

# Analytical Gas Monitoring

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## Analytical Gas Monitoring System

The analytical gas monitoring system is a collection of hardware, software, and infrastructure designed to record, report, and alert interested parties in the current and historical status of various analytical gases. The monitoring system currently comprises 2 primary parts:

- Hardware
- Data logging and reporting software

## Hardware

This system is comprised of four pieces of hardware purchased from National Instruments (<http://www.ni.com/en-us.html>).

Part Number	Description	Quantity
NI-9237/779521-01	4-channel C series strain/bridge input module (RJ50 connectors)	1
cDaq-9181/781496-01	1-Slot, ethernet CompactDAQ chassis	1
FSH00827	Female port pressure sensor (PFP350 Series) 0-3000psi	3
FSH01785	Thirty foot cable with LEMO connector.	3

### cDaq-9181/781496-01

The cDaq 9181 is a chassis used for housing NI C series I/O modules. The chassis controls the timing, synchronization, and data transfer between the module and an external host.



### NI-9237/779521-01

The NI-9237 includes all signal conditioning required to power and measure up to four bridge-based sensors simultaneously.

Currently, channel 0 is used to monitor the helium pressure and channel 1 is used to monitor the argon pressure.



## FSH00827 0–3000 psi Futek pressure sensor

The pressure sensor measures pressure in the 0–3000 psi range. It is supplied an excitation of 10 V and has an LEMO connector. Connector pin out is listed on the side of the sensor, with an output positive and negative and excitation positive and negative.

Three of these sensors are currently installed. These require no maintenance or special considerations, other than taking care not to physically crush them when working near them.



0–3000 psi pressure sensor.

## 30 foot LEMO cables

These 30 foot braided steel shielded cables have a LEMO connector on one end to plug directly into the sensor and 4 bare wire terminals on the other end to connect to the data logger.

## Software

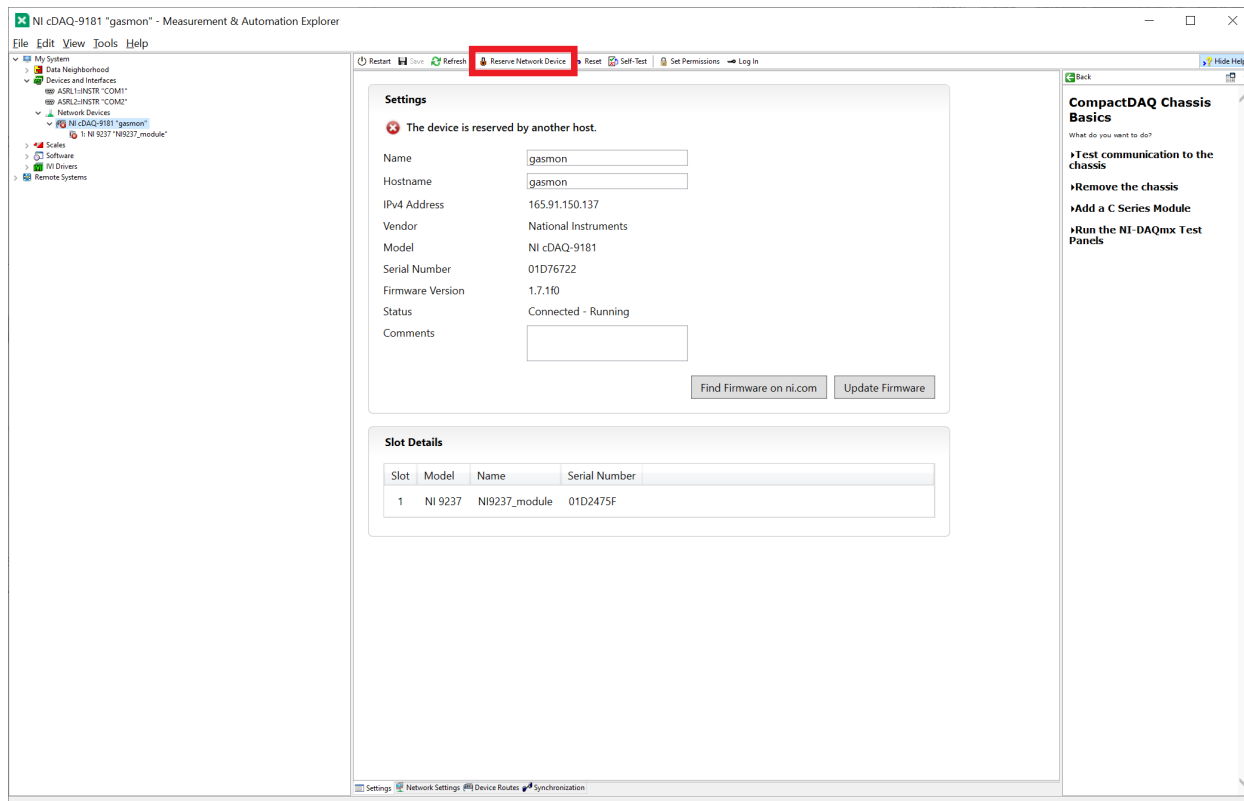
Data is reported through two Labview gas monitoring programs. One master/main gas monitor which can only be used in one location, and a remote gas monitor for use in other locations. The master version communicates with the loggers and collects data; and the remote version receives data shared by the master version.

