

## 9020 Series LonWorks® Compatible Carbon Dioxide Transmitter With Temperature



Wall  
TR9020-L



Wall  
TR9020



Duct Probe  
TR 9021-L

### A Breakthrough In Simplicity And Cost!

- ✓ Attractive wall mount case with display for temperature and CO<sub>2</sub> levels. No-Display version also available.
- ✓ Self-calibrating sensor eliminates calibration/maintenance requirements.
- ✓ Easy to install duct mount version with 8" aspiration probe. (No tubes to plug or clean.)
- ✓ Easy choice of voltage or current via jumper selection, relay output also available.
- ✓ Display, output range and scaling easily customized via a PC interface.
- ✓ Transmits CO<sub>2</sub> and Temperature concentrations for AirTest TR9000 Products using LonTalk® protocol.
- ✓ Gold plated optical sensor ensures long-term durability and stability.
- ✓ Purposefully built for quality - designed and built using Internationally Certified ISO 9001 processes.

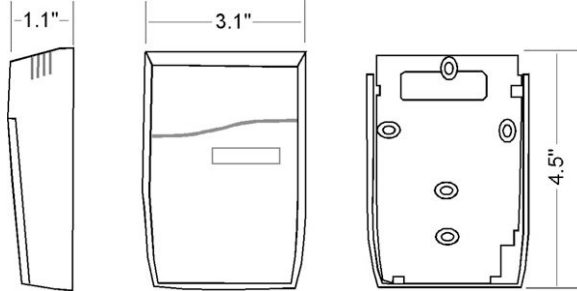
### Why Active Ventilation Control With CO<sub>2</sub>?

- Ventilation control with CO<sub>2</sub> is a viable and energy efficient way of controlling ventilation to target cfm/person levels based on actual occupancy. This approach offers many advantages over the traditional approach of providing fixed ventilation based on maximum occupancy.
- ⇒ Reduce ventilation and energy costs in applications with variable occupancy.
  - ⇒ In static occupancy applications, owner can continuously control ventilation rates to reflect current occupancy conditions.
  - ⇒ Actively control ventilation to eliminate unintended over and under ventilation conditions resulting from post commissioning adjustment of outside air quantities.
  - ⇒ Monitor and control zone ventilation efficiency and take advantage of using preconditioned transfer air from under occupied spaces for ventilation.
  - ⇒ Documented CO<sub>2</sub> levels can provide ongoing verification that code-required ventilation rates are being maintained.

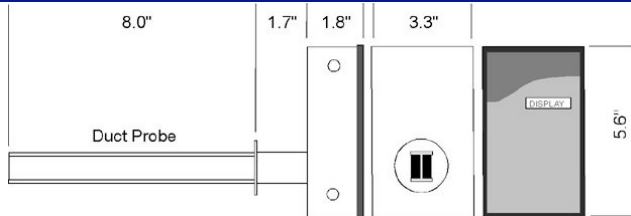
## About The CO<sub>2</sub> And Temperature Transmitter

The TR9200 is a state of the art monitor for zone ventilation (CO<sub>2</sub>) and temperature control. Versions for wall or duct mount are available. The need for calibration has been eliminated through use of a unique self-calibration algorithm that has been proven in over 8 years of use.

### Wall: TR9020



### Duct: TR9021



### Network Variables For Node Objects

**nviRequest** ..... To control objects and request modes for objects within this node.  
**nvoStatus** ..... To report status of objects on this node.

### Network Variables For Temperature

**nviSpaceTemp** ..... Space Temperature Input.  
**nvoSpaceTemp** ..... Space Temperature Output.  
**NvoSpaceTempCopy** ... Copy of nvoSpaceTemp.  
**nciMinDeltaTemp** ..... Updates nvoSpaceTemp.

