

# Cisco Industrial Asset Vision

---

# Contents

Product overview	3
Features and benefits	4
Prominent features	5
Platform Support	6
Licensing	6
Product specifications	7
<b>1. AV200: Outdoor Temperature and Humidity Sensor</b>	<b>7</b>
<b>2. AV201: Indoor Temperature and Humidity Sensor</b>	<b>12</b>
<b>3. AV202: Product Temperature Sensor</b>	<b>17</b>
<b>4. AV203: Refrigerator Temperature and Humidity Sensor</b>	<b>22</b>
<b>5. AV204: Door and Window Sensor</b>	<b>27</b>
<b>6. AV205: Water Leak Sensor</b>	<b>32</b>
<b>7. AV206: Light Level Sensor</b>	<b>37</b>
<b>8. AV207: Indoor Occupancy Sensor</b>	<b>42</b>
<b>9. AV250: Machine Temperature Sensor</b>	<b>49</b>
<b>10. AV251: Vibration Monitoring Sensor</b>	<b>54</b>
<b>11. AV300: Outdoor GPS Sensor</b>	<b>64</b>
<b>12. AV400: Industrial Sensor Bridge</b>	<b>69</b>
Ordering information	80
Product sustainability	82
Cisco Capital	83
Learn more	83
Document history	84

Make your organization better, safer, and more efficient by monitoring assets and facilities using Cisco Industrial Asset Vision, a simple, all-in-one, cloud-managed sensor IoT solution.



**Figure 1.**  
Cisco Industrial Asset Vision components

## Product overview

Today, data governs all aspects of business decision making, helping to improve efficiencies across the organization. But the impact of the pandemic is driving organizations to look to the Internet of Things (IoT) not just for efficiencies but also for resiliency. To adapt and thrive in the new normal, organizations need data and visibility into their operations even when no one is on the ground.

Monitoring assets and facilities using sensors helps businesses **become better, safer, and more resilient**. Data such as temperature, humidity, and ingress/egress all impact the status of a facility or an asset, whether it is a motor, a refrigeration unit, or even the networking gear itself. Remote monitoring helps to:

- Improve employee safety and efficiency by preventing unnecessary site visits and reducing employee movement throughout facilities
- Reduce expenses by avoiding premature equipment failure
- Improve customer satisfaction by reducing unplanned network outages and operational downtime

Cisco® Industrial Asset Vision helps to improve safety, business resiliency, and operational efficiencies by monitoring assets and facilities using sensors. It is a simple all-in-one, cloud-managed solution. Industrial Asset Vision has everything you need, from sensors to the gateways to the cloud-managed operations dashboard – integrated, secure, and ready to go.

The solution deploys in minutes using a simple QR or bar code, and scaling is designed to grow with your business. Users gain holistic and actionable insights in one easy-to-use cloud-native dashboard. The dashboard has been optimized to require minimal network expertise, thus reducing the burden on IT or the need for expensive service contracts. The dashboard provides a single view of the asset or facility health across all its associated sensors. It includes the ability to monitor health across related assets and facilities, even down to the gateway itself.

## Features and benefits

**Table 1.** Features and benefits

Feature	Benefit
<b>All-in-one simple solution</b>	Other solutions lack integration between network, sensors, and management dashboards, causing long deployment cycles, complexity at scale, and missed insights. In contrast, Cisco Industrial Asset Vision has everything you need, including the sensors, gateways, and management capability, secure, integrated, and ready to deploy.
<b>Cloud-based data operations and management dashboard</b>	<p>Gain holistic and actionable insights in one easy-to-use, cloud-based dashboard. The centralized management dashboard takes the guesswork out of which sensors and gateways monitor and connect to hundreds of locations and thousands of pieces of equipment. It offers a single view of the asset or facility health across all its associated sensors. And it includes the ability to monitor and troubleshoot the gateway itself.</p> <p>Drill-down menus for assets, sensors, alerts, and networks help both OT and IT staff to quickly see the status and resolve issues through a comprehensive troubleshooting capability. They can set alerts or generate reports to take notification action and to better service their facilities and equipment.</p> <p>Using REST APIs and the defacto standard MQTT connectivity protocol, Industrial Asset Vision can share data with enterprise systems such as Enterprise Resource Planning (ERP), service management, inventory control, and analytics. User can also integrate with Azure IoT Hub.</p>
<b>Cisco sensors</b>	Cisco Industrial Asset Vision includes a family of industrial sensors that provide telemetry and location information for assets and facilities. They are preintegrated with the Cisco Wireless Gateway for LoRaWAN (IXM) and management dashboard. Most have IP65 and IP67 ratings, allowing them to be deployed in outdoor and industrial indoor environments. Deploy one or many to monitor a wide variety of conditions, including, humidity, leak detection, room temperature, machine temperature, product temperature, ingress and egress, lighting, occupancy, vibration and asset location. All sensors which support battery powering come with batteries and are easy to install.
<b>Cyber security</b>	Backed by Cisco security, investment, and industry expertise, our solutions run on Cisco's trusted networks so that your data is protected, available, and safe for you to use.
<b>Easy sensor and gateway provisioning</b>	Provisioning and installing Cisco Industrial Asset Vision's sensors and gateways requires minimal technical expertise. Using a mobile app and a QR code or bar code, the devices are provisioned in seconds and immediately generate either environmental, asset, or geolocation data. This dramatically improves the time to value and the ROI for these IoT projects. Scaling to thousands of sensors becomes a breeze.

Feature	Benefit
<b>Cisco Wireless Gateway for LoRaWAN (IXM gateway)</b>	Industrial Asset Vision includes support for the Cisco <a href="#">IXM gateway</a> . This gateway supports LoRaWAN for wireless connectivity and, like the sensors, is designed for outdoor and industrial indoor spaces. It is ideal for use cases that require long-range wireless connectivity and extended sensor battery life. Its cost-effective ruggedized form factor makes it ideal to deploy in a variety of places. It also provides a high sensor-to-gateway ratio, making deployments very cost-effective. Asset Vision includes an RF Performance tool to help determine the coverage area at customer sites.
<b>Subscription/SaaS model</b>	IoT solutions need implementation models that can grow and scale with enterprise business demands. After a one-time fee for the sensors and gateway hardware, customers pay a low monthly subscription fee based on the number of connected sensors.

## Prominent features

Cisco Industrial Asset Vision is **simple, scalable, and secure**

Sensors provide insights into the status of an asset or a facility, giving you the control you need to improve your operations and your business resilience without being onsite. But today, only a small portion of assets and facilities are connected with sensors. And these sensors are unreliable, unsecure, and difficult to use and scale. They lack the integration between the network, the sensors, and management, causing long deployment cycles, complexity, and missed insights. Cisco Industrial Asset Vision overcomes these challenges. It offers:

- **Accelerated time to value:** Sensors and networks from different vendors can lead to long testing cycles and unreliable interoperability between sensors and gateways. Cisco Industrial Asset Vision uses Cisco sensors and Cisco LoRaWAN gateways that are fully validated, resulting in simple, quick, and reliable installation and provisioning.
- **Enterprise scale:** Installing and triaging multivendor solutions across sensors, the network, and dashboard applications is challenging – especially at scale. Most current sensor solutions use unmanaged networks with little to no ability to make network updates remotely and securely. These limitations can heavily burden IT or require expensive service contracts to operate at scale. However, Cisco Industrial Asset Vision brings the ability to make changes and updates remotely. For organizations with geographically dispersed assets and facilities, having this capability enables scaling to any size of sensor solution deployment anywhere.
- **Ability to make better and timelier decisions:** Without timely and relevant insights, there is a greater risk that problems will go undetected and opportunities to improve efficiencies will be missed. The network is typically non-integrated with the rest of the solution. If there is a problem with the network, it often manifests as a problem with the asset or the sensor environment itself. With Cisco Industrial Asset Vision’s dashboard, customers need only one solution to correlate data and identify business-impacting trends.
- **Cyber Security:** Every sensor solution runs the risk of incurring various forms of data loss, intrusion, and malware. Since Cisco Industrial Asset Vision is built on the features and benefits of Cisco security, OT customers can be assured that their solution is running on Cisco’s trusted and managed network. The integrated solution helps reduce complexity and minimize vulnerabilities.

## Platform Support

**Table 2.** Platform Support

Product family	Platforms supported
LoRaWAN gateway	Cisco IXM 900 MHz Cisco IXM 800 MHz
LoRaWAN sensors	AV200, AV201, AV202, AV203 AV204, AV205, AV206, AV207 AV250, AV251, AV300, AV400
Cloud application	Cisco IOT Operations Dashboard
Mobile Application	Apple IOS, Android

## Licensing

Cisco Industrial Asset Vision subscription is purchased and licensed using the IOTAV-BUNDLE-US, IOTAV-BUNDLE-EU, IOTAV-BUNDLE-AU and IOTAV-BUNDLE-IN Multiline Bundle (MLB).

**Table 3.** Multiline bundles

Part number	Description	Geography or region
IOTAV-BUNDLE-US	Industrial Asset Vision Bundle (1yr, 3yr, or 5yr)	United States and Canada (US915)
IOTAV-BUNDLE-EU	Industrial Asset Vision Bundle (1yr, 3yr, or 5yr)	Europe (EU868)
IOTAV-BUNDLE-AU	Industrial Asset Vision Bundle (1yr, 3yr, or 5yr)	Australia, New Zealand, Brazil, Argentina and Chile (AU915)
IOTAV-BUNDLE-IN	Industrial Asset Vision Bundle (1yr, 3yr, or 5yr)	India (IN865)

## Product specifications

Industrial Asset Vision includes a portfolio of sensor in two categories: location tracking and condition monitoring. Sensor product specifications are detailed below.

Product specifications for the Cisco LoRaWAN IXM gateway may be found at [this link](#).

### 1. AV200: Outdoor Temperature and Humidity Sensor

#### Solution overview

The AV200 is an outdoor temperature and humidity sensor for use with Cisco Industrial Asset Vision. Data from the sensor is communicated via the LoRaWAN protocol.

#### Product image



**Figure 2.**  
AV200 Outdoor Temperature and Humidity Sensor

#### Key benefits

- Temperature and humidity detection

#### Product details

**Table 4.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-ENV-O1-US
Europe	IOTAV-L-ENV-O1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-ENV-O1-AU
India	IOTAV-L-ENV-O1-IN

**Table 5.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55° C (-4 to 131° F)
Storage Temperature	-40 to 85° C (-40 to 185° F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP54
Dimensions (L x W x H)	222 x 130 x 195 mm (8.74 x 5.11 x 7.67 inches)

**Table 6.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 7.** Measurements

Specification	Description
Temperature Measurement Range	-20 to 55° C (-4 to 131 °F)
Temperature Accuracy	+/- 1.5° C @ 25° C
Humidity Measurement Range	0% RH to 100% RH
Humidity Accuracy	+/- 10% RH @ 25° C
Battery Voltage Accuracy	+/- 0.1V



**Table 8.** Battery

Specification	Description
Battery Type	2x 1.5V AA in series
Operating Voltage	2.3V to 3V
Battery Life	4 years (25C, 60-minute reports, TxPower=20dBm, SF10)

**Table 9.** Reporting metrics

Monitoring	Default Reporting Interval	Expected Battery Life*
Temperature, Humidity, Battery	60 mins	4 years

\* Assume default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 10.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
UL/CSA 60950-1/62368-1	North America
EN 60950-1/62368-1	EU
CB to IEC 60950-1	Worldwide
CB to IEC 62368-1	Worldwide
IEC 60529 (IP54)	Worldwide
IEC 60950-22	Worldwide
<b>EMC Immunity</b>	
EN 301489-1	EU
EN 301489-3	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN 300220-1	EU
EN 300220-2	EU
CE RED	EU

Specification	Applicable regions
<b>US 902-928 (USA, Canada)</b>	
<b>FCC 47CFR Part 15 B and C</b>	USA
<b>RSS210</b>	Canada
<b>IC ICES-003</b>	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
<b>RCM approval AS/NZS4268</b>	Australia, New Zealand
<b>Anatel certification<sup>1</sup></b>	Brazil
<b>Enacom certification</b>	Argentina
<b>IN865 (India)</b>	
<b>WPC certification</b>	India
<b>Other</b>	
<b>RoHS</b>	EU
<b>FCC Part 2</b>	USA
<b>RSS 102</b>	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

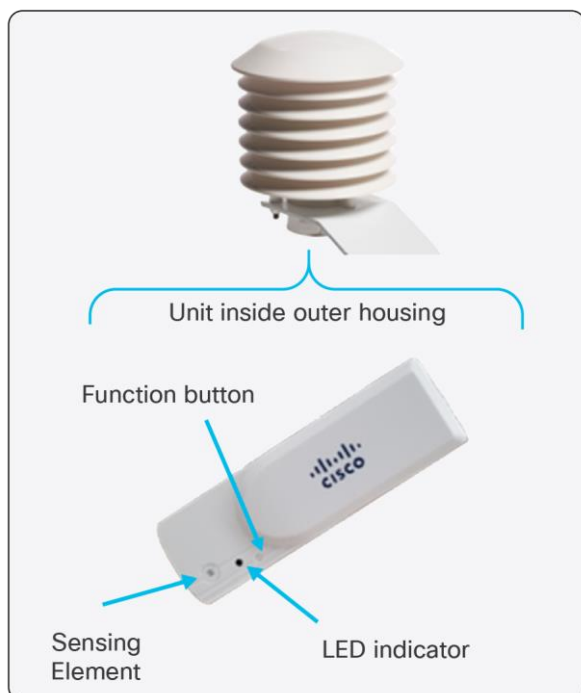
### Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

### EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

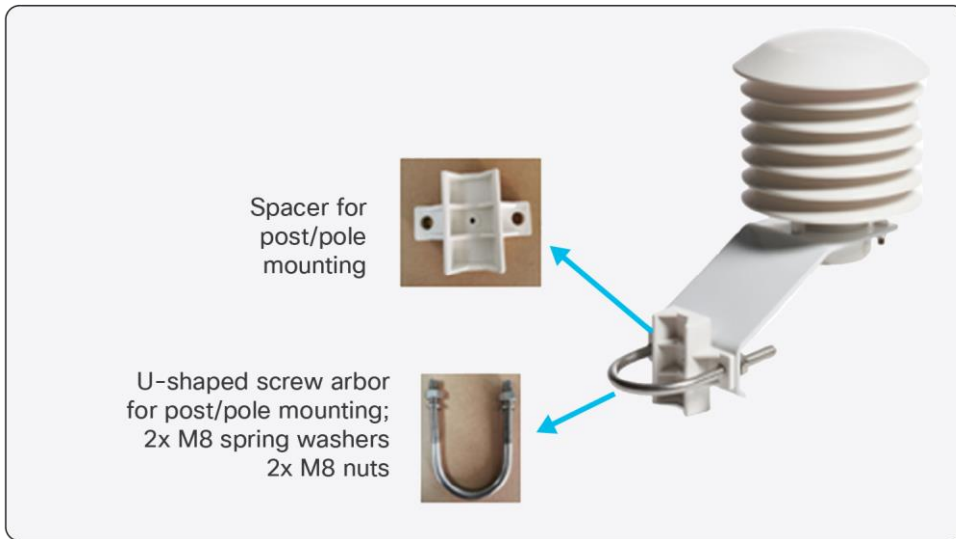
## Turning AV200 On/Off



**Figure 3.**  
Turning AV200 On/Off

- Press and hold the Function button until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for one second:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.
- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

## Mounting Accessories and Methods AV200



**Figure 4.**  
Mounting Accessories and Methods AV200

- Pole/Post Mounting via included spacer and U-bolt assembly.
  - Pole/Post size: 25-50mm.

## 2. AV201: Indoor Temperature and Humidity Sensor

### Solution overview

The AV201 is a LoRaWAN sensor which detects ambient air temperature and humidity. It is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 5.**  
AV201 Indoor Temperature and Humidity Sensor

## Key benefits

- Indoor Temperature and Humidity Monitoring
- Useful in Smart Buildings, factories, warehouses, and Smart Offices

## Product details

Table 11. Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-ENV-I1-US
Europe	IOTAV-L-ENV-I1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-ENV-I1-AU
India	IOTAV-L-ENV-I1-IN

Table 12. Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55°C (-4 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP65
Dimensions (L x W x H)	112 x 65 x 28 mm (4.4 x 2.5 x 1.1 inches)
Weight	141 g (0.31 lbs)

Table 13. Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 14.** Measurements

Specification	Description
Temperature Measurement Range	-20 to 55°C (-4 to 131 °F)
Temperature Accuracy	+/- 1°C@ 25 °C
Humidity Measurement Range	0% RH to 100% RH
Humidity Accuracy	+/- 4% RH @ 25 °C
Battery Voltage Accuracy	+/- 0.1V

**Table 15.** Battery

Specification	Description
Battery Type	2x 3.6V ER14505 AA in parallel
Operating Voltage	3.1V to 3.65V
Battery Life	5 years (25C, 15-minute reports, TxPower=20dBm, SF10)

**Table 16.** Reporting metrics

Monitoring	Default Reporting Interval	Expected Battery Life*
Temperature, Humidity, Battery	15 mins	5 years

\* Assume default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 17.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
UL/CSA 60950-1/62368-1	North America
EN 60950-1/62368-1	EU
CB to IEC 60950-1	Worldwide
CB to IEC 62368-1	Worldwide
IEC 60529 (IP65)	Worldwide
IEC 60950-22	Worldwide

Specification	Applicable regions
<b>EMC Immunity</b>	
EN 301489-1	EU
EN 301489-3	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EU 863-870	EU
EN 300220-1	EU
EN 300220-2	EU
CE RED	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

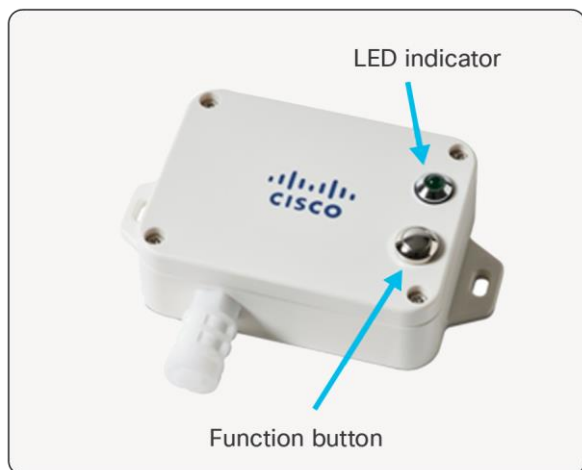
## Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

## Turning AV201 On/Off



**Figure 6.**  
Turning AV201 On/Off

- Press and hold the Function button for 3-5 seconds until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for a few seconds:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.



- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

### Mounting Accessories and Methods AV201



**Figure 7.**  
Mounting Accessories and Methods AV201

- Magnetic mount to ferromagnetic surfaces.
- Screws for attaching to walls and other flat surfaces.
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock.
- Double-sided tape (not included).

## 3. AV202: Product Temperature Sensor

### Solution overview

The AV202 is a LoRaWAN product temperature sensor with an external platinum probe. It is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 8.**  
AV202 Product Temperature Sensor

### Key benefits

- Temperature measuring for liquid, vapor, grain, and solid plane surfaces

## Product details

**Table 18.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-PTM-I1-US
Europe	IOTAV-L-PTM-I1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-PTM-I1-AU
India	IOTAV-L-PTM-I1-IN

**Table 19.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55°C (-4 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP65
Dimensions (L x W x H)	112 x 88.19 x 32 mm (4.4 x 3.4 x 1.25 inches)
Weight	141 g (0.31 lbs)
Probe Material	316 Stainless Steel
Probe Dimensions	5mm (diameter); 15cm long (pointed)
Probe Lead Length	2m

**Table 20.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 21.** Measurements

Specification	Description
External PT1000 probe temperature range	-40 to 200°C (-40 to 392 °F)
Temperature Accuracy	(Assume base unit is @ 0°C ≤ t ≤ 55°C) Probe @ 0°C ≤ t ≤ 55°C: +/- 0.5°C Probe @ -40°C ≤ t < 0°C: +/- {(0.15 + 0.002*  t ) + 1} °C Probe @ 55°C < t ≤ 200°C: +/- {(0.15 + 0.002*  t ) + 0.3} °C
Battery Voltage Accuracy	+/- 0.1V

**Table 22.** Battery

Specification	Description
Battery Type	2x 3.6V ER14505 AA in parallel
Operating Voltage	3.1V to 3.65V
Battery Life	5 years (25C, 15-minute reports, TxPower=20dBm, SF10)

**Table 23.** Reporting metrics

Monitoring	Default Reporting Interval	Expected Battery Life*
Temperature, Battery	15 mins	5 years

\* Default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 24.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
UL/CSA 60950-1/62368-1	North America
EN 60950-1/62368-1	EU
CB to IEC 62368-1	Worldwide
CB to IEC 60950-1	Worldwide
IEC 60529 (IP65)	Worldwide
IEC 60950-22	Worldwide

Specification	Applicable regions
<b>EMC Immunity</b>	
EN 301489-1	EU
EN 301489-3	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN300220-1	EU
EN300220-2	EU
CE RED	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

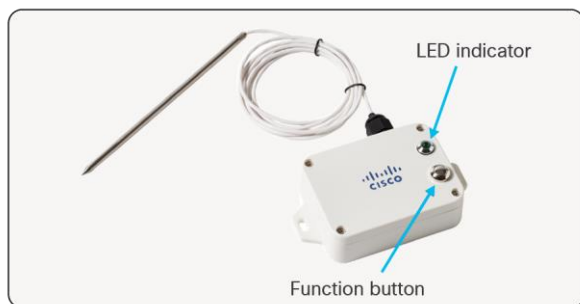
## Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

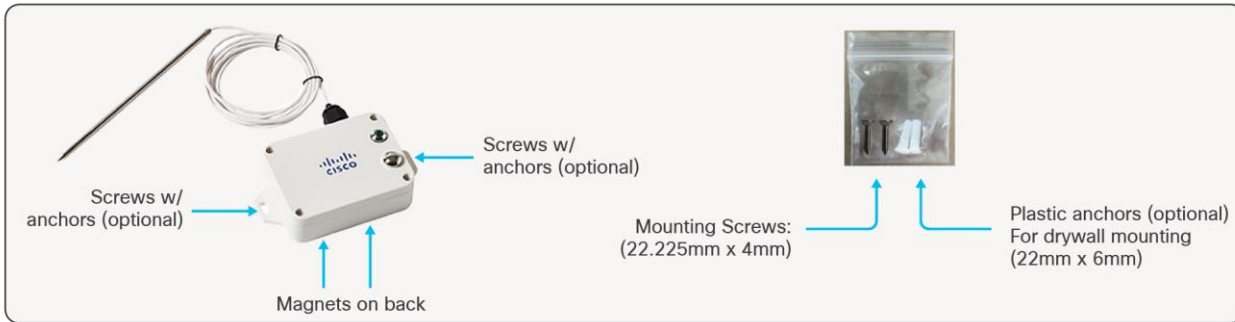
## Turning AV202 On/Off



**Figure 9.**  
Turning AV202 On/Off

- Press and hold the Function button for 3-5 seconds until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for a few seconds:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.
- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

## Mounting Accessories and Methods AV202



**Figure 10.**  
Mounting Accessories and Methods AV202

- Magnetic mount to ferromagnetic surfaces.
- Screws for attaching to walls and other flat surfaces.
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock.
- Double-sided tape (not included).

## 4. AV203: Refrigerator Temperature and Humidity Sensor

### Solution overview

The AV203 is a LoRaWAN sensor used to measure the temperature and humidity in low temperature environments such as freezers. It is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 11.**  
AV203 Refrigerator Temperature and Humidity Sensor

### Key benefits

- Domestic and Commercial Refrigerators
- Cold Chain Logistics
- Data Logger

## Product details

**Table 25.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-FRZ-01-US
Europe	IOTAV-L-FRZ-01-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-FRZ-01-AU
India	IOTAV-L-FRZ-01-IN

**Table 26.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-40 to 55°C (-40 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP65
Dimensions (L x W x H)	112 x 65 x 28 mm (4.4 x 2.5 x 1.1 inches)
Weight	141 g (0.31 lbs)

**Table 27.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 28.** Measurements

Specification	Description
Temperature Measurement Range	-40 to 55°C (-40 to 131 °F)
Temperature Accuracy	+/- 0.5°C@ 25 °C
Humidity Measurement Range	0% RH to 100% RH
Humidity Accuracy	+/- 3% RH @ 25 °C
Battery Voltage Accuracy	+/- 0.1V

**Table 29.** Battery

Specification	Description
Battery Type	2x 3.6V ER14505 AA in parallel
Operating Voltage	3.1V to 3.65V
Battery Life	5 years (25C, 15-minute reports, TxPower=20dBm, SF10)

**Table 30.** Reporting metrics

Monitoring	Default Reporting Interval	Expected Battery Life*
Temperature, Humidity, Battery	15 mins	5 years

\* Default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 31.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
UL/CSA 60950-1/62368-1	North America
EN 60950-1/62368-1	EU
CB to IEC 60950-1	Worldwide
CB to IEC 62368-1	Worldwide
IEC 60529 (IP65)	Worldwide
IEC 60950-22	Worldwide



Specification	Applicable regions
<b>EMC Immunity</b>	
EN 301489-1	EU
EN 301489-3	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN 300220-1	EU
EN 300220-2	EU
CE RED	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

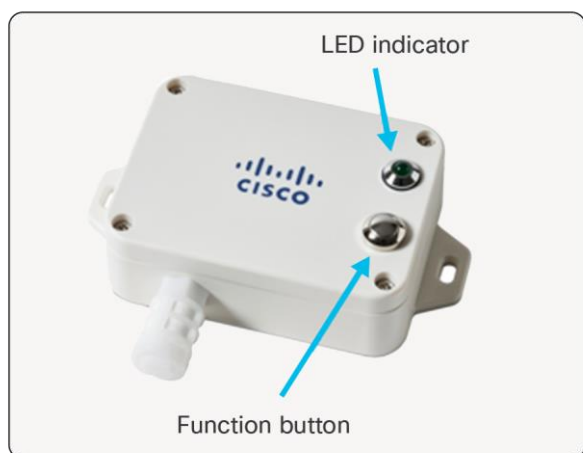
## Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

## Turning AV203 On/Off



**Figure 12.**  
Turning AV203 On/Off

- Press and hold the Function button for 3-5 seconds until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for a few seconds:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.

- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

### Mounting Accessories and Methods AV203



**Figure 13.**  
Mounting Accessories and Methods AV203

- Magnetic mount to ferromagnetic surfaces.
- Screws for attaching to walls and other flat surfaces.
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock.
- Double-sided tape (not included).

## 5. AV204: Door and Window Sensor

### Solution overview

The AV204 is a LoRaWAN sensor that detects door and window open/close status. It is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 14.**  
AV204 Door and Window Sensor

### Key benefits

- Monitoring of doors, windows, and other items which incorporate an open/close mechanism

## Product details

**Table 32.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-HAL-I1-US
Europe	IOTAV-L-HAL-I1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-HAL-I1-AU
India	IOTAV-L-HAL-I1-IN

**Table 33.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55°C (-4 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP65
Dimensions (L x W x H)	112mm x 65mm x 32mm (4.4 x 2.55 x 1.25 inches)
Hall Sensor Dimensions	42mm x 13mm x 12mm (1.65 x 0.51 x 0.47 inches)
Weight	141 g (0.31 lbs)
Probe Lead Length	1m
Sensing distance	Less than 3cm

**Table 34.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 35.** Measurements

Specification	Description
Battery Voltage Accuracy	+/- 0.1V

**Table 36.** Battery

Specification	Description
Battery Type	2x 3.6V ER14505 AA in parallel
Operating Voltage	3.1V to 3.65V
Battery Life	5 years (25C, 15-minute reports, TxPower=20dBm, SF10)

**Table 37.** Reporting metrics

Monitoring	Report on State Change?	Default Reporting Interval	Expected Battery Life*
Open/close, Battery	Yes	60 mins	5 years (~100 triggers/day)

\* Default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 38.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
UL/CSA 60950-1/62368-1	North America
EN 60950-1/62368-1	EU
CB to IEC 60950-1	Worldwide
CB to IEC 62368-1	Worldwide
IEC 60529 (IP65)	Worldwide
IEC 60950-22	Worldwide
<b>EMC Immunity</b>	
EN 301489-1	EU
EN 301489-3	EU

Specification	Applicable regions
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN 300220-1	EU
EN 300220-2	EU
CE RED	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

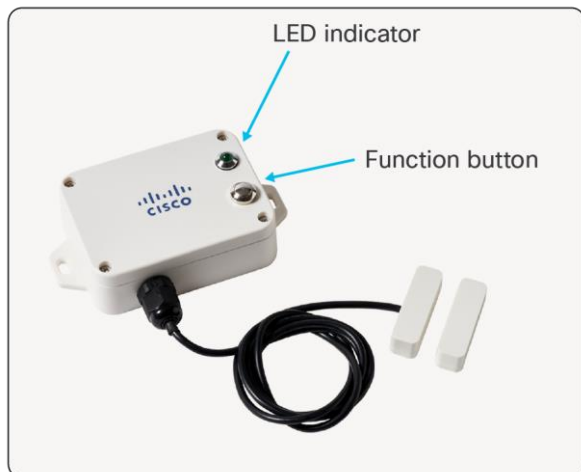
### Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

## Turning AV204 On/Off



**Figure 15.**  
Turning AV204 On/Off

- Press and hold the Function button for 3-5 seconds until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for a few seconds:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.
- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

## Mounting Accessories and Methods AV204



**Figure 16.**  
Mounting Accessories and Methods AV204

- Magnetic mount to ferromagnetic surfaces.
- Screws for attaching to walls and other flat surfaces.
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock.
- Double-sided tape for base unit (not included).
- Double-sided tape on the external probes.
  - Be sure to clean/dry the mounting surface prior to mounting.

## 6. AV205: Water Leak Sensor

### Solution overview

The AV205 is a LoRaWAN sensor which can be used to detect water leaks. It is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 17.**  
AV205 Water Leak Sensor



## Product details

**Table 39.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-WLK-O1-US
Europe	IOTAV-L-WLK-O1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-WLK-O1-AU
India	IOTAV-L-WLK-O1-IN

**Table 40.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55°C (-4 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP67
Dimensions (L x W x H)	112mm x 65mm x 32mm (4.4 x 2.55 x 1.25 inches)
Water Sensor Dimensions	38.5mm x 11.9mm x 13.7mm (1.51 x 0.46 x 0.53 inches)
Weight	141 g (0.31 lbs)
Probe Lead Length	1m
Probe Temperature	Up to 50 °C

**Table 41.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 42.** Measurements

Specification	Description
Battery Voltage Accuracy	+/- 0.1V

**Table 43.** Battery

Specification	Description
Battery Type	2x 3.6V ER14505 AA in parallel
Operating Voltage	3.1V to 3.65V
Battery Life	5 years (25C, 15-minute reports, TxPower=20dBm, SF10)

**Table 44.** Reporting metrics

Monitoring	Report on State Change?	Default Reporting Interval	Expected Battery Life*
Leak, Battery	Yes	60 mins	5 years

\* Default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 45.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
UL/CSA 60950-1/62368-1	North America
EN 60950-1/62368-1	EU
CB to IEC 60950-1	Worldwide
CB to IEC 62368-1	Worldwide
IEC 60529 (IP67)	Worldwide
IEC 60950-22	Worldwide
<b>EMC immunity</b>	
EN 301489-1	EU
EN 301489-3	EU

Specification	Applicable regions
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN 300220-1	EU
EN 300220-2	EU
CE RED	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

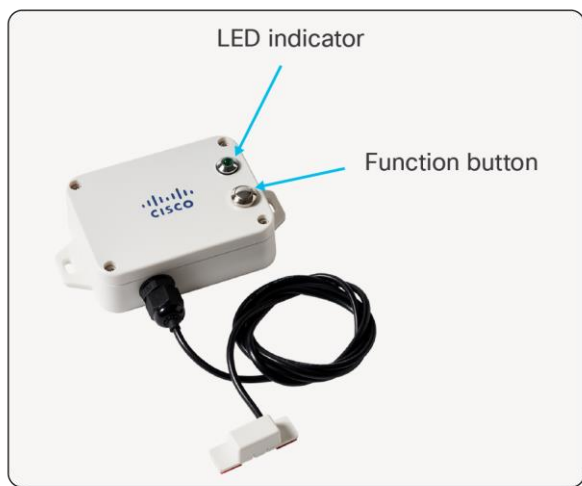
### Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

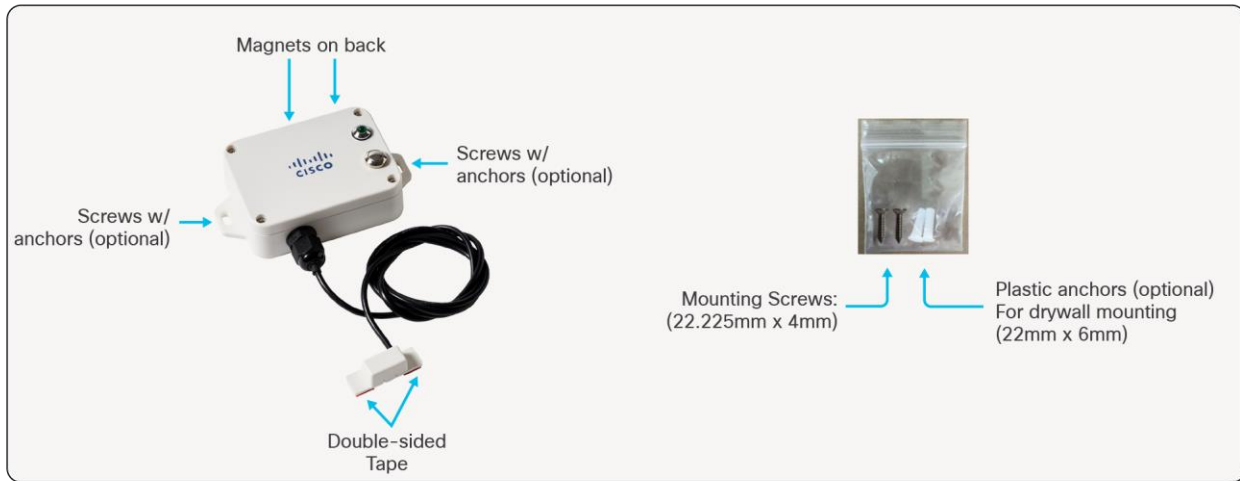
## Turning AV205 On/Off



**Figure 18.**  
Turning AV205 On/Off

- Press and hold the Function button for 3-5 seconds until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for a few seconds:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.
- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

## Mounting Accessories and Methods AV205



**Figure 19.**  
Mounting Accessories and Methods AV205

- Magnetic mount to ferromagnetic surfaces
- Screws for attaching to walls and other flat surfaces
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock.
- Double-sided tape for base unit (not included)
- Double-sided tape on the external probe
  - Be sure to clean/dry the mounting surface prior to mounting.

## 7. AV206: Light Level Sensor

### Solution overview

The AV206 is a LoRaWAN sensor which detects ambient light intensity. It is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 20.**  
AV206 Light Level Sensor

## Product details

**Table 46.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-LUX-I1-US
Europe	IOTAV-L-LUX-I1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-LUX-I1-AU
India	IOTAV-L-LUX-I1-IN

**Table 47.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55°C (-4 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP65
Dimensions (L x W x H)	112mm x 65mm x 32mm (4.4 x 2.55 x 1.25 inches)
Weight	141 g (0.31 lbs)

**Table 48.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 49.** Measurements

Specification	Description
<b>Illuminance Measurement Range</b>	0.01 Lux to 157K Lux
<b>Illuminance Accuracy</b>	+/- 10%; Test Condition: white LED light, 6500K, room temperature
<b>Battery Voltage Accuracy</b>	+/- 0.1V

**Table 50.** Battery

Specification	Description
<b>Battery Type</b>	2x 3.6V ER14505 AA in parallel
<b>Operating Voltage</b>	3.1V to 3.65V
<b>Battery Life</b>	5 years (25C, 15-minute reports, TxPower=20dBm, SF10)

**Table 51.** Reporting metrics

Monitoring	Default Reporting Interval	Expected Battery Life*
<b>Illuminance, Battery</b>	15 mins	5 years

\* Default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 52.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
<b>UL/CSA 60950-1/62368-1</b>	North America
<b>EN 60950-1/62368-1</b>	EU
<b>CB to IEC 60950-1</b>	Worldwide
<b>CB to IEC 62368-1</b>	Worldwide
<b>IEC 60529 (IP65)</b>	Worldwide
<b>IEC 60950-22</b>	Worldwide

Specification	Applicable regions
<b>EMC immunity</b>	
EN 301489-1	EU
EN 301489-3	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN 300220-1	EU
EN 300220-2	EU
CE RED	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings



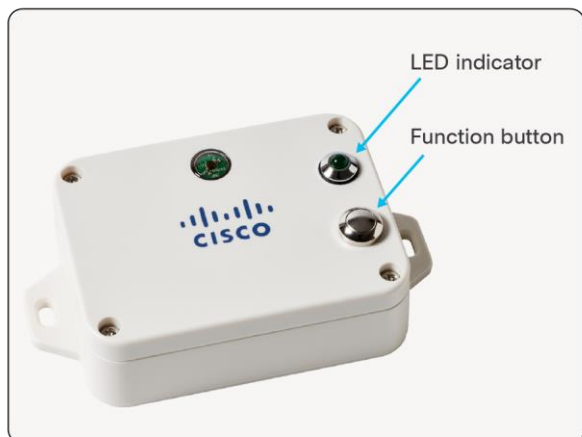
## Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

## Turning AV206 On/Off

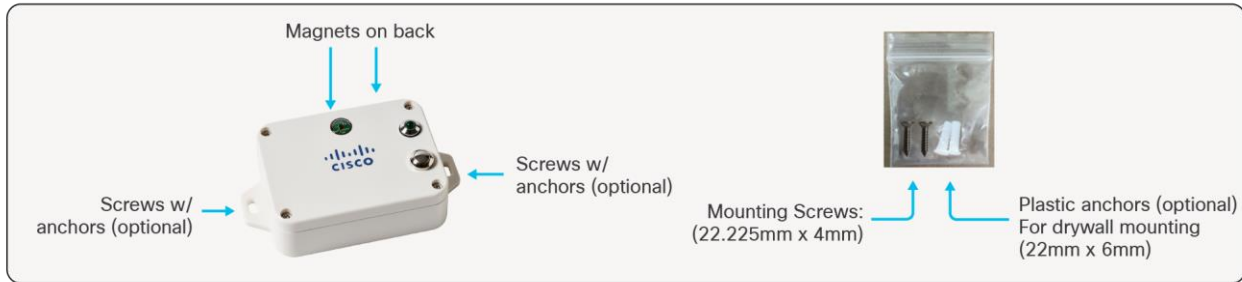


**Figure 21.**  
Turning AV206 On/Off

- Press and hold the Function button for 3-5 seconds until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for a few seconds:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.

- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

### Mounting Accessories and Methods AV206



**Figure 22.**  
Mounting Accessories and Methods AV206

- Magnetic mount to ferromagnetic surfaces
- Screws for attaching to walls and other flat surfaces
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock.
- Double-sided tape (not included)

## 8. AV207: Indoor Occupancy Sensor

### Solution overview

The AV207 is a LoRaWAN indoor occupancy sensor. The AV207 senses the movement of people, animals, or other objects, and if a person or an object moves in the monitoring area, the sensor detects the infrared signal and reports the status information. The AV207 is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 23.**  
AV207 Indoor Occupancy Sensor

### Key benefits

- Area Access Monitoring
- Detect Ingress/Egress of people, animals, or objects

## Product details

**Table 53.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-OCU-I1-US
Europe	IOTAV-L-OCU-I1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-OCU-I1-AU
India	IOTAV-L-OCU-I1-IN

**Table 54.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55°C (-4 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP30
Dimensions (L x W x H)	78mm x 78.8mm x 82.2mm (3.07 x 3.10 x 3.23 inches)
Weight	128.8 g (0.28 lbs)

**Table 55.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 56.** Measurements

Specification	Description
Sensing distance	2 meters to 12 meters
Mounting Height	2 to 2.2 meters above ground level
Mounting Angle	Tilt 15° downward
Sensing Angle	Horizontal 110°, Vertical 60°
Temperature Measurement Range	-20 to 55°C (-4 to 131 °F)
Moving speed to trigger	>= 0.2 m/s
Temperature Accuracy	+/- 2°C@ 25 °C
Illuminance Measurement Range	3 Lux to 1100 Lux
Illuminance Accuracy	+/- 15%
Battery Voltage Accuracy	+/- 0.1V

**Table 57.** Battery

Specification	Description
Battery Type	2x 3.6V ER14505 AA in parallel
Operating Voltage	3.1V to 3.65V
Battery Life	2.5 years (25C, 100 triggers/day, TxPower=20dBm, SF10)

**Table 58.** Reporting metrics

Monitoring	Report on State Change?	Default Reporting Interval	Expected Battery Life*
Motion, Temperature, Illuminance, Battery	Yes	60 mins	2.5 years (~100 triggers/day)

\* 25C environment, spreading factor=10, max Tx power of sensor

**Table 59.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
<b>UL/CSA 60950-1/62368-1</b>	North America
<b>EN 60950-1/62368-1</b>	EU
<b>CB to IEC 60950-1</b>	Worldwide
<b>CB to IEC 62368-1</b>	Worldwide
<b>IEC 60529 (IP30)</b>	Worldwide
<b>IEC 60950-22</b>	Worldwide
<b>EMC immunity</b>	
<b>EN 301489-1</b>	EU
<b>EN 301489-3</b>	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
<b>EN 300220-1</b>	EU
<b>EN 300220-2</b>	EU
<b>CE RED</b>	EU
<b>US 902-928 (USA, Canada)</b>	
<b>FCC 47CFR Part 15 B and C</b>	USA
<b>RSS210</b>	Canada
<b>IC ICES-003</b>	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
<b>RCM approval AS/NZS4268</b>	Australia, New Zealand
<b>Anatel certification<sup>1</sup></b>	Brazil
<b>Enacom certification</b>	Argentina

Specification	Applicable regions
<b>IN865 (India)</b>	
<b>WPC certification</b>	India
<b>Other</b>	
<b>RoHS</b>	EU
<b>FCC Part 2</b>	USA
<b>RSS 102</b>	Canada

<sup>1</sup> Brazil – Anatel Regulatory Warnings

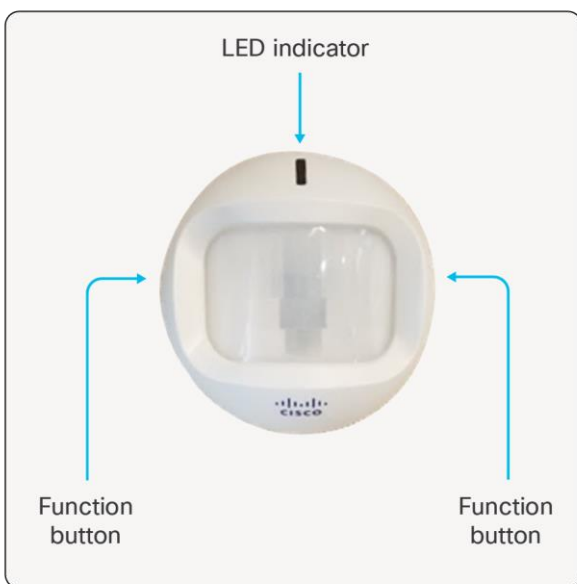
### Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

### EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

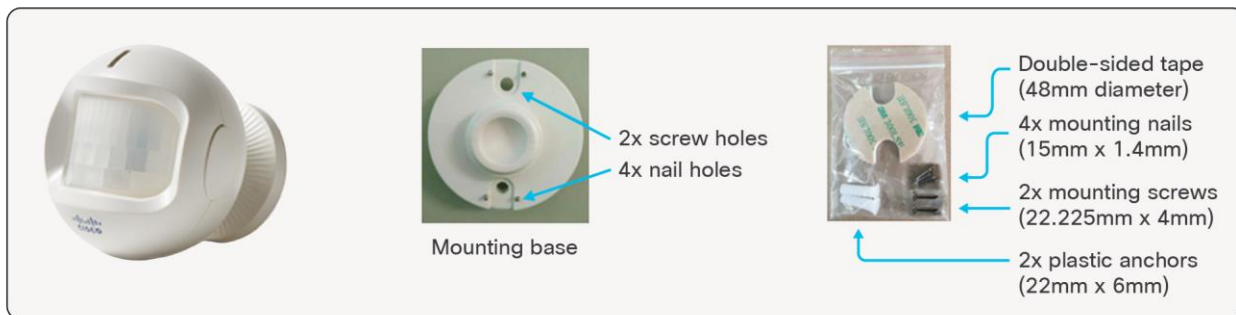
### Turning AV207 On/Off



**Figure 24.**  
Turning AV207 On/Off

- Turn on: Press and hold either function button until indicator flashes green and red.
  - Sensor attempts to register with the network server.
  - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
- Turn off: Press and hold both function buttons until indicator flashes green 20 times.
- Allow about 10 seconds after turning off before turning on.
- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of either function button.
  - LED will flash green to indicate that message has been triggered.

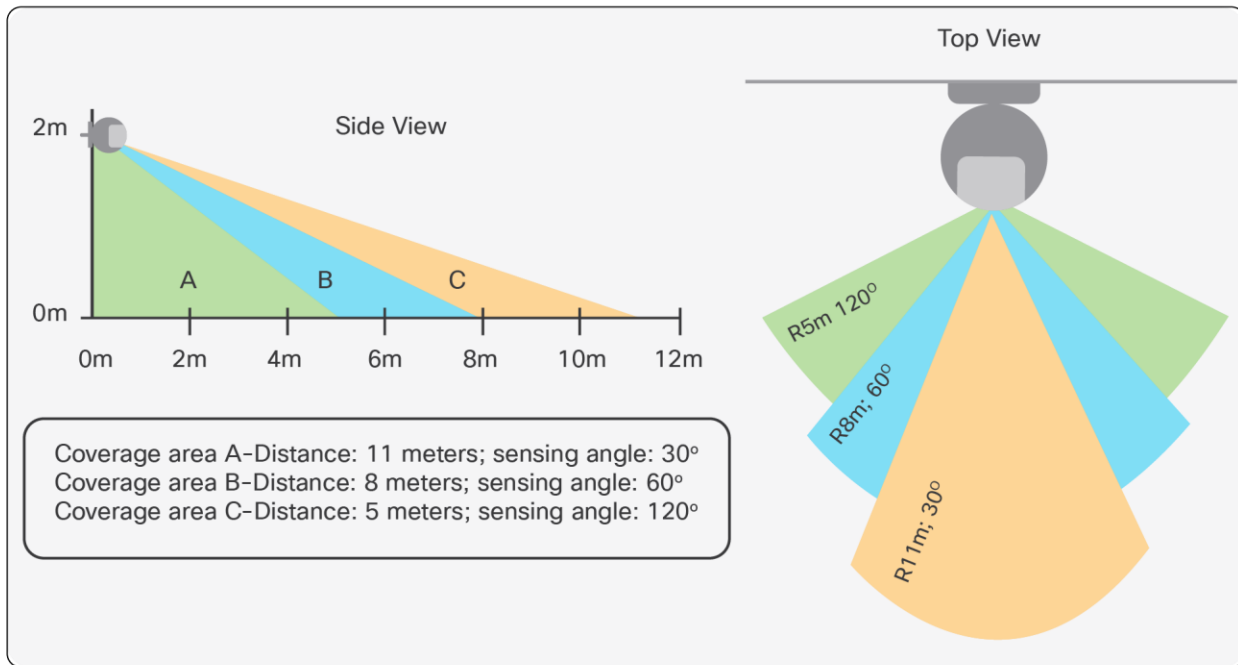
### Mounting Accessories and Methods AV207



**Figure 25.**  
Mounting Accessories and Methods AV207

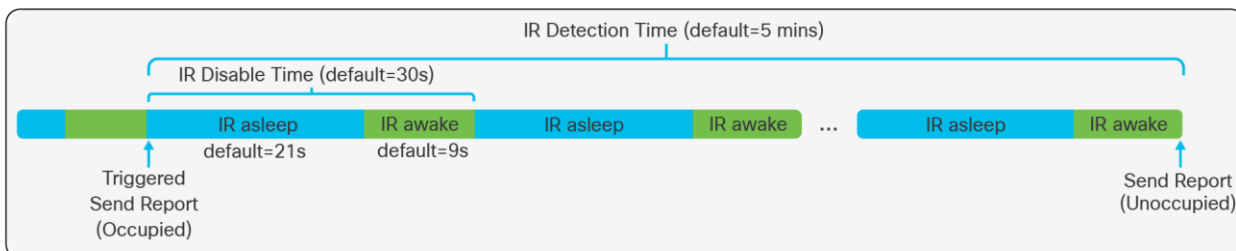
- Screws for attaching to walls and other flat surfaces
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock
- Nails for attaching to walls and other flat surfaces
- Double-sided tape
  - Be sure to clean/dry the surface before application

## AV207 Motion Detection Range



**Figure 26.**  
AV207 Motion Detection Range

## AV207 Disable/Detection Time



**Figure 27.**  
AV207 Disable/Detection Time

- To conserve battery, IR detection is not running constantly.
- IR detection is done within a window called IR Disable Time.
- IR sensor is asleep during first 70% of IR Disable Time window. Sensor is awake for the last 30%.
- Once sensor is triggered, sensor continues to evaluate for occupancy according to IR Disable Time window.
- If motion is detected during the awake window, sensor proceeds to the next IR asleep window and IR Detection Time counter is reset.
- Once motion has been undetected for the IR Detection Time window, a data report indicating “not occupied” is sent.



## 9. AV250: Machine Temperature Sensor

### Solution overview

The AV250 is a LoRaWAN sensor which can be used to detect temperature of an environment or to a medium to which its thermocouple is connected. It is intended for use with Cisco Industrial Asset Vision.

### Product image



**Figure 28.**  
AV250 Machine Temperature Sensor

### Key benefits

- Temperature measuring Equipment
- Measuring temperature in manufacturing ovens and industrial control equipment

### Product details

**Table 60.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-MTM-O1-US
Europe	IOTAV-L-MTM-O1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-MTM-O1-AU
India	IOTAV-L-MTM-O1-IN

**Table 61.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 55°C (-4 to 131 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Operating Humidity	<90% RH (No Condensation)
IP Rating	IP67
Base Unit Dimensions (L x W x H)	112mm x 88.19mm x 32mm (4.4 x 3.47 x 1.25 inches)
Weight	141 g (0.31 lbs)
Probe Type	Type T thermocouple
Probe Dimensions	5mm (diameter); 30mm long (rounded)
Probe Lead Length	1m

**Table 62.** Radio

Specification	Description
Frequency Band	800 MHz / 900 MHz ISM Band
Transmit power (conducted)	US915: 20 dBm EU868: 16 dBm AU915: 20 dBm IN865: 20 dBm
Rx Sensitivity	-136dBm (SF12)
Range	Up to 10km (dependent on environment)

**Table 63.** Measurements

Specification	Description
<b>External PT1000 probe temperature range</b>	-40 to 125° C (-4 to 257 °F)
<b>Temperature Accuracy</b>	(Assume base unit is @ 0° C ≤ t ≤ 55° C) Probe @ 0C ≤ t ≤ 55° C: +/- 0.5° C Probe @ -40° C ≤ t < 0° C: +/- 3° C Probe @ 55° C < t ≤ 125° C: +/- 1.5° C
<b>Battery Voltage Accuracy</b>	+/- 0.1V

**Table 64.** Battery

Specification	Description
<b>Battery Type</b>	2x 3.6V ER14505 AA in parallel
<b>Operating Voltage</b>	3.1V to 3.65V
<b>Battery Life</b>	4.8 years (25C, 15-minute reports, TxPower=20dBm, SF10)

**Table 65.** Reporting metrics

Monitoring	Default Reporting Interval	Expected Battery Life*
<b>Temperature, Battery</b>	15 mins	4.8 years

\* Default reporting interval, 25C environment, spreading factor=10, max Tx power of sensor.

