



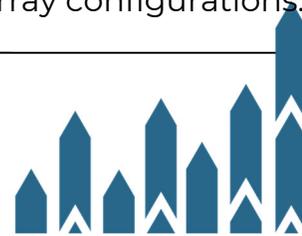
3D Electrical Resistivity Tomography (ERT) Re-Imagined

The advanced and Intelligent **DAS-M** system is re-imagining the way ERT and Induced Polarization (IP) data are acquired and how surveys are conducted in the field. It features our multi-source technology, cables with 16 electrode take-outs, four isolated receiver channels, full waveform recording, radio communication, GPS timing and positioning, flexible spectral IP, and a modular design with expansion in mind.



DAS-M and DAS-M Multiplexer (MUX)

The portable **DAS-M Transceiver** system (13.5 lbs or 6 kg, and less than 0.64 ft³ or 0.019 m³) allows the user to handle rough terrain with ease and uses its long-range radio frequency (RF) Module for unit-to-unit communication. All **DAS-M** units contain a GPS module for timing and positioning and a long-range radio for inter-device communication and multi-source operation. The GPS module enables many unique self-configuring/diagnosing features capable of determining the electrode locations, cable integrity, background noise levels and spectra, creating optimal collection parameters, and array configurations.

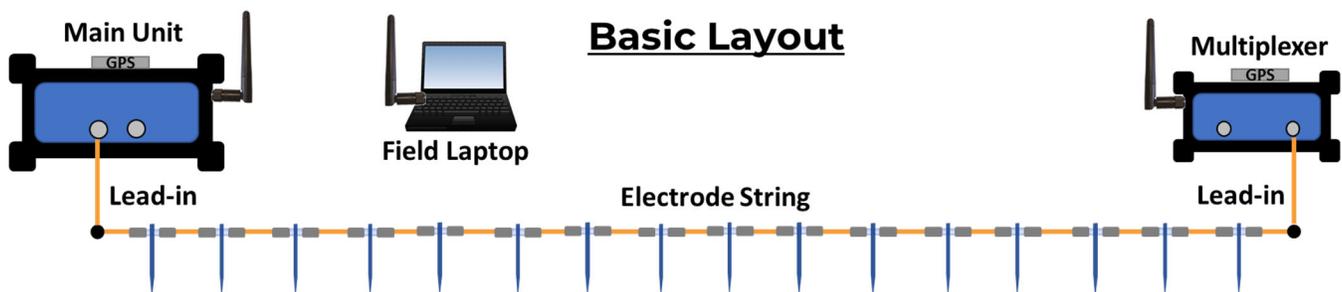


The acquisition and control program runs remotely on a Windows field laptop wirelessly connected to the **DAS-M** units via a dedicated RF interface module. The **DAS-M Transceiver** has its own 375 Watt transmitter powered by an internal hot swappable 240 watt-hour replaceable battery.

The **DAS-M Multiplexer** system (9 lbs or 4 kg, and less than 0.39 ft³ or 0.011 m³) has a RF module for communications and a GPS module for location and timing. Each MUX can use up to 16 electrodes with a routing capability to pass transmitting and receiving connections to additional Multiplexers. Every unit knows where it is located and knows how it is connected to the other units. The MUX is powered by a rechargeable internal battery.

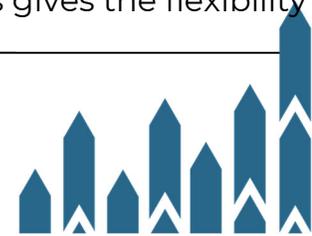
The **DAS-M** is called **M** for its **Modular** design allowing the user to expand their system by 16 electrodes at a time and thereby customizing the system to your size and budget, with the option to expand later. Either through a **DAS-M MUX** unit or by adding another **DAS-M Transceiver** unit, which provides Multi-Source and additional line capability as well. The **DAS-M's** tightly GPS synchronized timing coupled with the wireless communication capability allows for collecting data across several lines without the need to connect them by cables. Each separate line requires at least one **DAS-M Transceiver**.

The basic **DAS-M** system uses one main transceiver unit, one multiplexer, and one 16 take-out cable with electrodes, plus a computer remotely controlling the whole system through a dedicated RF interface module.



