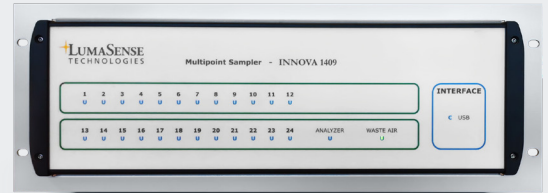


# INNOVA 1409

A reliable, fully remote-controlled multipoint gas sampler for up to 24 different locations



The Innova® 1409 multipoint sampler is designed to extend the capabilities of Innova gas monitors. The 1409 is delivered as a 6, 12, or 24 channel multipoint sampler, enabling gas samples to be drawn from up to 24 different sampling locations and delivered to the gas monitor.

## PRODUCT HIGHLIGHTS

- Full remote control over the USB interface: the system controller can either be the gas monitor or an online PC
- 6 to 24 sample input channels depending on the configuration
- Self-test function
- Pneumatic system constructed of AISI-316 Stainless Steel and PTFE tubing to minimize gas adsorption
- Integrates seamlessly with the Innova Photoacoustic Gas Monitors
- LED indicators for active channel and interface

## TYPICAL APPLICATIONS

- Occupational safety and health area monitoring - air sampling in up to 24 locations and delivery of the sample to an Innova photoacoustic monitor
- Leak monitoring - air sampling with good spatial distribution (up to 24 sampling points) across large enclosed rooms, and delivering the sample to a central monitor unit
- Multipoint gas analysis - parallel processing of multiple gas cells or chambers with a unique monitor

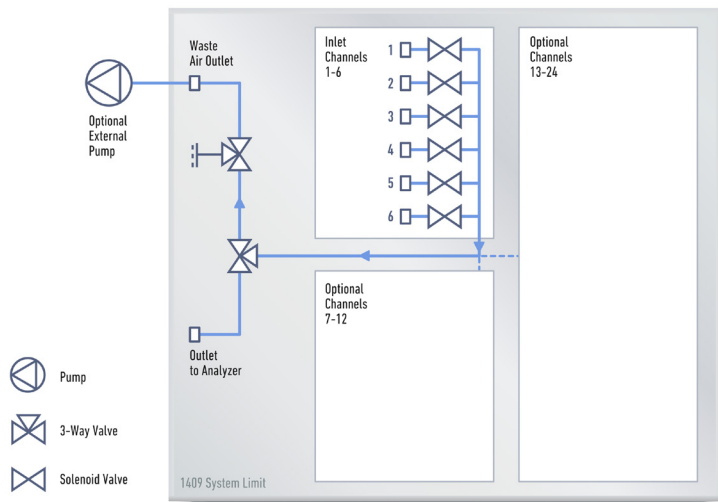
OVERVIEW

The sampling system is configured from the system controller: either directly via the front panel interface of the gas monitor, or using one of the available software (BZ7007 or LumaSoft 7880). The 1409 communicates with the gas monitor over a USB interface. When using LumaSoft 7880 as a system controller, the computer is connected to the gas monitor via the RS232 serial, USB, or Ethernet interface.

The pneumatic system of the 1409 is shown below. The sampler system is constructed of AISI-316 stainless steel and PTFE (poly-tetrafluoroethylene) tubing to minimize adsorption of samples. The system has 6 to 24 inlet channels depending on the configuration. Each inlet channel has a tubemounting stub on the backplate of the 1409; to connect each channel to the respective

sampling point. The 24 inlet channels converge into one; a three-way valve then directs the gas sample to the gas monitor for analysis, or through the external pump (optional) via the waste-air outlet on the 1409's backplate.

The highly efficient 1409's sampler system transports gas samples from the sampling point at approximately four meters per second. This speed depends on the type of pump, the diameter of the tubing, and the length of tubing attached to the 1409. An air filter is attached to the end of each sampling tube to keep the 1409 free of particles.



A schematic diagram of the 1409's pneumatic system. The use of non-reactive materials throughout minimizes gas adsorption in the internal air-channels.



