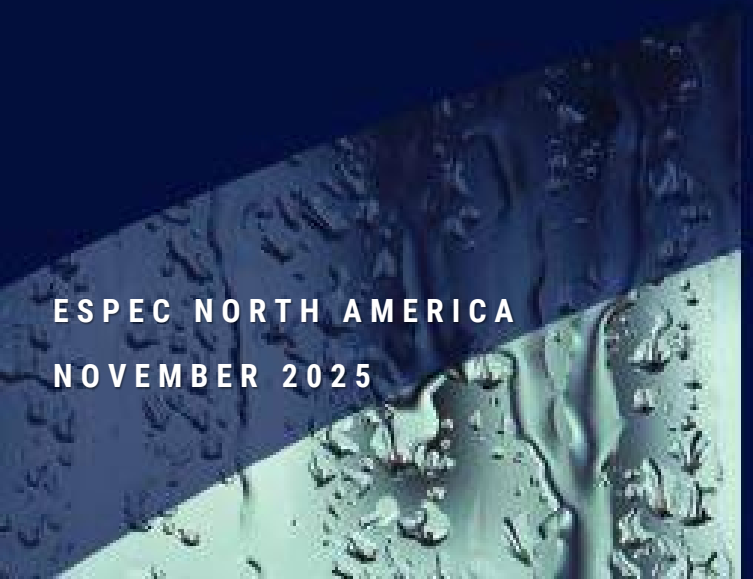
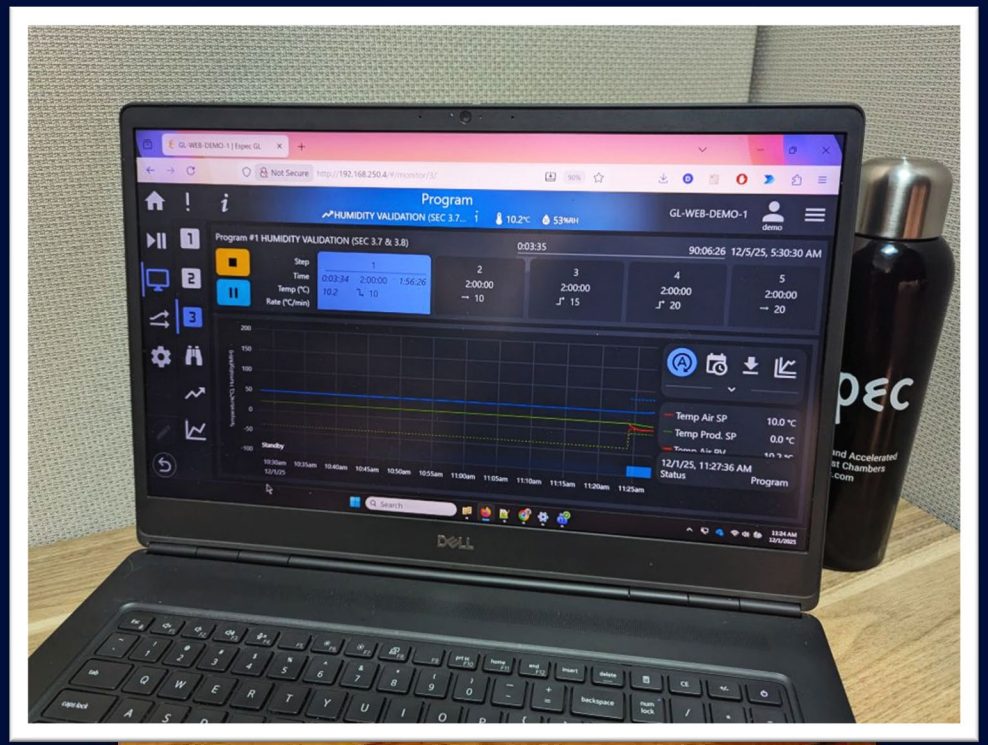
ESPEC GL CONTROL SYSTEM
REMOTE/SOFTWARE ACCESS GUIDE





