

# KT-20 3F-32 Large Diameter Sensor

Magnetic Susceptibility • Conductivity

## For Shallow Applications

Agriculture • Archaeology • Environmental Investigations

The 3F-32 is a large diameter sensor that is used in conjunction with the KT-20 handheld console to measure the magnetic susceptibility or magnetic susceptibility plus conductivity of the Earth's subsurface to map soils, detect anomalies, or find buried objects. Applications for the 3F-32 sensor include agriculture, archaeology, and environmental investigations.

The 3F-32 sensor features three frequencies: 1, 10 and 100 kHz. Each frequency has its own benefit for measuring magnetic susceptibility and conductivity, and enable the sensor to be used for sounding investigations in favorable soil conditions. The 3F-32 sensor is equipped with a telescopic pole and arm support enabling users to easily and comfortably take measurements while standing or walking.

The KT-20 with 3F-32 sensor is an ideal instrument for field research. It can take a single measurement at a specific location, or continuously collect data to map an entire area. A GPS receiver is integrated into the KT-20 console to provide location coordinates with the data. It also has a built-in high resolution digital camera to visually document any sample of interest. Data from the KT-20 can be exported into third-party mapping software programs.



3F-32 Sensor During an Archaeology Investigation in Newfoundland

## Benefits

### Modular Magnetic Susceptibility and/or Conductivity System

The KT-20's 3F-32 sensor is able to measure magnetic susceptibility and conductivity simultaneously. Because the KT-20 console is modular, the 3F-32 sensor is available as either a dedicated magnetic susceptibility or conductivity measuring system, or as a combined system that can measure both properties. Dedicated systems can be upgraded at a later date via a firmware upgrade that is available through the internet.

### Measurements with Three (3) Separate Frequencies

The 3F-32 sensor can collect readings from three frequencies: 1, 10 and 100 kHz. With a combined system, the user can obtain six different readings for every measurement point.

### Different Depth Capabilities for Each of the Three Frequencies

One advantage of using three frequencies is that each frequency allows the user to obtain measurements from different depths. For those using the combined magnetic susceptibility and conductivity system, the user is able to read two data points at three different depths or for each frequency.

### Soil/Material Discrimination with Each Frequency and Measurement

Different soil or material structures generate distinct results for each of the three frequencies. These different frequency results provide users with parameters to analyze the soil's or material's internal structures, including the size of conductive particles. Measuring both magnetic susceptibility and conductivity using three different frequencies opens the space for future material and structure analysis.



## Benefits (continued)

### Advanced Zero Drift Compensation

One of the greatest limitations of magnetic susceptibility and conductivity measuring instruments is drift over time and temperature variations. The KT-20 includes an advanced zero drift compensation algorithm that monitors slow drifts and temperature variations, and applies a correction to the data.

### Better Data Resolution

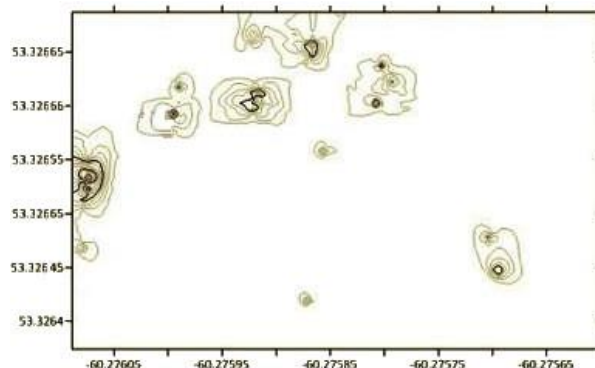
Users can simultaneously measure both magnetic susceptibility and conductivity as fast as 10 times per second, per frequency. This allows users to obtain higher data density and better spatial resolution. Users have the option of selecting two different sampling rates: 4 readings per second, or 10 times per second.

### High Precision Contour Mapping

Due to the ability for the KT-20 3F-32 to collect more data, users can create highly precise contour maps using mapping software programs, such as Surfer. External GPS units can be interfaced with KT-20 3F-32 to improve GPS accuracy.



3F-32 Sensor for Soil Mapping



Contour Map of Magnetic Susceptibility Data

## Additional Benefits

- Single point and continuous measurement options. Data profiles are presented in real-time during continuous measurements.
- High sensitivity for magnetic susceptibility ( $1 \times 10^{-6}$  SI units) and conductivity (0.05 S/m) measurements.
- Telescopic pole with arm support to comfortably operate the system.
- Integrated GPS to record location coordinates. An external GPS device can be interfaced with the KT-20 to improve accuracy.
- Built-in digital camera to visually document samples.
- Transflective colour display that works in any lighting situation.
- Can be used with a range of additional KT-20 sensors to measure the magnetic susceptibility, conductivity, chargeability and resistivity of artifacts and samples.



KT-20 Console with 3F-32 Sensor



## Specifications

### 3F-32 Large Diameter Sensor

Operating Frequencies	1 kHz	10 kHz	100 kHz
Magnetic Susceptibility Sensitivity	1 x 10 <sup>-5</sup> SI	1 x 10 <sup>-6</sup> SI	1 x 10 <sup>-5</sup> SI
Conductivity Sensitivity	1 S/m	0.1 S/m	0.05 S/m
Magnetic Susceptibility Measurement Range	0.01 x 10 <sup>-3</sup> to 1999.99 x 10 <sup>-3</sup>	0.001 x 10 <sup>-3</sup> to 1999.99 x 10 <sup>-3</sup>	0.01 x 10 <sup>-3</sup> to 1999.99 x 10 <sup>-3</sup>
Conductivity Measurement Range	1 to 10,000 S/m	0.1 to 10,000 S/m	0.05 to 10,000 S/m
Measurement Frequency:	<ul style="list-style-type: none"> <li>• 4 readings per second, in stationary mode</li> <li>• 10 readings per second, in scan mode</li> </ul>		
Sensor Diameter	32 cm		
Sensor Weight	2.0 kg		

### KT-20 Console Specifications

Memory:	16 GB
Data Input/Output:	USB and Bluetooth
Power Supply:	2 x Li-Ion Rechargeable Batteries
Operating Temperature:	-20°C to 60°C
Display Dimensions:	76 x 47 mm
Display Resolution:	400 x 240 pixels
Rating:	IP65
Maximum Sample Weight for Density Measurements:	1.0 kg
Size:	260 x 72 x 60 mm
Weight:	0.60 kg
Internal GPS Accuracy:	2.0m
Internal GPS Receiver Satellite Accessibility:	SBAS (WAAS, EGNOS, MSAS)
Built-in Camera :	2 Mega Pixels

*Specifications are subject to change without notice (October 18, 2019)*



3F-32 Sensor Assembled



3F-32 Sensor with Telescopic Pole, Control Handle and KT - 20 Console



3F-32 Transportation Case

