

# R151 Tethered Temperature Sensor

The R151 Tethered Temperature Sensor, with its tethered digital thermometer, is particularly well-suited for monitoring temperatures in harsh environments.

## Features & Benefits

- ◆ Accurate temperature monitoring within 2° F from 14° F to 185° F
- ◆ Continues reporting temperature down to -67° F and up to 212° F (+/- 4° F typical)
- ◆ Can be installed inside a metal enclosure
- ◆ Removable and re-attachable sensor cable (tether)
- ◆ Industrial-strength adhesive mounting and flexible mounting options
- ◆ Tether (sensor and cable) design suitable for plenum spaces
- ◆ Monitor harsh environments (e.g., temperature/humidity extremes, condensation)
- ◆ Encoded radio transmissions at 433 MHz
- ◆ Works with all RF Code fixed and mobile readers

The R151 Tethered Temperature Sensor is a battery-powered RF transmitter that monitors and reports the temperature observed by a digital thermometer that is embedded at the end of a 6-foot wire (tether). This modular design provides physical separation between the RF transmitter (tag) and the sealed temperature sensor itself; this allows the tethered sensor to be installed in harsh environments (particularly in applications where use of the R150 Temperature Tag is not practical, such as potentially wet conditions or inside freezers).

The RF transmitter will periodically report its own unique ID, along with the ambient temperature observed by the sensor (updated every 20 seconds). The R151 sensor is designed for use in a variety of challenging environmental monitoring applications. This form factor is particularly well-suited for environments where the RF transmitter (tag) module is mounted in open space while the temperature sensor is installed inside RF-blocking enclosures such as a metal ductwork or refrigerators. Mounting is easy and flexible; the tethered sensor

can be routed into difficult to reach places, such as above a suspended ceiling or inside HVAC air ducts.

The RF transmitter (tag) is housed in an ABS enclosure with a strong industrial adhesive on the back of the enclosure. It can be securely mounted using adhesive, mechanical fasteners (screws) or zip ties. The digital thermometer (sensor) is sealed at the end of plenum-rate cable that can be detached from the RF transmitter (tag) during the installation process and then re-attached via screw-terminal block.

The R151's modular design ensures clear RF signal transmissions in high density deployments, such as within racks and data centers. The RF tag operates with a very low duty cycle that translates to long battery life (typically 5 years). Featuring a low-battery alert, the tag will continue to monitor and report temperature for at least two months following the initial low battery condition. After that, the tag will continue to broadcast its unique ID and a low battery indication with each beacon, but will not report temperature until the batteries are replaced.

*The R151 Tethered Temperature Sensor's digital thermometer is embedded at the end of a 6-foot tether, which provides physical separation between the RF transmitter (tag) and the sealed temperature sensor and permits the tethered sensor to be installed in harsh environments.*



# RF Code R151 Tethered Temperature Sensor Specifications

## OPERATION

Operating Frequency	433.92 MHz
Group Code & Tag ID Codes	> 540,000 unique IDs per Group Code
Typical Transmission Range	> 30 ft in the data center; up to 300 ft open field
Radiated Emissions	71.8 dBuV/m at 3 meters (maximum)
Modulation	ASK
Stability	Saw stabilized

## ENCLOSURE: RF TRANSMITTER (TAG)

Width	2.53 in (64.3 mm); 3.50 in (88.9 mm) including mounting wings
Depth	2.53 in (64.3 mm)
Height	1.03 in (26.2 mm)
Case Weight (with tag)	2.61 oz (74 g)
Construction	ABS
Durability	Tough, impact resistant and temperature stable
Mounting Options	Mechanical screws (2 places) or adhesive pads

## DIGITAL THERMOMETER SENSOR TETHER

Sensor Width	0.38 in (9.7 mm)
Depth	0.84 in (21.3 mm)
Height	0.30 in (7.6 mm)
Tether Construction	0.15 in (3.8 mm) diameter plenum-rated cable
Tether Length	72 in (1829 mm) = 6 ft (1.83 m)

## ENVIRONMENTAL: RF TRANSMITTER (TAG)

Operating Temperature*	-20° C to +70° C (-4° F to +158° F)
Storage Temperature	-40° C to +80° C (-40° F to +176° F)

## ENVIRONMENTAL: DIGITAL TEMPERATURE TETHER

Operating Temperature Range (+/- 4° F typical)	-55° C to +100° C (-67° F to +212° F)
Accurate Temperature Range (+/- 2° F)	-10° C to +85° C (14° F to +185° F)
Liquid Durability	Suitable for condensing environments

## POWER

Battery Type	Three (3) Lithium CR2032 replaceable coin cells
Smart Tag Features	Low battery indication
Battery Life	5 years

\* The R151 RF Transmitter (Tag) will continue to operate over the Operating Temperature range and withstand periods of time subjected to the Storage Temperature limits, however the battery life is optimized at 5 years for normal use in temperature-controlled environments between 50° F and 130° F. If the RF Transmitter (Tag) module is subject to prolonged exposure or use under extreme temperature conditions, this will decrease the useful life of the batteries. The RF Transmitter (Tag) module should be protected from condensing environments; condensation can cause the mechanical wiring / connector to become unreliable. Exposing the RF Transmitter (Tag) to liquids may cause the product to malfunction, or permanently damage the circuitry, and voids the product warranty. Based on the ratings and specifications from the battery manufacturers, RF Code develops usage models to calculate the life of the active RFID Tags. Like all models, there are assumptions and approximations involved. The values are to be taken as engineering estimates - not guaranteed performance. Exposure to extreme temperatures will shorten the battery life. RF Code warrants all tags to be free from defects in materials and workmanship for a period of 1 year.



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