**Table 66.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
<b>UL/CSA 60950-1/62368-1</b>	North America
<b>EN 60950-1/62368-1</b>	EU
<b>CB to IEC 60950-1</b>	Worldwide
<b>CB to IEC 62368-1</b>	Worldwide
<b>IEC 60529 (IP67)</b>	Worldwide
<b>IEC 60950-22</b>	Worldwide

Specification	Applicable regions
<b>EMC immunity</b>	
EN 301489-1	EU
EN 301489-3	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN 300220-1	EU
EN 300220-2	EU
CE RED	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

## Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

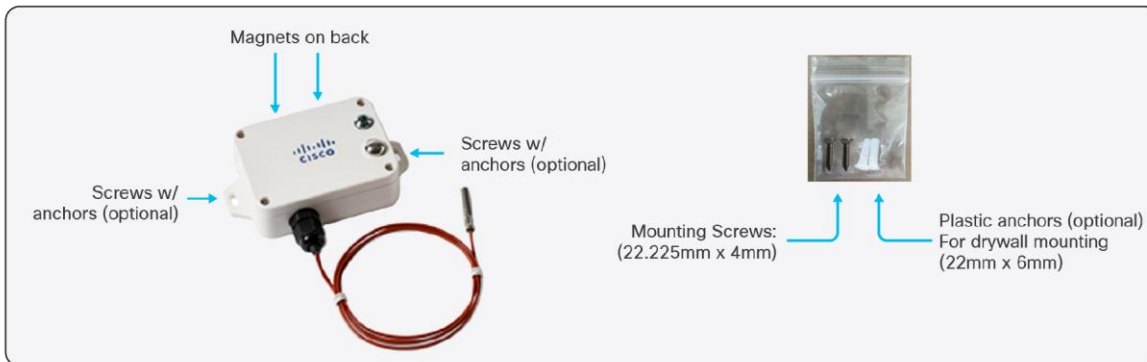
## Turning AV250 On/Off



**Figure 29.**  
Turning AV250 On/Off

- Press and hold the Function button for 3-5 seconds until...
  - LED blinks 20 times:
    - Sensor has been turned off.
  - LED illuminates solid for a few seconds:
    - Sensor has been turned on.
    - Sensor attempts to register with the network server.
    - Another blink of the LED indicates that sensor has joined properly (usually happens within 30 seconds).
  - Allow about 10 seconds after turning off before turning on.
- Once sensor has joined:
  - Manual uplink message can be initiated with a short press of the Function button.
  - LED will flash to indicate that message has been triggered.

## Mounting Accessories and Methods AV250



**Figure 30.**  
Mounting Accessories and Methods AV250

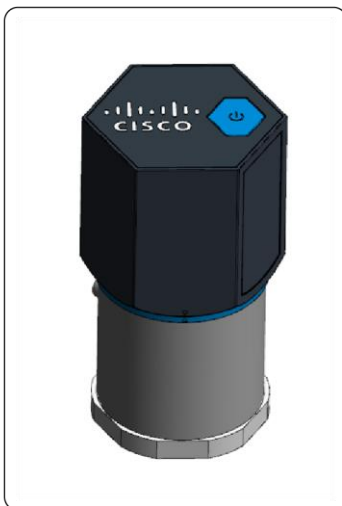
- Magnetic mount to ferromagnetic surfaces
- Screws for attaching to walls and other flat surfaces
  - Package also includes plastic anchors for installation into material such as drywall/sheetrock.
- Double-sided tape (not included)

## 10. AV251: Vibration Monitoring Sensor

### Solution Overview

The AV251 is a LoRaWAN vibration sensor capable of reporting Velocity RMS, Acceleration RMS, Peak, Displacement, Kurtosis, Crest factor, Skewness, and Standard Deviation values. The AV251 is intended for use with Cisco Industrial Asset Vision and is ideal for applications such as pumps, HVAC systems, motors, facility monitoring, and more.

### Product Image



**Figure 31.**  
AV251 LoRaWAN Wireless Vibration Sensor

## Key Benefits

- LoRaWAN wireless connectivity
- Built-in 3-axis accelerometer and temperature sensor
- On-board computing to provide Velocity RMS, Acceleration RMS, Acceleration Peak, Displacement, Kurtosis, Crest factor, Skewness, and Standard Deviation.
- Battery-powered, no wiring needed
- ISO 10816-3 compliant
- Supports wide temperature range of -20 to +70 °C
- IP66 enclosure design

## Product Details

**Table 67.** Sensor Cisco Part Numbers

Geography	Cisco PID
US, Canada	AV251-VIB-US
Europe	AV251-VIB-EU
Australia, New Zealand, Brazil, Argentina, Chile	AV251-VIB-AU

**Table 68.** Mounting Options Cisco Part Numbers

Item	Cisco PID
Magnetic base	AV251-MGTB=
Non-magnetic, Metal base	AV251-MB= (epoxy/adhesive not included)

**Table 69.** Environmental/Physical Specifications

Specification	Description
Operating Temperature	-20 to +70 °C (-4 to +158 °F)
Storage Temperature	-25 to +90 °C (-13 to +194 °F)
Operating Humidity	10% to 95% RH
Storage Humidity	10% to 95% RH
IP Rating	IP66
Dimensions (H x D)	84.7 x 48.3 mm (3.3 x 1.9 inches)

Specification	Description
<b>Weight</b>	AV251-VIB-xx w/o batteries: 136.4g (4.81 ounces) Stud mount: 1.68g (0.059 ounces) AV251-MGTB=: 43g (1.52 ounces) AV251-MB=: 35g (1.23 ounces)
<b>Mounting</b>	Stud mount (included with base sensor PID) Magnetic base (AV251-MGTB=) Metal base (AV251-MB=) w/ epoxy (not included)

**Table 70.** Radio Specifications

Specification	Description
<b>Frequency Band</b>	AV251-VIB-US: 902-928MHz ISM Band AV251-VIB-EU: 863-870MHz ISM Band AV251-VIB-AU: 915-928MHz ISM Band
<b>Tx Power (conducted)</b>	AV251-VIB-US: 17.5dBm AV251-VIB-EU: 13.4dBm AV251-VIB-AU: 17.5dBm
<b>Antenna gain (internal)</b>	-0.7dBi
<b>Rx Sensitivity</b>	-148dBm
<b>Range</b>	Up to 10km (6.213 miles) (dependent on environment)

**Table 71.** Measurement Specifications

Specification	Description
<b>Measurement Axis</b>	X, Y, Z
<b>Frequency Range</b>	10 - 1000Hz
<b>Amplitude Range</b>	+/- 16g
<b>Output Data Rate</b>	6600Hz
<b>Resolution</b>	16 bit
<b>Accuracy (Fc = 100Hz)</b>	Under 5%
<b>Noise (Ta = 25C, 0g)</b>	+/- 40mg
<b>Nonlinearity</b>	+/- 0.5%
<b>Cross-Axis Sensitivity</b>	+/- 1%



Specification	Description
<b>Sensitivity change due to temperature</b>	+/- 0.02 %/degC
<b>Base Temperature Measurement Range</b>	-20 to +120C
<b>Accuracy (Ta = 27C. direct contact w/ heat source via metal base)</b>	-5C @ +85C base temperature -10C @ +120C base temperature

**Table 72.** Battery Specifications

Specification	Description
<b>Battery Type</b>	3.6V ER14505 AA, Qty=2 (in parallel) Supplied with sensor
<b>Battery Life</b>	2 years (update interval = 1 per hour)

**Table 73.** Reporting Metrics

Monitoring		Default Reporting Interval	Expected Battery Life*
<b>Per axis (X, Y, and Z)</b>	<b>Velocity RMS</b>	60 mins	2 years
	<b>Acceleration RMS</b>		
	<b>Acceleration Peak</b>		
	<b>Displacement</b>		
	<b>Kurtosis</b>		
	<b>Skewness</b>		
	<b>Standard Deviation</b>		
	<b>Crest Factor</b>		
<b>Temperature</b>			
<b>Battery</b>			

\* Default reporting interval, 50C environment, spreading factor=7, max Tx power of sensor.

**Table 74.** Product Certification and Compliance

Specification	Applicable regions
<b>Safety</b>	
UL 61010-1/CSA 22.2 No. 61010-1	North America
EN/IEC 62368-1 Ed 3	Worldwide
IEC 60529 (IP66)	Worldwide
<b>EMC Immunity</b>	
EN 301489-1/-3	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
EN 300220-1/-2	EU
CE	EU
<b>US 902-928 (USA, Canada)</b>	
FCC 47 CFR Part 15 Subpart B	USA
FCC 47 CFR Part 15 Subpart C	USA
FCC 47 CFR 15.247	USA
RSS247	Canada
ICES-003	Canada
<b>AU 915-928 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>Other</b>	
EN62311, RoHS	EU
FCC 47 CFR Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

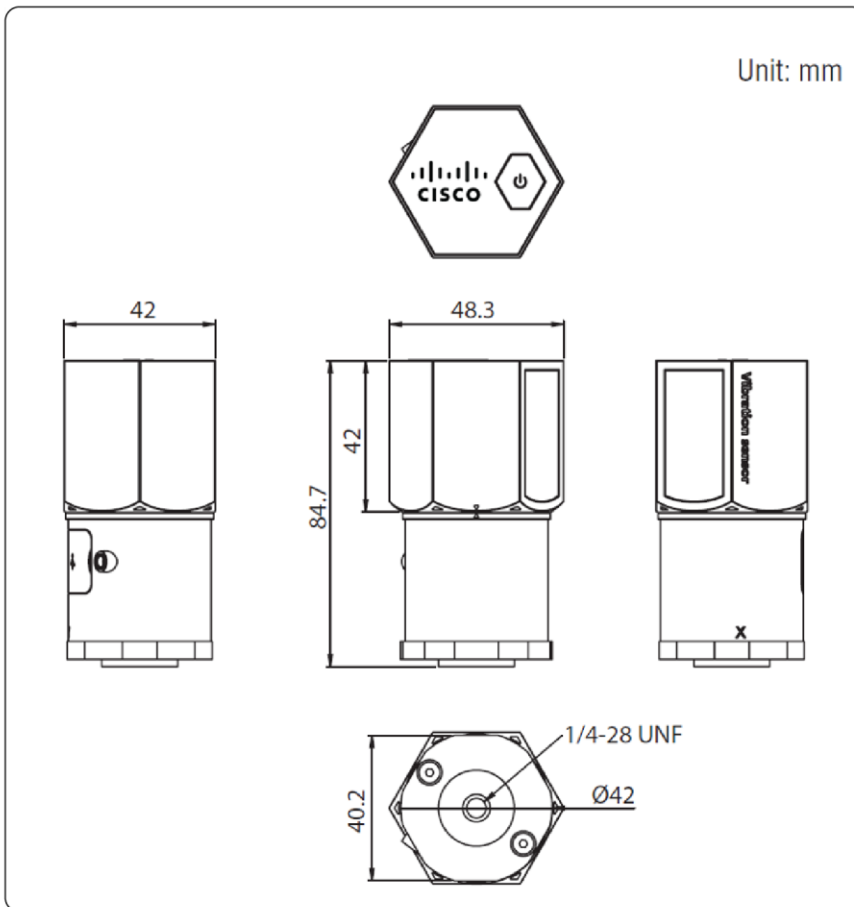
## Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

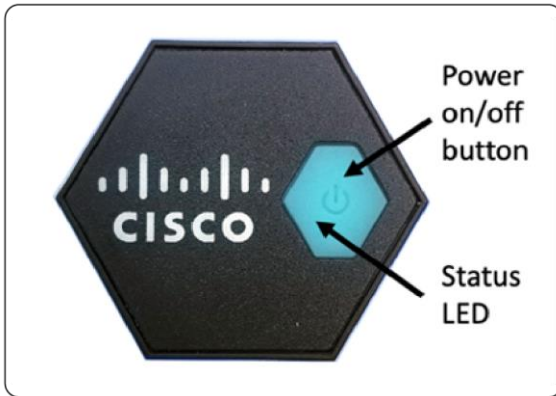
## EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

## Dimensions



## Turning AV251 On/Off



To turn the sensor on, press firmly in the center of the power button and release. If the LED blinks for 10 seconds, this means it has entered a waiting state and will not attempt to join the network for 5 minutes. This waiting state can be avoided by turning off (press/release the power button) the sensor for 20 seconds and then turning the sensor back on.

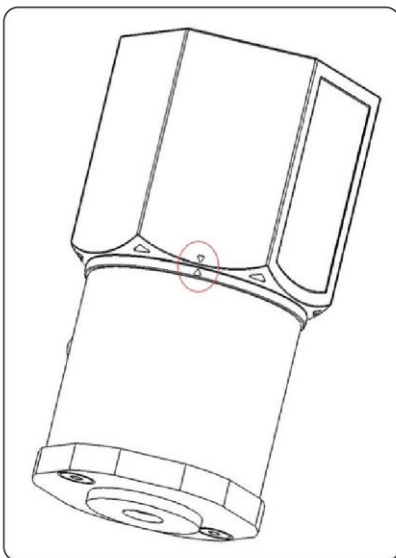
Otherwise, the LED should illuminate for 3 seconds. During this time, the sensor will attempt to register with the Industrial Asset Vision cloud service. When this has succeeded, the LED will again illuminate for 3 seconds. If the sensor is unable to register, the LED will quickly blink for about 10 seconds (this will only happen if multiple attempts over the course of several minutes are unsuccessful). In this case, the sensor should be turned off, the connectivity issue should be resolved, and then the sensor should be turned on, again.

