

EZ Res Pro™

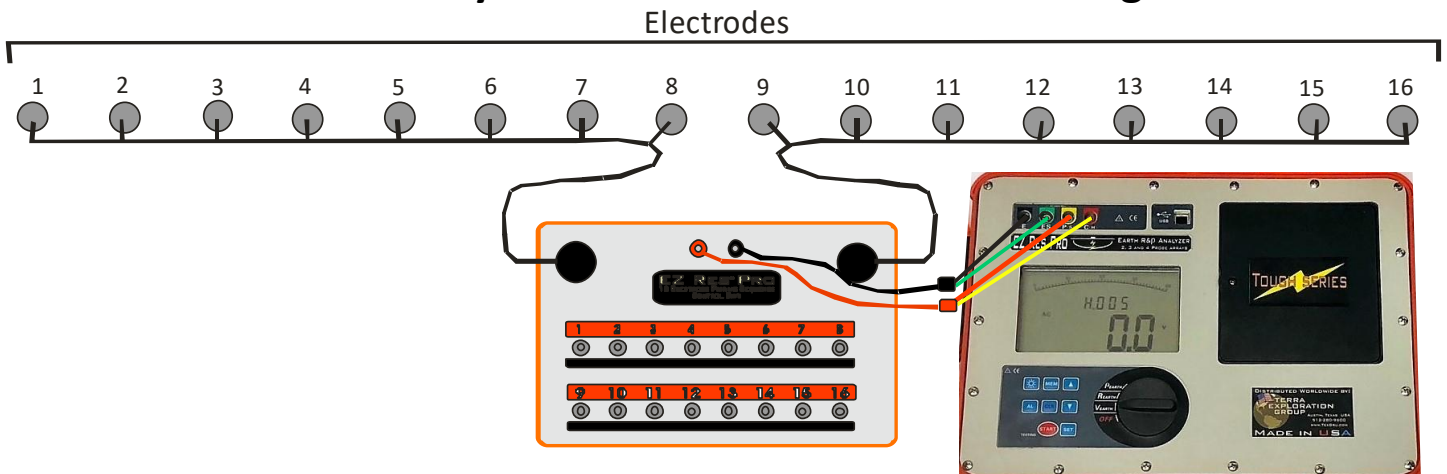
Electrode Pairing Sequence Control Unit

This introduces and explains the proper use and function of the **EZ Res Pro Electrode Pairing Sequence Control Unit** (Switching Unit) to produce imaging results from Dipole-Dipole resistivity arrays quickly and efficiently. Proper use of the unit allows pairs of electrodes to be switched on and off in a controlled sequence such that the possible 28 pairing of an eight electrode array and the 120 pairings of a sixteen electrode array can be easily managed to produce data for **Terra Imaging Software**.

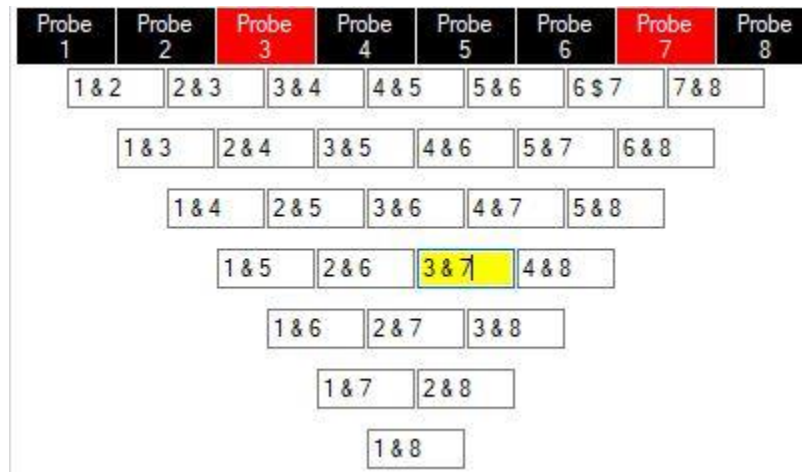


EZ Res Pro

Electrodes Layout and Connection to Switching Unit



EZ Res Pro Electrode Layout and Connection Sequence for Terra Imaging Software



8 Probe Array

Operating Procedure:

