

Flux measurements using a single eosAC and Picarro analyzer

Introduction

This application note covers scheduling eosAC autochamber measurements and processing flux data with supported Picarro analyzers, without an eosMX multiplexer.

While most eosAC deployments consist of multiple autochambers connected to a single gas analyzer through the eosMX multiplexer, users with a single eosAC have the option of using their Picarro analyzer to provide the measurement scheduling. This requires the single chamber power/data cable as well as the eosMonitor-AC software.

IMPORTANT

See **AN0003: eosAC/eosMX and Picarro Quick Setup** for technical details on making proper tubing connections, including Swagelok tightening guidelines.

Required Components

- eosAC
- Picarro Analyzer
- Picarro Recirculation Pump
- Tubing 2 x 30 m (one end pre-swaged)
- Single chamber power/data cable (special order)
- eosMonitor-AC software

Hardware Setup

Connect the eosAC to the analyzer and pump with tubing: eosAC INLET to analyzer INLET, and eosAC OUTPUT to pump outlet port. Connect the two-headed end of power/data cable to any USB port and the VALVES port on the rear of the analyzer, and the other end to the eosAC COMM port.

Monitoring Chamber Data

The eosMonitor-AC software collects temperature and pressure data from the eosAC chamber, which is used by the eosAnalyze-AC software to correct the flux measurements. eosMonitor-AC must be running and connected prior to deployment in order log this peripheral data.

The main eosMonitor-AC window shows the current program status (Connecting, Idle, Monitoring) as well as several buttons: **Stop/Start Monitoring** allows the user to pause and resume data collection; **Hide** minimizes the program window to the system tray; **Quit** completely exits the program.



Figure 1. eosMonitor-AC system tray icon showing “Connecting” status

Please note that if the eosMonitor-AC program is not running, or running but not monitoring, then the eosAC temperature and pressure data will not be recorded. Any flux measurements can still be processed, however they will be lacking accurate temperature and pressure corrections.



Figure 2. eosMonitor-AC main window showing “Connecting” status

Scheduling Chamber Measurements

The External Valve Sequencer of the Picarro Gas Analyzer is used to schedule eosAC chamber measurements by manually setting the open and close events. To access the valve sequencer, select Show/Hide Valve Sequencer GUI from the Tools menu of the CRDS Data Viewer (see the relevant Picarro User Manual for more information on this interface). This will open the External Valve Sequencer window (Figure 3), which shows the current valving sequence as one or more steps.

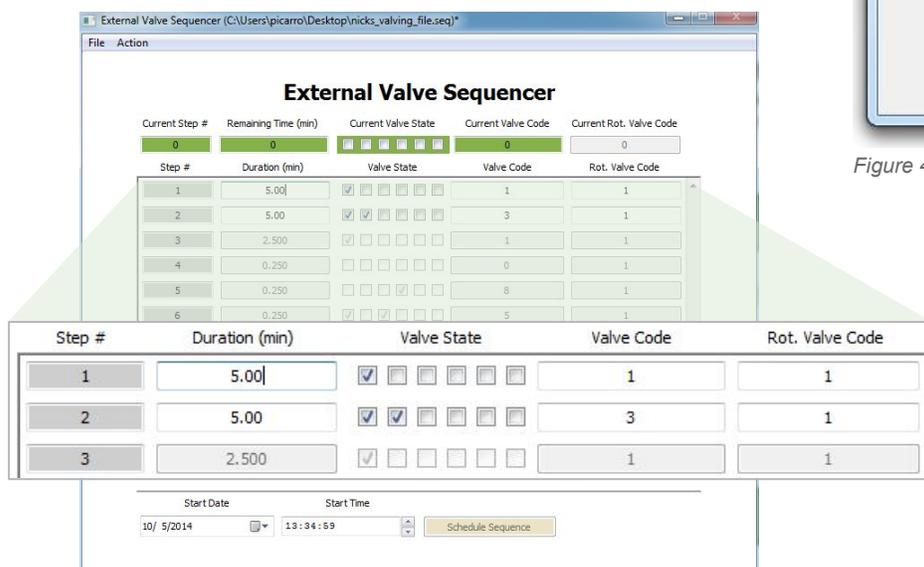


Figure 3. Example valve setup showing a two-step sequence. (Picarro Valve Sequencer software)

Creating an eosAC measurement cycle requires two steps: a wait and a period of chamber closure. During the wait period, only the first valve state should be active (Valve Code 1). For the chamber closure, the first and second valves states should be active (Valve Code 3).

A simple example valve sequence is shown in Figure 3, consisting of an initial five minute wait, followed by five minutes of chamber closure. Once the two steps are complete, the sequence begins again from Step 1. Users can configure these wait and chamber durations as needed; however both should be set to 60 seconds minimum.

Once the valving sequence has been configured, choose **Start Sequencer** from the **Action** menu in the External Valve Sequencer window to launch the chamber measurement cycle. Once started, the specified valve sequence will continue running eosAC flux measurements until the user selects **Stop Sequencer** from the **Action** menu in the External Valve Sequencer window.

Once all of the flux measurements have been collected, data processing occurs through the eosAnalyze-AC software as described in the eosAC user manual. Simply choose **Select Chamber Type (Options menu)** and set **Eosense eosAC (Single)** before importing data.

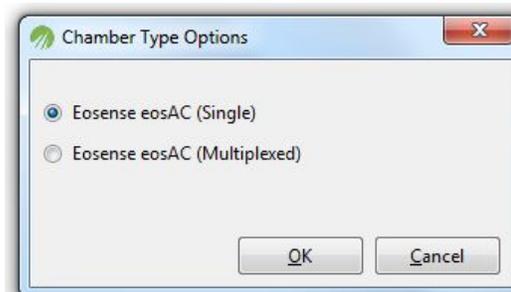


Figure 4. eosAnalyze-AC Chamber Type Options dialog.

Summary

While most eosAC chambers are deployed alongside of the eosMX multiplexer, a single chamber can be operated using a Picarro analyzer, the single chamber power/data cable, and the eosMonitor-AC software.

For more information on the eosAC hardware or the data processing software, please refer to the eosAC manual, available through the online customer resources or by contacting: support@eosense.com.