Assuming the batteries are installed and are at a suitable level, if the LED never illuminates or blinks, it means the sensor was already on and now has been turned off.

## Mounting Accessories and Methods AV251

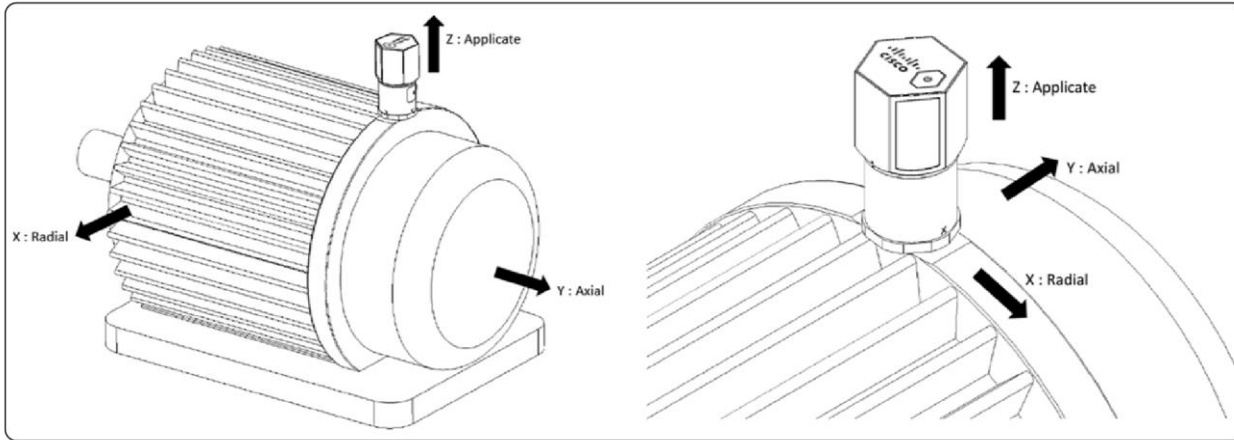
### Tighten Chassis

Turn the top chassis clockwise to the locking point to create a tight connection with the bottom chassis.



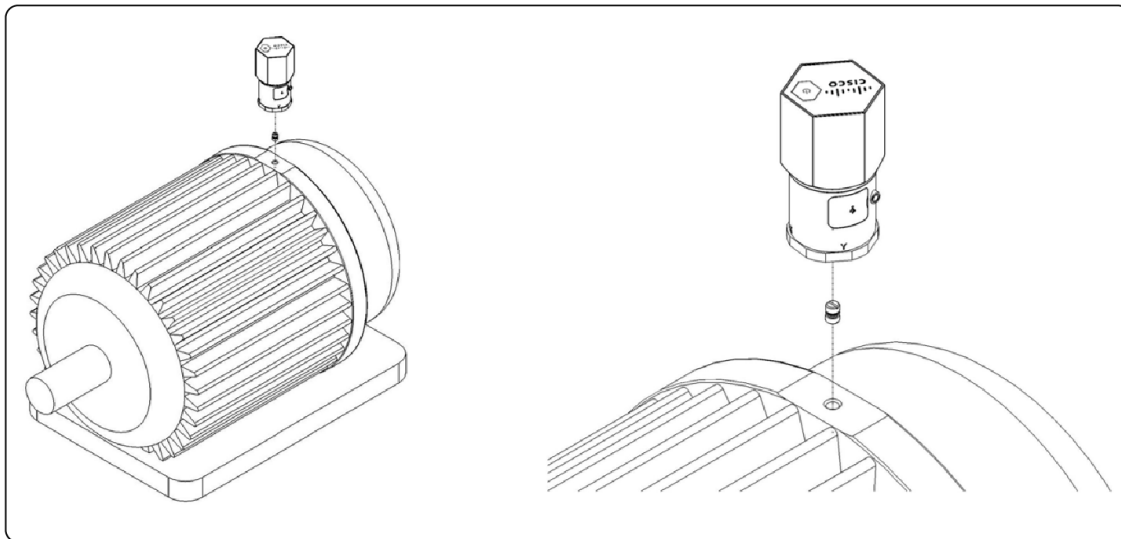
## Installation Direction

The AV251 reports vibration on the x, y, and z axis. Mount the sensor with the orientation shown below to ensure proper reporting of eigenvalues.



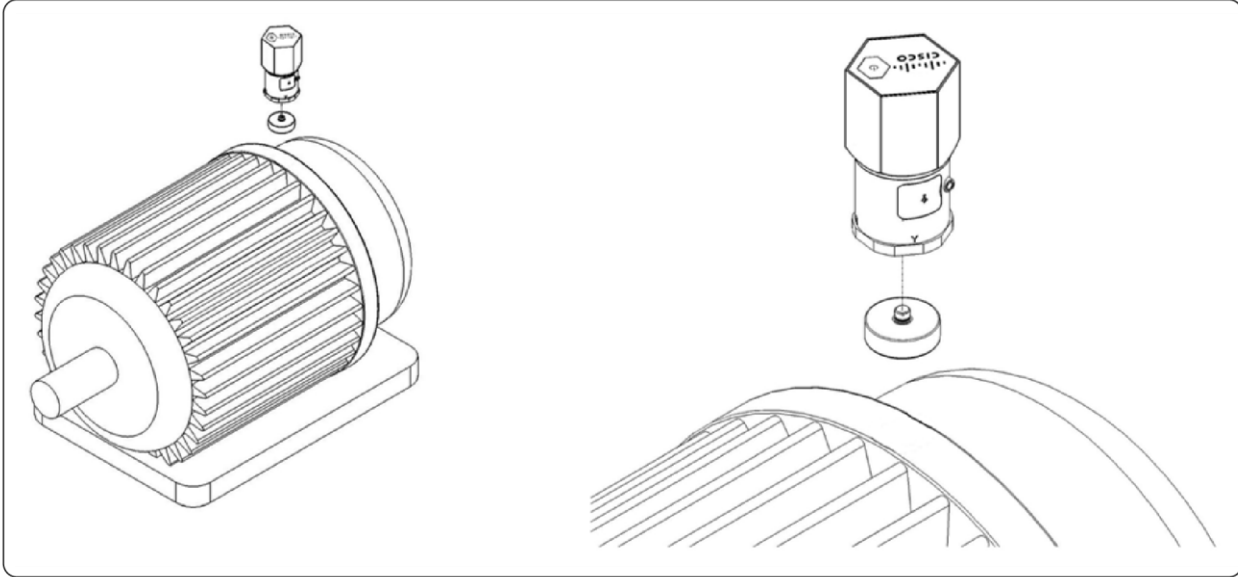
## Stud Mount

1. Drill a hole in the motor surface (1/4" - 28).
2. Fasten the sensor and the stud.
3. Fasten the sensor (with stud attached) to the corresponding hole in the motor surface. When using a wrench to fasten the sensor, make sure to place the head of the wrench around the base of the sensor. Do not place the head of the wrench around the shaft part of the sensor.



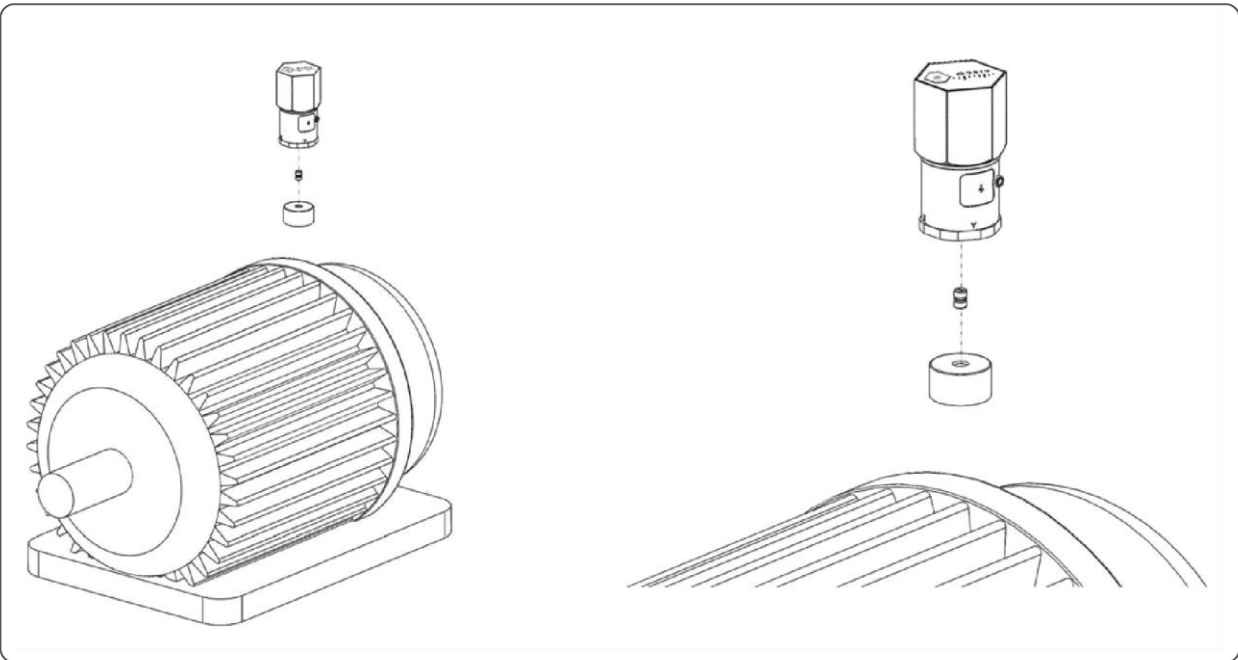
### Magnetic Base Mount

1. Fasten the magnetic base on the motor.
2. Fasten the sensor and the magnetic base.



### Metal Base Mount

1. Fasten sensor to metal base using mounting stud.
2. Use epoxy glue adhesive (24-hour drying variety) to attach the metal base to the motor.



---

## Replacing batteries

1. Slowly remove the top chassis.



2. Grab the mylar and disconnect the battery holder connector from the connector on the PCB.



3. Take out the battery holder and plug-in new batteries. Make sure both the batteries are in the right anode and cathode positions.



4. Re-insert the battery pack into the sensor enclosure, wrap the wire through the notch in the PCB, and connect the battery pack wire connector to the PCB connector. Make sure the keyed part of the wire connector is aligned with the accompanying notch in the PCB connector.



5. Re-attach the top chassis.

## 11. AV300: Outdoor GPS Sensor

### Solution overview

The AV300 sensor is a LoRaWAN asset tracking sensor which utilizes GPS for determining location. The sensor can be mounted on non-powered assets exposed to rain, dust, and marine conditions, where long battery life is required. The device has built-in antennas for GPS reception and for LoRaWAN communication, a 3D accelerometer, a high-performance GPS that can track both GPS and GLONASS satellites simultaneously, and flash memory for storing non-volatile information. The device also integrates with the dashboard geofence feature for location defined alerting.

### Product image



**Figure 32.**  
AV300 Outdoor GPS Sensor



## Key benefits

- Track assets such as vehicles, containers, trailers, and freight
- Detect unauthorized movement of the assets

## Product details

**Table 75.** Cisco part number

Geography	Cisco PID
US, Canada	IOTAV-L-GPS-L1-US
Europe	IOTAV-L-GPS-L1-EU
Australia, New Zealand, Brazil, Argentina, Chile	IOTAV-L-GPS-L1-AU
India	IOTAV-L-GPS-L1-IN

**Table 76.** Environmental/Physical specifications

Specification	Description
Operating Temperature	-20 to 60°C (-4 to 140 °F)
Storage Temperature	-20 to 60°C (-4 to 140 °F)
IP Rating	IP67
Dimensions (L x W x H)	108 x 86 x 31 mm (4.25 x 3.38 x 1.22 inches)
Weight	188 g (0.41 lbs)
Housing	Ultra-rugged nylon glass

**Table 77.** Radio

Specification	Description
Frequency Range	800 MHz / 900 MHz ISM Band
Range	Up to 15km (dependent on environment)

**Table 78.** Location specifications

Specification	Description
Constellation	Concurrent GPS/GLONASS
Channels	72
Tracking sensitivity	-167 dBm

**Table 79.** Battery

Specification	Description
<b>Battery Type</b>	3x 1.5V AA in series (lithium-ion recommended)
<b>Operating Voltage</b>	4V to 6V
<b>Battery Life</b>	~5 years (1 location acquisition/day, 25C, max SF, and max Tx power)

**Telemetry reporting metrics**

When motion is detected, sensor moves into “in trip” state with a default reporting interval of 15 minutes. When sensor has been stationary for at least 5 minutes, it moves into an “out of trip” state with a default reporting interval of 24 hours.