View of the back panel for the 1409-24 Multipoint Sampler. Plug and play design for a seamless integration with the Innova Photoacoustic Gas Monitors

TECHNICAL DATA

| Sampler Specifications  |   |           |          |        |       |       |           |      |       |       |             |      |       |
|---|---|-----------|----------|--------|-------|-------|-----------|------|-------|-------|-------------|------|-------|
| Pump Performance  | Two external pumps are available:   |           |          |        |       |       |           |      |       |       |             |      |       |
|   | <table border="1"> <thead> <tr> <th>Pump</th> <th>Distance</th> <th>Tube Ø</th> <th>Speed</th> </tr> </thead> <tbody> <tr> <td>Small</td> <td>0 to 75 m</td> <td>3 mm</td> <td>4 m/s</td> </tr> <tr> <td>Large</td> <td>75 to 150 m</td> <td>4 mm</td> <td>5 m/s</td> </tr> </tbody> </table> | Pump      | Distance | Tube Ø | Speed | Small | 0 to 75 m | 3 mm | 4 m/s | Large | 75 to 150 m | 4 mm | 5 m/s |
|   | Pump  | Distance  | Tube Ø   | Speed  |       |       |           |      |       |       |             |      |       |
|   | Small   | 0 to 75 m | 3 mm     | 4 m/s  |       |       |           |      |       |       |             |      |       |
| Large   | 75 to 150 m   | 4 mm      | 5 m/s    |        |       |       |           |      |       |       |             |      |       |
| For tube lengths up to 300 m a pump must be placed in front of each sampling channel. |   |           |          |        |       |       |           |      |       |       |             |      |       |
| USB Interface   | Gas-dependent, but typically in the ppb region. Using the Gas Detection Limits chart, the detection limit for a selected sample integration time (S.I.T.) can be calculated.  |           |          |        |       |       |           |      |       |       |             |      |       |
| Internal Volume   | 1409-6  | 3.6 ml    |          |        |       |       |           |      |       |       |             |      |       |
|   | 1409-12   | 5.4 ml    |          |        |       |       |           |      |       |       |             |      |       |
|   | 1409-24   | 9.0 ml    |          |        |       |       |           |      |       |       |             |      |       |

| Environmental Specifications |   |                   |
|------------------------------|---|-------------------|
| Operating Temperature        | 5 to 40°C (41 to 104°F)   |                   |
| Storage Temperature          | -25 to 55°C (-13 to 131°F)  |                   |
| Humidity                     | Max relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity @ 40°C |                   |
| Altitude                     | Up to 2000 m  |                   |
| Other Environment            | UL 61010A-1: Environmental conditions.  |                   |
|                              | Pollution Degree 2  |                   |
|                              | Overvoltage Category II   |                   |
|                              | Indoor Use  |                   |
| Enclosure                    | IP 40   |                   |
| Dimensions (W x H x D)       | 445 mm x 155 mm x 260 mm (17.5" x 6.10" x 10.2")  |                   |
| Weight                       | 1409-6  | 6.6 kg (14.6 lb)  |
|                              | 1409-12   | 7.9 kg (17.4 lb)  |
|                              | 1409-24   | 10.3 kg (22.7 lb) |

| Electrical and Safety Specifications |  |
|--------------------------------------|--|
| Power Requirement                    | 100 to 240 VAC 50 and 60 Hz  |
| Power Consumption                    | 0.4 A  |
| Safety                               | EN/IEC 61010-1 3rd Edition   |
| EMC Emission                         | EN 61326-1:2013: Electrical equipment for measurement, control and laboratory use – EMC requirements; Part 1: General requirements |
| Standard Compliance                  | CE-mark indicates compliance with: EMC Directive and Low Voltage Directive.  |

**Included Accessories**

- Knurled nuts to secure tubing to nozzles (3xYM0652)
- USB interface cable (AS0001)
- Remote/offline software (BZ7007)
- Mains cable
- Instruction manual

**Warning**

The Innova 1409 must not be placed in areas with flammable gases/vapors in explosive concentrations or be used to monitor explosive concentrations of these. Certain aggressive gases can damage the internal airways of the 1409. Contact your Advanced Energy sales representative for further information.

MEASURING DETAILS

**Control of the 1409**

The 1409 is remotely controlled either by using the gas monitor as a system controller (the monitoring/sampling system then operates in standalone mode), or by LumaSoft 7880 Multipoint Software running on a computer connected to the gas monitor and communicating over the RS232, USB, or Ethernet interface. Commands and information requests are sent over the USB interface to the 1409 to control the sampler system and to read-out data.

