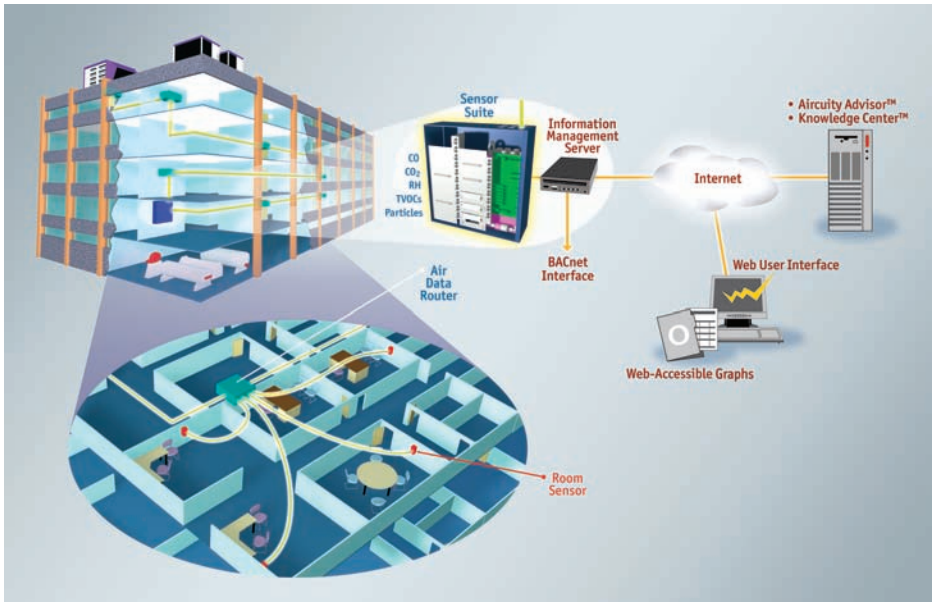
AIRCUITY®

OptiNet®

Energy Savings, Safety, and Comfort for Today's Smart Buildings

OptiNet is a comprehensive suite of technologies which enable energy efficient, healthy, building ventilation control strategies. OptiNet's multipoint sampling system senses a multitude of indoor environmental parameters throughout a facility to deliver cost effective, accurate, and reliable knowledge on ventilation performance.

This information is integrated with a building control system to enact several key energy savings approaches including demand control ventilation, differential enthalpy based free cooling, and the dynamic control of dilution ventilation in laboratories and animal facilities. These strategies significantly reduce building energy consumption while also enhancing the facility's indoor environmental quality, and in many cases, can reduce building first costs.



Applications

- Demand Controlled Ventilation (DCV)
- Differential Enthalpy Economizer Control
- Laboratory/Vivarium DCV
- LEED Certification
- IAQ Monitoring

Benefits

- Lower energy costs
- Reduce operating costs
- Improve Indoor Air Quality

Markets

- Commercial Office
- Educational Facilities
- Healthcare Facilities
- Research Laboratories and Vivariums
- Museums, Art Galleries & Libraries
- Data Centers

The OptiNet system continuously collects an array of building indoor environmental data. Air samples are gathered from individual spaces and at the air handler level and routed through the OptiNet network to the Sensor Suite for analysis. The sampled data is then transmitted to the web based Aircuity Knowledge Center for archiving, review, and graph generation. Additionally, the data is communicated to the facility's Building Management System for control of the facility's ventilation systems to reduce energy costs while improving indoor environmental quality.

The **Room Sensor (RS)** interfaces to the Air Data Router for room level sensing of temperature; and for drawing air samples from the test areas through the patented MicroDuct® communications path. The assembly is flush mounted and can be custom painted to match architectural interiors.

The **Duct Probe (DPB)** interfaces to the Air Data Router for duct and outside air level sensing of temperature; and for drawing air samples from the test areas through the patented MicroDuct® communications path. Enclosures are selected based on interior and exterior (weather tight) applications.

The **Sensor Suite (SST)** is built on a scalable architecture to accept a variety of sensors for multipoint sampling of a host of indoor environmental parameters. The sensor suite affords distributed, multiplexed based sensing of the monitored areas by automating the collection of real time, area specific data received from Air Data Routers. A shared sensor platform minimizes calibration and maintenance costs while maximizing potential energy savings.

Located within a Sensor Suite, **Sensor Suite Sensors (SEN)** evaluate an array of environmental conditions using a shared sensor architecture. Each sensor is designed for optimal performance based upon a specific control or monitoring application. A range of sensors are available to measure carbon dioxide (CO2), carbon monoxide (CO), dewpoint temperature, total volatile organic compounds (TVOCs), and airborne particulates.

Air Data Routers (ADR) convey air samples to the Sensor Suite from up to four distinct test areas (sample points) via dedicated Room Sensors and/or Duct Probes and the associated OptiNet Structured Cable. The router multiplexes air samples from the room sensors and probes via onboard solenoid valves that are commanded to open/close through the router; and take direct temperature readings from the same sensors and probes when so equipped. Multiple areas can be monitored from one Air Data Router, and the routers can be networked as part of a larger distributed system.

