

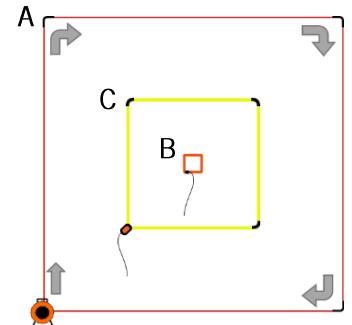


This Quick Guide is used to configure an ABEM WalkTEM 2 (plus TX-8 or TX-20) with the correct lay-out and measurement parameters for successful soundings with a TL-1k6 transmitter loop (40 x 40 m) as well as the RC-5 and/or RC-200 receiver coils. For more detailed and in-depth instructions plus other important information please consult *ABEM WalkTEM 2 User Manual*.

CENTRE LOOP LAYOUT PROCEDURE (TL-1K6 transmitter loop, RC-5 & RC-200 receiver coil)

A. Lay out the TL-1k6 transmitter loop

- to ensure current flow and measurements are all positive, everything will be laid out in the same direction: clockwise from bottom left;
- a compass, optical square or tapes can be used to help make the loop square - it does not need to be a perfect square to still perform acceptably;
- leave loose end of the loop near TX unit and walk around with cable drum;
- use the black markers on the loop as a guide for the corner positions.



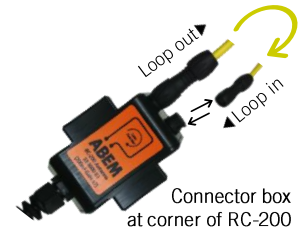
B. Lay out RC-5 receiver coil

- start with the RC-5 as it is the easiest coil to locate centrally;
- either use people on the corners of the transmitter loop to align someone in the middle OR (easier) walk from the middle of one side, toward the middle of the other side, measuring the distances as you walk (see “Layout Overview” on last page for details);
- RC-5 is the correct way up, when black connector box is above the seam (see image, right)
- ensure that the RC lead-in cable is not coiled and crosses other loops at close to 90°



C. Lay out RC-200 receiver coil (RX Advanced option)

- use the RC-5 as a guide for centring and aligning the RC-200;
- the RC-200 coil also has corner markers on the cable;
- at the corner of the RC-200 there is a connector box with a diagram on it to show which is the correct direction for laying it out (see image, right);
- ensure that the RC-200 lead-in cable is not coiled, runs parallel to the RC-5 cable separated by ~2m, and crosses the transmitter loop at 90° (or as close as possible).



D. Connect TX loop & RX coil(s) to WalkTEM TX & RX units

- the RC-5 / RC-200 connect to Inputs A and B, on the RX unit; it is good practice to put the RC-5 into Input A and the RC-200 into Input B;
- a 3.0m lead-in cable connects the TL-1k6 to the TX unit; the black connector attaches to the cable drum, and the red connector attaches to the loose end of the loop.



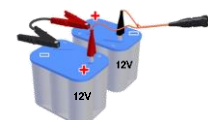
E. Connect the WalkTEM TX & RX units together

- use the 1.5m TX sync cable to connect the WalkTEM RX and TX units together.
- although it is advisable to connect this cable before powering up the instruments, the units will sync at any time the connection is made.



F. Connect external power to the TX (and RX, if required)

- the minimum requirement for the TX-8 / TX-20 unit is a single 12V battery an additional 12V battery can be connected in series for 24V on the TX-20;
- adding a further 6V battery in series will provide 30V and allow the TX-20 to reach maximum current.



USER INTERFACE AND MEASUREMENT CONFIGURATION

Configuration
Tab for setting up measurement parameters. 1

Measurement
Tab for initiating and monitoring data collection. 2

Post Processing
Tab for file management and inversion. 3

Administration
Tab for instrument settings and error logging. 4

Project
Select existing project to add in additional stations or create a new one. 5

Script
Choose your preferred measurement script with this drop-down and how many repetitions on the right; total time is shown on the right and details of the script are summarised below. 6

Damping
Select one of the internal damping resistors from the drop-down or choose to use a custom external resistor.

Selecting “Analyze” provides instructions on performing a Rogowski Coil test to assess which damping resistor to use. This feature is included on the RX Advanced and an optional extra on the RX Standard.

