

VAISALA

Monitoring systems and instruments

Life science, pharmaceutical & biotechnology applications



Monitoring & mapping: laboratories, cleanrooms, warehouses



Continuous Monitoring System (CMS)

The Vaisala viewLinc CMS is designed for GxP-regulated environments. The system combines Vaisala's viewLinc Enterprise Server software with Vaisala data loggers, smart probes, transmitters, and third-party Modbus-enabled devices.

Vaisala offers optional documentation and services, including: IQOQ) protocols, a GxP documentation package to help you implement your system according to GAMP guidance, and services for field calibration, installation, and validation in selected regions.

viewLinc CMS Features and Benefits

- Validatable software and data loggers meet 21 CFR Part 11 and Annex 11
- Simple installation & validation, with optional IQOQ protocols
- Easy network connectivity with Ethernet, PoE, Wi-Fi, or VaiNet wireless technology
- Web-based interface for remote monitoring
- Alarm notifications through email, text, phone, PC display, signal tower and annunciator
- Secure audit trail and customizable reporting
- viewLinc validated monitoring data can integrate with other systems via Vaisala's OPC UA or the viewLinc API
- Allows inputs from Modbus-enabled devices

Validation/Mapping System

Designed for the most demanding validation applications, the Vaisala mapping system comprises vLog software and Vaisala's data loggers for downloading, displaying, analyzing and reporting. Fully encrypted and validatable, vLog produces tabular and graphical reports that are easy to customize to your documentation needs.

Validation/Mapping system Features and Benefits

- Stable and reliable hardware minimize sensor accuracy drift
- Compact data loggers are easy to place and less disruptive to operations
- Easy-to-use vLog software provides detailed, customizable reports
- Comprehensive IQ/OQ protocol available
- Three levels of security to control access: Windows, domain level, and local account authentication
- Security status of data on reports for compliance with 21 CFR Part 11/Annex 11
- Audit trail ensures all system actions are recorded

viewLinc data loggers

VaiNet Wireless RFL100 Data Loggers

Vaisala's proprietary VaiNet wireless technology is based on the LoRa® spread spectrum modulation technique. VaiNet provides low power, long range, secure data transmission that is extremely reliable in complex environments.

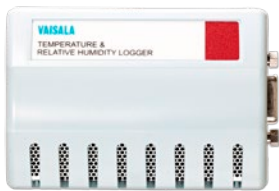
- RFL-series data loggers and AP10 network access points eliminate the need for repeaters
- Set-up is easy; access points are pre-programmed to establish communication with RFL100 data loggers
- Each AP10 access point can host up to 32 RFL-series data loggers; detachable probes for easy calibration
- Parameters: temperature only (2 channels), temperature and relative humidity, CO₂%, with or without temperature/RH (1 - 3 channels)
- Signal strength ≥100 meters, even in obstructed environments
- Battery-powered data loggers with on-board memory provide gap-free point-of-measurement reliability



VaiNet RFL 100 data loggers

VaiNet AP10 Access Point

DL-series data loggers



DL2000 relative humidity and temperature data logger

The DL2000 data logger combines internal temperature and relative humidity sensors with optional external channels for current or voltage inputs for recording parameters such as differential pressure, CO₂, level, particles, or conductivity.

- Optional Boolean channel for door switches or alarm contacts
- Ideal for standalone or networked monitoring and mapping applications
- Connects to a PC with USB, or networkable via Ethernet, Power over Ethernet, or Wi-Fi
- Battery-powered with onboard memory for gap-free point-of-measurement data



DL4000 universal input data logger

The DL4000 Universal Input data logger is a simple solution for recording and monitoring pressure, flow, fluid level, pH, electrical properties, moisture and gas concentrations.

- Ideal for standalone or networked monitoring and mapping applications
- Connects to a PC with USB, or networkable via Ethernet, Power over Ethernet, or Wi-Fi
- Battery-powered, large onboard memory for gap-free point-of-measurement data



DL1016 temperature data loggers

The DL1016 and DL1000 series temperature data loggers have up to four channels and a wide temperature measurement range.