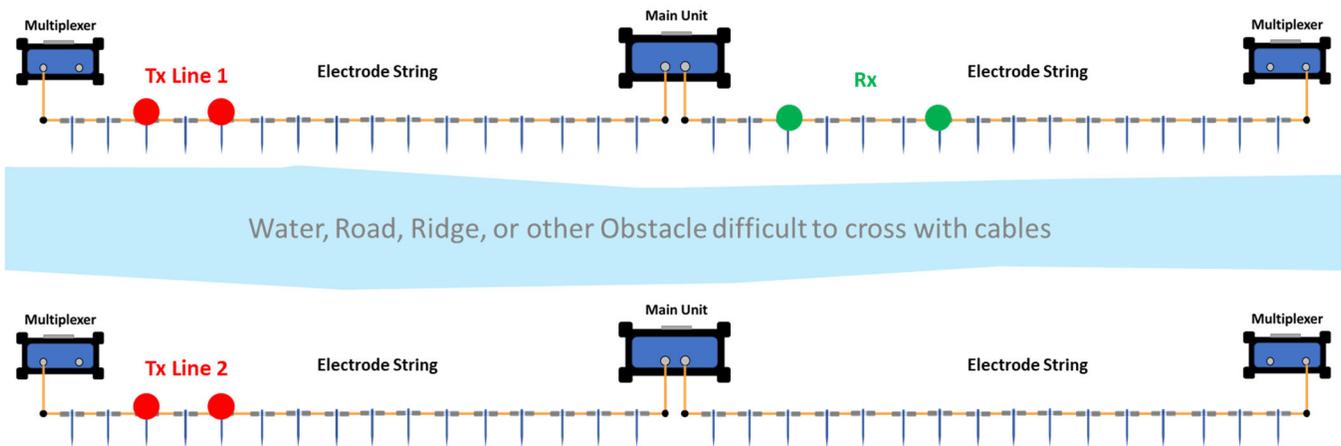
A major advantage is that **DAS-M** Transceiver and Multiplexer groups can operate independently, allowing surveys to be collected across physical boundaries like busy roads, around buildings, rivers, canyons, dense vegetation, etc. without any expensive cable management.

To take advantage of this feature a more typical configuration would contain two **DAS-M** transceivers units, four multiplexers, and four or five cables providing a 64 or 80 electrode capability, respectively. This gives the flexibility



to either have one long 80 electrode line or two separate lines of 32 electrodes each, as shown below.

Typical Two-Line Layout

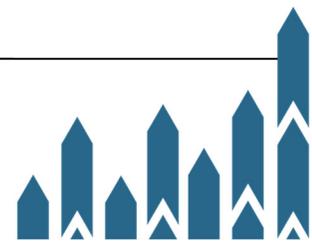


With more **DAS-M Transceiver** main units, data can be collected on as many lines, e.g. between red Tx Line 2 dipole and green RX dipole. Note that the lines are not connected, still allowing data to be collected with transmitter and receiver dipoles on different lines.

The **DAS-M** uses isolated lines for transmitting and receiving, which decreases the inductive and capacitive coupling in cables and multiplexers, and thus improves the quality of data, especially spectral IP data.

With multiple Main Units, the system can collect Multi-Source data where multiple **DAS-M Transceiver** units transmit simultaneously, e.g. transmit on red Tx Line 1 and TX line 2 simultaneously and receive on the green RX dipole, or any other receiver dipole on either line.

Multi-Source technology represents a new approach for performing mid-to large-scale ERT and IP surveys. The transceivers are wirelessly connected to a central communication module. Using multiple sources simultaneously can enhance both the signal levels and the resolution of deeper structures allowing for deeper exploration. Each transceiver can operate independently, allowing data to be collected across places that would be inaccessible with normal resistivity systems. For example, the transceivers can operate in urban areas, along roads, in medians, or around buildings without running cables across roadways.



Transceiver Specifications:

User Interface	Windows compatible computer with a USB port
System Weight	Transceiver 13.5 lbs (6 kg) without battery, 23.5 lbs (11 kg) with 240 watt hour battery
Dimensions	11.6 x 12.8 x 7.4 inches (29.5 x 32.5 x 18.8 cm)
Timing	GPS: approximately 100 nanoseconds
Minimum Configuration	1 transceiver
Maximum Configuration	up to 255 transceivers + multiplexers
GPS	7 ft (2 m) (clear sky view)
Receiver Channels	4 Channels + current monitor each with its own 32-bit ADC
Input Voltage	+/- 10 volts maximum with auto gain ranges from 1 to 128 with manual override.
Signal Averaging	Real-time proprietary noise removal stacking routine with 2 to 255 stacks and full waveform recording at up to 1200 samples per second
Battery	Replaceable 240 watt hour (standard) NiMH or external 12V
Maximum Output Power	375 Watts
Maximum Output Current	2.0 Amps
Measurement Precision	0.01% typical
Measurement Accuracy	0.05% typical
Communications	900 MHz self-healing network 200m/1km line of site (standard) or 1800m/9km line of site
Internal Multiplexer	16 electrodes auto-routing
Transmitter	Constant current, 375 Watts, maximum current 2.0. Constant current: typical current control precision 0.1% or 100 microamps with auto calibrate
Resistivity/ TDIP Mode	.0156 to 300 Hz Time of Frequency Domain
Spectral/ FDIP	Auto schedule multiple back frequencies for spectral IP.
TDIP Measurements	Up to 32 user defined windows

Multiplexer Specifications

User Interface	Windows compatible computer with a USB port
System Weight	9 lbs (4 kg) with internal battery
Dimensions	11.5 x 11.5 x 5 inches (29.2 x 29.2 x 12.7 cm)
Maximum Configuration	up to 255 multiplexers + transceivers
GPS	7 ft (2 m) (clear sky view)
Battery	Internal NiMH battery and charger or external 12 to 24V
Communications	900 MHz self-healing network 200m/1km line of site (standard) or 1800m/9km line of site
Internal Multiplexer	16 electrodes, auto-routing

