SynapSense® Wireless Mesh ThermaNode™

PANDUIT®

SPECIFICATION SHEET

specifications

The wireless mesh node shall be a battery-operated wireless device designed for environmental node data collection from server and telephony equipment racks and cooling units, as part of a comprehensive cooling optimization solution. Each wireless node shall provide temperature and humidity measurement for up to seven external thermistors connected to the node via a latching connector, allowing for comprehensive capture and consolidation of both front and rear cabinet intake and exhaust readings within each unit.

technical information

Dimensions:	91.44mm L x 63.5mm W x 30.48mm H (3.6" L x 2.5" W x 1.2"H)
Housing:	ABS Plastic
Packaging:	Includes four AA batteries
Mounting:	Can be mounted using screws (via four holes that accommodate up to #6 machine screws) or with cable ties (via four holes that can accommodate up to 4.572mm or 0.18 in cable tie width) or by double-sided adhesive included.

key features and benefits

Multi-Faceted Monitoring Unit	Replaces the needs for multiple environmental cabinet nodes by consolidating monitoring of various touch points into one single, cost-effective unit
Wireless Mesh Network	Serves as one node within an innovative wireless mesh network made up of multiple nodes that "talk" to each other to share environmental monitoring data across the data center
Simple Deployment	Allows wireless placements of nodes at any points, avoiding the cost or time of installing complex or additional connectivity in data center
Self-Configuring	Self-configures into the existing wireless mesh network structure without needing any complicated configurations by the network administrator
Auto Adjusting Receiver Sensitivity	Adjusts receiver sensitivity to compensate for powerful ambient radio noise from other devices like Wi-Fi, enabling radios to communicate with each other in harsh RF environments
Channel Black-listing	Identifies and avoids radio frequencies that have high levels of RF noise, speeding up data transfer and conserving battery life
Battery Operated	Operates on four AA batteries that provide up to seven years of battery life, cost-effectively powering node over life of data center
Time Stamped Data	Allows automatic time stamping of each piece of node data to indicate and document the exact time at which data was collected making historical comparisons possible
SmartSend Notifications	Compares data collected every 30 seconds and recognizes temperature deviations outside of specified thresholds, causing override of configured reporting intervals to ensure that potential concerns are identified for quick resolution
Smart-Over-the-Air (SMOTA) Firmware Update	Uses wireless network to transmit hardware firmware updates directly to node without need for physical intervention for simplicity of updates*
128-bit Network Encryption	Encrypts data over the network using a unique 128-bit key to ensure security
Single IP Address Scalability	Allows interconnect ability of up to 200 nodes on a single wireless mesh network gateway thru one single IP address, reducing the need for separate IP ports, IP capital costs, and management overhead
SmartZone™ Software DCIM Suite integration	Captures environmental data that is consolidated by connected gateways and then utilized by SynapSoft® Cooling Software, part of the SmartZone™ Solutions portfolio, for real-time monitoring and display, management, and automated documentation

*Performing a firmware upgrade is a specialized process which must involve technical support or a qualified reseller.

applications

The SynapSense® Wireless Mesh ThermaNode™ is a key component of SynapSense® Cooling Optimization, a turn-key wireless monitoring and cooling control solution for data centers that uses intelligent software, leading edge wireless nodes, and professional services to optimize cooling, increasing current capacity and reducing costs to deliver tangible ROI.

The SynapSense® Wireless Mesh ThermaNode™ is a battery-operated wireless device designed for environmental data collection from server and telephony equipment racks and cooling units. Each ThermaNode™ supports up to seven external thermistors connected to the node via a latching connector.

Up to 200 sensors can be connected to one single IP address, with expandability up to 2,000 sensors on a single network thru additional gateways.

This allows an individual ThermaNode™ to be installed on a cabinet to cost-effectively capture front and rear cabinet intake and exhaust readings from connected thermistors at specific points, rather than deploying separate nodes individually.

As part of a wireless mesh network, Up to 200 ThermaNodes™ can be connected thru a single IP address to captured real-time temperature and humidity data across a data center. This data is then used by SynapSoft® Cooling Software to create thermal maps and movies to identify developing hotspots or anomalies, find reclaimable cooling capacity, or simply optimize the efficiency of the cooling overall for tangible ROI.

