



Monitoring of resistivity and IP: The Syscal Monitoring Unit (SMU), a new system dedicated for remote control of the Syscal Pro resistivimeter

Julien Gance, Orlando Leite, Benoît Texier, Jean Bernard, and Catherine Truffert
IRIS Instruments, Orléans, France (sales@iris-instruments.com)

All matter, gas, fluids and energy transfer at soil/atmosphere interface govern soil, rock and life evolution in the critical zone. Near surface electrical resistivity and chargeability modifications with time are distinguishable and process related enough for bringing to geoscientist relevant clue within this highly studied zone. Such non-invasive measurements are directly sensitive to a wide range of remarkable parameters (soil water content, temperature, soil water conductivity, clay content, etc.). In order to increase physical, chemical and biological processes understanding, resistivity and IP monitoring remain the less costly and the more powerful method among others. Indeed, these methods are the most suitable to image 2D/3D and 4D processes in an automated way.

Whether such geophysical survey are for academic knowledge, waste landfill leakage or landslide monitoring purpose, it has to be done during medium to long period of time (from days to years). Nevertheless, operators don't need to be on site all the survey long. So, equipment manufacturers had to propose them suitable solutions for their needs. Syscal Pro resistivimeter is well adapted to observe the critical zone down to 100 m depth with its 10 channels and 250 watts. Its high speed recording (up to 1000 records/min) ability is also suited to apprehend expected kinetics of studied phenomena.

In this context, IRIS Instruments developed a dedicated remote unit able to remote control Syscal Pro resistivimeter. It allows to change acquisition parameters (sequences), to check the main constant (battery levels, internal temperature) and to alert in case of any recording troubles. Data can be sent directly to FTP or SSH server or by mail for an easy and constant access to the data. Alert functionalities sent by mail in case of low battery or too many outliers present in the data are welcome to check the dimensioning of the energy source and for easily maintaining the long-term acquisition necessary for such applications.

This paper present the device and how it can be easily used, connected directly to the internet network, to the 3G/4G mobile network or not. A large field of application is then now accessible to geoscientist.