### Network Variables For CO<sub>2</sub> Sensor

**nviSpaceCO<sub>2</sub>** ..... Space CO<sub>2</sub> Sensor Input.  
**nvoSpaceCO<sub>2</sub>** ..... Space CO<sub>2</sub> Sensor Input Access To Adjustment Buttons.  
**nciMinDeltaCO<sub>2</sub>** ..... Updates nvoSpaceCO<sub>2</sub>.

### Other AirTest CO<sub>2</sub> Products

**nvoUnitStatus** ..... Space Comfort Controller Status  
**nciSndHrtBt** ..... Send Heartbeat  
**nciRcvHrtBt** ..... Receive Heartbeat  
**nciHvacType** ..... HVAC Unit-Type Identifier  
**nciSetpoints** ..... Space Temperature Setpoint  
**nciMinOutTm** ..... Minimum Send Time

### CO<sub>2</sub> & Temp LonWorks® Compatible Products

Wall Mount: **TR-9020** (No Display), **TR-9020-L** (Display)  
 Duct Mount: **TR-9021** (No Display), **TR-9021-L** (Display)

Distributed By:

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## Specifications

### General

**CO<sub>2</sub> Detection Method:** Gold Plated Non-Dispersive Infrared Optical Sensor with Automatic Baseline Correction for Self-Calibration. Diffusion Sampling.

**Certification:** CE, EMC89/336/EEC, CA Energy Commission  
**Temperature Measurement:** Thermistor With Linear Output  
**Transmitter Rated Life:** 15 years

**Operating Conditions:** 32 to 122° F (0 to 50°C), 0 to 95% RH  
**Storage Conditions:** -40 to 158° F (-40 to 70° C)

### Performance

**CO<sub>2</sub> Measurement Range:** 0-2000 ppm (factory set), user adjustable to 3000 ppm

**CO<sub>2</sub> Accuracy:** +/- 1% of measurement range + 5% of measured value.

**Calibration:** Self Calibrating, Calibration Not Required  
**Response Time:** T<sub>90</sub> = <2 minutes (diffusion)

**Temperature Measurement Accuracy:** +/- 0.9° F ( 0.5° C)

### Power

**Input:** 18-30 VAC, 50-60 hz (half-wave rectified)

**Average Power Consumption:** £ 3 Watts average

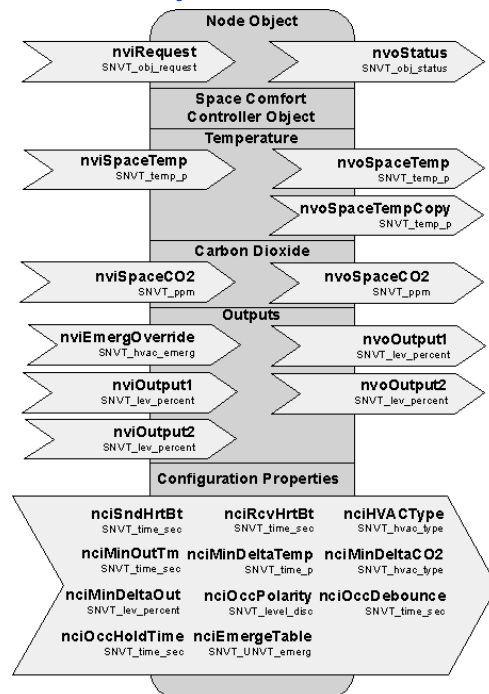
### Outputs

**Digital Display:** CO<sub>2</sub> Concentrations in ppm, Temperature in °F or °C. (User selectable with PC Interface)

**Linear Analog Outputs:** (CO<sub>2</sub> =Out1, Temp = Out2) jumper selectable for VDC or mA

0 to 10 VDC R<sub>OUT</sub> < 100 ohm, 0 to 5 VDC R<sub>LOAD</sub> >5k ohm, 4 to 20 mA R<sub>LOAD</sub> < 500 ohm

**LonWorks® Node Objects:**



Covered By US Patents: 6194735, 6016203, other patents pending



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 Sensors That Make Buildings Smart!