

Natural Gas Processing, Transmission and Storage

Analyzers, systems and portable instruments
for quality, safety and compliance

Benefit from Natural Gas Analyzers to Ensure Quality, Safety and Compliance in Natural Gas Transmission and Storage

Natural gas extracted from underground sources is saturated with liquid water and heavier hydrocarbon components. It goes through several stages of processing to meet the requirements for a clean, dry gas that is suitable for transmission through pipelines and burning by end users. At all processing stages our analyzers measure the key parameters in natural gas to ensure compliance with international standards, protect pipelines and equipment from corrosion, ensure safety of personnel.

Benefits

- Ensure compliance with gas quality specifications such as EASEE-gas
- Protect equipment from corrosion
- Ensure the safety of staff

Measurement parameters

- Hydrocarbon dew point
- Water dew point
- Hydrogen Sulphide
- Trace and % oxygen
- Trace moisture

Selected served applications

- Quality measurement of transmission gas at custody transfer
- Moisture and Oxygen measurement of network gas storage
- Hydrocarbon dew point measurement of fuel gas conditioning for gas turbine power plants
- Moisture and oxygen measurement in CNG compression/dryer skids
- Moisture and oxygen analysis for bio-methane injection to network
- See full list at: processensing.com/natural-gas

Measurement Parameters

We offer a wide choice of instrumentation for measuring trace moisture, hydrocarbon dew point, oxygen and hydrogen sulphide. All the Michell Instruments on-line process moisture analyzers featured here are suitable for use with natural gas containing up to 20% hydrogen with no further modification required.

Expertise in Products for Natural Gas

We offer analyzers for continuous online monitoring, lightweight portable analyzers for spot checking or transmitters for direct installation where space or cost-efficient measurement are of importance. For specific needs or large projects, our experienced systems engineering department will work with you to create custom systems and packages.

Product Selector Guide by Application

| Natural gas upstream | Location | Onshore production wellhead or offshore platform | Onshore/offshore reinjection into depleted oil/gas reservoir | Offshore export gas |
|----------------------|------------------------|---|---|--|
| | Process | Glycol dehydration | Carbon Capture | Compression |
| | Purpose of measurement | Avoid corrosion, water and/or hydrates | Avoid turbine compressor damage | Conform to seabed pipeline operation specification |
| | Fluid | Natural Gas with Hydrocarbon Concentrates | Natural Gas with higher CO ₂ and H ₂ S from amine process | Natural Gas with hydrocarbon condensates |
| | Parameter | Water dew point or moisture | | |
| | Range | 10...100 ppmv, -30...-10 °C Wdp at line pressure | | |
| | Pressure | 40...70 barg | 70 barg | 120...210 barg |
| | Analyzer | OptipeakTDL600, QMA601, Promet EExd/I.S., Easidew Pro XP (ES70) | | |

| Natural gas downstream | Location | Biomethane injection to area grid network |
|------------------------|-----------------------------------|--|
| | Process | Refrigeration + silica gel drying |
| | Purpose of measurement | Conform to national grid gas quality specifications |
| | Fluid | Sweetened biogas |
| | Parameter | Wdp or moisture |
| | Range | Typically alarm -5 °C dew point at grid pressure, <200 mg/std m ³ |
| | Pressure | 5...10 barg |
| Analyzer | Easidew TX IS and PRO I.S. (ES70) | |

| Natural gas midstream | Location | Central processing plant or shore receiving terminal | Transmission pipeline | Natural gas liquids extraction plant | Liquid natural gas liquefaction plant |
|-----------------------|------------------------|--|---------------------------|--|---|
| | Process | HC dew point reduction | Metering custody transfer | Molecular sieve drying | |
| | Purpose of measurement | Confirm to contractual gas quality specification | | <ul style="list-style-type: none"> Avoid ice formation causing damage within turbo expander <-80 °C operating temperature | <ul style="list-style-type: none"> Avoid ice build up within cryogenic heat exchanger <-160°C process temperature |
| | Fluid | Natural gas | | Natural gas potentially entrained with hydrocarbon liquid | |
| | Parameter | HCdp and Wdp in °C, moisture, oxygen and H ₂ S concentration | | Moisture in ppm _v | |
| | Range | <ul style="list-style-type: none"> HCdp: -25...0 °C dp at cricondenthem (27 bar) Wdp: -30...-10 °C Wdp at line pressure Moisture content: 5...150 ppm_v Oxygen: 1 ppm_v...1 %v H₂S: <1...25 ppm_v | | <ul style="list-style-type: none"> 0.01...5 ppm_v Alarm 0.05 ppm_v <-80°Cdp at line pressure | <ul style="list-style-type: none"> 0.03...10 ppm_v Alarm 0.1 ppm_v <-70 °Cdp at line pressure |
| | Pressure | 70 barg | | 55...70 barg | |
| | Analyzer | <ul style="list-style-type: none"> Condumax II with Wdp, Combo: Condumax II + OptiPEAK TDL600 or Condumax II+QMA601 CDP301 XTC601 Minox-i GPR-7500 and GPR-7100 GPR-1200 GPR-18 Series GPR-1800 Series | | <ul style="list-style-type: none"> Promet EExd/I.S. Easidew Pro XP (ES70) QMA601 with enhanced calibration | |

Trace Moisture in Natural Gas

Michell OptiPEAK TDL600 – Moisture in Natural Gas Analyzer

Features the latest generation of tuneable diode laser spectroscopy technology for automatic online measurements of trace moisture in natural gas and biomethane.

