SIGNAL GEOFÍSICA LTDA
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ARMT-5 — 5-channel 16/24-bit broadband EM system

Main features:

- Large set of methods
- Frequency bandwidth 0.1 Hz–1 MHz
- 5 channels of registration
- Programmable external amplifiers
- Built-in data processing and visualization
- Automatic calibration

ARMT-5 system is designed for implementation of a variety of electromagnetic survey methods: AMT, CSAMT, CSEM, RMT, CSRMT. Its wide frequency range (0.1 Hz–1 MHz) makes it possible to apply this tool to explore depths from first meters up to several kilometers for a wide range of purposes.

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ARMT-5 recorder allows visualizing data in real time in both time and frequency domains. For quality control, a robust estimator of tensor and scalar transfer functions (impedance and tipper) is built-in. The receiver has several useful features for a controlled source EM exploration. The receiver is equipped with a built-in sine signal generator for automatic calibration (including calibration of magnetic sensors) and programmable external amplifiers for magnetic and electrical sensors (gain: 1–256). Thanks to sophisticated functionality, application of the most up-to-date element base, high-quality connectors and case, large color screen, fast interfaces for downloading data from an SSD drive, and other technical solutions, ARMT-5 can be considered the most modern, convenient and versatile broadband electromagnetic tool.

A range of induction magnetic sensors are available for the ARMT-5:

- ARMT-HF with operating frequency range 1–1 000 kHz
- ARMT-MF with operating frequency range 20–20 000 Hz
- ARMT-LF with operating frequency range 0.1–20 000 Hz

Magnetic MF and HF sensors are placed in a single plastic container with a bubble level and a display for digital compass in its upper part. Antennas ARMT-LF can be additionally equipped with portable precision tripods, allowing fast and accurate installation of sensors on any surface.

The estimated penetration depth of the ARMT-5 complex is presented in the table below. It depends on the frequency of the signal and the average electrical resistivity of the investigated section:

		Frequency (f), Hz							
		0,1	1	10	100	1 000	10 000	100 000	1 000 000
Resistivity (ρ), Om·m	1	1 600	500	160	50	16	5	1,6	0,5
	10	5 000	1 600	500	160	50	16	5	2
	100	16 000	5 000	1 600	500	160	50	16	5
	1 000	50 000	15 800	5 000	1 600	500	160	50	16

An important feature of the complex is the high execution speed of observations when performing shallow studies due to implementation of automated and remote control of a controlled source (generator) over a radio channel. For example, it takes only about two minutes to perform measurements with frequencies from 100 Hz and above, taking into account the time for laying out and assembling the measuring equipment on site. Such a speed of data acquisition is unattainable for other complexes and methods. For example, to perform VES at depths of about 300–500 m, it takes about half an hour, which is 10–20 times longer than working with ARMT-5. It is also important to understand that the inversion of ARMT-5 data can be performed in both 1D and 2D variants, and the interpretation

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of VES data is carried out only within the framework of a 1D model, which leads to an increase in the error in constructing a geoelectric section in a complex medium.

The high-impedance input of the preamplifier of electric channels realized in ARMT-5 allows to work with short (20 m) ungrounded lines at frequencies from 100 Hz and higher. This is especially useful when working in winter conditions or in arid areas, where it is difficult to achieve acceptable grounding with conventional electrodes. When operating at frequencies from 0.1 Hz, it becomes necessary to use longer (50–100 m) electric lines that are grounded by non-polarized or brass electrodes.

Problems that can be solved with ARMT-5:

- Study of geological structure
- Structural geographic mapping
- Determination of rock depth
- Mapping of karst structures, fracturing zones, and zones of high humidity
- Search for underground water
- Monitoring of dangerous processes
- Search, exploration and monitoring of hydro-therms
- Permafrost studies
- Environmental studies
- Search and exploration of deposits of solid minerals
- Search for oil and gas

Package contents:

- Recorder ARMT-5
- Battery charger
- External GNSS antenna
- Power cable
- Comm cable
- USB with software
- Documentation

In addition to ARMT-5 the following items may be purchased:

- Low-Frequency magnetic coil sensor
- Electric lines
- Non-polarizing electrodes
- Portable Precision Tripods
- Controlled source with radio modem

