LI-7500DS and SmartFlux 3 System

Quick Start Guide

for Eddy Covariance Measurements

This document serves to help you get started with an eddy covariance system that includes the LI-7500DS Open Path CO_2/H_2O Gas Analyzer, the SmartFlux 3 system, and accessories.

Software

Each instrument in the system has embedded firmware. Some have both embedded firmware and desktop software, which is used to configure the instrument. Always use the most current software and firmware for the best performance.

Go to licor.com/7500ds-software to download software for the following:

- LI-7500DS Interface Software and Embedded Firmware updater
- The SmartFlux 3 System Embedded Firmware updater
- EddyPro Software for Windows or macOS
- (Optional) LI-7700 Interface Software and Embedded Firmware updater
- (Optional) Blueprint Utility for the LI-COR Biomet Data Acquisition System

Install the software and the firmware updaters so you'll be ready to update the firmware when you connect to the system. When you connect to the instruments, check the firmware versions and update if needed.

Documents

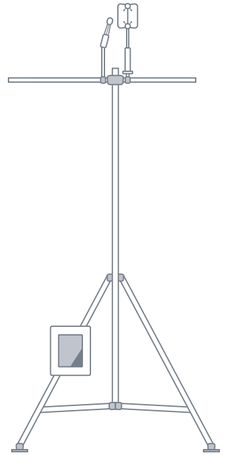
Additional literature is available to help you use your instruments.

- LI-7500DS CO_2/H_2O Gas Analyzer and the SmartFlux 3 System
  Manuals and resources: licor.com/7500ds-support
- LI-COR Biomet Data Acquisition System
  Manuals and resources: licor.com/ec-biomet
- RV50X Cellular Communication System
  Manuals and resources: licor.com/cellular-support
- LI-7700 CH_4 Gas Analyzer
  Manuals and resources: licor.com/7700support

Preparations

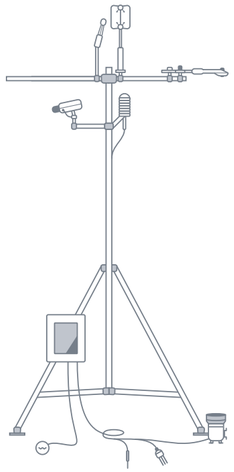
- Clear a space in your lab to configure and test the system before going to the field.
- Obtain a DC power supply that can provide 4 to 5 amps at 12 to 24 VDC output, depending on the components in your system.
- Allow plenty of time to assemble the system and verify the setup.
- Choose from the following options.

LI-7500DS Only



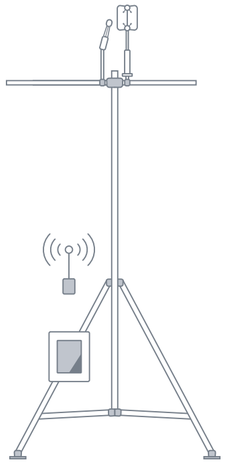
Complete instructions are in the LI-7500DS instruction manual.

LI-7500DS + Biomet Data Acquisition System



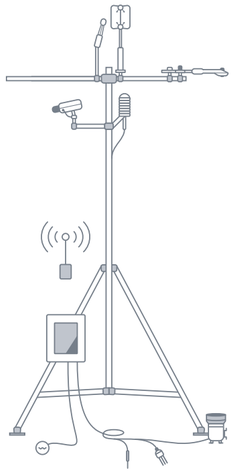
1. **Initial Assembly:** Start with the Biomet Data Acquisition System instruction manual and finish with the LI-7500DS instruction manual.
2. **Initial Configuration:** Start with the LI-7500DS then follow this order, passing over any sections that do not apply: Biomet Data Acquisition System, PhenoCam, and LI-8100A.

LI-7500DS + RV50X Cellular Modem



1. Arrange a data plan with a cellular service provider as described in the RV50X instruction manual from LI-COR.
2. **Initial Assembly:** Start with the LI-7500DS instruction manual and finish with the RV50X instruction manual from LI-COR.
3. **Initial Configuration:** Start with the RV50X manual from LI-COR. Finish with the LI-7500DS instruction manual.

LI-7500DS + Biomet Data Acquisition System + RV50X Cellular Modem



1. Arrange a data plan with a cellular service provider as described in the RV50X instruction manual from LI-COR.
2. **Initial Assembly:** Follow instruction manuals in this order: Biomet Data Acquisition System, RV50X manual from LI-COR, and the LI-7500DS.
3. **Initial Configuration:** Pass over any components that do not apply.
   a. Set IP addresses as described in the RV50X manual from LI-COR for the PhenoCam, LI-8100A, and LI-7500DS.
   b. Configure the Biomet Data Acquisition System, PhenoCam, LI-8100A, LI-7500DS, and RV50X as described in the respective instruction manuals.

Any Previous Configuration + LI-7700

1. **Initial Assembly:** Follow instruction manuals in this order: Biomet Data Acquisition System, LI-7500DS, LI-7700, and RV50X instruction manual from LI-COR.
2. **Initial Configuration (with RV50X):** Pass over any components that do not apply.
   a. Set IP addresses as described in the RV50X manual from LI-COR for the LI-7700, PhenoCam, LI-8100A, and LI-7500DS.
   b. Configure the LI-7700, Biomet Data Acquisition System, PhenoCam, LI-8100A, LI-7500DS, and RV50X as described in the respective instruction manuals.
3. **Initial Configuration (without RV50X):** Configure the LI-7500DS, LI-7700, Biomet Data Acquisition System, PhenoCam, and LI-8100A as described in respective instruction manuals.

