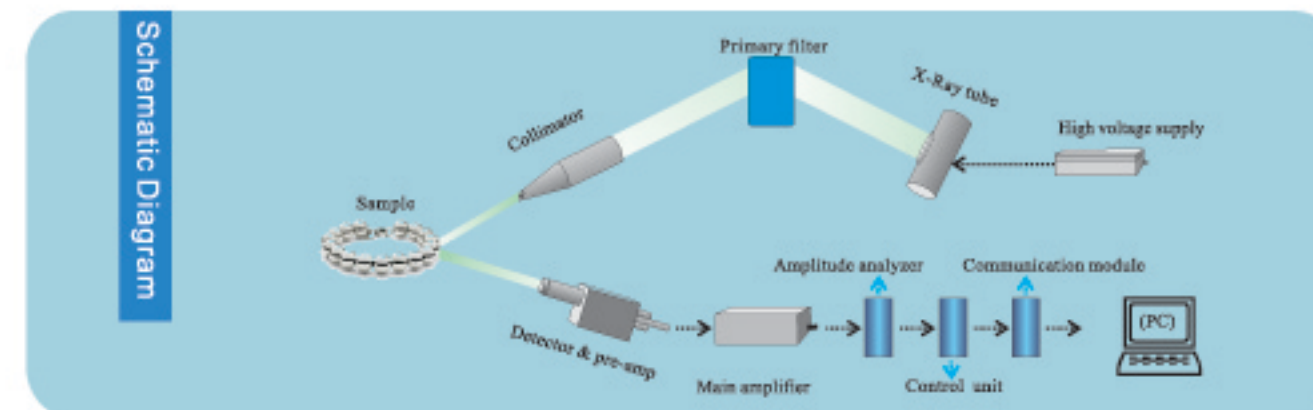
Main Specifications

- ◆ Model: EDX-Pocket Series Handheld X-ray Fluorescence Spectrometer
- ◆ Detector: electric-cooling Si-PIN detector
- ◆ Excitation source: 40KV/50uA-Ag anode end window integrated mini X-ray tube
- ◆ Measurement time: 10-200s (handheld or in stand mode)
- ◆ Forms of objects: solid, liquid or powder
- ◆ Measurable elements: S-U
- ◆ Ability of simultaneous analysis: up to 24 elements
- ◆ Detection limit: 0.001%~0.01%
- ◆ Correction mode: Ag
- ◆ Safety: administrator mode with in-built password at which data can be saved at any time
- ◆ Data storage: stored in computer for printing out. Massive storage card is supplied.
- ◆ Battery rundown time: 4 hours
- ◆ Weight: 1.47 Kg (with PDA and battery) ; 1.2 Kg (without PDA and battery)
- ◆ Ambient temperature: -10℃ - +50℃
- ◆ Ambient humidity: up to and including 90%

Example



Working Principle



Characteristic X-radiation of element

Each element will emit X-ray at its own energy level when excited. This X-ray is characteristic and called X-ray fluorescence. It is the foundation of analysis.

Scattering

It is the background of spectrum.

Photoelement

The photoelectron is the foundation of detector. In the sample, the X-ray intensity of every element is expressed as $I_1, I_2, I_3, I_4, \dots$ respectively. The element content C is the function of X-ray fluorescence intensity I , expressed as follows:

$$C = f(I_1, I_2, I_3, I_4, \dots)$$

This equation is too complicated and can be simplified as:

$$C = K_1 I_1 + K_2 I_2 + K_3 I_3 + K_4 I_4 + \dots$$

Where

C is the element content in the sample; $I_1, I_2, I_3, I_4, \dots$ are X-ray intensity of element respectively; $K_1, K_2, K_3, K_4, \dots$ are coefficients which can be determined by measuring known standard sample to calibrate.

The main strengths of EDX-Pocket Series

- ◆ Rapid: just a few minutes is taken to test the mineral elements.
- ◆ Non-destructive: no physical or chemical destruction is caused to the sample after the test.
- ◆ Accurate: ppm precision, a reliable data index.
- ◆ Intuitive: real-time spectrum to show the content of the minerals in the sample.
- ◆ Light: the inconvenience of operation greatly minimized.
- ◆ Easy: simple operation and low requirement of the operator.
- ◆ Safe: powerful Bluetooth connection, remote control enabled.

Typical Customers

No.	Name of Customers	Application Fields
1	National Research Center for Geoanalysis	Mineral survey in Tibet
2	Indonesia PT Harum Resources	Ferro-Nickel test
3	Sinomine Resource Exploration Co.,Ltd.	Determine grades of ores