1. Estimate depth to target.
2. Plan electrode total span (distance between outer electrodes) equal to two times estimated depth to target (depth = ½ distance between outer electrodes)
3. For eight electrode array, divide total electrode total span by 7 to determine distance between electrodes.
4. For sixteen electrode array, divide total electrode total span by 15 to determine distance between electrodes.
5. Install electrodes according to above, using measuring tapes to mark precise distance between electrodes. Hammer in electrodes making sure very good/strong contact is made in the soil with each electrode.
6. Unroll **EZ Res Pro Switching Unit** wires---1-8 go on the left side (facing control unit) of the control unit, 9-16 go on the right side (all will be used only if 16 electrode array is planned).
7. Attach alligator clips starting on the left side #8, then #7, then #6 and so on until all are attached out to #1.
8. If 16 electrode array is planned, connect alligator clips to electrodes #9-16 in sequence, starting with electrode #9.
9. Once all desired electrodes are attached to their appropriate alligator clips, scans may begin.
10. Scan sequence:
 - A. Connect **EZ Res Pro Switching Unit** to **EZ Res Pro** face panel via connectors to jumper wires.
 - B. Turn on **EZ Res Pro** set to "R Earth".
 - C. Scan imaging process: the following steps must be completed to provide information to Terra Imaging Software.

Imaging scan sequence:

1. Initiate scan line one: In the first scan line, every switch will operated. First, set #1 switch up (to red), #2 switch down (to black), touch "**START**" on **EZ Res Pro** face panel, record reading in software prompt box and manually. Next scan: #2 switch up and # 3 down, touch "**START**" on **EZ Res Pro** face panel, record reading in software prompt box and manually. Next scan: #3 switch up and # 4 down, touch "**START**" on **EZ Res Pro** face panel, record reading in software prompt box and manually. Continue this same process scanning process until the final scan of line one---#7 up and #8 down (for 8 electrode array) or #15 up and #16 down (for 16 electrode array).

- 2.** Scan line two: In this scan line, every second switch will operated---#1 switch up and #3 switch down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Next scan: #2 switch up and # 4 down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Continue this same process until the final scan of line one---#6 up and #8 down (for 8 electrode array) or #14 up and #16 down (for 16 electrode array).
- 3.** Scan line three: In this scan line, every third switch will operated---#1 switch up and #4 switch down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Next scan: #2 switch up and # 5 down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Continue this same process until the final scan of line one---#5 up and #8 down (for 8 electrode array) or #13 up and #16 down (for 16 electrode array).
- 4.** Scan line four: In this scan line, every fourth switch will operated---#1 switch up and #5 switch down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Next scan: #2 switch up and # 6 down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Continue this same process until the final scan of line one---#4 up and #8 down (for 8 electrode array) or #12 up and #16 down (for 16 electrode array).
- 5.** Scan line five: In this scan line, every fifth switch will operated---#1 switch up and #6 switch down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Next scan: #2 switch up and # 7 down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Continue this same process until the final scan of line one---#3 up and #8 down (for 8 electrode array) or #11 up and #16 down (for 16 electrode array).
- 6.** Scan line six: In this scan line, every sixth switch will operated---#1 switch up and #7 switch down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Next scan: #2 switch up and # 8 down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Continue same switching process for 16 electrode array until the final scan in this line #10 up and #16 down.
- 7.** Scan line seven): In this scan line, every seventh switch will operated---#1 switch up and #8 switch down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. This is the final scan line for 8 electrode array. Next scan (only used if continuing to complete 16 electrode array): #3 switch up and # 10 down, touch “**START**” on **EZ Res Pro** face panel, record reading in software prompt box and manually. Continue same switching process for 16 electrode array until the final scan in this line #9 up and #16 down (for 16 electrode array).
- 8.** Scan line eight: each in sequence---#1 up and #9 down, #2 up and #10 down, #3 up and #11down, #4 up and #12 down, #5 up and #13 down, #6 up and #14 down, #7 up and #15 down, #8 up and #16 down.
- 9.** Scan line nine: each in sequence---#1 up and #10 down, #2 up and #11 down, #3 up and #12down, #4 up and #13 down, #5 up and #14 down, #6 up and #15 down ,#7 up and #16 down.
- 10.** Scan line ten: each in sequence---#1 up and #11 down, #2 up and #12 down, #3 up and #13down, #4 up and #14 down, #5 up and #15 down, #6 up and #16 down.
- 11.** Scan line eleven: each in sequence---#1 up and #12 down, #2 up and #13 down, #3 up and #14down, #4 up and #15 down, #5 up and #16 down.
- 12.** Scan line twelve: each in sequence---#1 up and #13 down, #2 up and #14 down, #3 up and #15 down, #4 up and #16 down.
- 13.** Scan line thirteen: each in sequence---#1 up and #14 down, #2 up and #15 down, #3 up and #16 down.
- 14.** Scan line fourteen: each in sequence---#1 up and #15 down, #2 up and #16 down.

