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**Interactive
comment**

Interactive comment on "A remote-control datalogger for large-scale resistivity surveys and robust processing of its signals using a software Lock-In approach" *by* Frank Oppermann and Thomas Günther

Anonymous Referee #1

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Comments to editor

The paper is very interesting for people works on geoelectrical no-standard system for deep investigation. The introduction misses some papers on the DC deep approach that already use no-standard equipment. Moreover, the authors introduced the Lock-in approach a methods on the correlation between current and voltage signals and it is used when there are small signals out of a huge noise floor. Anyway, the paper introduce a digital Lock-in detection, that is considered more robust then the analoge one. Finally, I think that this approach adds new things and I suggest to publish it.

Comments to authors

Introduction: The introduction is well described but some cited papers are not indicated in the final bibliography. Moreover, I suggest to add some deep DC application with no-standard instruments (transmitter and receiver physically separated) with a single and multichannel system. In example, there are papers where a deep DC instrument with single channel was used: a)Rizzo E., Colella, A., Lapenna, V. and Piscitelli, S. (2004). "High-resolution images of the fault controlled High Agri Valley basin (Southern Italy) with deep and shallow Electrical Resistivity Tomographies". Physics and Chemistry of the Earth, 29, 321-327;

b)Colella A., Lapenna V., Rizzo E. (2004). High-resolution imaging of the High Agri Valley basin (Southern Italy) with Electrical Resistivity Tomography. Tectonophysics, 386, 29-40;

c)Tamburriello G., M. Balasco, E. Rizzo, P. Harabaglia, V. Lapenna, A. Siniscalchi. Deep electrical resistivity tomography and geothermal analysis of Bradano foredeep deposits in Venosa area (Southern Italy): first results. Annals of Geophysics, Volume 51,No.1, pag.203-212, February 2008)

Moreover, there are some more recent with deep DC multichannel use: a)Santilano A, Godio A, Manzella A, Menghini A, Rizzo E, Romano G (2015). Electromagnetic and DC methods for geothermal exploration in Italy, state-of-the-art, case studies and future developments. First Break . First Break 33 (8), 81-86

b)Balasco M., Giocoli A., Lapenna V., Rizzo E., Romano G., Siniscalchi A., Votta M. (2008). Deep resistivity image of the Agri Valley (Southern Italy). Near Surface 2008 – 14th European Meeting of Environmental and Engineering Geophysics Kraków, Poland, 15 - 17 September 2008

Datalogger: Line 90 to 92: I suggest to explain why only 3 channels are used.

Line 96: The GSM module is used only for the communication between the DL and the

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laptop as remote control. . .to download the acquired data the system uses a USB way. Why is it not possible to use a 3G module? I suggest to add one sentence to explain.

Line 120: I suggest to add on the figure 4 the frequencies indicated: powerlines, railway, the signals 0.2hz and the harmonics.

Field case: Line 275-279: the authors wrote "Higher DD correspond to larger penetration depths but exhibit lower. . ."". . .the figure 14b show low S/N signals (blue color) in two zone (one shallow and one deep) with in the middle a better S/N signals zone. Therefore, the sentence needs some more details. . . it depends also for the electrical resistivity distribution. Low resistivity zone (i.e. clay) produce low S/N signals then relative high resistive layer (i.e. sandstone). I suggest to explain better this part.

References: I suggest to check the matching between the list of the references and the indication in the text.

Figures: Figure 15: I suggest to add the unit (may be "m") for the X axis

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