

Systems: Magnetotelluric Array System



KMS-820 data acquisition unit

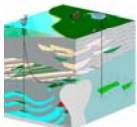
LEMI-701 non-polarized electrodes

**LEMI-120 induction coil
(0.0001 – 1,000 Hz)**

**LEMI-118 induction coil
(1 – 70,000 Hz)**



Figure 1: MT survey system: KMS-820 data acquisition unit, LEMI-118 and LEMI-120 induction coil magnetometers, LEMI-701 electrodes, wireless antenna.



KMS Technologies introduces its new generation 2D/3D wide-band 24-bit, 6-channel, low power consumption, magnetotelluric (MT) array system, with sampling rate up to 100 kHz. For magnetic field measurements, the system provides 2 different sets of induction coil magnetometers for different frequency bands (MT & AMT 2D/3D applications). For stable measurements of the electric field, 2 ultra-low noise, low drifting, matched pairs of Cu-CuSO₄ electrodes are provided. The system provides digital interface for digital fluxgates for low frequency measurements or customized applications. The system contains all equipment and cables to conduct 2D/3D MT surveys. The provided acquisition and processing software analyzes the data with graphical display for quality control and also output the apparent resistivity & phase into the standard EDI format for further processing and inversion by other commercial available software, such as WinGLink® by Geosystem.

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Figure 2: Field data acquisition with MT system.

V 1.0

Product specifications

Magnetic field measurement	
Frequency band LEMI-120 Induction coil magnetometer	0.0001 to 1,000 Hz
LEMI-118 Induction coil magnetometer	1 to 70,000 Hz
Noise level LEMI-120 Induction coil magnetometer	$\leq 100 \text{ pT}/\sqrt{\text{Hz}} @ 0.01\text{Hz}$ $\leq 10 \text{ pT}/\sqrt{\text{Hz}} @ 0.1 \text{ Hz}$ $\leq 0.1 \text{ pT}/\sqrt{\text{Hz}} @ 1 \text{ Hz}$ $\leq 0.01 \text{ pT}/\sqrt{\text{Hz}} @ 100 \text{ Hz}$
LEMI-118 Induction coil magnetometer	$\leq 5.0 \text{ pT}/\sqrt{\text{Hz}} @ 1\text{Hz}$ $\leq 0.2 \text{ pT}/\sqrt{\text{Hz}} @ 10 \text{ Hz}$ $\leq 0.005 \text{ pT}/\sqrt{\text{Hz}} @ 10,000 \text{ Hz}$ $\leq 0.010 \text{ pT}/\sqrt{\text{Hz}} @ 50,000 \text{ Hz}$
Shape of transfer function	Linear – flat
Electrical field measurements	
Frequency band	DC-50,000 Hz
Noise level in frequency band (0.01 to 0.3 Hz)	0.1 μV_{RMS}
Non-polarized electrodes noise in frequency band (0.01 to 0.3 Hz)	<10 nV
Acquisition System	
Number of channels	6
A/D resolution	24 bit
Sample rate	Up to 100 kHz
Input impedance	> 1.0 M Ω
Signal gain	Each channel has 12 different gain setting from 1 to 2,560
Timing control	GPS synchronized
Wireless	Long range wireless up to 8 km (5 miles) line-of-sight or unlimited distance in mesh network mode. Bluetooth.
Data saving	Data is saved to SD card
Data monitoring	Data can be monitored wirelessly or via USB for real-time status and quality check
Power supply	External 7.5 V to 32 V, typical 5 W power consumption; it has internal 12 V battery
System includes:	KMS-820 data acquisition unit (1 unit) Operation manuals GPS antenna 900 MHz 3 dB antenna KMS-100 induction coil transition cable (allows connecting 3 induction coil to unit) KMS-110 electrode transition cable (allows connecting up to 3 pairs of electrodes to the unit) External battery connector USB A-A cable 16 GB class 10 SD card Internal battery charger KMS-300 USB wireless adapter (allows wireless control and monitoring of the KMS-820 (1 unit)) KMS-105 20 m Induction coil extension cables (3 cables) KMS-115 50 m electrode extension cables (4 cables) LEMI-118 Induction coil magnetometer (3 units) LEMI-120 Induction coil magnetometer (3 units) LEMI-701 Non-polarized electrodes (2 matched pairs) ACQ 2.0 acquisition & monitoring software (1 license)