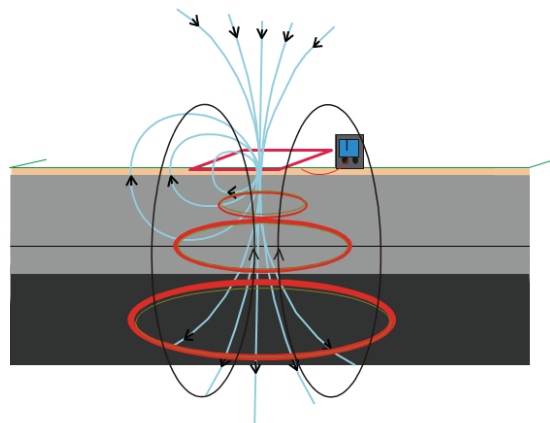


The TEM method

TEM stands for Transient Electro-Magnetic (or Time Domain Electro-Magnetic TDEM) method. This inductive method was originally designed for mineral investigations but is increasingly popular for hydro-geological purposes as well as general geological mapping.

The TEM method has excellent suitability since it offers good penetration of conductive overburden and is fast and efficient. Furthermore, since there is no requirement for galvanic ground contact, data can be collected in high resistivity surficial zones and in areas covered by ice or exposed rock.



*The principle of a TEM survey:
A current cut-off in the transmitter loop emits an electromagnetic transient that induces secondary fields (eddy currents) in conductive structures. The receiver coil intercepts the transient and the resulting voltage decay is digitally recorded.*

The WalkTEM system

The WalkTEM system comprises a high current transmitter and a dual channel high dynamic and wide band width receiver.

By connecting an external power supply, transmitter performance will be enhanced and the field survey duration can be extended.

WalkTEM also contains an integrated PC and dual internal batteries and chargers.

The WalkTEM system comes with two models of low noise air-cored receiver coils; one optimised for high resolution shallow soundings and the other with a larger effective area, suitable for deeper soundings.

The receiver coils can be used in combination and measures taken simultaneously using the dual receiver channels.

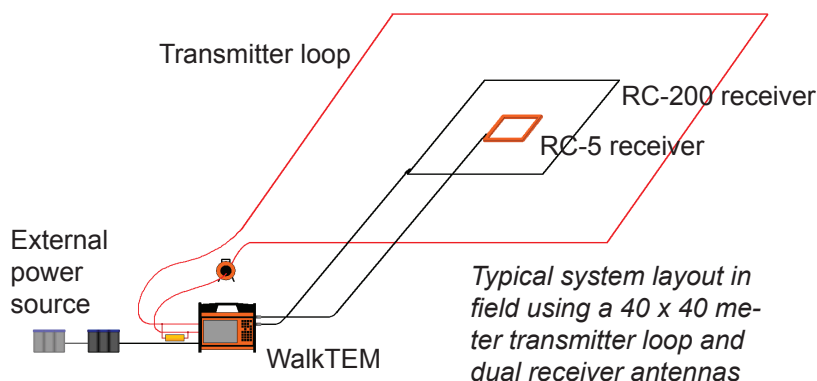
WalkTEM operates using dual-moment transmission where it automatically alternates between maximum and reduced current pulses, thus utilizing the benefits from both high energy fields as well as fast current pulse turn-off. The advantage is high resolution response from shallow to maximum depth.



The unique acquisition technology combines analog integration and high speed digital quantization resulting in a superior dynamic range. This allows the WalkTEM to accurately resolve a wider span of amplitudes; from higher level signals from shallow structures down to very low (near noise) levels from deeper layers.

Field setup

A single-core cable, called the transmitter loop, is laid out on the ground in a square shape. A typical loop size is 40 x 40 m. The WalkTEM is placed at the start and end corner of the loop. The two receiver coils are subsequently placed in the centre of the transmitter loop and their respective lead-in cables are laid out and connected to the receiver inputs on the WalkTEM.