“Plot” will show the results of the Rogowski Coil tests so you can choose the most suitable damping resistor. 8

GPS Status
Shows number of satellites in use for positioning. 13

Transmitter Loop
Select the loop you will use for measurement. The choice is limited on an RX Standard. 7

Receiver Antenna(s)
Select which coils and input you will use; RC-5 on A is only option on an RX Standard. 9

Automatic Repetition
Set-up a schedule for repeated measurements. 10

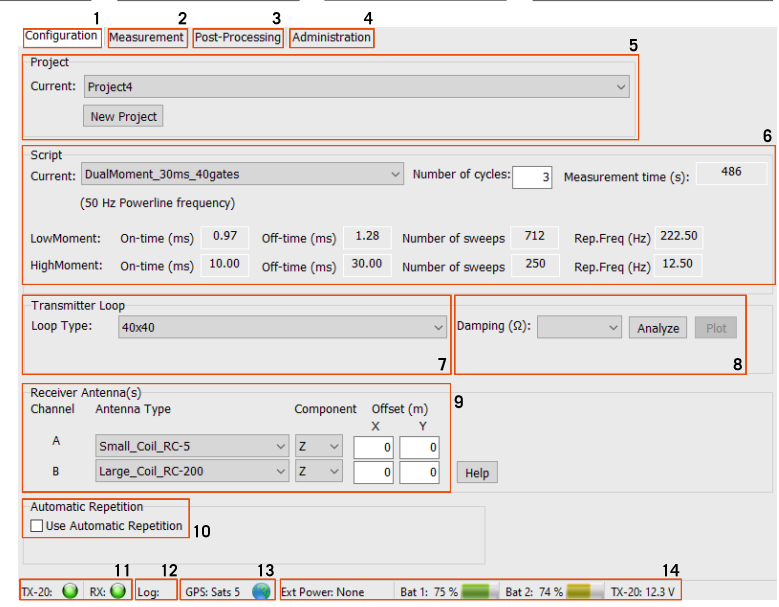
Transmitter/Receiver Status
Yellow shows TX is initialising, green means everything is okay with the TX / RX and ready to measure. During measurement, icons change to show system is active. 11

Log
Notifies of issues recorded on the Administration tab. 12

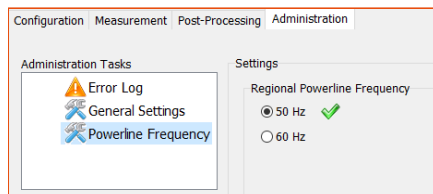
Battery Status
“Ext Power” shows if the office power supply is attached or the voltage of externally connected 12V batteries (when connected) – any external battery will take over from the “Bat 1” internal battery.

“Bat 1 / Bat 2” shows the voltage of the internal battery pair. These run the computer, screen and receiver if there is no external power source. To do a ‘hot swap’, keep one battery in place whilst changing the other.

“TX-8 / TX-20 / TX-60” indicates voltage on the TX unit (when attached). 14



HARDWARE AND SCRIPT SETUP



A. Choose powerline frequency

- navigate to the “Administration” tab (*PgUp / PgDn*) and choose the correct powerline frequency for the country you are surveying in;
- this ensures that only compatible scripts are shown, i.e. those designed to minimise electricity grid transmission noise.

B. Select or create a project

- return to the “Configuration” tab, and select an existing project or create a new project with “New Project”.

C. Choose a suitable measurement script

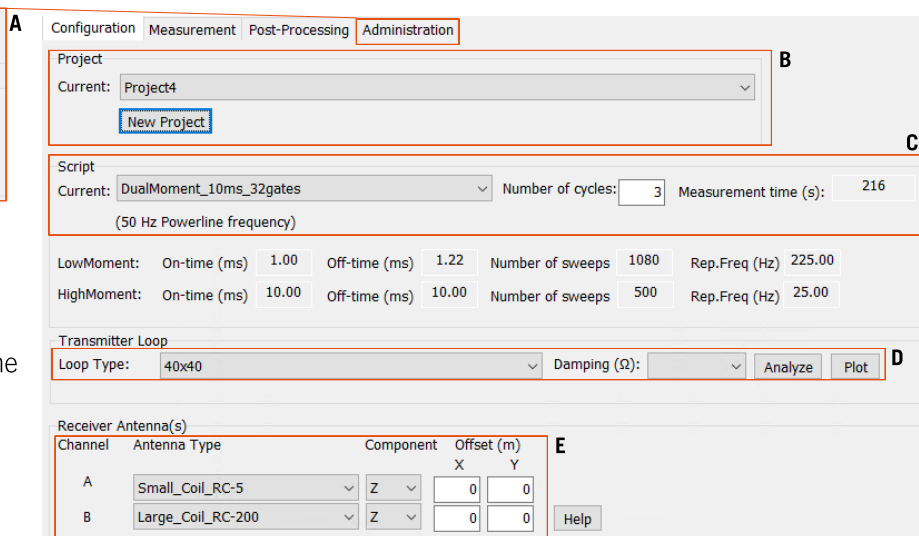
- the table overleaf provides an overview of available scripts. In hot weather, a script with a lower duty cycle can reduce heat build-up in the transmitter. “Number of cycles” dictates how many times the script will be repeated which will increase survey times; 3 - 5 is typical.