Data types reported by the sensor include: In trip/out of trip, Latitude/Longitude, Speed, Heading, Battery level.

**Table 80.** Product certification and compliance

Specification	Applicable regions
<b>Safety</b>	
<b>UL/CSA 60950-1/62368-1</b>	North America
<b>EN 60950-1/62368-1</b>	EU
<b>CB to IEC 60950-1</b>	Worldwide
<b>CB to IEC 62368-1</b>	Worldwide
<b>IEC 60529 (IP67)</b>	Worldwide
<b>IEC 60950-22</b>	Worldwide
<b>EMC Immunity</b>	
<b>EN 301489-1</b>	EU
<b>EN 301489-3</b>	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
<b>EN 300220-1</b>	EU
<b>EN 300220-2</b>	EU
<b>CE RED</b>	EU

Specification	Applicable regions
<b>US 902-928 (USA, Canada)</b>	
FCC 47CFR Part 15 B and C	USA
RSS210	Canada
IC ICES-003	Canada
<b>AUS915 (LATAM, AU, NZ)</b>	
RCM approval AS/NZS4268	Australia, New Zealand
Anatel certification <sup>1</sup>	Brazil
Enacom certification	Argentina
<b>IN865 (India)</b>	
WPC certification	India
<b>Other</b>	
RoHS	EU
FCC Part 2	USA
RSS 102	Canada

<sup>1</sup> Brazil - Anatel Regulatory Warnings

### Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

### EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

## Turning AV300 On/Off



**Figure 33.**  
Turning AV300 On/Off

- Turn on: Insert (3) 1.5V AA batteries.
- Turn off: Remove batteries.
- Allow about 10 seconds after turning off before turning on.
- LED indicator:
  - When batteries are inserted: Flash for 1 second.
  - If brownout condition is detected, LED illuminates for 10s. Please insert new batteries.
  - Sensor attempts to join network. LED flashes 2 times per second. Join may fail, in which case, LED turns off for some time and then retries the join process.
  - Sensor attempts to acquire GPS fix (may take up to a few minutes). LED flashes 1 time per second during fix time.
  - Sensor sends GPS fix. LED flashes 2 times.
  - LED off for the duration of operation.

## Mounting Accessories and Methods AV300



**Figure 34.**  
Mounting Accessories and Methods AV300

- Fasten back cover to outer shell using 6x enclosure screws.
- Attach to wall or other flat surface using 2x mounting screws.
- Attach via included zip-tie.
  - Included zip-tie is intended for pole size with diameter up to 85mm.

## 12. AV400: Industrial Sensor Bridge

### Solution Overview

The AV400 Industrial Sensor Bridge enables the user to convert industry-standard analog or digital sensor signals to LoRaWAN.

The AV400 is intended for use with Cisco Industrial Asset Vision (IAV) and provides flexibility to 3rd party sensors outside of the IAV core sensor catalog. The AV400 is ideal for applications such as monitoring tank levels, pressure, flow, current, and more.

### Product Image



**Figure 35.**  
AV400 LoRaWAN Wireless Condition Monitoring Sensor

## Key Benefits

- Long-range wide area IoT application
- Provides connectivity to industry-standard analog or digital sensors
- Rugged, IP66-rated, fiber-reinforced polyester PBT enclosure

## Product Details

**Table 81.** Cisco Part Numbers

Geography	Cisco PID
US, Canada	AV400-BRI-US
Europe	AV400-BRI-EU
Australia, New Zealand, Brazil, Argentina, Chile	AV400-BRI-AU

**Table 82.** Power Specifications

Specification	Description
Internal	Two 3.6V ER14505 AA batteries* * Battery powering is not supported at the current time; Contact Cisco for more details.
External, Wired Power	9 ~ 36 VDC Steady state power consumption (typical): 144mW @ 24V Power consumption during transmission time (typical): 0.6W @ 24V (Condition: 20 degC, spreading factor=10, US915, maximum transmit power)

**Table 83.** Environmental/Physical Specifications

Specification	Description
Operating Temperature	-40 to +75° C (-40 to +167° F)
Storage Temperature	-40 to +85° C (-40 to +185° F)
Operating Humidity	10 ~ 95% non-condensing
Storage Humidity	10 ~ 95% non-condensing
Physical Connection	12.7-mm (1/2") conduit or cable-gland (not included) Two sensor interface cables included; 8-wire, 26 AWG, 1m (39 in)
Mounting	Magnetic mounting via an internal magnet, Holding force = 2.13 kg (4.7 lbs) Four mounting ears, M5 (#10)

Specification	Description
Enclosure	IP66-rated, fiber-reinforced polyester PBT
Weight	400 g (0.88 lbs)

**Table 84.** Radio Specifications

Specification	Description
Frequency Band	AV400-BRI-US: 902-928MHz ISM Band AV400-BRI-EU: 863-870MHz ISM Band AV400-BRI-AU: 915-928MHz ISM Band
Rx Sensitivity	-137dBm
Tx Power (conducted)	AV400-BRI-US: 18.9dBm AV400-BRI-EU: 14.4dBm AV400-BRI-AU: 18.9dBm
External Antenna	RP-SMA, omnidirectional 1.7dBi Length: 170 mm (6.69")
Range	Up to 10km (6.213 miles) (dependent on environment)

**Table 85.** Digital Inputs

Specification	Description
Voltage Range	Dry contact: Logic level 1: 0 ~ 1V; Logic level 0: open Wet contact: Logic level 1: 0 ~ 1 VDC; Logic level 0: 3 ~ 30 VDC <b>Note:</b> Inputs are active low, as reflected above.
Pull-Up Current	32 $\mu$ A
Isolation	None
Channels	2 (DI1 and DI2)

**Table 86.** Analog Inputs

Specification	Description
<b>Input Range</b>	Analog Inputs 1 & 2: 0 – 20mA Analog Inputs 3 & 4: 0 – 10V
<b>Resolution</b>	16 bit
<b>Input Load Resistance</b>	10MΩ (voltage), 120Ω (current)
<b>Accuracy</b>	±0.1% (Voltage) at +25 °C ±0.2% (Current) at +25 °C

**Table 87.** Reporting Metrics

Monitoring	Default Reporting Interval
<b>AI1-4, DI1-2</b>	Measured together every 15 mins
<b>Battery</b>	6 hours

**Table 88.** Product Certification and Compliance

Specification	Applicable regions
<b>Safety</b>	
<b>UL/CSA 62368-1</b>	North America
<b>EN/IEC 62368-1 Ed 3</b>	Worldwide
<b>IEC 60529 (IP66)</b>	Worldwide
<b>EMC Immunity</b>	
<b>EN 301489-1/-3</b>	EU
<b>Radio</b>	
<b>EU 863-870 (EU)</b>	
<b>EN 300220-1/-2</b>	EU
<b>CE</b>	EU
<b>US 902-928 (USA, Canada)</b>	
<b>FCC 47 CFR Part 15 Subpart B</b>	USA
<b>FCC 47 CFR Part 15 Subpart C</b>	USA
<b>FCC 47 CFR 15.247</b>	USA



Specification	Applicable regions
RSS247	Canada
ICES-003	Canada
<b>AU 915-928 (LATAM, AU, NZ)</b>	
<b>RCM approval AS/NZS4268</b>	Australia, New Zealand
<b>Anatel certification<sup>1</sup></b>	Brazil
<b>Enacom certification</b>	Argentina
<b>Other</b>	
<b>EN62311, RoHS</b>	EU
<b>FCC 47 CFR Part 2</b>	USA
<b>RSS 102</b>	Canada

<sup>1</sup>Brazil - Anatel Regulatory Warnings

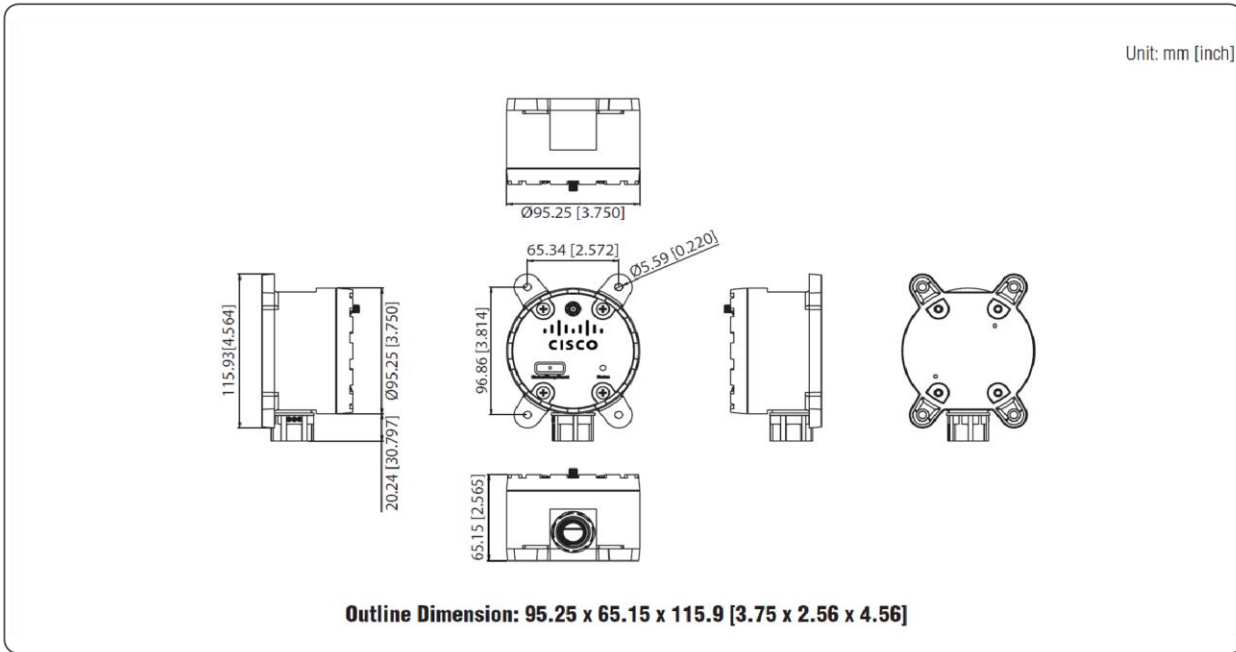
#### Wireless statement

- Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
- This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems.

#### EMC CISPR statement

- Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.
- This product is not suitable for use in a domestic environment as it may cause electromagnetic interference that requires the user to take necessary actions to minimize such interference.

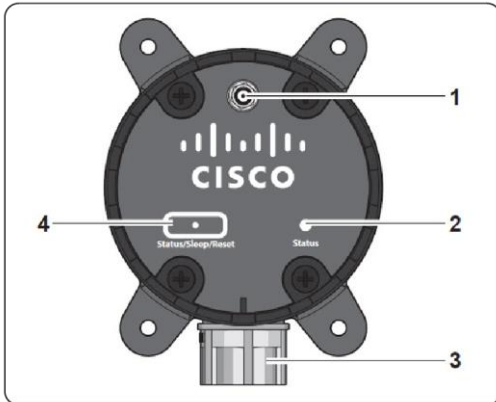
## Dimensions



**Figure 36.**  
AV400 Dimensions

## Device Description

### Overview



**Figure 37.**  
AV400 Overview

1. Antenna connector
2. Status LED
3. Cable conduit
4. Status/Sleep/Reset button

## Turning AV400 On/Off and Button/LED Behavior

To turn on the AV400, apply power to it; conversely, removing power turns it off.

When the device turns on, it will enter a 5-minute waiting period before attempting to register with the IAV cloud service. This is indicated by a fast blinking of the LED. To avoid the 5-minute waiting period, quickly press/release the button. Note that the registration process will be successful only if the device has first been onboarded with the IAV mobile application.

Once the device starts attempting to register, the LED behavior is shown in the following table.

**Table 89.** Startup LED Behavior

LED Behavior	Description
<b>Illuminates solid for 3 seconds (first time)</b>	Registration attempts have started.
<b>Illuminates solid for 3 seconds (second time)</b>	Registration has been successful.
<b>Flashes quickly for 10 seconds</b>	Indicates that repeated registration attempts have been unsuccessful.  This occurs after each failed registration sequence. For the -US and -AU PIDs, a registration sequence is defined as one attempt at a low LoRaWAN spreading factor (suitable for closer range) and one attempt at a higher spreading factor (needed for longer range). For the -EU PID, a registration sequence is defined as one attempt at each spreading factor from SF7 to SF12.  <b>Note:</b> The device will continue trying to register; the LED flashing is just an indication that the device is having problems registering.

Once in normal operation, press/release the button quickly to initiate an immediate sampling of data and associated data report to the cloud. The LED behavior in this scenario is described in the following table.