## Main Gas Monitor

The main gas monitor should only be used from one set pc as the remote gas monitor obtains values by looking for shared variables coming from that pc. This is because the cDAQ-9181 can only communicate with one pc and must be reserved by a pc in NI MAX. If the main gas monitor is to be used from a different pc, the device needs to be reserved by the new pc and the remote gas monitor will have to be edited to point at the new pc.

To reserve the cDAQ-9181 to a new pc:

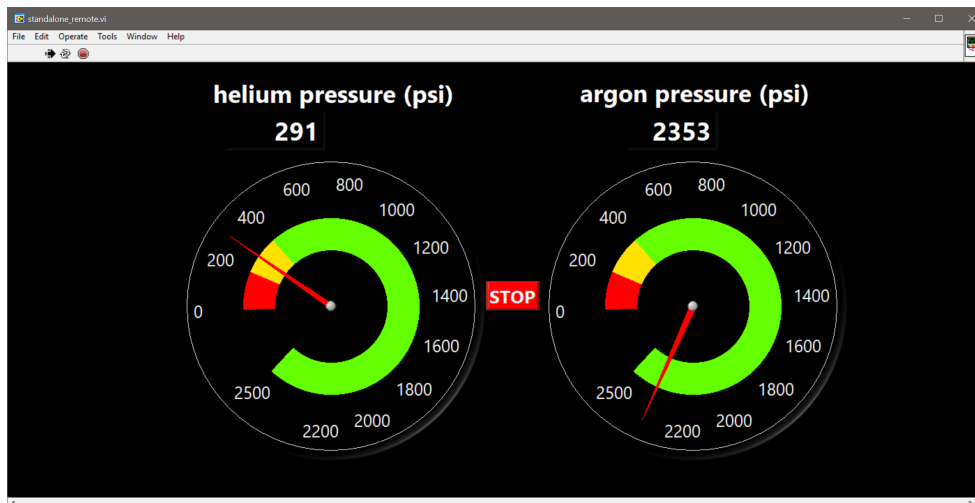
- Open NI MAX on the new pc
- On the left, navigate to My System > Devices and Interfaces > Network Devices
- Select the NI cDAQ-9181 "gasmon"
- Select Reserve Network Device



The main gas monitor can now be run by opening the gasmon\_main.vi.