**System Use**

The 1409 combined with a gas monitor offers wide-ranging monitoring capabilities. The 1409 makes it possible to perform multipoint monitoring tasks in a variety of situations and environments, without changing the system components. Air samples are drawn from up to 24 sampling points and delivered to the monitor. The monitor can then measure the concentrations of up to five gases, water vapor, and air pressure in each sample. With its design with a set of 3-way valves, the 1409 sampler can be equipped with an optional external pump: while the gas monitor analyzes the active channel, the system can already sample gas from the next channel in the sequence order.

**Setting Up the Sampling Task**

The selection of the active channels can be done either directly via the front panel interface of the gas monitor, or using one of the available software (7880 and BZ7007). The 7880 software enables to customize the sampling sequence across the active channels.

**Standalone Multipoint Monitoring**

Innova Photoacoustics Gas Monitors (1512, 1314i, 1412i, and 3434i) can be setup as a system controller. Their internal CPU is then synchronizing the sampling and gas measurement tasks; it stores the measurement readings in the internal memory on a gas per gas basis, and across the active sampling channels.

**Online Multipoint Monitoring**

The LumaSoft Gas Multipoint 7880 software offers full coordination and control of all the sampling and monitoring functions of the system. The software coordinates the functions of the instruments to form

a monitoring system which, via tubing, can perform gas-monitoring tasks in up to 24 different locations.

When a user sets up a measurement task using the software, the task is performed automatically and measurement data is collected and displayed on the screen. Measurement data is stored in an SQL Server 2014 database, providing easy access to measurement data during a measurement task. The user also has online access to measurement data from Microsoft Excel while a task is running. This makes the data readily available to produce tailor-made reports.

**Reliability**

Reliability is ensured by automatic self-tests of both hardware and software. The 1409's operating status can be read-out at any time.

**Alarm Features**

When operating in online multipoint monitoring with LumaSoft 7880, software alarms can be defined for each gas on each channel. In standalone operation with the 1314i Photoacoustic Monitor, alarm relays can be configured as an option, either for each gas on any channel or for selected channels on any gas.

**1409 Configurations**

The 1409 is delivered in three different configurations.

- 1409-6: with 6 channels
- 1409-12: with 12 channels
- 1409-24: with 24 channels

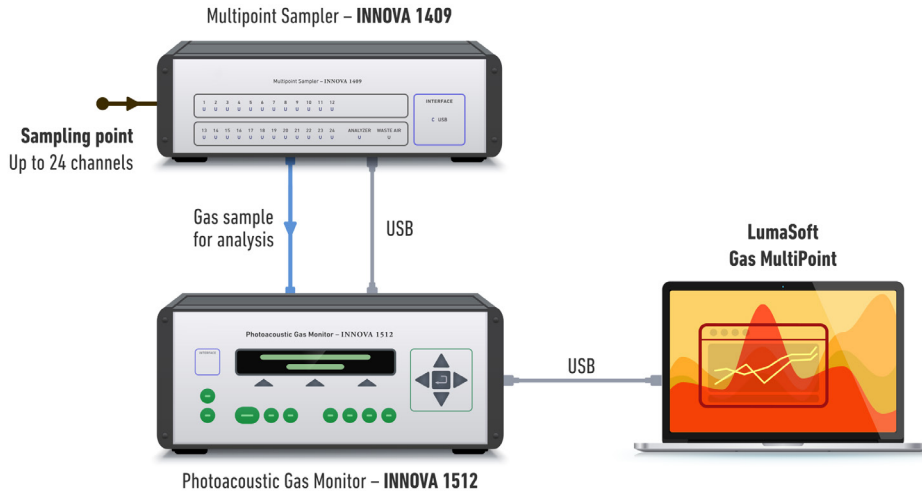
**Rack Version**

The 1409 can be delivered as a rack version by adding the flange panel for rack mount.

