Resistivity measurements using the Syscal Switching systems

Subsurface Geophysical Solutions
Website: https:sgs4d.com
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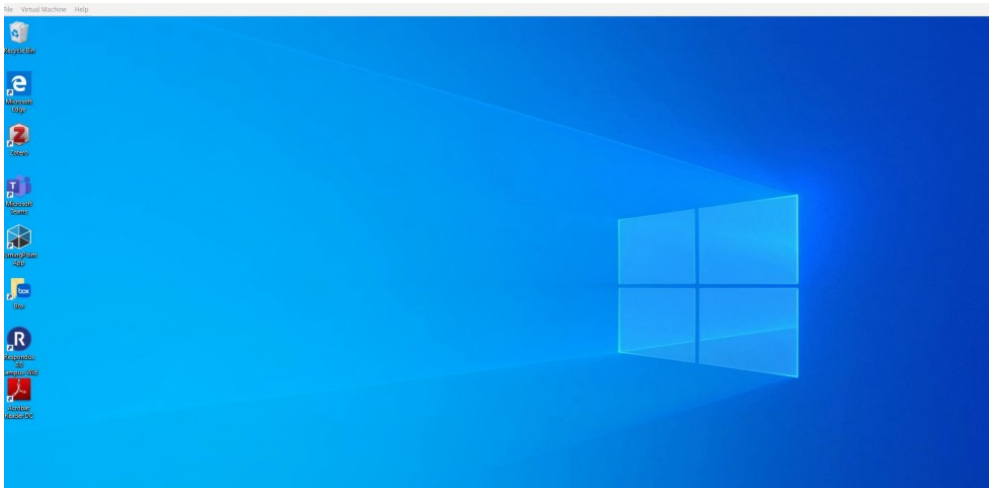
- Step 1 – Survey configuration
  - Although surveys can be configured on the syscal instruments, it is recommended that the survey(s) are prepared in advance using Electre Pro and uploaded to the system.
  - Then upload to Syscal (through Electre Pro)
  - See demonstration video



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- Step 2: In the field
  - Lay down the cable and insert electrodes in the ground at the desired distance (e.g. every 5 m)
  - Connect the cable leads to the electrodes using the crocodile clip cords

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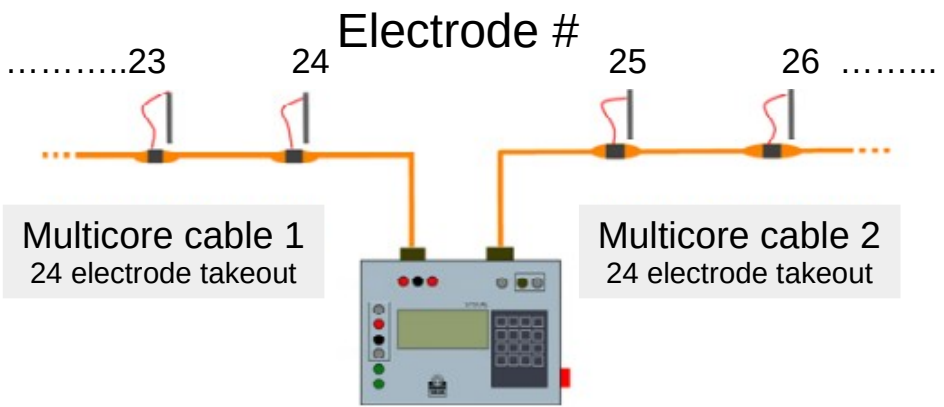
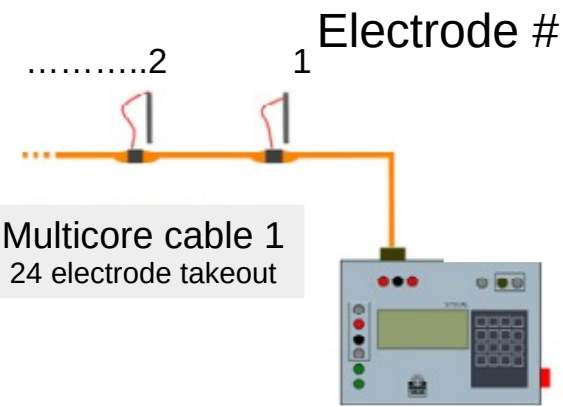
  - Lay down the cable and insert electrodes in the ground at the desired distance (e.g. every 5 m)
  - Connect the cable leads to the electrodes using the crocodile clip cords
  - The SYSCAL is placed in the middle part of the survey line if multiple cables are being used.
    - If one cable is being used, the syscal system can be placed at either end of the cable





General considerations

For more details see attached 'summary of operation' document

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- Step 2: In the field
  - The metallic electrodes have to be inserted into the ground deep enough to decrease the ground resistance, for both the transmitting electrodes A, B, and the receiving electrodes M, N.
  - A resistance of a few kohms is typically fine (< 20 kohm max, < 5 kOhm preferred).
  - If needed, conductive water can be poured on the electrodes, or two electrodes can be set in parallel at each point to decrease this value.

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- When the measurement becomes noisy (standard deviation Q greater than 5%), it is recommended to:
  - decrease the ground resistance of the A, B electrodes
  - drive more current,
  - to increase the number of stacking,
  - and to repeat several times the same reading.
- Rule of thumb:
  - The depth of investigation is of the order of 20% of the length of the AB line.

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SUMMARY OF OPERATION
First reading :
1) connect Cables
2) check batteries – Press Battery (8)
   1) If connected to external battery for Tx flip switch to Ext (otherwise to Int)

R1+ keyboard panel

A full charge will indicate: 12.7 V – 100%
A null charge will indicate: 10 V – 0%

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R1+ keyboard panel

Details **Set Up**:

- Mode – select Multi Electrode
- Select a pre-uploaded sequence
- If needed select:
- stack number – typical Min:4 Max:8
  - Qmax: 5%
  - Tx parameters: select Rho
  - Time: typical 1 or 2s
  - Vp requested –select 800mV (or Max)
  - Alternatively you can select select Vab Max: 50 (based on your electrode spacing and the conditions)

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After setting up (once per survey)
Protocol for each measurement (Wenner):

1) check electrodes, (press Rs Check – 6)
2) Press start
    1) Follow prompt

R1+ keyboard panel

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Menu button (reset to main menu)

Start survey button

Arrows to navigate menu

Return/enter button