STRATAGEM

Electrical Conductivity Imaging System - Hybrid-Source Magnetotellurics

Stratagem lets you view 1D soundings and 2D sections in the field to provide better field quality control and immediate access to resistivity results.

In addition to the LCD video display you can use the built-in thermal printer for field generation of hardcopy for time-series data; signal amplitude; phase; coherency; apparent resistivity; depth curves; and depth and frequency cross-sections.

The Stratagem can be operated as a seismograph with the addition of seismic data acquisition and digital signal processing boards, the appropriate seismic connectors, geophones, software, and other standard acessories.

The Stratagem EH4 transmitter consists of a dual-loop antenna, transmitter electronics, and controller. The transmitter provides unpolarized source fields which allow for true tensor measurements of ground resistivities. This provides more accurate interpretation of true resistivities than conventional single-dipole transmitter source signals. The transmitter is powered by a 12VDC battery.

You can explore from the near surface to depth as great as 1km. The actual depth to which a target can be imaged depends on the resistivity / conductivity of the earth at the measurement site and the lowest frequency for

Stratagem EH4

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Features

- In-field display and print-out of 1D inversion and 2D section for improved quality control.
- Both scalar and tensor measurement of resistivity for more accurate data interpretation.
- Optional combined MT/seismic system provides instrument economy and flexibility.
- Natural MT signal and controlled source transmitter enhance signal availability.
- Images from 10m up to 1km for complete sounding curves.
- Optional low-frequency sensors for greater depth of investigation.

General

Stratagem EH4 uses the magnetotelluric (MT) method to measure subsurface conductivity. The magnetotelluric method is based on the fact that the ratio of the magnetic to electric fields (known as the impedance) at a given frequency is constant for a constant resistivity. Natural signal sources, such as lightning activity, can be measured to determine this ratio. Unfortunately, natural signals are sometimes not available at the time, frequency, and amplitudes needed. Stratagem's hybrid-source technique helps overcome this problem. Hybrid source means we use a combination of natural MT signals and man-made transmitter signals. Any available natural background signals are used in the entire frequency band while the Stratagem transmitter is used to provide additional high-frequency signals in the range of 1kHz to 70kHz where natural signals are weak. The standard Stratagem can be operated using frequencies from 10Hz to 100Hz. The low-frequency option can use signal as low as 0.1Hz for a greater depth of investigation.

The operator can select the frequency bands and the number of time series "stacks" for data collection allowing optimization of high/low frequency data collection. Typical data collection time per station is 5 to 10 minutes. The Stratagem can then be moved and set up in from 5 to 10 minutes per station. This means complete setup and data acquisition can be done in 10 to 20 minutes giving from 3 to 6 stations per hour. The MT technique means that each station is a complete sounding. In other words, you can do 3 to 6 complete soundings per hour.

which there are reliable data. Depths up to 500m can be expected with standard sensors (10Hz to 100kHz), and up to 1km with optional low-frequency sensors)down to 0.1Hz).

You can archive and store complete data sets. The Stratagem EH4 maintains files of the complete time series data, cross-power and spectral amplitudes, as well as full tensor and scalar values of resistivity, phase, and coherency. Inverted depth and resistivity data are saved and can be exported to third-party software. These data files can be used in the built-in Stratagem software and with third-party software tools such as EMIX MT or EMIX MT2D.

Specifications

Operating Principle: Natural & controlled source tensor MT

Frequency Range: 10Hz to 100kHz

Transmitter: Model TxIM2 with vertical loop antennas

Frequency Range: 1kHz to 70kHz

Antenna Moment: 400 Amp-m²

Antenna Size: Two perpendicular vertical loop antennae each 4m²

Power Requirements: 12V, 60Ah Battery

Electrical Sensors: Four model BE-26 buffered active high frequency dipole 26m cable with four SSE stainless steel electrodes

Magnetic Sensors: Two Model BF-IM magnetic field sensors (10Hz to 100kHz) with 10 meters of cable

Analog Front End: One model AFE-EH4 unit for analog signal conditioning. Couples 2 electric and 2 magnetic channels to the data acquisition package.

Data Acquisition Package

Channels: four (2E, 2H)

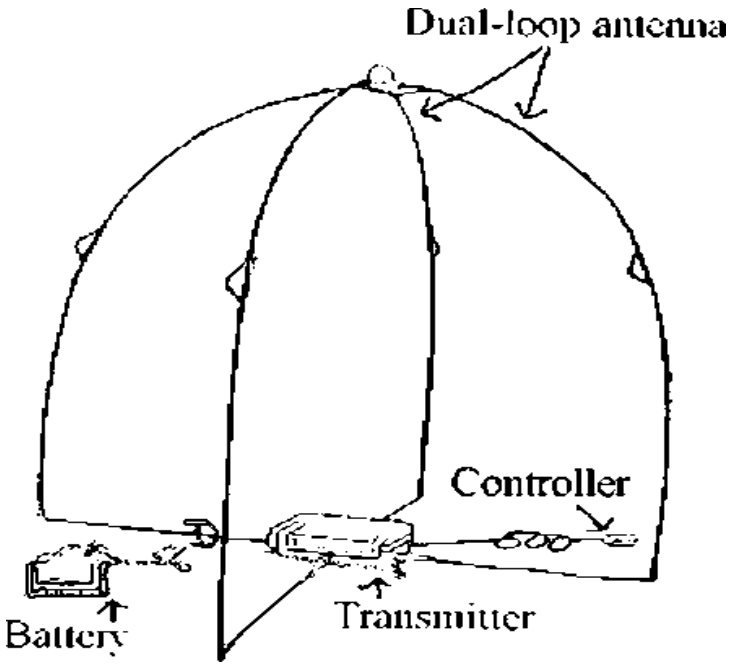
Hard Disk: 1.2 Gbyte or greater

Analog to Digital Conversion: 18 bit

Digital Signal:

Processor: 32-bit floating point

Bandwidth: DC to 96kHz



Display: Liquid crystal VGA

Plotter: Built-in 4” (11cm) wide plotter

Power: 12V, 40Ah

Operating:

Temperature: 0°C to +50°C

Component Case: Rugged portable/water-proof

Options

Compatibility with StrataView™ for Seismic Work: Available with 12, 24, or 48 channels

Magnetic Sensors: Low frequency investigations. 0.1Hz to 1kHz magnetic sensor

Electrical Sensors: Four model BE-50 buffered active high frequency dipole 50m cable

High-Powered Antennae:

Frequency Range: 300Hz to 35kHz

Antenna Moment: 6,000 Amp-m²

Antenna Size: Two perpendicular vertical loop antennas each 45 m²

PC Logging Console: Interface to PC laptop for data logging and processing.

Standard Components

Stratagem Console, 3 E. Field sensors, 2 magnetic sensors (10Hz to 100kHz), transmitter, software and manual.

Ordering Information

Description	Order Information
Stratagem	385-380-0010