Wireless Mesh Nodes	
ThermaNode™:	99-0501-001
ThermaNode™ EZ (measures temperature):	99-0944-001
ThermaNode™ EZ-H (measures temperature and humidity):	99-0944-010
Pressure Node:	99-0331-001
Constellation Node:	99-0348-003
Wireless Mesh Gateway	
Gateway:	100-1156-001
Gateway mounting shelf: :	67-0811-003
SynapSoft® Software	
Software Fee Modbus Driver:	SWFee-I-MB
Software Fee BACnet Driver:	SWFee-I-BN
Software Fee SNMP Driver:	SWFee-I-SN
Environmental Monitoring License:	99-0794-001

SynapSense® Wireless Mesh ThermaNode™

General Specifications

Specifications	Description
Node Specifications	• 2.4 GHz, ISM unlicensed band • IEEE 802.15.4 MAC.
Data Rate Maximum	• 250 Kbps
Maximum RF Output Power	• 0 dBm
RF Data Range	Typical data center environment: 50 feet (15m); Max 260 feet (80m) open air, line of sight
Battery Life	Five to seven years (typically)
Maintenance and Calibration	No recalibration or maintenance possible
Antenna Type	+0 dBi omni-directional antenna
Software Requirements	Requires SynapSoft® Version X.0 or newer Device Manager Software NOTE: LiveImaging, Device Manager, MapSense, and other software features referenced in this document are included within the SynapSoft® Software Platform.

Mechanical Specifications

Specifications	Description
Connectors	Molex Micro-Fit^ series 14 position I/O connector for use with external thermistor wire harness (provided)
Power Requirements	Two or four AA 1.5 VDC lithium batteries
Life Expectancy	• Temperature Sensors: No recalibration possible. No stated life degradation. We use only US Sensors NTC 10k Jcurve thermistors potted in a vinyl encapsulation. • Internal Humidity Sensors: Manufacturer states 1% per year accuracy degradation. Replace sensors at 10 years (this assume worst case + 12% accuracy for the RH measurements our system provides)..
Mechanical Expectancy	Protection for electronics is up to seven foot, multi-axis drop (battery compartment may open above two feet)
On/Off Switch	ThermaNode™ contains an on/off power switch. The switch is ON in the left positon.
Regulatory Information	• FCC Part 15, Subpart C, 15.247 U62-SRS100 and U62-THERM • Industry Canada 7265A-SRS100 and 7265-THERM • CE Marketing EN 300 328; V1.7.1 (2006-05) and EN 300 440-2 V1.1.2 (2004-07

^Micro-Fit is a trademark of Molex.

ThermaNode™ Internal Sensor (Relative Humidity)

Parameter	Specification
Operating Range	50°F to 95°F (10 TO 35°C)
Accuracy	Nominal +0.86°F to 0.82°F (+0.48°C to 0.46°C)
Accuracy Over Time*	• After 1 year +0.92°F to 0.88°F (+0.51°C to 0.49°C) • After 2 years +0.99°F to 0.94°F (+0.55°C to 0.52°C) • After 3 years +1.06°F to 0.99°F (+0.59°C to 0.55°C)

ThermaNode™ Internal Sensor (Temperature)

Accuracy	+0.5°F (+0.3°C)
Stability	Negligible
Operating Range	32°F to 140°F (0°C to 60°C)
Time Constant	230 seconds moving air (typical)