D. Choose the transmitter loop

- select from the drop-down list which loop you have connected and undertake a Rogowski Coil test (if available); see the separate “ABEM WalkTEM 2 Rogowski Coil Tests” guidance document for more information.

E. Identify the receiver antenna connections

- map receiver coils to the correct input channel; there is an option for “none” if only one is connected.



A Configuration Measurement Post-Processing Administration

B Project
Current: Project4
New Project

C Script
Current: DualMoment_10ms_32gates
Number of cycles: 3 Measurement time (s): 216
(50 Hz Powerline frequency)

LowMoment:	On-time (ms)	1.00	Off-time (ms)	1.22	Number of sweeps	1080	Rep.Freq (Hz)	225.00
HighMoment:	On-time (ms)	10.00	Off-time (ms)	10.00	Number of sweeps	500	Rep.Freq (Hz)	25.00

D Transmitter Loop
Loop Type: 40x40
Damping (Ω): Analyze Plot

E Receiver Antenna(s)
Channel Antenna Type Component Offset (m)
X Y
A Small_Coil_RC-5 Z 0 0
B Large_Coil_RC-200 Z 0 0

SCRIPT NAME	BRIEF DESCRIPTION	MOMENT SUMMARY	DUTY CYCLE	CYCLE TIME
DualMoment_Testscript	Fast measuring script, useful for quick tests of equipment, set-up and the survey location.	High: 50 stacks Low: 178 stacks Noise: 50 stacks	50%	5s
HighMoment_Testscript	Fast script with only High and Noise moment. Useful for quick tests of equipment, set-up and the survey location.	High: 100 stacks Noise: 50 stacks	50%	6s
DualMoment_10ms_32gates	Measuring script for shallow to deep data collection, divided into 32 gates with slightly longer first gate.	Noise: 250 stacks High: 1250 stacks Low: 2700 stacks	50%	72s
DualMoment_10ms_40gates	Measuring script for shallow to deep data collection, divided into 40 gates; shorter gating at start.	Noise: 500 stacks High: 2500 stacks Low: 5340 stacks	50%	135s
DualMoment_25ms_40gates	40 gate measuring script with a longer measuring time for medium to deep data collection. Useful in hot conditions to lessen heating of transmitter unit.	Noise: 606 stacks High: 1750 stacks Low: 4628 stacks	25%	162s
High Moment_25ms_40gates	Measuring script for medium to deep data collection with no low moment pulses.	Noise: 250 stacks High: 1750 stacks	25%	140s
HighMoment_Noise_10_90ms_51gates	Measuring script for deepest data collection, divided into 51 gates, with now low moment.	Noise: 125 stacks High: 500 stacks	10%	125s

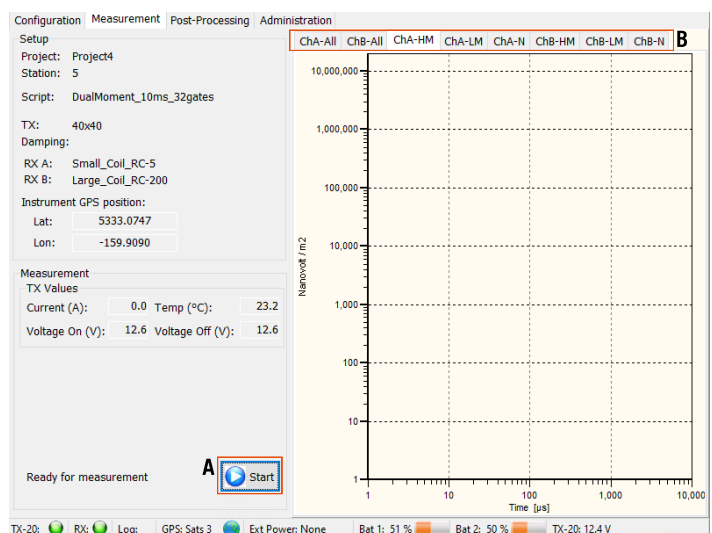
MEASUREMENTS

A. Initiate measurements

- switch to the “measurement” tab, review settings and press “Start” to begin running the script.
- a progress bar will appear and provide an estimation of time remaining.
- the instrument provides both audio (for which the supplied Bluetooth speaker is required) and visual notifications when the measurement is complete.

