

Decane Ammonia LEL Ethylene Oxide Chlorine Ketones Chloroethene

Model DL102 Snap-On Photoionizer™

Solvents Diesel Fuel Nitric Oxide Inorganic Compounds RH/Temperature Benzene Propylene Vinyl Chloride

Oxygen Methane Solvents Gasoline Inorganic Compounds Benzene Trifluoroethene Ammonia



FREE BLUETOOTH CAPABILITY

Model DL102 Snap-On PID™ with 11.7 eV Head

Bromoethane Solvents Propylene Acetic Acid Chloroform Phosphine Arsine Nitrogen Dioxide Butane Biphenyl Dibromoethane Hydrogen Sulfide Benzene Hydrogen Telluride Hydrogen Sulfide Inorganic Compounds Ammonia Ethanoic Acid Diethyl Ether Propanol Hydrogen Cyanide Isopropanol Relative Humidity Kerosene Aliphatic Hydrocarbons Chloroethene

Ethane

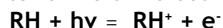
A New Era in Photoionization;
from the makers of the *original* photoionizer

INTRODUCTION-

PID Analyzers recently acquired HNU's technology including [Field Portable PIDs](#), [Laboratory Instruments and Continuous Monitors](#). HNU introduced the first commercial photoionization based instrumentation. Nearly 35,000 of the portable and laboratory PIDs have been sold throughout the world. Many United States Environmental Protection Agency and Occupational Safety & Health Administration (OSHA) methods have been published in the Federal Register.

Principle of Operation

The process occurs when a molecule absorbs light of sufficient energy to ionize a molecule see below:



in which

RH is a molecule of gas

hv is a photon with an energy greater than or equal to the ionization potential of the molecule RH.

The ultraviolet lamp generates photons that ionize the molecule RH (above) and generates positive ions. An accelerator electrode (positively biased) pushes the ions, to the collector electrode where the current generated (proportional to concentration) is amplified and displayed on the digital meter.

FEATURES

Durable & Rugged

More than 25,000 HNU portable PID's (101's) have been sold worldwide since HNU introduced the first PID in 1974. More than 90% of these instruments are still working today. These instruments are the most rugged and durable instruments on the market today. They do not require replacement every two to three years.

Accurate Results

HNU's unique electronic zero, state-of-the-art electronics and **ultra stable** PID lamp ensure the most accurate results available for VOCs.

Electronic Zero

HNU's unique automatic electronic zero provided a reliable calibration point so that when calibrated with a span gas, this is a two point calibration.

Easy to Maintain

HNU's new Duraclean™ PID is more inert and will run for longer periods without the need for cleaning the lamp or the ion chamber

In addition, **a new library of compounds > 200 is available** for selection by the customer.

Snap On PID- easy to interchange modules for 9.5, 10.2 or 11.7 lamps just snap on to the Docking Module. Now change the mode to the PID module inserted and the instrument is *ready for calibration in seconds*. No cables or wires to fuss with.



Chemicals Detected

VOC's, hydrocarbons, hydrogen sulfide, ammonia, benzene, phosphine, arsine, methylene chloride, 1,3 butadiene ...

Extended Range- (linear)

From 0.1 ppm to 3000 ppm for DL102; **optional dilution probe** extends the linear range to > 30,000 ppm for leak detection

- Fast response 1 second to 90%
- Wide dynamic range (16 bit ADC) ppb to % with optional dilution probe
- Library- >200 compounds
- Excellent stability (zero & span)
- Alphanumeric display- pt. #, units, mode
- Other "snap on" detectors for CO, NH₃, H₂S, CH₄, SO₂, NO, Cl₂, H₂ ...- available soon

APPLICATIONS

Non-specific- 102- Responds to VOC's & inorganic species (NH₃, H₂S, PH₃, AsH₃, etc.)

