

KT-20 INDUCED POLARIZATION/RESISTIVITY MODULE

Magnetic Susceptibility · Conductivity · Density

Physical property measurements of rock samples, such as induced polarization (IP), resistivity, magnetic susceptibility, conductivity, and density, can be significant tools in improving geophysical survey programs as well as post-processing 3D interpretation.

The KT-20 Physical Property Measuring System provides magnetic susceptibility, conductivity and density readings of a geological sample. The IP/Resistivity module, consisting of a sensor (includes Tx-Rx electronics) and sample holder, adds these measurement capabilities to the KT-20 ecosystem.

The KT-20 IP can be used as a dedicated Galvanic IP/resistivity meter, or integrated together with an existing KT-20 magnetic susceptibility and conductivity system.

The IP-T10 reference pad is available as an option for users who wish to verify the measurement parameters of their KT-20 IP.



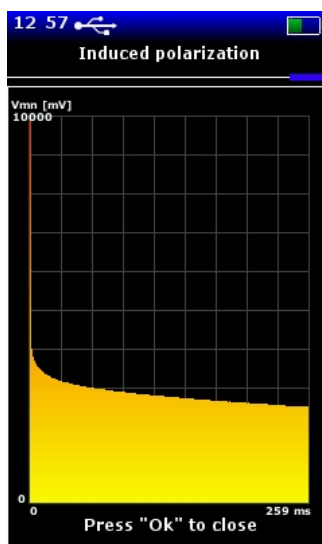
KT-20 Console with IP/Resistivity Sensor (includes Tx-Rx Electronics) and Small Sample Holder

Features

The KT-20 IP is available in two models: **Standard (S)** and **Pro (P)**.

- Real-time decay curve on colour display (S & P)
- 20 IP windows (S) and up to 16,000 data points for decay curve analysis (P)
- User programmable windows (P)
- Total Tau (S), 3 Tau (P), and 3 Constant x (P)
- M ip calculation with first reading at 2 ms (P)
- Raw data available (P)

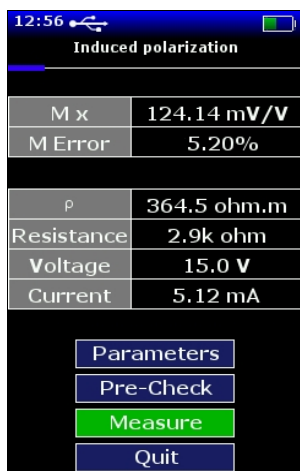
Operators can also choose between two sample holder sizes, **Small** and **Large**, dependent on the length and width of the cores/samples being measured.



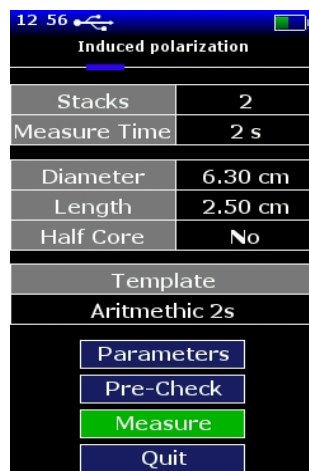
Decay Curve



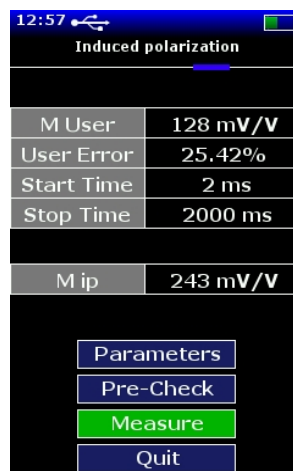
Standard Model (S)	Pro Model (P)
<ul style="list-style-type: none"> • Chargeability calculated using 20 windows, using arithmetic, logarithmic, semi-logarithmic and Cole-Cole plotting options • Chargeability also calculated using the M_xFIT, an algorithm that uses several thousand data points for greater accuracy • Resistivity and resistance measured • Automatic voltage and current calibration • Total Tau 	<ul style="list-style-type: none"> • Full waveform decay curve analysis using 16,000 data points • Raw data recording • Initial chargeability (M_{ip}) calculated • Decay analysis starting 2 ms after switch off • Chargeability calculation from user defined interval (M User) • 3 time constants (Tau) calculated • 3 exponential decay models
<p>The KT-20 IP Standard model calculates total chargeability (M_x) using two methods: 20 windows and M_xFIT.</p>	<p>The KT-20 IP Pro enables users to analyze decay curves with up to 16,000 data points for any measurement time. Through these data points the decay curve is studied to calculate total chargeability (M_x) and initial chargeability (M_{ip}). Users are also able to customize their own chargeability windows (M User) and time periods (t1 and t2).</p>
<p>The first measures total chargeability using the traditional 20 windows standard.</p>	<p>Furthermore, an extra early delay time, as fast as 2 ms after turn-off, allows KT-20 IP Pro users to collect data much earlier than before. This early time IP data provides geophysicists with new capabilities to improve their interpretation.</p>
<p>The second, M_xFIT, is an algorithm that measures total chargeability over the same time period, but uses several thousand windows instead of 20. The purpose of M_xFIT is to provide increased accuracy and confidence in the measurements.</p>	<p>The KT-20 IP Pro model also incorporates all of the same capabilities as the Standard model.</p>