**MONITORING SETUPS**

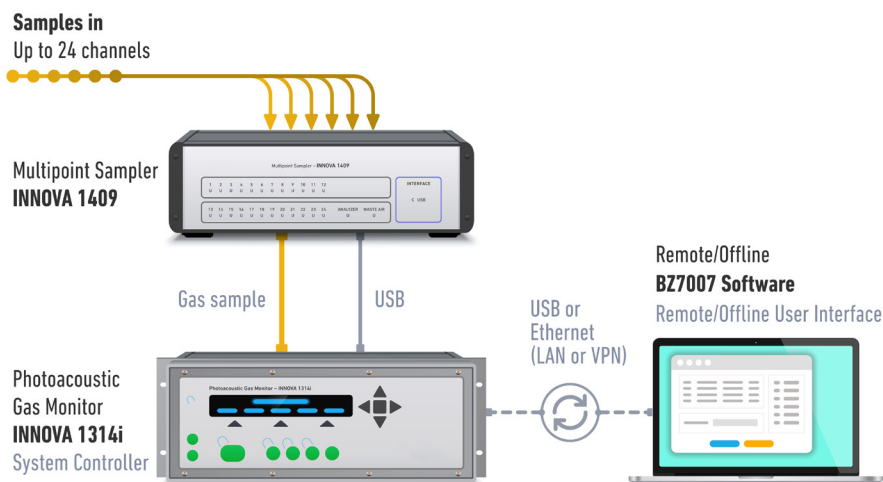
**Online Multipoint Monitoring**

The Innova 1409 Multipoint Sampler is connected to one Innova Photoacoustic Gas Monitor via USB interface. The system (Sampler + Monitor) is controlled remotely by the LumaSoft Gas Multipoint 7880 software from a PC which can connect to the gas monitor via RS232, USB, or Ethernet. The software provides online monitoring features, including a real-time display of the data.

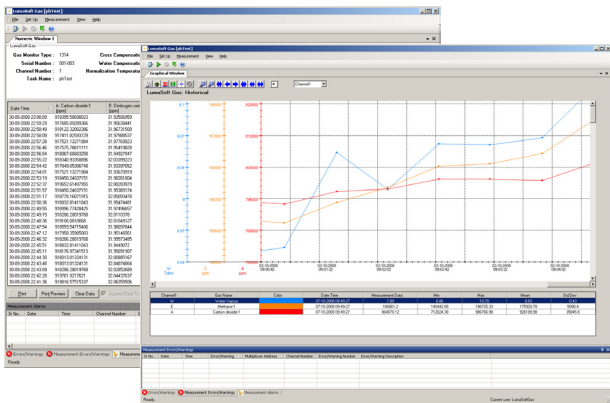


**Standalone Multipoint Monitoring**

The Innova 1409 Multipoint Sampler is connected to one Innova Photoacoustic Gas Monitor via USB interface. The gas monitor is the system controller for this standalone multipoint monitoring system. The BZ7007 software is a remote and offline user interface which can be used to configure the system (including an optional alarm relay module for the Innova 1314i), or to connect upon need to the system and retrieve the measurement log from the monitor internal memory.



SOFTWARE



**LumaSoft 7880**

With LumaSoft 7880, the systems operates in online mode with numeric and graphic windows showing the measurement values and other appropriate information for each sample channel and each gas in real time.

The screenshot shows the 'Data Output Settings' dialog box. It has a title bar 'Data Output Settings' and a section 'Date & Time Range'. Under this section, there are two date pickers: 'First Measurement' set to '07:35:18 Tuesday October 13, 2015' and 'Last Measurement' set to '09:33:00 Friday November 06, 2015'. Below these is a 'Refresh Date & Time Range' button. At the bottom of the dialog, there are two buttons: 'Retrieve Channel View' and 'Retrieve Gas View'.

**BZ7007**

When the gas monitor and the 1409 Multipoint Sampler run as a standalone system, the Remote/offline software (BZ7007) can be used to retrieve the measurement log from the monitor's memory and then export it in MS Excel format.

## ACCESSORIES

| PN     | Description   |
|--------|---|
| 7880   | LumaSoft Gas Multi Point Software                                     |
| EB6000 | External pump (small), 230 V  |
| EB6004 | External pump (small), 115 V  |
| EB6002 | External pump (large), 230 V  |
| EB6003 | External pump (large), 115 V  |
| AF0614 | PTFE tubing   |
| AF0007 | Nylon tubing  |
| UD5023 | External air-filter   |
| DS0759 | Filters (25) for airfilter unit (UD5023)                              |
| UA1365 | In line genie membrane separator                                      |
| DS6015 | Membrane replacements (5) for UA1365                                  |
| EH6039 | 6-channel nozzle modification kit (to use 4 mm tubing with the 1409). |
| KS0160 | Flange panel for 19" rack mount                                       |



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## ABOUT ADVANCED ENERGY

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AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

PRECISION | POWER | PERFORMANCE

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