15. Scan line fifteen: very last scan---#1 up and #16 down.

Upon completion of all scan steps, the software will prompt you to “Render” image and the tomography image will then be presented on the screen.

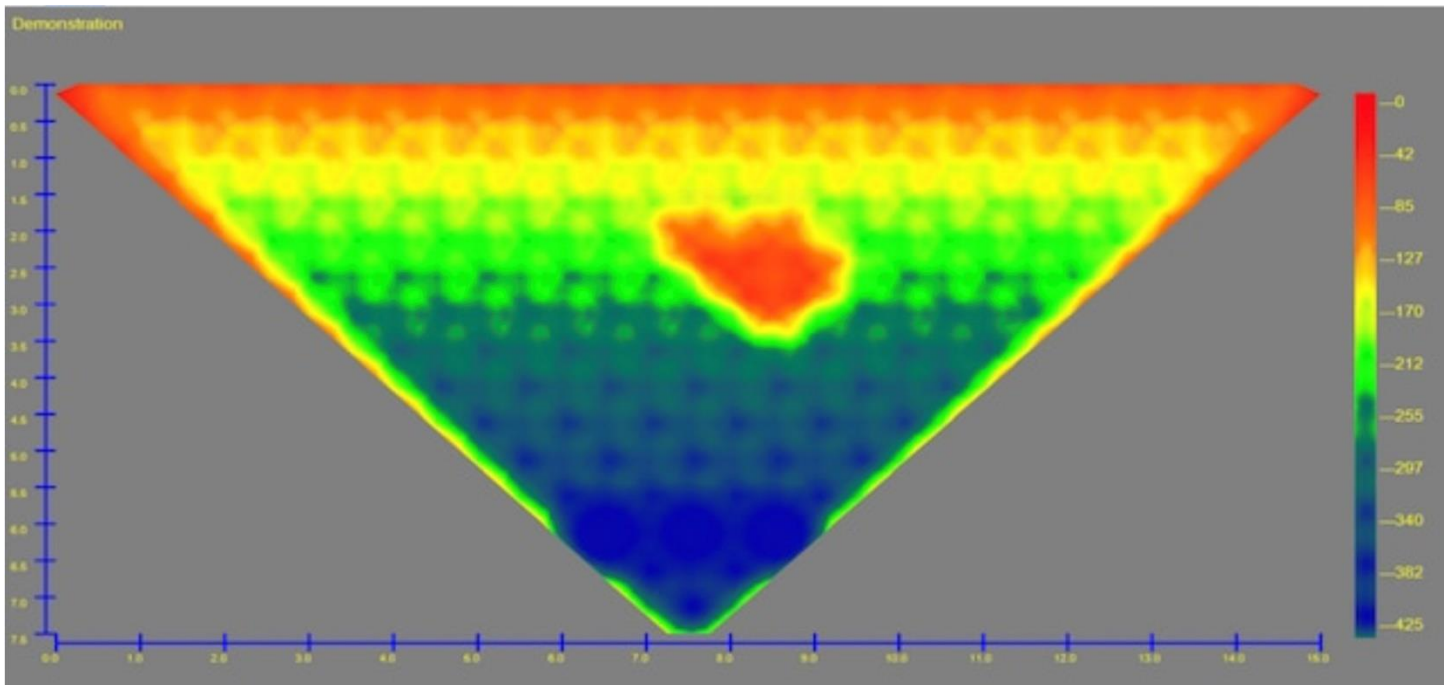


Image interpretation: Red represents a relatively low resistance (high conductivity) zone---near surface is generally red because initial electrode pairings are close together to yield low resistance. A solid red zone deeper within the image body can represent water or high conductivity materials such as metals. Green represents “normal or average” resistance soil conditions. “Patchy” blue zones are associated with approaching high resistance (low conductivity) zone(s), while solid dark blue represents high resistance (low conductivity) zones such as caves, tunnels or rough voids---can also be associated with very loose soil and or heavy gravel deposits. Images of ‘normal’ soil conditions, without interesting anomalies, will always progress from red at the surface to dark blue at the bottom----without clearly defined anomaly zones.