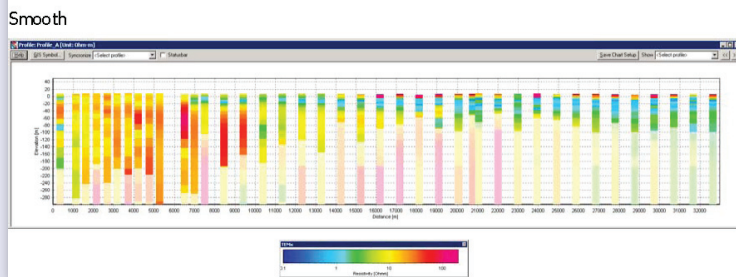
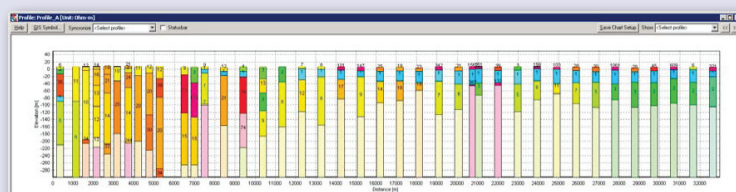
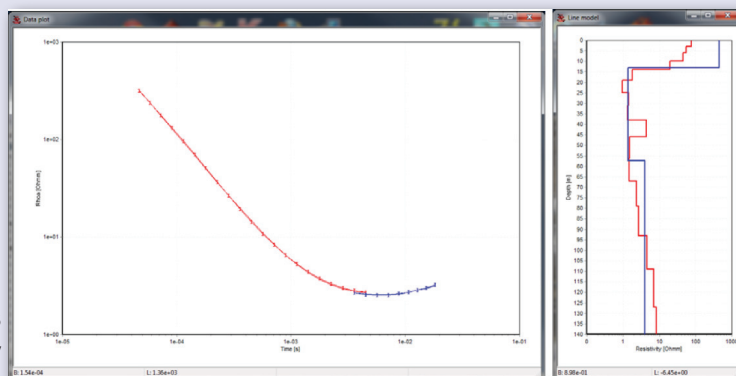
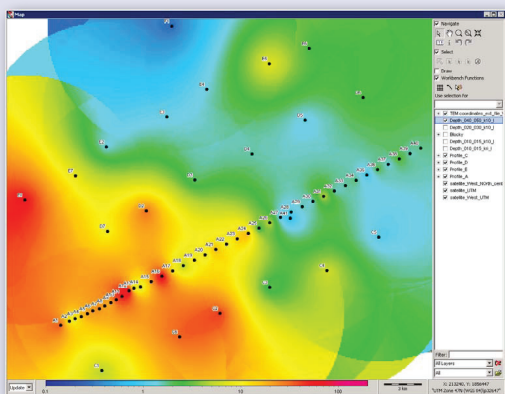
An external power source, a car battery or similar, can be connected with the supplied external power cable. This will provide more power and thus enables more hours of survey.

After a short power on, the measuring project is quickly set up and executed using the easy and intuitive user interface. When the sounding is complete, an inversion can be made directly in the instrument in order to display a layer model.

A field example

The WalkTEM system has been used for a field survey in Myanmar with the intention to find bedrock as well as to establish the ground properties above it in terms of water intrusion etc.

A large number of 1D soundings were collected and data were processed both into 1D models but also blocky models and average resistivity maps, using the Aarhus Workbench of Aarhus Geophysics, which can be readily integrated with SiTEM Semdi as well as ViewTEM.

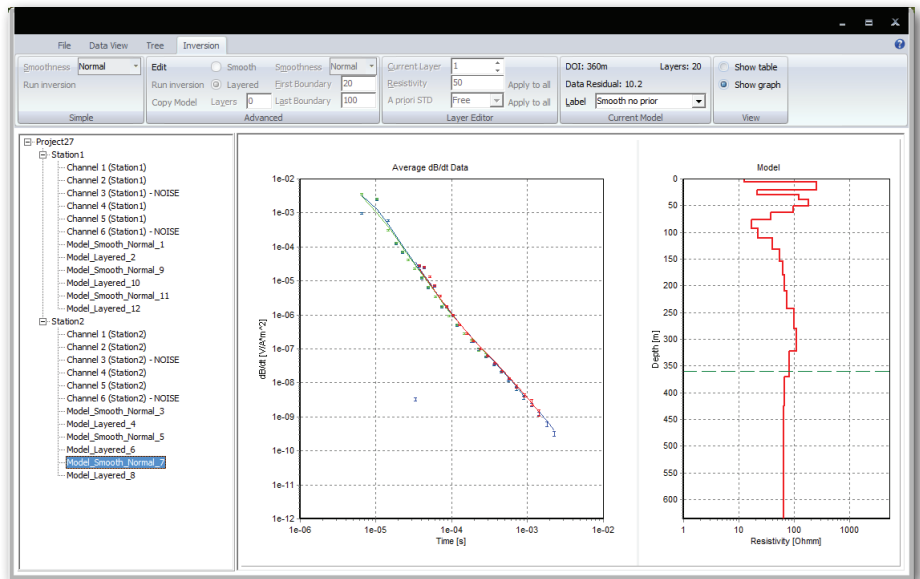


ViewTEM software offers in-field 1D modelling

ViewTEM is an TEM data inversion software developed by HydroGeophysics Group, Aarhus, Denmark. It comes installed as standard in the WalkTEM system and enables the operator to perform a data inversion directly after performing the actual sounding. It is therefore the perfect tool for quality assessment as well as processing the final data from the survey.

As an option, ViewTEM can also be installed on an office PC which offers a more advanced usage.

The processed data can be directly imported into the very powerful Aarhus Workbench for further processing and visualisation, such as making 2D profiles.



Options and accessories

By connecting a 24 VDC external power source, the sourced current will increase, thus permitting a stronger field to be transmitted into the ground. This is particularly useful when utilizing larger transmitter loops and makes a strong solution for e.g. searching for mineralized geologies.

ABEM offers a number of different transmitter loops, like 100x100 m or 200x200 m, for deeper surveys. Customized loops can also be quoted upon request.

Contact ABEM to get the solution that best fits your needs.



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