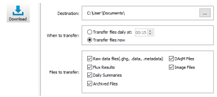
Verify the Configuration

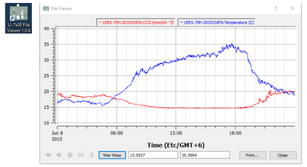
To verify that fluxes are calculated, review the data after at least 30 minutes of data have been logged and processed. View the results under the **Results** graph in the software dashboard. To get a better idea of system performance, review 24 hours of data.

- Review Biomet data under **Biomet > Data** tab.
- Review LI-7700 flux data under **Results** of the dashboard.

Download Data Files

Download data files manually or on a schedule with the **Download** utility in the interface software. If desired, you can quickly review plotted data with the File Viewer application.





Site Maintenance Plan

A site maintenance plan is critical to your success. With regular checkups on the system you'll be able to correct issues at the site and prevent the loss of data.

When you first deploy the instrument:

- Check the signal strength and record this for a baseline. This will help you determine when the optics should be cleaned.

Every day or every few days:

- Check the overall performance of the instruments, including the measured values and diagnostic information. This will ensure that you don't lose data (or that you lose less data) if something is wrong.
- Check the measured values. Air temperature, pressure, sonic temperature, dew point, gas concentrations, covariances and fluxes. Any unexpected readings may indicate an issue.
- Check the diagnostics. Signal strength, detector temperature, chopper housing temperature, and thermocouples.

Once per week:

- After installing the new system, start by checking the signal strength once per week. There is no absolute guideline for good or bad signal strength, but 100% indicates very clean optics and optimal performance from the analyzer. If the signal strength has dropped, it is a good idea to clean the optics. For most sites, the maintenance frequency is once every 3-4 weeks. The signal strength limit, below which the instrument readings are compromised, varies due to the spectral characteristics of the contaminants involved. Typically, signal strength values should be maintained in the upper 90's for consistent performance.

Once per month:

- Check the zero and span. If they have shifted, do a user calibration. As you become familiar with your instrument, you will probably find that this does not need to be checked as often.
- Clean the upper and lower windows of the analyzer.
- Download all your data and store it to an archive.
- Check cables for damage. Tighten any loose cable connections.

Every six months:

- If your instrument is in a humid environment, replace the head chemicals.

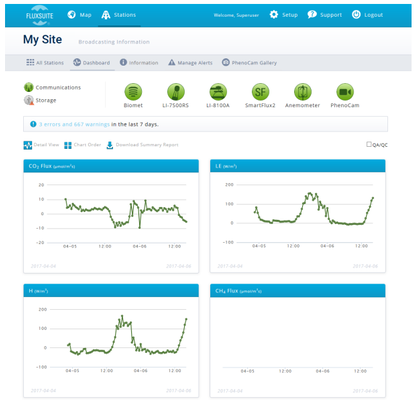
Once per year:

- Replace the head chemicals.

View Live Data in FluxSuite Software

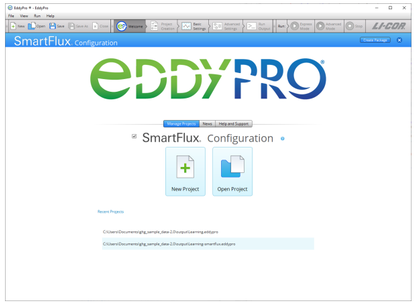
All LI-COR eddy covariance systems include a free subscription to FluxSuite Software, a web service that provides instrument status information, email alerts, and graphs of data. Go to licor.com/env/products/eddy-covariance/fluxsuite for details.

FLUXSUITE



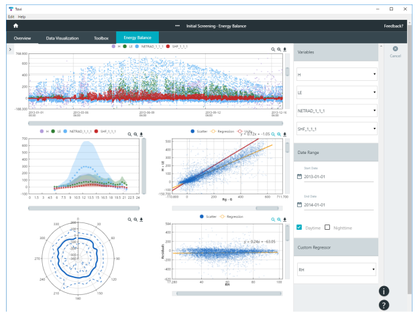
Create an Advanced Configuration with EddyPro 7 Software

All LI-COR eddy covariance systems include EddyPro 7 Software. EddyPro is used to recompute flux results or create an advanced data processing configuration, which can be loaded on the SmartFlux System if circumstances require advanced data processing beyond that provided by the default Express Mode. Go to licor.com/env/products/eddy-covariance/eddypro for details.



Evaluate Long-term Results in Tovi Software

All LI-COR eddy covariance systems include Tovi Software — a suite of tools for analyzing eddy covariance datasets that have been processed with EddyPro Software. Tovi brings together analysis tools, developed by or with the scientific community, into an interactive software interface to facilitate common processes such as quality control, flux gap filling and partitioning, footprint-based flux allocation, and more. Go to licor.com/tovi for details.



Get Technical Support

- For technical support resources, go to licor.com/env/support/home.html. Click **Contact Support** for more contact options.
- To submit a request for support, fill out the **Support Contact Form** at licor.com/envsupport
- To contact sales, fill out the **Sales Contact Form** at licor.com/env/contact/contact-sales.html

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