- Simultaneously monitor four different areas with a single data logger
- Ideal for ultra-low temperature freezers, freezer/refrigerator units, warehouses and incubators
- Connects to a PC with USB, or networkable via Ethernet, Power over Ethernet, or Wi-Fi
- Battery-powered, large onboard memory for gap-free point-of-measurement data

Vaisala Indigo products



Measure with Intelligence and Insight

Designed for use with Vaisala's smart probes, Indigo transmitters provide a simple interface for a wide range of measurements, including temperature, humidity, dew point, barometric pressure, carbon dioxide (CO₂), moisture in oil, and vaporized hydrogen peroxide (H₂O₂). Typical applications include compressed air drying, incubators, cold storage, isolators, transfer hatches, and demanding HVAC such as animal laboratories and housing.

The Vaisala Indigo family includes intelligent, interchangeable measurement probes, optional host devices and Vaisala's Insight PC Software. **Indigo 200** series transmitters are lightweight, easy-to-install host devices for Vaisala Indigo-compatible probes. **Indigo 500** series transmitters are industrial-grade, robust devices that accommodate up to two Vaisala Indigo-compatible probes.

Indigo transmitters provide easy visualization of data, optional wireless interface, simple installation, and plug-and-play connection with probes. Enclosures are rated IP65 (Indigo 200 Series); or IP66 and NEMA 4 rated (Indigo 500 Series), safe for harsh environments, and resistant to dust and most chemicals. Transmitters feature local display options and connection to automation systems through analog signals, relays, or Modbus TCP/IP protocol.

Insight PC Software

Field calibration is a quick way to check and verify measurement accuracy. With Indigo compatible probes, calibration can be performed using Vaisala's Insight PC software. Insight software automatically detects and connects to up to six probes. The software provides an intuitive graphical user interface, easy access to diagnostics data and device-specific advanced features, such as event logs, parameter backup copy, or electronic copies of calibration certificates. Data can be exported to a spreadsheet. Insight software is downloadable at: www.vaisala.com/insight.



Indigo 500 Series Transmitters for Humidity, Temperature, Dew Point, Barometric Pressure, Moisture in Oil, CO₂ and H₂O₂ probes



Insight Software

Incubators

Incubators require precise control of temperature, relative humidity and carbon dioxide. The patented Vaisala CARBOCAP® carbon dioxide sensor has become a standard for use in incubators. With excellent long-term stability, Vaisala CO₂ devices are ideal as a reference measurement. Each sensor features built-in temperature/pressure compensations and operates reliably in high humidity environments.



Indigo 200 Transmitter with GMP251 carbon dioxide probe



Vaisala CARBOCAP® GMP251 CO₂ probe

- Can be used as a standalone instrument or with Indigo transmitters
- Measurement range of 0-20% CO₂
- Operating range -40 to +60°C with built-in temperature compensation
- Sensor heating to prevent condensation
- Calibration certificate included



Portable humidity, temperature & CO₂ meters

- CO₂ and RH/T probes can be used simultaneously
- CO₂ measurements in parts per million or percentage
- Ideal for spot checking and field calibration
- Probes can be directly placed in incubators
- Available with CO₂ pump option to draw a sample without opening incubator doors



Vaisala HUMICAP® HMP110 humidity and temperature probe

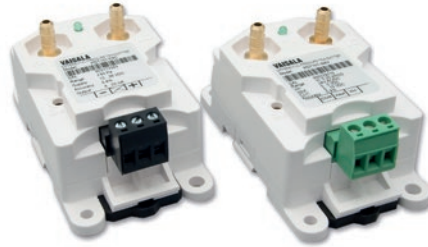
- Can be used as a standalone instrument or with a transmitter
- Measurement range of -40 to +80°C, 0 - 100% RH
- Voltage and digital output options

Demanding HVAC and cleanrooms



CAB100 Industrial Cabinets

The **CAB100** is designed for continuous monitoring in cleanrooms and industrial areas. The cabinets provide centralized integration of transmitters with the viewLinc continuous monitoring system software. A simple, pre-configured instrument panel for monitoring humidity, temperature, differential pressure and many other parameters, the CAB100 is configurable to your application requirements. Options include large or small size cabinets, analog inputs for remote transmitters, and safety barriers for areas that require Intrinsically Safe devices. Cabinet devices can be changed or expanded as needed.



PDT101 differential pressure transmitter

The **PDT101 differential pressure transmitter** is designed for demanding cleanroom applications. The sensor integrates with the viewLinc monitoring system and the CAB100 industrial cabinets to monitor pressure differentials in regulated environments. Ideal for high-performance cleanrooms.