ESPEC NORTH AMERICA

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SEVERAL CHOICES FOR REMOTE ACCESS OF THE GL CONTROL SYSTEM

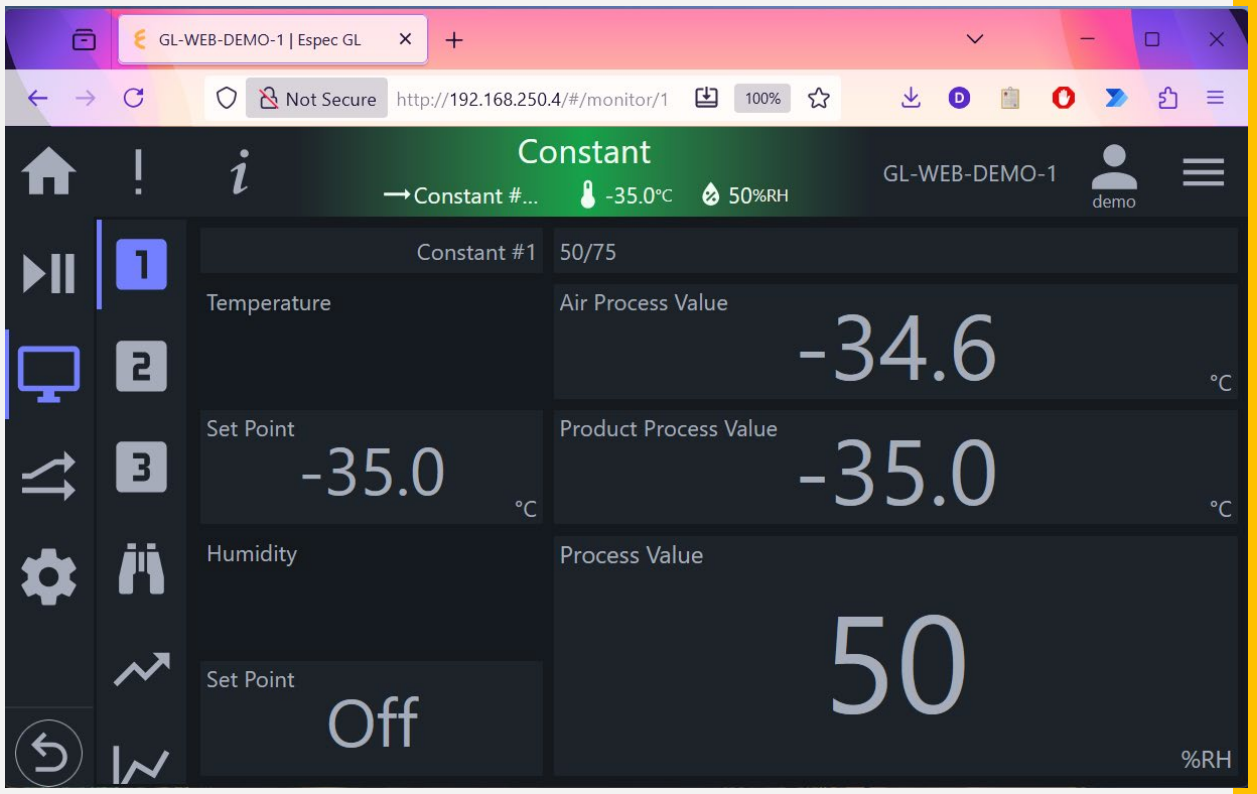
In a nutshell (see following pages for details):

1. Direct remote user access via **Ethernet/LAN**:
    1. Remote browser operation
    2. Datalogging and file downloads via USB or browser
    3. Custom macros for email notifications or other actions (like scheduled data downloads)
2. Ethernet for **RESTful API** integration with your other software
3. Ethernet or optional RS-232 serial port for **connecting directly** to the controller via your software
    1. ESPEC Chamber Connect Library in **Python** available
4. Use **LabVIEW** with either a serial port or the API

1. WEB BROWSER

Web server for remote access via a browser

- Access the chamber from any device on the local network. Same interface as the controller.
- View current chamber operational status including trend-graph
- Internal data storage for two years (when set at 10 second sampling)
- Export operation data as a CSV file (20+ parameters)
- Test profile creation, upload/download, and back-up
- Remote only functions:
  - Network view: see all your enabled ESPEC chambers on one screen.
  - Macro editor



Try the live demo at
http://gl.espec.com:8080

1A. USB PORT

The system includes a USB port with three functions:

1. **Data Download**
   Get all the stored data points from the controller or just a specific segment of time. Download will be a CSV file that can be opened in Excel. 25 operational parameters available.
2. **Program upload/download**
   Enables the user to save programs and swap between chambers.
3. **Input connection**
   A mouse and/or keyboard can be connected via the USB, if needed.
4. **Firmware updates**
   The GL can get firmware updates directly from the internet, or uploaded via the USB.

2. RESTFUL API

Simplified software integration with RESTful API.

- API allows machine-to-machine communication without complicated command protocols. The GL is built on the API and a SQL database.
- View our API Documentation and guide
- Use sample Python code

- Note: The API uses a data cache that updates every 10 seconds. Some setup settings are not accessible from the API.

Our 3-minute video on the magic of APIs and Macros

3. DIRECT CONTROLLER CONNECTION

You can bypass the webserver and talk directly to the chamber controller.

ESPEC offers a Chamber Connect Library to help users jump-start their custom software applications. This library is hosted on Github and uses Python 3 code. It includes a communications protocol library applicable for other software languages.

This library is offered as-is and some functionality of the GL may not be available at this time. It is also applicable to the following controllers: ESPEC P-300 & SCP-220, Watlow F4T & F4.

The Communications Manual provides complete system documentation of commands and protocol. Free software, such as PuTTY (for TCP) and Termite (for serial), can be used with for directly sending these commands.

Chamber Connect Library (Github)

GL Communications Manual (pdf)

3A. RS-232

ESPEC offers RS-232 serial communication port as an optional feature. See the previous page for functionality.

Third party devices:

- Ethernet-to-Serial converter: Grid Connect
- USB-to-Serial converter: Mouser FTDI CHIPI-X10

RS-232 / Serial Port

4. USING LABVIEW

Want to use LabVIEW? You can talk to the API or via a serial port to the controller directly:

Using serial port and LabVIEW VISA drivers:

1. Purchase optional RS-232 serial port
2. Download VISA drivers via NI: Espec Climatic-Chamber SCP

Using LabVIEW via the RESTful API: Install and set up following LabVIEW tools shared on Github, then use our API.

1. JSON Serialization & Deserialization Library for LabVIEW
2. REST Client Library for LabVIEW