Headspace- VOCs in soil or water

Quality control- residual monomer in resins, residual solvents in paper or food, testing gas masks, residual gases in cylinders

Emergency response- spills from trucks & trains

Fugitive emissions- leak detection

Arson investigations- find trace accelerants

Confined space entry- health & safety

Controls

- On/off
- Bkl- Backlight
- Incr
- Decr

Menus

- Log
- Cal

Options

Dilution probe (10:1) extends range to 30,000 ppm

- ppb Readout
- Carrying case
- Calibration kit
- RS232 & downloading software
- Belt clip for holding 102 via strap

Specifications

- Single unit construction
- 8.0" L x 3" W x 2.25"D
- Weight 1.9 pounds
- Simple 5 button operation
- No keyboard
- Easy to use even for unskilled operators
- **Library of sensitivities built in** for > 200 compounds
- Use "Resp as" to setup for direct reading
- Alphanumeric display for compound, detector, alarm, range, & logging
- Linear to 3,000 ppm
- Bright LED digital display for readability/backlighting selectable
- Fast response 1 sec to 90%
- Datalogging for 7,000 points
- Duraclean™ PID
- RS232 output
- Auto electronic zero in Cal, background zero
- Simple pushbutton sensitivity control

Reliability

The basic simplicity, durable construction and design of the Model 102 has resulted in the elimination of problem areas associated with many measurement techniques.

Other Instruments -

Process Analyzers manufactures continuous monitors such as: FIDs & PIDs for total hydrocarbons, NDIRs for CO, CO₂, CH₄, N₂O NO SO₂ and hydrocarbons, & Process GCs. Additional products include portable PIDs, portable GCs laboratory GCs, add-on detectors and XRF instruments

Controls for the Model 102

- On/Off**- Battery power
- Incr**-Function ON, scrolling menu up, increase number
- Decr**-Function OFF, scrolling menu down, decrease number
- Bkl**-Turns backlight on/off



Menus

Log

- Manual-Set site #, and manually log each pt.
- Auto- Set ave. time (sec) and samples/hr. to Auto log
- Site # 1-7000
- Setup- Setup Auto; Ave. time sec., samples/hour
- Exit- Return to Run

Cal

- Cal- Performs Autozero, set cal value, calibration
- Bkg Zero-
- Cal Gas- Select name of cal gas
- Resp as- Once the 102 is calibrated-change to direct reading on any of > 200 compounds
- Alarm- Set Alarm value for audible alarm
- Exit- Return to Run mode

Datalogging

The 102 has manual or automatic datalogging capability for up to 7,000 points. The software for data logging is included with the Model 102. IT uses Windows Hyperterminal for downloading the information for the 102. A typical Auto datalogging format is shown below:

```
102 Data From Hyperterminal
Site      Date      Time      ppm
495  SP6  6/12/2002 15:02:27  7  1.7
496  SP6  6/12/2002 15:03:27  7  1.6
497  SP6  6/12/2002 15:04:27  7  1.6
498  SP6  6/12/2002 15:05:27  7  1.6
499  SP6  6/12/2002 15:06:27  7  1.6
500  SP6  6/12/2002 15:07:27  7  1.6
End Of Log Data
```

This data can be imported directly into Excel as Tab Delimited ASCII.

SNAP ON HEADS

There are more than 20 sensors available for the HNU Snap On Head. Each head has a PID (except for the TCD head). **Three additional sensors can be added** to a PID head (9.5 eV, 10.2 eV, or 11.7 eV). These include electrochemical (choice of 12), infrared (choice of 2), RH/T (combined 2 sensors), and TCD

Typical Applications include:

- Indoor Air Quality- PID/RH/T/CO₂
- Confined Space- PID/LEL/O₂/CO
- Leak Detection- PID/LEL
- Wastewater tmt.-PID/H₂S
- Chemical Plant- PID/Cl₂
- Pulp & Paper- PID/H₂S
- Combustion leaks- PID/CO

Sensors for the Model 102 Snap On Head



There are more than 20 sensors available for the Model 102.
A PID **and** any three sensors can be incorporated into the head.

