Analyzers for ultra-high purity gas quality control for semiconductor manufacture
# Analyzers for Ultra-High Purity Gas Quality for Semiconductor Manufacture

To ensure product quality and prevent loss of yield, semiconductor component fabrication processes must be monitored for moisture ingress, as well as O2 and other gases down to parts per trillion. Four well-known Process Sensing Technologies (PST) companies, Analytical Industries Inc, Michell Instruments, LDetek and Ntron offer a broad range of moisture, oxygen and speciality gas analyzers that ensure the quality of ultra-high purity gases used in semiconductor manufacture. PST brings together years of experience in serving this highly specialised and demanding application, making it easier for you to find the exact product, or mix of products to meet your needs at the critical measurement points throughout your process.

## Trace Impurities

A good analytical tool is essential to ensure the quality of the UHP gases used in semi-conductor manufacture. LDetek’s ranges of gas chromatograph analyzers allow impurity detection down to sub-ppb levels.

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## Multidetek 2 – Compact Gas Chromatograph

Based on LDetek’s Patented Plasma Emission Detector technology, this stand-alone gas analyzer is the ideal flexible and customizable solution.
- Sub ppb trace measurements
- A single analyzer for trace measurement of multiple impurities
- Plug & Play, user friendly configuration
- Ethernet connectivity for remote control

## LD8000 Plus – Online ppb Trace Nitrogen in Argon/Helium Analyzer

The LD8000 Plus is designed for ultra-pure Argon or Helium gas analysis. It is an online analyzer, providing a continuous monitoring. A maintenance-free solution inside a compact 3U rack.
- Unique Plasma Emission Detector design based on a duty cycle controlled system
- PPB sub-system integrated
- Range identification relay
- Bypass sample flow control to ensure high purity

Compact and robust industrial rackmount 6U chassis

Low sample consumption
TRACE IMPURITIES CONTINUED

**LDGSS – HIGH PURITY GAS STREAM SELECTOR**

Based on high purity connections with a unique diaphragm valve and no dead volume, its unique design brings an easy way to provide clean gas to any process GC and on-line process analyzers.

- Compact design (3U) with 2 to 9 streams configurable
- Connectable to MultiDetek 2 for remote control switching and sequence programming
- Options available for high purity or corrosive and toxic gases

**LDGDS – DILUTION GAS SYSTEM**

A user friendly gas dilution system that offers all the flexibility to manually or automatically generate the desired gas mixtures. The Windows user interface gives the ability to control and monitor the mixtures, flows, pressures and the concentrations.

- Automatic calculation of dilution concentrations
- Broad range of dilution ratios (up to 1000 to 1)
- Integrated heated gas purifier to generate ultra high-purity zero gas reference (optional)

**LD1000 Series**

The LDP1000 & Compact-LDP1000 series is a sub ppb purifier ideal for calibration gas for on-line analyzers as well as carrier gas for chromatograph.

- Purification of noble gases, nitrogen and hydrogen
- Enhanced 2 beds of purification
- Cost effective, interchangeable getter
- Real end-of-life monitoring in combination with MultiDetek 2

**LDRACK – (SYSTEM INTEGRATION INTO 19" NEMA CABINETS)**

- Welded equipment and VCR fittings/valves/regulators to ensure optimal performance for ppbv measurements
- Unique slide out design to offer easy access for maintenance without removing unit from gas sources
- Installation of third-party analyzers when required

Leak proof, tested and certified

Manual or automatic pressure controller

Different gas flow capability

Portable cabinets solution available
TRACE OXYGEN

A range of galvanic electrochemical or zirconium oxide sensors packaged in a choice of transmitters and analyzers ensures the most appropriate choice per application.

**PI2-UHP 50/100 – Oxygen Analyzer for Ultra-high Purity Gases**
Accurate and stable measurements of oxygen down to low parts per billion – with an LDL of less than 100 ppt.
- Cost-effective and reliable electrochemical sensors with 12 months life
- Heated sample system for measurement integrity – negating the diurnal temperature effect
- Auto-calibration system with true zero feature via O₂ scrubber

**PI2-MS 500/1000 – Oxygen Analyzer for Ultra-high purity gases**
Accurate and stable measurements of oxygen down to parts per billion.
- Cost-effective and reliable electrochemical sensors with 12 - 24 months life
- Easy to maintain, simple to operate
- Optional auto calibration system with true zero feature via O₂ scrubber