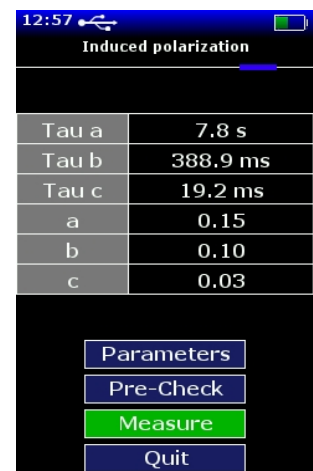
Standard & Pro



Standard & Pro



Pro Only



Pro Only

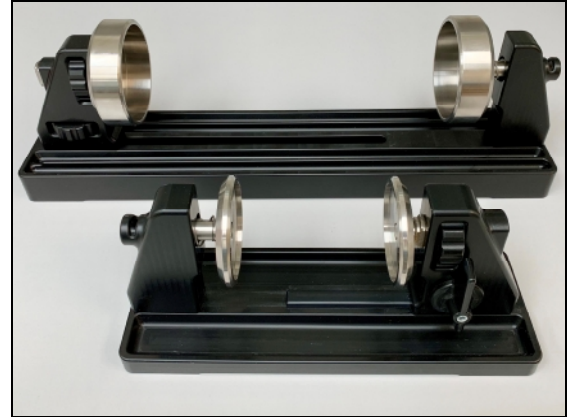


Sample Holders

The KT-20 IP module comes with either a **Small** or **Large** adjustable Sample Holder, which enables operators to measure the chargeability and resistivity of various core/sample sizes, as defined below.

	Small	Large
Length of Core/Sample	40 - 140 mm	50 - 350 mm
Diameter of Electrodes	70 mm	90 mm

The Large Sample Holder also comes with a 25 mm lip on either side of the electrodes to facilitate measurements on uneven-ended samples and improve mounting for larger/heavier cores.



Small and Large Sample Holders

IP-T10 Reference Pad

The IP-T10 is a dedicated reference pad for the KT-20 IP Induced Polarization/Resistivity module and can be used with either the Small or Large Sample Holder. The purpose of the reference pad is to verify the KT-20 IP's various measurement parameters, including parasite capacities in the circuits. The reference pad's housing is shaped like a core sample and is made from polished granite to minimize the influence of any surface contamination. Its electrodes are made of stainless steel, and the electronics are sealed in a water resistant compound. Relative precision of the reference pad is +/- 1% at 20°C. Each IP-T10 reference pad is certified and a test certificate is issued. Results are based on one second ON/OFF, using 6V.



IP-T10 Reference Pad

IP-T10 Reference Pad Specifications ¹

- M_{xFIT} : $\sim 16.9 \pm 0.4$ mV/V
- M_{ip} (Initial Chargeability): $\sim 97.8 \pm 0.5$ mV/V
(measurement available in Pro model only)
- R (Contact Resistance): $\sim 99.7 \pm 0.8$ k Ω
- Total Tau (Time Constant): $\sim 236.9 \pm 4$ ms
- Maximum voltage: Up to 50V
- Dimensions: 60 mm (length); 70 mm (diameter)
- Weight: 700 g
- Electrode contact material: Stainless steel

¹ Nominal values indicated are approximate and will vary from pad to pad



KT-20 IP Specifications

- Parameters Calculated and Displayed:
 - Chargeability M
 - M error
 - Apparent Resistivity
 - Current
 - Voltage
 - Resistance
- Chargeability Resolution: 10 $\mu\text{V}/\text{V}$
- Chargeability Precision: 0.2%
- Voltage Resolution: 10 μV
- Current Sensitivity: 10 μA

KT-20 IP Electrical Characteristics

Transmitter:

- Signal Waveform: Time Domain (ON+, OFF, ON-, OFF)
- Pulse Duration: 0.5, 1, 2, 4 and 8 seconds
- Current: Maximum 150 mA (electronically fused)
- Voltage: 6V and 15V DC
- Contact Resistance Range: 50 Ω to 5M Ω
 - 50 Ω to 2M Ω @ 6V DC
 - 100 Ω to 5M Ω @ 15V DC
- Automatic Voltage and Current Calibration

Receiver:

- Voltage Resolution: 10 μV
- Current Resolution: 10 mA
- Early delay time: 2 ms (Pro Model only)

KT-20 IP Systems

KT-20 IP Dedicated System

Measures Induced Polarization (IP) and Resistivity

System Includes:

- 1 KT-20 IP Console (**Standard** or **Pro** Model) with:
 - Digital Camera
 - Transreflective Colour Display
 - Internal GPS Receiver
- 1 IP/Resistivity Sensor (includes Tx-Rx electronics)
- 1 IP Sample Holder (**Small** or **Large**) with Accessories
- 2 Rechargeable Li-Ion Batteries with Charger & Adapters
- 1 USB Cable
- 1 USB Key with GeoView 2 Software & Operations Manual
- 1 Quick Start Guide
- 1 Rugged Transportation Case

KT-20 Integrated S/C IP System

Measures Magnetic Susceptibility, Conductivity, Induced Polarization (IP) and Resistivity

System Includes:

- 1 KT-20 S/C IP Console (**Standard** or **Pro** Model) with:
 - Digital Camera
 - Transreflective Colour Display
 - Internal GPS Receiver
- 1 IP/Resistivity Sensor (includes Tx-Rx electronics)
- 1 IP Sample Holder (**Small** or **Large**) with Accessories
- 1 Dual-Frequency *or* Single-Frequency Sensor (*Sold Separately*)
- 2 Rechargeable Li-Ion Batteries with Charger & Adapters
- 1 USB Cable
- 1 USB Key with GeoView 2 Software & Operations Manual
- 1 Quick Start Guide
- 1 Rugged Transportation Case

Specifications are subject to change without notice (July 11, 2024)



Terraplus Inc.

120 West Beaver Creek Rd, Unit #15
Richmond Hill, ON, Canada, L4B 1L2

terraplus.ca

1.905.764.5505
sales@terraplus.ca