Table I
Specifications of Gas Sensors for the Model 102

Analyzer	Range ppm	Det. Limit	Response Time	Interferences
PID				
9.5 eV	0-3000	0.1	1 sec.	NA resp. to VOCs
10.2 eV	0-3000	0.1	1 sec.	NA resp. to VOCs
11.7 eV	0-3000	0.1	1 sec.	NA resp. to VOCs
Electrochemical				
Carbon Monoxide	0-500/1000	1/2	15 sec.	H ₂ , C ₂ H ₄
Chlorine	0-10	0.1	30 sec.	-----
Hydrogen	0-1000	2	45 sec.	CO, C ₂ H ₄
Hydrogen Cyanide	0-100	0.1	50 sec.	C ₂ H ₄ , H ₂ S, SO ₂
Hydrogen Chloride	0-100	0.1	1.5 min.	-----
Hydrogen Sulfide	0-100	0.1	20 sec.	-----
Nitric oxide	0-50	0.1	10 sec.	NO ₂
Nitrogen dioxide	0-20	0.	15 sec.	Cl ₂ , H ₂ S
Oxygen	0-30%	0.1%	15 sec.	-----
Sulfur dioxide	0-20	0.1	20 sec.	NO ₂
Carbon dioxide	0-3000	1	25 sec.	vol. org acids
Ammonia	0-3000	0.1	15 sec.	vol. amines
Infrared				
LEL	0-100%	1%	20 sec.	-----
Carbon dioxide	0-2%	0.04%	20 sec.	-----
RH/Temperature				
Relative humidity	0-100%	0.1%	50 sec.	-----
Temperature	0-60°C	0.1°C	20 sec.	-----
TCD*				
Organic & inorganic	0-100%	1%	30 sec.	NA

Not available with PID in head at the same time

PID Analyzers, LLC
2 Washington Circle
Sandwich, MA 02563
T 1 774 413 5281; F 1 774 413 5280

Introduction

The free software for the PID Analyzers portables is an easy to use graphing and data log extraction package. It connects to the PID Instrument through a serial (RS232/485) line and reads the data in the data log for rapid display, export, or long term graphing. The data log, and set logging timers and triggers can also be fully configured. The software runs on Microsoft Windows 2000, XP, Vista, 7, or



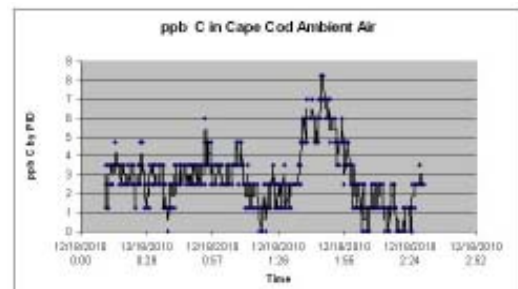
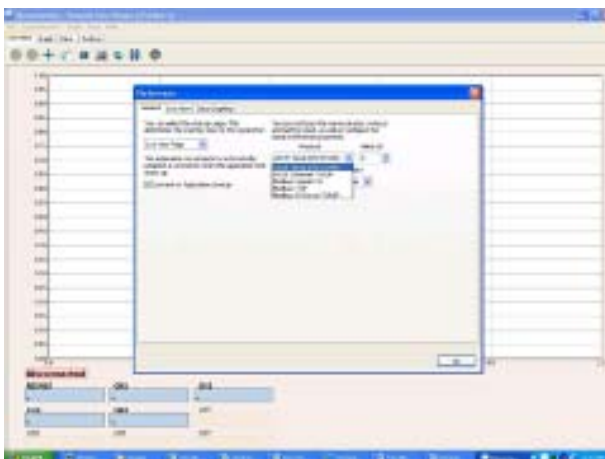
Model 113 EC+