**GPR-1600 – Electrochemical Oxygen Analyzer**
For monitoring trace oxygen in low parts per million.
- Low measurement range 0-10 ppm
- Long sensor life up to 24 months in <1,000 ppm O₂

**XZR400 Series – Trace Oxygen Analyzers**
Zirconia-based oxygen analyzer designed to measure oxygen as an impurity in pure inert gases.
- Measurement range 0.1 ppm up to 25% O₂
- High accuracy with built-in pressure compensation
- Calibration intervals of up to 6 months
- Integrated moisture sensor for -100 °C to +20 °C dew point

**SIL O2 – Fail-safe Oxygen Analyzer**
This SIL2 rated oxygen analyzer has been developed specifically for the measurement and control of oxygen for process safety critical applications.
- Safety Integrity Level (SIL2) in accordance with IEC61508/ IEC61511
- Zirconia sensor developed to withstand harsh environments
- 3 configurable alarm outputs
- 4-20 mA and RS485 Modbus communication

www.processsensing.com
TRACE OXYGEN CONTINUED

**SENZTX**
Utilizes Zirconia technology to give a reliable and fast response time, long life and virtually no sensor drift.
- Measures from 1 ppm - 96% oxygen
- 4-20 mA and RS485 Modbus communication
- Integrates easily with OEM equipment
- Fast response time from ambient air

**MICROX – OXYGEN ANALYZER**
Microx oxygen Analyzers comprise of a range of low-cost OEM solutions for the ppm or % oxygen measurement which utilizes zirconia technology.
- Flexible panel, wall or din rail configurations
- 4-20 mA and RS232 Modbus communication
- LCD display and 3 alarm contacts

TRACE MOISTURE

Trace moisture measurements are essential for quality assurance in semiconductor manufacture.

**S8000 RS**
The S8000 RS chilled mirror sensor directly measures the formation of condensation, giving long-term and unmatched, drift-free readings of dew-point and relative humidity.
- Precision measurement to -90°C dew point (100ppb) with no need for additional cooling
- Sensor head optimised for fast response to low moisture levels
- Ethernet or USB connections with SD card data logging

**QMA401 – TRACE MOISTURE ANALYZER**
Quartz crystal microbalance sensing technology provides reliable, fast and highly accurate measurements of trace moisture.
- Precision measurement from 0.1 to 2000 ppmV
- Low maintenance

**PURA – PURE GAS TRACE MOISTURE TRANSMITTER**
Rugged, self-contained hygrometer to measure trace moisture content in ultra-high-purity gases.
- Precision measurement from 0.1 to 2000 ppmV
- Low maintenance

**EASIDEW – INDUSTRIAL DEW-POINT TRANSMITTERS**
Simple to install and maintain, the Easidew range of dew-point transmitters measures dew point or ppmV to ensure quality of inert gases.
- Measurement ranges from -110 up to +20 °C dew point
- Wide range of process connectors
The PST Group consists of a group of manufacturers who together provide an unmatched suite of instruments, analyzers and sensors for precision measurements in industrial process control, environmental monitoring, natural gas and petrochemical processing as well as applications in food and medicine.

Using our products, customers save millions of dollars each year through increased energy efficiency in their processes and reduced process disruptions. The quality of food, medicines, semi-conductors and thousands of manufactured goods depends on reliable measurements of critical parameters such as humidity, O₂, CO, N₂, H₂, Hydrocarbons, pressure or CO₂ during production, storage and transport. Our products directly improve the profitability of our customers and help them to stay compliant with stringent industry regulations.

We own and manufacture the sensing technologies used in the majority of our products. This allows us to remain in a strong leadership position and pass on the benefits of our innovation to our customers.

**COMPANIES**
Analytical Industries – Pomona, CA, USA
Michell Instruments – Ely, UK
Rotronic – Bassersdorf, CH
LDetek – Quebec, CA
Dynament – Mansfield, UK
Ntron – Navan, IE

**MARKET LEADER**
In oxygen sensors and gas analysis instrumentation, humidity and trace moisture instrumentation, impurities in gases analysis and flammable gas sensors.

**Group Facts**
- OEM for leading AM technology manufacturers
- 15 Service and sales subsidiaries
- Global support network with 50+ authorized distributors
- 7 global manufacturing locations

**Global PST Sales, Manufacturing and Distribution Locations**