B. View incoming data

- use the tab key (**↵**) to select the first tab above the data plot on the right-hand side of the screen. The left and right arrow will now switch between the different real-time measurement views.
- “ChA-All” and “ChB-All” refreshes each time a new High Moment, Low Moment or Noise measurement is made on Channel A and B, respectively.
- the remaining tabs show only one of the measurement phases (High, Low or Noise) for each channel. These refresh the next time one of these measurement phases are completed.



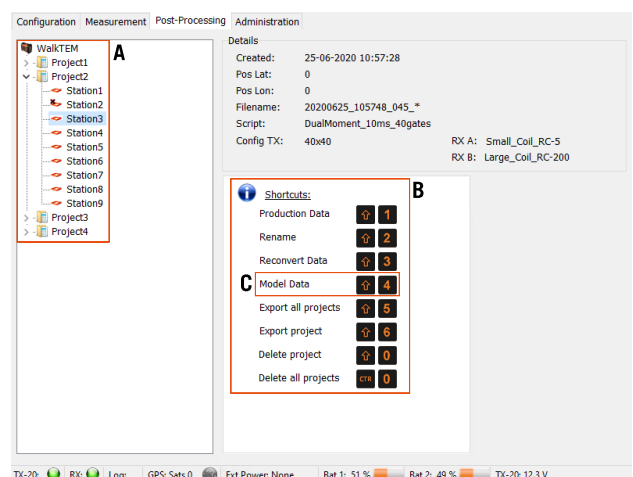
FILE MANAGEMENT

A. Project / Station list

- use the Down Arrow to select a project.
- the Right Arrow will expand the ‘tree’ to show Stations (soundings) measured within a project.
- When a station is selected, a summary of the main measurement parameters are shown on the right side.
- an “X” next to a Station indicates that the measurement was not completed.

B. File management options

- the Menu button (**☰**) will give a series of file management options for the Project or the Station depending upon which is highlighted.
- most of the tasks have a shortcut button associated with them.



C. Initiating the onboard SPIA TEM inversion software

- inversion of Station data is undertaken in a special automated version of SPIA TEM. Use the menu button or shortcut key combination to select “Model Data” to launch SPIA TEM.

CREATING A RESISTIVITY MODEL

A. Review data

- after initiating SPIA TEM (see above) the initial view shows the stacked sounding curves.
- the inversion software automatically discards poor quality readings: coloured data will be carried through for inversion, grey ones will be discarded.
- you can look at alternative data displays in the “Data View” tab.

B. Run inversion

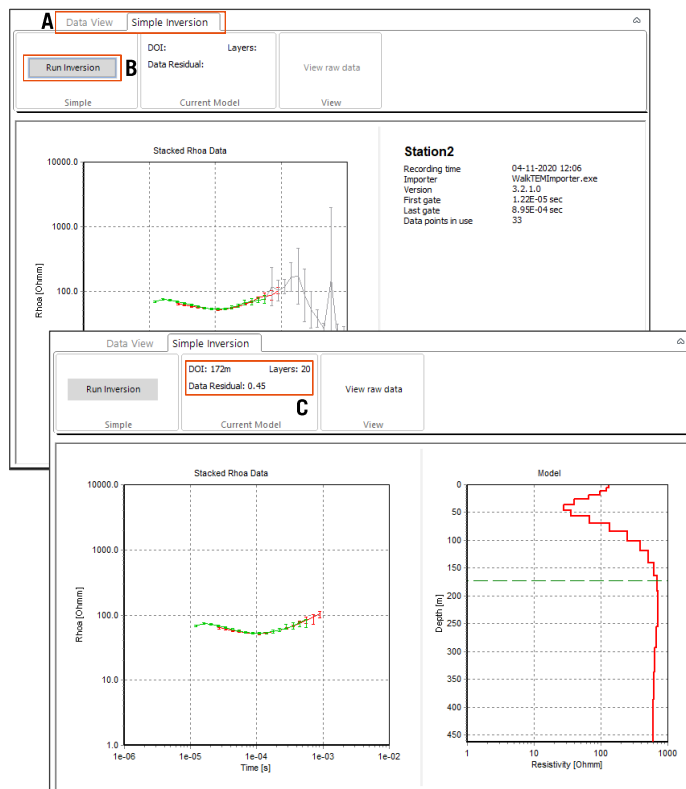
- select “Run Inversion” to generate a 1D resistivity model from the active data.
- if too few data points remain active after the automated filtering, inversion will not be possible.