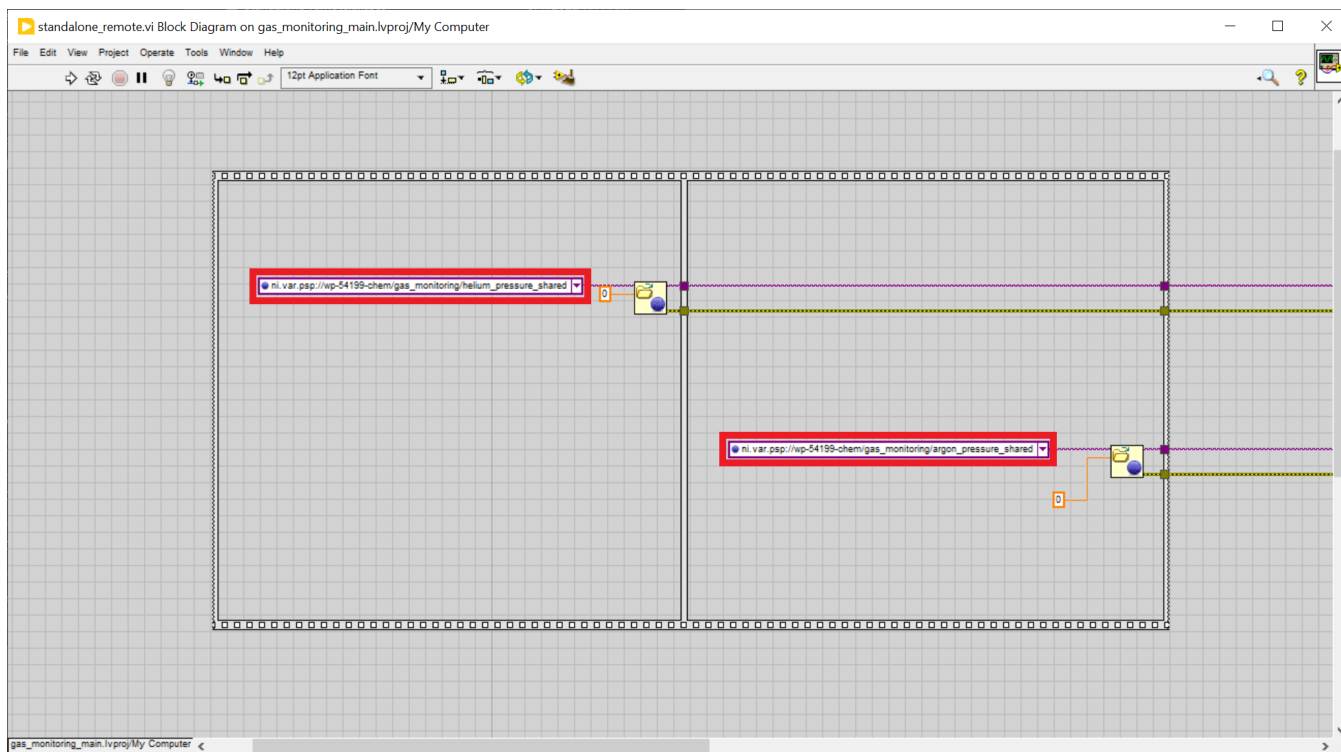
## Remote Gas Monitor

This display allows the user to view the actual pressure of the Helium and Argon gasses connected on Upper Tween. Red zones indicate that the gas lines should be switched to a new set of bottles. The stop button stops data updating. The play button in the upper left of the window will start it again.



If the main gas monitor has been switched to another pc, it will be necessary to update the remote monitor's labview code to direct it towards the new pc.

- Open standalone\_remote.vi
- Select Window > Show Block Diagram
- The outlined fields in the picture below will need to be updated with the name of the new pc.
  - ni.var.psp://PC NAME HERE/gas\_monitoring/helium\_pressure\_shared
  - ni.var.psp://PC NAME HERE/gas\_monitoring/argon\_pressure\_shared



## Archived Versions

[LMUG-AnalyticalGasMonitoring-230220-1710-106.pdf](#)