Theory of Operation

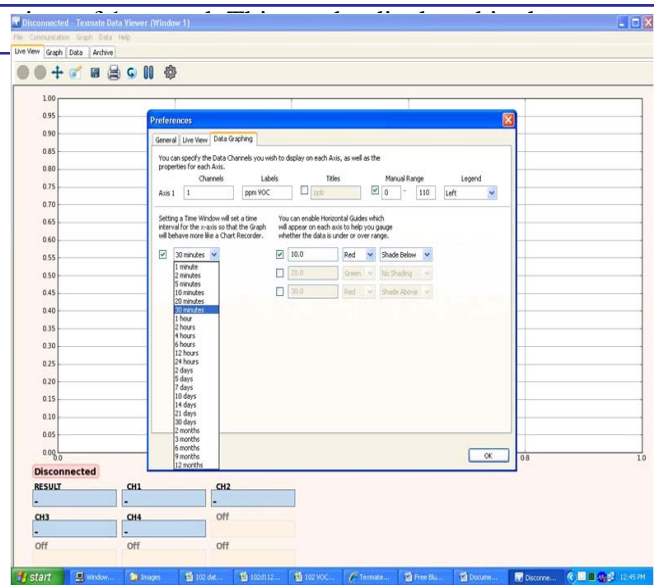
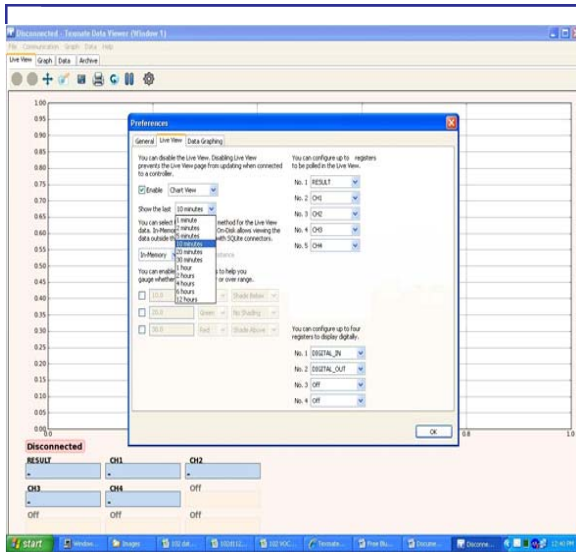
This free software will connect the new PID Analyzers portables and remote PC wirelessly through the new *free* Bluetooth connection. Of course, older PID portables can also be modified for bluetooth connectivity. See our website <http://www.hnu.com>. The portable analyzers can be interfaced through the internal RS232 connection or through a TCIP connection that could be controlled with Windows Remote Desktop.

The hardware and wireless connections to the PID Analyzers portable analyzers are many fold and very easy to use.

Five channels can be monitored simultaneously with the Model 102+ and only one for the Model 102. The time for the chart can be varied from 1 minute to one year. The data can be saved as a CSV file in Excel format and printed later from Excel like the plot below:



for printing later. The graph can also be printed or saved as a png or pdf file. The control screen for graphing the five channels of data is shown next:



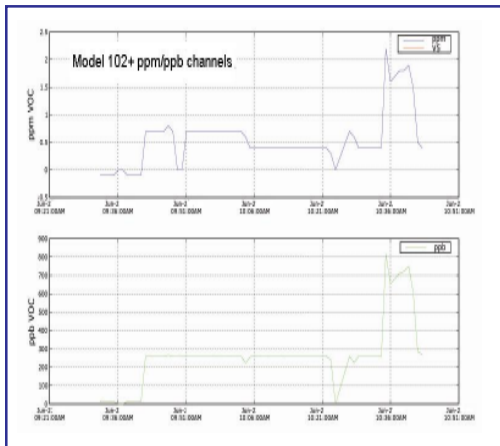
The second control for graphing is shown next. The Photoionization detector (PID) in the Model 102 has the fastest response of any on the market with a 90% response time of 1 second. This can be displayed in the live view chart of the Datalogging

software by reselecting a 1 minutetelling display for recording rapidly responding systems. The portables also have one analog (0-1 VDC) output that is selected by the display. This feature is not available on most portable instruments sold today.

Logging Data from Software

We recently added bluetooth capability to our Model 102 portable photoionization analyzer. This wireless capability links the datalogging in the 102 with the free logging software in the external PC to produce 1 to 5 graphs (PID ppm/ppb and three other channels selecte from one [IR(CO2, CG or TCD)/TCD/or CG and two other electrochemical sensors (select from > 30 EC Sensors). A typical plot of PID VOC's ppb and ppm is shown below:

The data is logged into an EXCEL compatable file that is saves in CSV format for opening directly into EXCEL. The format is shown below:



Ascii Data exported into EXCEL

Date/Time	CH1	CH2
1/31/2011 11:56	1	261
1/31/2011 11:57	3	325
1/31/2011 11:58	6	365
1/31/2011 11:59	2	262
1/31/2011 12:00	0	262
1/31/2011 12:01	23	262
1/31/2011 12:02	10	324
1/31/2011 12:03	3	262
1/31/2011 12:04	9	324
1/31/2011 12:05	0	365