Frequency bandwidth	0.1 – 1 000 000 Hz

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A/D converter	24-bit Σ-Δ and 16-bit SAR
Dynamic range	110 dB (0.1 Hz – 10 000 Hz) and 90 dB (10 - 1 000 kHz)
Sampling frequency	4, 32, 400, 4 000 kHz
Number of channels	5 (2 electric and 3 magnetic)
Display	color high-contrast 7” (1024x600)
Keyboard	membrane (22 buttons)
Drive	SSD (128 GB)
OS	Linux
Communication interfaces	1000BASE-T Ethernet, 802.11b / g Wi-Fi, the ability to connect an external radio modem for remote control of the generator
GNSS	built-in and external antennas for time synchronization and position evaluation
Calibration	automatic with built-in sine wave generator
Amplifiers	external programmable for magnetic and electrical sensors (gain: 1-1 000)
Operating temperature range	-30 ÷ +40°C
Power	from built-in battery or 12 V

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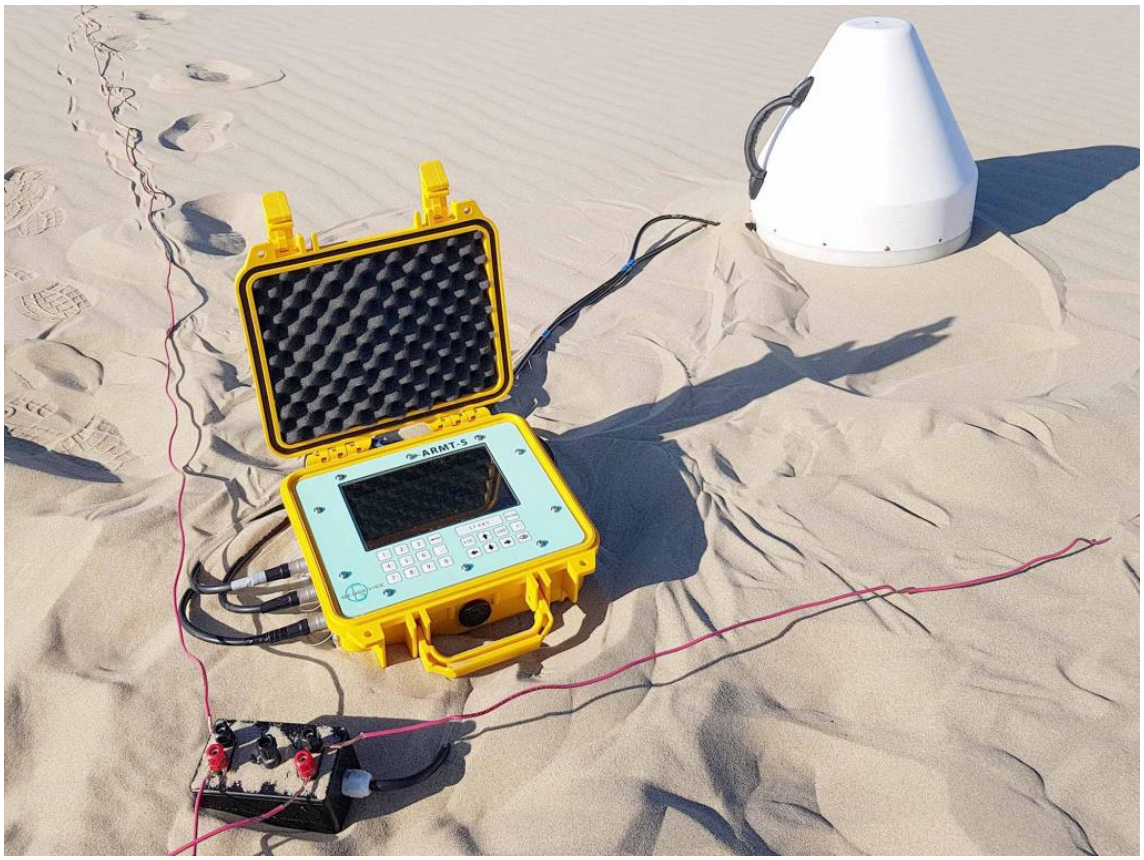

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