ThermaNode™ Environmental Specifications

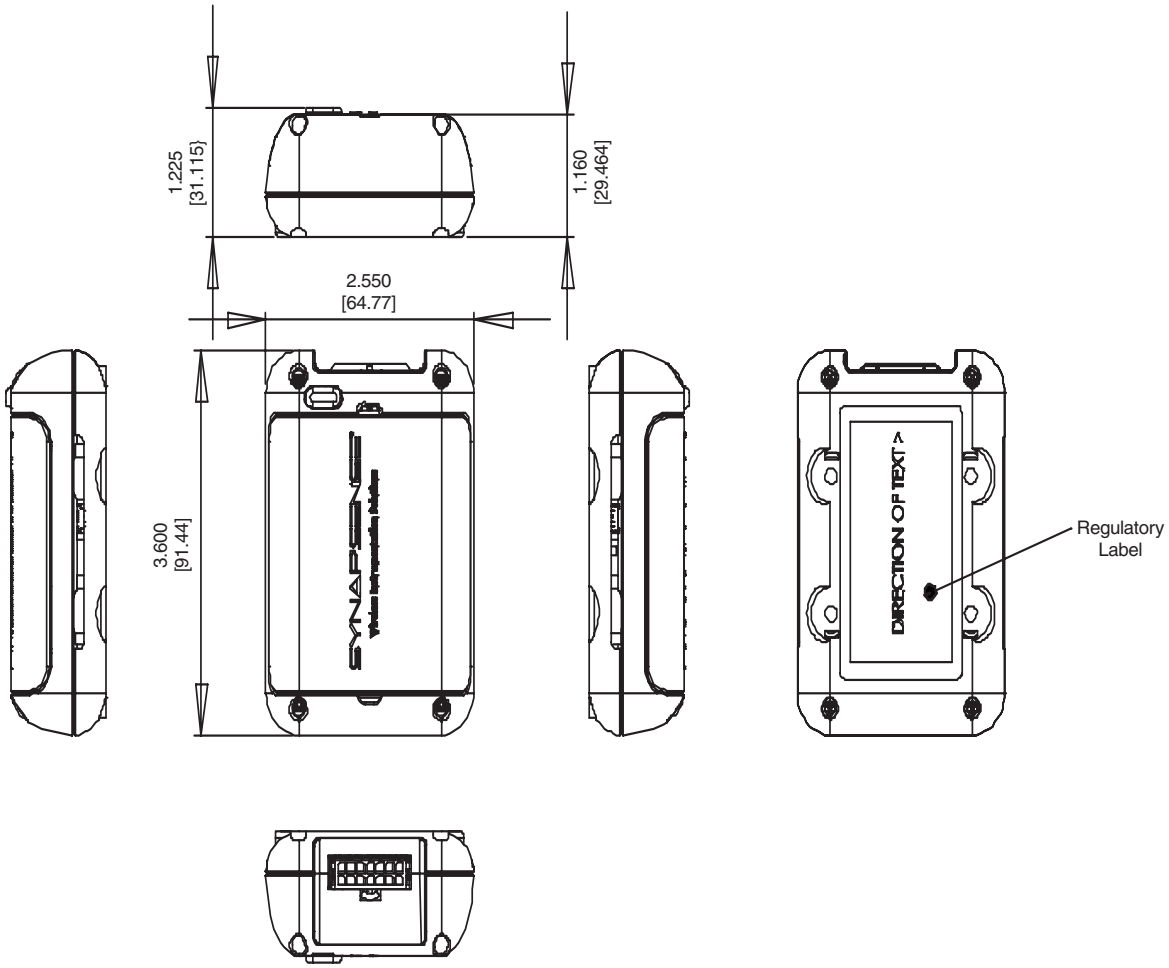
Operating	32°F to 140°F (0°C to 60°C)
Storage	Storage (with batteries) 14°F to 140°F (-10°C to 60°C)

SynapSense® Wireless Mesh ThermaNode™

ThermaNode External Sensor Data

Parameter	Specification
Number of Supported Thermistors	Up to seven
Temperature Range	32°F to 140°F (0°C to 60°C)
Temperature Accuracy	10 to 43°C: +0.5°F (+0.3°C)
0 to 10 and 43 to 60°C:	+1.2°F (+0.7°C)
Time Constant	30 seconds moving air; 60 second static air (typical)
Resolution	+0.02°F at 77°F (+0.01°C at 25°C)
Stability	Typically +0.0056°F (0.0031°C) over five years
Thermistors	10k ohm, Type J Curve
Thermistor Time Constant	60 second static air; 30 second moving air (typical)

Dimensions



Dimensions are in inches. [Dimensions in brackets are metric.]

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