



Molecular Property Spectrometer™ MPS™ A2L Refrigerant Gas Sensor

MPS Firmware Upgrades

The MPS A2L Refrigerant Gas Sensor comes preprogrammed with firmware that operates the sensor. This document provides instructions for upgrading the firmware to the latest version, if desired. Also provided in this document is a version history of this firmware.

Firmware upgrades are performed using the “Evaluation Kit” and accompanying “MPS Sensor Interface” application (Figure 1). Information about these can be found on our web page: <https://www.nevadanano.com/downloads/>



Figure 1: On the left, the “Evaluation Kit” hardware; on the right, the “MPS A2L Refrigerant Gas Sensor interface” application.

Make sure you have downloaded and installed the latest version of the application on your target PC. The PC must be connected to the internet for firmware upgrade. After installing the application, follow these steps:

1. Physically connect the interface board to the PC (Windows) via USB **directly**. Make sure the cable is fully connected to the PC and the interface board. Do **not** connect via a USB hub. When powered, the Green LED on the interface board should be on.
2. Start the “MPS A2L Refrigerant Gas Sensor Interface” application.
3. Select “Find MPS Devices”. From the drop-down list select your sensor.
4. The application will then connect to the cloud and check to see if the sensor is running the latest firmware. If the sensor is already running the latest firmware, the upgrade button will indicate “Firmware Up-To-Date”.
5. If a new firmware is available, the upgrade button will indicate “Upgrade Firmware”. Press the button to start firmware upgrade. During the upgrade process, make sure there is no disruption in communication between the sensor and the PC. Any disruption during upgrade could result in a “dead” sensor.
6. When firmware upgrade is completed successfully, a message box will appear indicating “Firmware upgraded successfully!”



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7. Disconnect USB to the sensor and reconnect (i.e. “power cycle” the sensor).
8. Re-launch the “MPS A2L Refrigerant Gas Sensor Interface” and select “Find MPS Devices” again. The sensor should appear with a new firmware version number.

MPS A2L Refrigerant Gas Sensor Firmware Version 3.1.0.0 Release Notes

Build 3.1.0.0 has the following improvements and updates:

- Enhancements to chemometric algorithms for handling rapid environmental transients.
- Improvement in accuracy of reported concentration.

MPS A2L Refrigerant Gas Sensor Firmware Version 3.0.0.0 Release Notes

Build 3.0.0.0 has the following improvements and updates:

- Significantly reduced average power consumption from 55 mW to 29 mW.
- Enhanced sensor capability when measuring up to 100% v/v concentrations.
- Faster response time: T90 is now ~5 seconds.
- Bug fixes.
- New API for UART communication:
 - All integers are now represented in Little Endian format. For processors with Little Endian format, this eliminates the need to swap bytes into native format. This change is **not backward compatible** with clients written against previous firmware releases.
 - A new command (ID 0x09) is available to query “engineering data” for debugging.
 - Inclusion of self-test commands, which are defined in the MPS A2L Refrigerant Gas Sensor User Manual.
- Previous versions of the MPS A2L Refrigerant Gas Sensor Interface are incompatible with this firmware upgrade. Version 1.6.1.4 of the MPS A2L Refrigerant Gas Sensor Interface must be used to properly upgrade and operate the sensor.