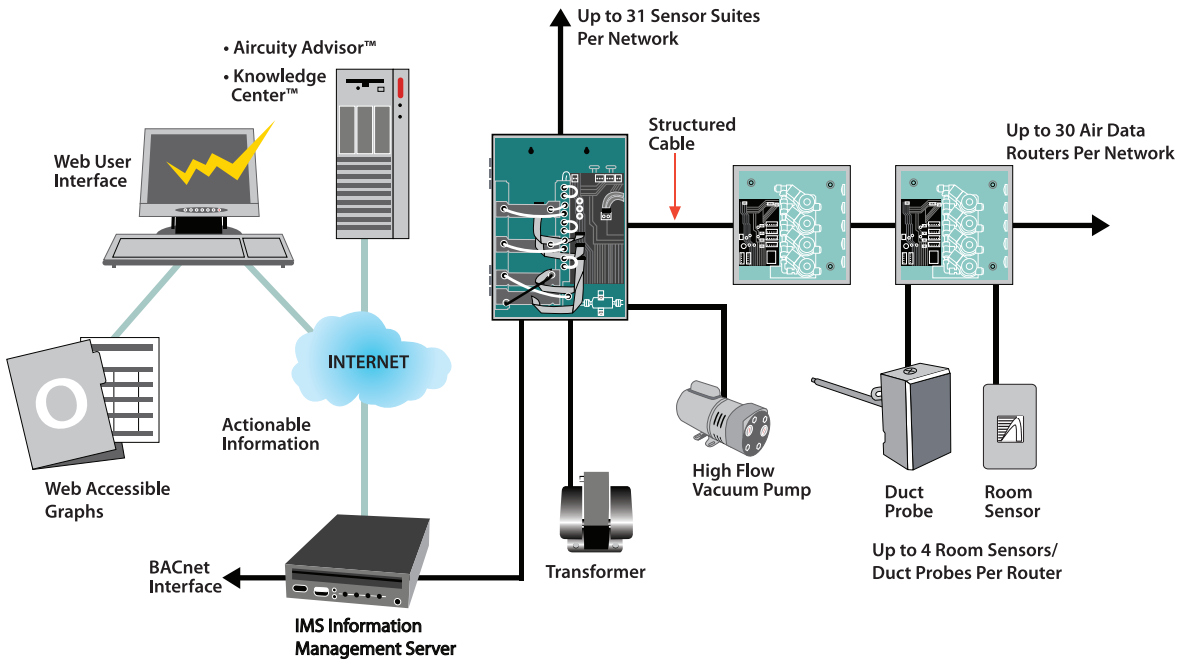
The **OptiNet® Structured Cable (OSC)** is the communications backbone for the OptiNet Facility Monitoring System. The cable is a composite of both traditional LAN based technologies; and a patent pending sampling media named MicroDuct®. An exact blend of carbon nanotubes and a fluoropolymer resin maintain superior particle transport and chemical purity of the air sample.

The **Information Management Server (IMS)** provides network management of the Sensor Suites; communications to the Aircuity Knowledge Center for a web based user interface and reporting; and for integration to a facility's Building Management System.

The **High Flow Vacuum Pump (HFP)** draws a continuous flow (vacuum) of air through the OptiNet communications backbone for evaluation. The pump interfaces to a Sensor Suite for sequencing of air samples from the Air Data Routers in the space.

OptiNet Architecture

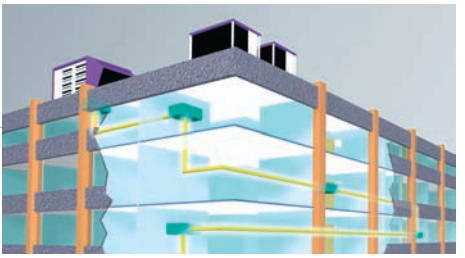
OptiNet® Network

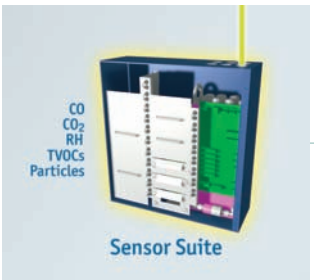


Sequence of Operation

Air samples are drawn from individual test areas through the Air Data Router, and then multiplexed across the OptiNet communications backbone back to the Sensor Suite.

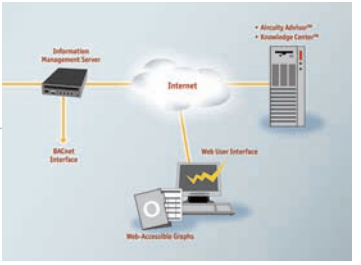
Multiple areas throughout a facility can be monitored and controlled by the networking of additional Air Data Routers.





The air samples are routed to the Sensor Suite for analysis. A shared common sensor platform negates sensor errors for true differential measurement; and minimizes calibration and maintenance costs.

A wealth of sensor data is transmitted from the network to the Information Management Server. The Server provides network management of Sensor Suites; communications to the Aircuity Knowledge Center for a web-based user interface and graphing; and integration to a facility's building management system.



About Aircuity

Aircuity is the leading manufacturer of facility monitoring systems that cost-effectively reduce building energy and operating expenses while simultaneously improving indoor environmental quality. Aircuity's goal is to optimize building ventilation for energy efficient performance without sacrificing occupant comfort, health or productivity.

The company's systems are suitable for a broad range of commercial building applications where energy efficiency and enhanced indoor environmental quality are important, including offices, laboratories, hospitals, educational institutions, museums, convention centers and sports arenas.

U.S. GREEN BUILDING COUNCIL MEMBER

AIRCUITY®

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