

Logging Setup for EGM-4 Using iOS and Android Mobile Applications

This application note summarizes a method to capture an EGM-4's data stream straight to widely used mobile devices running either iOS (Apple) or Android (Google) operating systems.

The recent increased interest in the use of mobile applications in the field of environmental monitoring (Berger-Tal and Lahoz-Monfort, 2018) and need for easy-to-use, transferable methods for data acquisition and sharing has increased as well (Marvin et al., 2016). Several manufacturers have innovated to answer to meet user needs.

The highly popular EGM-4 is still actively used around the world. To further increase its functionality and application, Sterk et al. (2019) describes a complete setup to use mobile devices to log, share and process the EGM-4's data output. The paper lists an overview of hardware and application requirements for both operating systems and the settings for the EGM-4. Scripts for use in R, Python and Matlab are provided to batch-process a series of raw datafiles from the mobile applications, fit for use in any flux estimate package afterwards.

Required equipment

- Any EGM-4 Environmental Gas Monitor by PP Systems
- An adaptor cable – various types are available:
 - › iOS mobile devices equipped with a Lightning* port require a Lightning to 9-pin adaptor. For example, the Redpark Lightning Console Cable (L2-RJ45V-A) with an ethernet to DB9 port adaptor for the RS-232 connection.
 - › Android mobile devices fitted with a micro-USB port require a micro-USB to RS-232 cable. The StarTech Micro USB to RS232 DB9 Serial Adaptor Cable for Android with USB Charging-M/M works** for these devices.
- Mobile application:
 - › iOS mobile devices can run the free Get Console app.
 - › Android mobile devices require the free FTDI AOA HyperTerm app.

Other adaptor cables and mobile applications can in theory be used, as long as they are able to connect to the EGM-4's RS-232 output port and able to send and log a serial signal. All adaptor cables should be fitted with a FTDI chip.

Figure 1: Ethernet to RS-232 adaptor (grey) connected to the RedparkLightning Console Cable (L2-RJ45V-A) (black).

Setup

As soon as the EGM-4 is turned on and ready for measurements according to the operation manual, the adaptor cable can be connected to both the EGM-4's RS-232 port and the mobile device. The EMG-4 can be used in any mode for the logging set-up, as the output from the RS-232 is in a fixed format, fit for the scripts provided in the supplemental material by Sterk et al. (2019). The output of the R, Python and Matlab is identical and the user can choose what language fits the purpose best.



* for older iOS mobile devices with a 30-pin port, a different adaptor (i.e. Redpark serial cable C2-DB9V) can be used.

** an additional power source might be required to be connected to the second USB-cable of this adaptor if the mobile device doesn't allow both data transfer and charging capabilities over the same cable.



Figure 2: Setup in the field, with an iPhone logging the EGM-4 output in the Get Console application.

Full publication and supplemental material:

More information on the workflow of the setup can be found in the full text and (open access) supplemental material online: <https://dl.sciencesocieties.org/publications/jeq/abstracts/48/5/1557>

References:

Berger-Tal, O., and J.J. Lahoz-Monfort. 2018. Conservation technology: The next generation. *Conserv. Lett.* 11(6):e12458. doi:10.1111/conl.12458

Marvin, D.C., L.P. Koh, A.J. Lynam, S. Wich, A.B. Davies, R. Krishnamurthy, E. Stokes, R. Starkey, and G.P. Asner. 2016. Integrating technologies for scalable ecology and conservation. *Glob. Ecol. Conserv.* 7(July):262–275. doi:10.1016/j.gecco.2016.07.002

Sterk, H. P., I. Detrey, C. Marshall, N. R. Cowie, R. Payne, J. McIlvenny, and R. Andersen. 2019. Capturing Gas Fluxes on Your Phone: An iOS- and Android-based Data-Logging Setup for EGM-4 Environmental Gas Monitoring Systems. *J. Environ. Qual.* 48:1557-1560. doi:10.2134/jeq2019.04.0163

PP Systems would like to thank and acknowledge Henk Pieter Sterk (Environmental Research Institute, Castle Street, Thurso, KW14 7JD) for providing the information contained in this application note.

 @HPSterk

 @hpsterk



If you would like to learn more about this application or speak with one of our experienced technical staff, please feel free to get in direct contact with us via any of the contact information listed below:

110 Haverhill Road, Suite 301
Amesbury, MA 01913 U.S.A.

Tel: +1 978-834-0505
Fax: +1 978-834-0545

support@ppsystems.com
ppsystems.com

@pp_systems

 company/pp-systems

 ppsystems.intl

 ppsystemsinc

10.19