- D-MET system: Factory-ready for varying gas compositions. For example, after stream blending or injection of shale gas or biomethane to a network.
- Operating range down to 1 ppm_v
- Sour gas compatible

Michell QMA601 – Process Moisture Analyzer

A low maintenance, quartz crystal based analyzer with built-in self-verification for reliable accuracy at sub-ppm trace moisture levels.

- Accuracy of ±0.1 ppm_v at <1 ppm_v and 10 % of reading from 1 to 2000 ppm_v
- IECEx, ATEX, TC-TR Ex certified for Exd flameproof, cQPSus certified for explosion proof
- Intuitive, color HMI with touch-screen keypad; no 'hot work' permit required

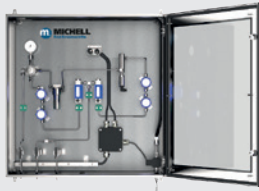
Michell Promet I.S and EExd – Process Moisture Analyzer

Heavy-duty moisture analyzers for continuous online measurements of water vapour content in low and high pressure process gases.

- Fully hazardous area certified for EExd or Intrinsically Safe
- Single or dual channel measurement
- Moisture range from ambient humidity to PPB levels



Wide range of configurations



High-speed portable dew-point hygrometer

Michell ES70 – Sampling System

Sample conditioning system to ensure optimal performance and reliability in moisture measurements.

- Indoor panel or outdoor enclosure mounting options
- Sample inlet pressure up to 138 barg
- Choice of Easidew PRO I.S., Easidew PRO XP or Easidew I.S. transmitter, flow & pressure control

Michell MDM300 I.S. – Intrinsically Safe Dew-Point Hygrometer

Easy to use, ergonomic portable dew point hygrometer for hazardous areas.

- Certification from ATEX, IECEx, CSA, INMETRO and TC TR Ex
- Repeatedly fast measurements in less than 30 minutes for T95 to -60 °C
- Up to 24 hours of typical usage between charges

Hydrocarbon and Water Dew-Point Measurements

Michell Condumax II – Online Hydrocarbon Dew-Point Analyzer

A fully self-contained hydrocarbon and water dew-point analyzer for continuous automatic measurements. Available as combined unit with either OptiPEAK TDL600 or QMA601.

- Objective, highly repeatable measurements of water and hydrocarbon dew point in natural gas
- 0.5 °C hydrocarbon dew point accuracy
- No purge or cooling gas required

Michell CDP301 Condumax – Dew-Point Tester

An Ex certified, portable dew-point tester for manual visual detection of water or hydrocarbon dew formation in natural gas.

- Fully compliant to ASTM D1142 and ISO 6327
- Measurement data logging with digital image capture for objective results
- Fundamental chilled mirror technology

Hydrogen Measurements

Michell XTC601 Ex d – For Hydrogen Measurements

A robust process hydrogen analyzer for stable, linear measurements of hydrogen in natural gas.

- Certified by ATEX, IECEx, CSA, TC TR Ex
- Integral touch screen display for local operation without the need for a hot works permit
- Minimal maintenance for low cost of ownership

Oxygen Measurements

Aii GPR-18 Ex d – Process Analyzer for Trace Oxygen

Certified explosion-proof oxygen analyzer for measuring trace oxygen in flammable gases.

- High quality galvanic oxygen sensor technology
- Long O₂ sensor life 24 to 36 months for low maintenance
- No need for frequent electrolyte top-up

Fully automatic measurements of hydrocarbon dew point



High-definition video for objective results



Designed for use in hazardous areas

Explosion proof





Cost effective and simple to use

Analytical Industries GPR-2800 – Process Oxygen Analyzer

Robust oxygen analyzers for measurements of oxygen from 0-1 up to 0-25% oxygen in hazardous areas.

- UL or ATEX certified for use in hazardous areas
- Four measurement ranges 0-1%, 0-5%, 0-10% & 0-25% O₂
- Low maintenance with an average sensor life of up to 32 months (for GPR sensor)



Cost effective and simple to use

Analytical Industries GPR-1800 – Process Analyzer for Trace Oxygen

An easy to use trace oxygen analyzer for use in demanding process applications.

- Lower detection limit of 50 ppb O₂
- Cost-effective and easy to maintain
- Liquid drain manifold available to extend sensor life

Ntron long-life electrochemical sensor technology



Ntron Minox-i – Intrinsic Safe Oxygen Transmitter

A reliable and compact oxygen transmitter which uses advanced galvanic fuel cell technology for a long lifespan with a high level of accuracy and stability.

- Measurement range 0-25 %
- Electrochemical sensor technology
- Industry standard 4-20 mA output



Suitable for hazardous area use

Analytical Industries GPR-1200 – Portable Trace Oxygen Analyzer for Rapid Spot Checks

ATEX certified portable analyzer with a 4-way valve that traps sample gas in the sensor for faster measurement times when moving between sample points.

- Measurement ranges from 0-10 ppm up to 0-100 % O₂
- 24-32 months sensor life span (in normal use)
- Up to 30 days battery life

Hydrogen Sulphide Measurements



Dedicated sample handling systems

Analytical Industries GPR-7500 – Process H₂S Analyzer

Cost-effective and low-maintenance hydrogen sulphide analyzer for continuous, online H₂S measurements.

- ATEX & UL certified variants
- Accurate to < 2 % (FS) with an LDL of 0.1 ppm H₂S
- Dedicated sample handling systems are included



Reliable spot checks

Analytical Industries GPR-7100 – Portable H₂S Analyzer

ATEX and UL-certified portable H₂S analyzer for spot-checking processes and during servicing or commissioning of a permanently installed gas analyzer.

- Small and self-contained portable H₂S analyzer
- LDL of 0.1 ppm H₂S
- Rechargeable battery provides 8 hours of typical usage



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