- Available with voltage output (3-wire) or current output (2-wire)
- DIN rail, panel or wall mountable
- 2 pressure ranges (Pa and in H₂O)
- Accessible zero and span adjustment potentiometers
- ¼" brass tubing connections
- LED status indicator
- Traceable calibration to national standards (certificate included)



HMT120/130 Humidity and Temperature Transmitter

The Vaisala **HUMICAP® HMT120/130** Humidity and Temperature Transmitters are resistant to dust and chemicals and can be mounted outdoors using a Vaisala installation kit.

- Interchangeable remote or local probes
- 2-wire loop-powered or 3-wire voltage output configurations
- Removable probe for easy field calibration
- Optional LCD display and easy USB connectivity to PC
- Wall-mounted or remote options available
- Constant output probe available
- Optional radiation shield & enclosure

Vaisala HUMICAP® HMW90 measures relative humidity and temperature in indoor environments. The HMW90 is a flexible product family with a variety of options and features, both analog and digital output models are available. The sensors are exceptionally easy to configure, install, and adjust in the field. Calculated parameters include temperature dew point, enthalpy, and wet bulb temperature.



HMW90 Humidity and Temperature Transmitter



HMD60 Humidity and Temperature Transmitter

Vaisala **HUMICAP® HMD60** Humidity and Temperature Transmitters mount easily on walls or ducts for monitoring HVAC applications.

Industrial drying & compressed air



Indigo 520 Transmitter



Dew point and temperature probe DMP8

Ideal for applications like tablet coating, fluid bed dryers, and dry rooms, the Vaisala HUMICAP® and DRYCAP® sensor technologies offer many solutions to reliably measure humidity, temperature and/or dew point and barometric pressure. With our newest Indigo family of products, probes can be used independently or combined with a transmitter for additional capabilities.

The DRYCAP® products provide stable measurement in extremely

dry conditions such as in compressed air, glove boxes, and dry rooms. Features include:

- Dew point range down to -80°C (-112°F)
- Fittings for elevated pressure up to 725 psia
- Patented auto-calibration technology allows for calibration intervals up to two years

The HUMICAP® products provide exceptional stability over a wide range of temperature and

humidity conditions, making them ideal for applications such as tablet coating and fluid bed dryers. Features include:

- Temperature range optimized for processes ranging from -70 ... $+180^{\circ}\text{C}$ (-94 ... $+356^{\circ}\text{F}$) and humidity 0...100%
- Purge cycles for chemical contaminants
- * Probe warming in near-condensing conditions for long-term measurement stability



DM70 Handheld Meters measure dew point and temperature accurately over a wide measurement range. The probe may be inserted directly into pressurized processes up to 20 bar-absolute (290 psi) and responds rapidly in ambient and process conditions.



HUMICAP® HMP7 Probe with Indigo201 Transmitter

Bio-decontamination & sterilization

Hydrogen Peroxide Vapor Bio-Decontamination

The HPP270 series probes use PEROXCAP® technology to provide repeatable, stable, and accurate measurements in isolator, transfer hatch, and room bio-decontaminations. The basic probe option HPP271 measures H₂O₂ vapor concentration (ppm) only; the HPP272 measures hydrogen peroxide vapor concentration, temperature, and humidity (relative saturation and relative humidity), dew point, and vapor pressure. For use as a standalone probe or with Indigo transmitters.

- Superior long-term stability and repeatability
- Traceable calibration certificate
- Corrosion-resistant stainless steel probe housing (IP65)
- Integrable with control systems
- Excellent long-term stability and negligible hysteresis



Vaisala PEROXCAP® HPP272 with Indigo 202



HMT370EX
with HMP378
Probe

Intrinsically Safe Humidity and Temperature Transmitter HMT370EX with HMP378 Probe

- HMT370EX Series Intrinsically Safe Humidity and Temperature Transmitters can be used in a variety of ETO gas mixtures
- Measures humidity and temperature, dew point, mixing ratio, absolute humidity and wet bulb temperature
- Safe operation with the entire transmitter in hazardous areas
- Features high accuracy, excellent long-term stability and negligible hysteresis



Liquid concentration measurements

Vaisala K-PATENTS® PR-43-PC Pharma Refractometers are designed to measure liquid concentrations in-line (in-situ); from laboratory-scale to pilot batches that are used in process development to the production-scale batches that support commercialization.