C. Review model

- when the inversion completes the model will be displayed as a smooth (many layer) model.
- Look at the residual for an indication of the model fit, i.e. how well it matches the raw data; values below 1 would indicate a reasonable fit at this stage.

D. Return to WalkTEM 2 UI

- To exit the inversion software and return to WalkTEM UI, press the “Esc” key.



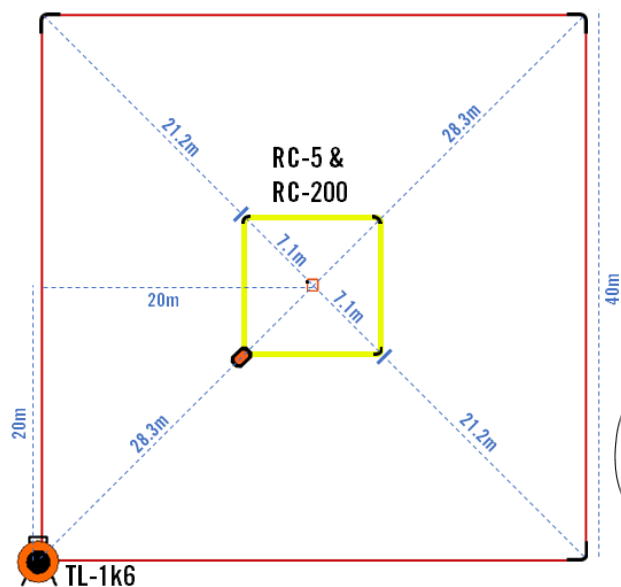
KEYPAD FUNCTIONS

Numerical keyboard	0 ... 9	For entering values into settings boxes and shortcuts in the Post-Processing tab
Backspace		Deletes the character on the left of the cursor
Navigation arrows		Moves the cursor in desired direction. Primarily used in drop-down menus
Tab		Jumps to next configuration item or command; jumps backwards in combination with Shift key
Shift key		Similar to a Shift key on a standard keyboard and used for shortcuts on Post-Processing tab
Ctrl and Alt		Works as Control and Alt keys on a standard keyboard
On/Off button		A short press turns the instrument on; within WalkTEM UI, another short press opens a dialog with an option to shutdown the instrument.

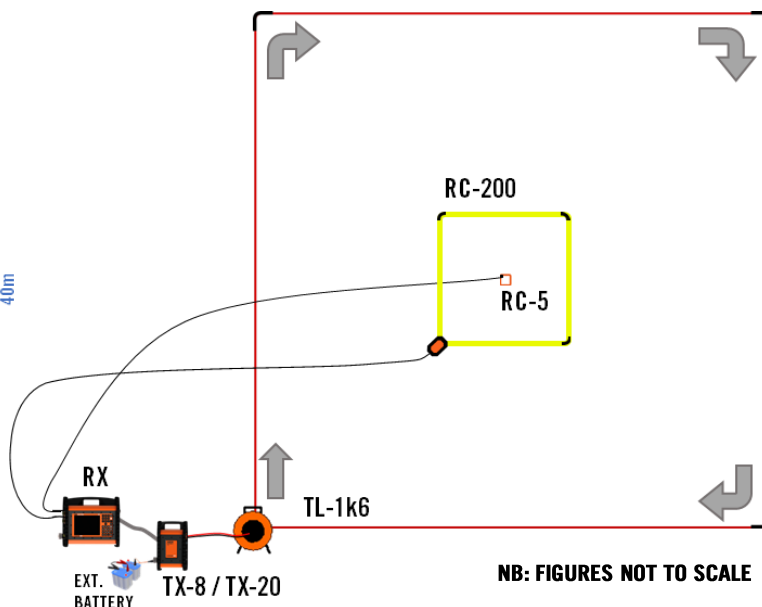
Esc		Works as a regular Escape key on a standard keyboard
Start/Stop measuring		Used as a quick command to start or stop a measuring cycle on the Measurement tab
Menu		Displays a pop-up menu in WalkTEM UI; used in combination with Shift key, the Windows menu appears
+/- sign		For entering a plus or minus sign; hold Shift key to enter + sign
Page Up/Down		Used to move between different tabs in the WalkTEM user interface (Configuration, Measurement, Post-Processing, Administration)
Enter		Acts like the Enter key on a standard keyboard; used to execute commands
Space		Acts like the Space bar on a standard keyboard; used to tick check boxes

LAYOUT OVERVIEW

A. Measurements for setting out loops



B. Generalized centre-loop layout



NB: FIGURES NOT TO SCALE