The concentration of dissolved solids is determined by making an optical measurement of a solution's refractive index. The advantage of this principle is that it enhances process understanding through the product lifecycle, and contributes significantly to the development of effective drugs and their efficient manufacturing processes. Example applications include processing of active pharmaceutical ingredients (APIs), biochemical/biopolymers, including vaccines, antibiotics, blood plasma products, proteins and buffer solutions. Vaisala K-PATENTS refractometers are the perfect process analytical technology (PAT) tool.

The Vaisala K-PATENTS Pharma Compact Refractometer PR-43-PC supports PAT framework, has FDA 21 CFR Part 11 compliant electronic data capture and storage technology.

Materials used are pharma grade, including product contact surface materials with traceability documentation and controls, electropolished finishes with the surface roughness of Ra 0.4µm (15µ inch), as well as USP Class VI Elastomers that are tested for materials' biocompatibility and toxicology safety.

Unique features:

- Sanitary 3-A and EHEDG certified to meet the highest hygienic requirements
- Meets PAT, GMP, CIP/SIP, 21 CFR
- Part 11 and validation guidelines
- Full Refractive Index (nD) 1.3200 – 1.5300 measurement range, which corresponds to 0-100 Brix.
- Proven NIST traceable accuracy
- **Fully scalable solution from lab to commercial production**
- Real-time process control
- Built-in instrument verification
- Measurement is not affected by bubbles, color, particles or dispersed air

In addition, the refractometer can send data to the control system (DCS) to develop an automated control strategy to standardize the process and achieve consistent quality, prevent batch-to- batch variations, reduce production time and costs, increase yield, and ensure product safety.

In-line measurement of refractive index can help to immediately identify problems during scale-up and to reduce development time.



Vaisala K-PATENTS® PR-43-PC Pharma Refractometer

The pharma refractometer can be used for:

- Process evaluation, validation and troubleshooting.
- Data collection for process understanding of different experiments and operations.
- Finding unique process profile. This is a reference during scale up to confirm that the process behaves as designed and to assure there is process equivalence.
- Monitoring the performance or operation on pilot and full scale, as well as in monitoring the concentration and purity of solvents, raw and final products.
- Monitoring blending operations and achieving the correct reactants composition. It can follow reaction degree, study different solvents and their suitability for the process.
- Determining supersaturation point in crystallization.

Life cycle services



As a manufacturer, Vaisala is dedicated to offering comprehensive customer care throughout the entire life cycle of your measurement devices and systems. Using our calibration services is the most convenient way to ensure your measurement data is accurate and your calibration records are compliant. Calibration options are available 24/7 from our online store. We are at your service worldwide with four global service centers and local field service options.

Life Cycle Services:



Training services



Maintenance and repair



Instrument modernization



Extended warranty



Technical support



Calibration services

Calibration Services:

- In compliance with ISO/IEC 17025 and ISO 9001 requirements
- Customized calibration points upon request
- Functional testing
- Traceable calibration
- Accuracy adjustment as needed
- Probe filter replacement as needed
- Calibration certificate with as-found and as-left results
- Service report



Original factory calibration performed on new Instruments

In compliance with ISO 9001 requirements

Predefined calibration points



Calibration for regulated Industries and reference Instruments

In compliance with ISO/IEC 17025 requirements

Predefined/selectable calibration points



Configurable calibration for customer-specific needs

In compliance with ISO 9001 requirements

Selectable calibration points



Visit our online store at store.vaisala.com

Contact Vaisala HelpDesk: www.vaisala.com/en/support-portal

Monitoring Systems Instruments

viewLinc Software



Dew point



Indigo 200



Data loggers



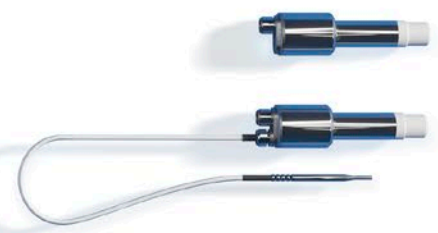
Carbon dioxide



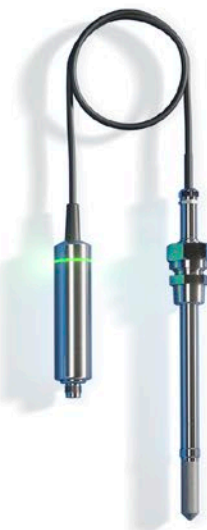
Humidity and temperature



Hydrogen peroxide vapor



Moisture in oil



Insight PC Software



Indigo 500