**Table 90.** Manually triggered report LED Behavior

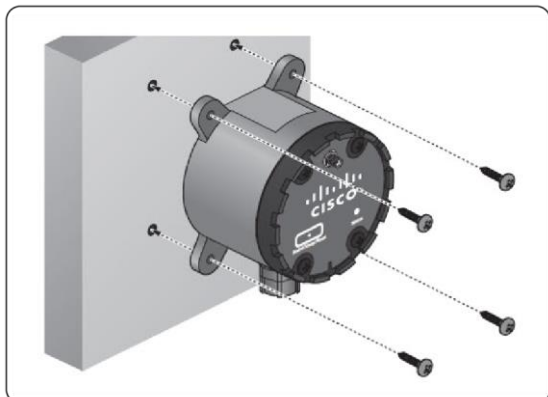
LED Behavior	Description
<b>Single fast blink</b>	Manually triggered data report has been initiated and will be sent within a few seconds.
<b>Several blinks for 10 seconds</b>	<b>Note:</b> This behavior only applies to regions which require duty cycle compliance (the -EU PID of the AV400).  Desire to send a manually triggered data report has been received, but device is not allowed to send it immediately due to regional duty cycle constraints. Message will be sent as soon as possible. Expected time to wait is between ~10 seconds and ~2.5 minutes. In this waiting time, do not continuously press the button.

To reset the unit, press/hold the pushbutton for 5 seconds before releasing. The AV400 will reload back to the initial state of attempting to register with the cloud service.

## Installation/Mounting

### Wall mounting

1. Locate the area to install and mark the four screw locations. If needed, drill pilot holes. If installing in concrete, it is recommended to use wall sinks.
2. Align the device to the holes (or markings) and secure with screws of less than 5mm in diameter.

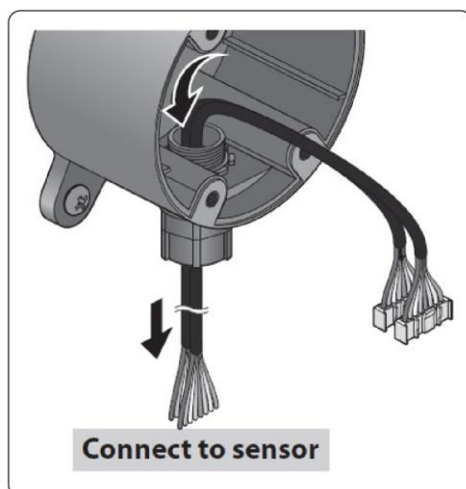


**Figure 38.**  
AV400 Wall mounting

### Routing data cables

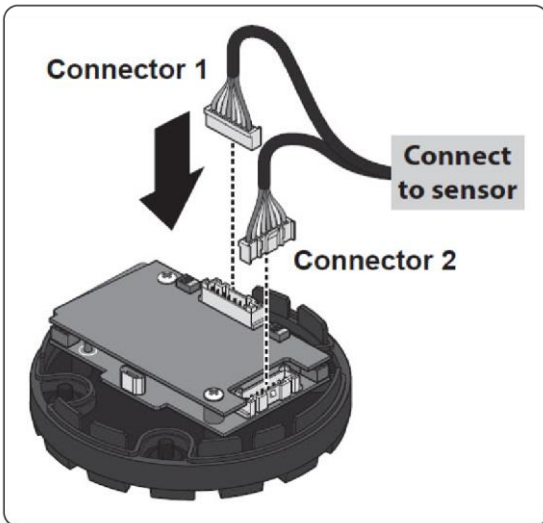
1. Loosen the four front cover screws and remove front cover.
2. Insert the sensor cables through the channel on the device. The two cables are physically and electrically identical. It can be helpful to place a piece of tape (or similar) on the ends of one cable so that you can differentiate between the two cables in later steps.

**Note:** Position the cable connector for each cable so that it can be connected to the circuit board.



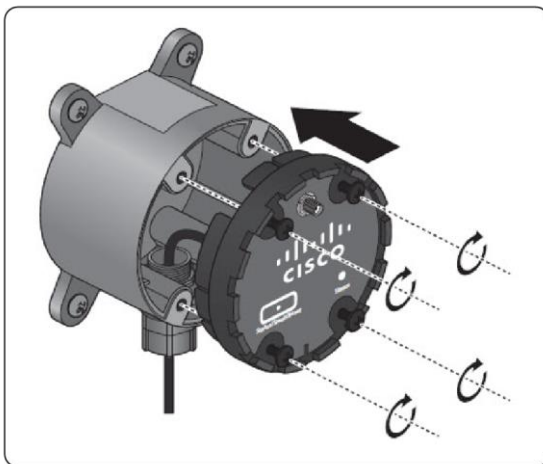
**Figure 39.**  
AV400 Routing data cables

3. Connect the sensor cables to the connectors on the device.



**Figure 40.**  
AV400 Connecting data cables

4. Align the top cover with the base and install while gently pulling the data cable slack. If there is resistance when pulling, do not pull the cable further to avoid damaging the connector.
5. Secure the top cover with the screws.

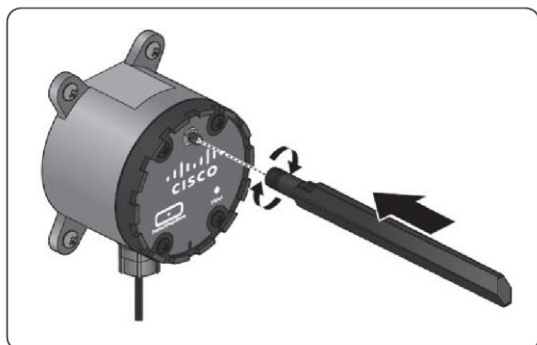


**Figure 41.**  
AV400 Reassemble housing

### Install the antenna

Connect the antenna by rotating the antenna connector in the clockwise direction.

**Note:** Positioning of the antenna is crucial for effective wireless connectivity.



**Figure 42.**  
AV400 Install the antenna

### Wiring Diagram

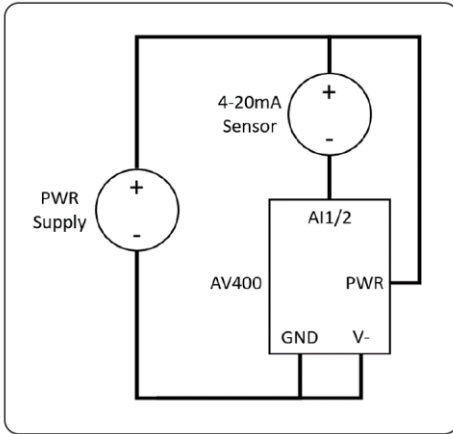
The following table defines each of the breakout cable wires based on wire color.

Wire Color	Connector 1 Cable	Connector 2 Cable
	Definition	Definition
Gray	A11	PWR
White	GND	V-
Blue	A12	DI1
Green	GND	GND
Yellow	A13	DI2
Pink	GND	GND
Red	A14	NC (No Connect)
Brown	GND	GND

**Note:** All signals labeled “GND” and “V-“ are non-isolated (electrically equivalent).

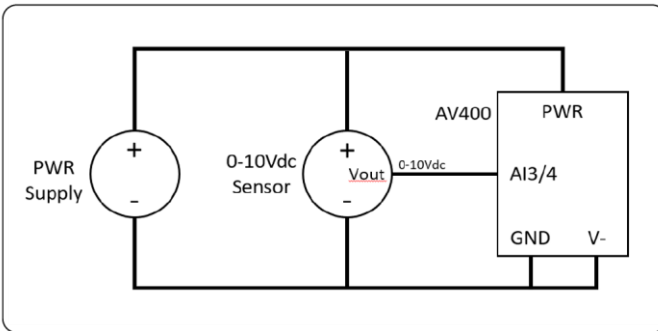
## Wiring examples

### 4-20mA Sensor Wiring Reference Example



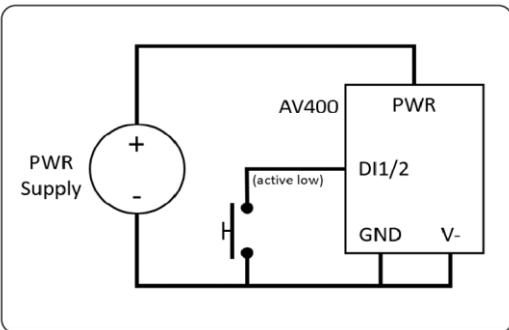
**Figure 43.**  
AV400 4-20mA Sensor Wiring Reference Example

### 0-10V Sensor Wiring Reference Example



**Figure 44.**  
0-10V Sensor Wiring Reference Example

### Digital Input Dry Contact Wiring Reference Example



**Figure 45.**  
AV400 Digital Input Dry Contact Wiring Reference Example

## Ordering information

Cisco Industrial Asset Vision is provided with two components: (1) one-time hardware purchase for sensors and gateways, and (2) SaaS subscription metered on each sensor to be connected in 1-, 3-, or 5-year terms.

A Cisco Industrial Asset Vision subscription is purchased using the IOTAV-BUNDLE-US, IOTAV-BUNDLE-EU, IOTAV-BUNDLE-IN, or IOTAV-BUNDLE-AU Multiline Bundle (MLB), depending on geographic region.

**Table 91.** Ordering multiline bundles

Part number	Description	Geography or region
<b>IOTAV-BUNDLE-US</b>	Industrial Asset Vision bundle	North America (US915)
<b>IOTAV-BUNDLE-EU</b>	Industrial Asset Vision bundle	Europe (EU868)
<b>IOTAV-BUNDLE-AU</b>	Industrial Asset Vision bundle	Australia, New Zealand, Brazil, Argentina, Chile (AU915)
<b>IOTAV-BUNDLE-IN</b>	Industrial Asset Vision bundle	India (IN865)

**Table 92.** Ordering gateway hardware

Part number	Description	Geography or region
<b>IXM-LPWA-900-16-K9</b>	Cisco wireless gateway for LoRaWAN	North America (US915) and Australia, New Zealand, Brazil, Argentina, Chile (AU915)
<b>IXM-LPWA-800-16-K9</b>	Cisco wireless gateway for LoRaWAN	Europe (EU868) and India (IN865)

**Table 93.** Ordering sensor hardware

Part number	Description	Geography or region
<b>IOTAV-L-GPS-L1-US</b>	Cisco Outdoor GPS Sensor	LoRaWAN 900 MHz (US915)
<b>IOTAV-L-GPS-L1-EU</b>		LoRaWAN 800 MHz (EU868)
<b>IOTAV-L-GPS-L1-AU</b>		LoRaWAN 900 MHz (AU915)
<b>IOTAV-L-GPS-L1-IN</b>		LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-ENV-O1-US</b>	Cisco Outdoor Temp/Humidity Sensor	LoRaWAN 900 MHz (US915)
<b>IOTAV-L-ENV-O1-EU</b>		LoRaWAN 800 MHz (EU868)
<b>IOTAV-L-ENV-O1-AU</b>		LoRaWAN 900 MHz (AU915)
<b>IOTAV-L-ENV-O1-IN</b>		LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-ENV-I1-US</b>	Cisco Indoor Temp/Humidity Sensor	LoRaWAN 900 MHz (US915)
<b>IOTAV-L-ENV-I1-EU</b>		LoRaWAN 800 MHz (EU868)
<b>IOTAV-L-ENV-I1-AU</b>		LoRaWAN 900 MHz (AU915)
<b>IOTAV-L-ENV-I1-IN</b>		LoRaWAN 800 MHz (IN865)



Part number	Description	Geography or region
<b>IOTAV-L-PTM-I1-US</b> <b>IOTAV-L-PTM-I1-EU</b> <b>IOTAV-L-PTM-I1-AU</b> <b>IOTAV-L-PTM-I1-IN</b>	Cisco Product Temperature Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915) LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-FRZ-O1-US</b> <b>IOTAV-L-FRZ-O1-EU</b> <b>IOTAV-L-FRZ-O1-AU</b> <b>IOTAV-L-FRZ-O1-IN</b>	Cisco Refrigerator Temp/Humidity Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915) LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-HAL-I1-US</b> <b>IOTAV-L-HAL-I1-EU</b> <b>IOTAV-L-HAL-I1-AU</b> <b>IOTAV-L-HAL-I1-IN</b>	Cisco Door/Window Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915) LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-WLK-O1-US</b> <b>IOTAV-L-WLK-O1-EU</b> <b>IOTAV-L-WLK-O1-AU</b> <b>IOTAV-L-WLK-O1-IN</b>	Cisco Water Leak Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915) LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-LUX-I1-US</b> <b>IOTAV-L-LUX-I1-EU</b> <b>IOTAV-L-LUX-I1-AU</b> <b>IOTAV-L-LUX-I1-IN</b>	Cisco Light Level Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915) LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-MTM-O1-US</b> <b>IOTAV-L-MTM-O1-EU</b> <b>IOTAV-L-MTM-O1-AU</b> <b>IOTAV-L-MTM-O1-IN</b>	Cisco Machine Temperature Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915) LoRaWAN 800 MHz (IN865)
<b>IOTAV-L-OCU-I1-US</b> <b>IOTAV-L-OCU-I1-EU</b> <b>IOTAV-L-OCU-I1-AU</b> <b>IOTAV-L-OCU-I1-IN</b>	Cisco Indoor Occupancy Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915) LoRaWAN 800 MHz (IN865)
<b>AV251-VIB-US</b> <b>AV251-VIB-EU</b> <b>AV251-VIB-AU</b>	Cisco Vibration Monitoring Sensor	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915)
<b>AV400-BRI-US</b> <b>AV400-BRI-EU</b> <b>AV400-BRI-AU</b>	Cisco Industrial Sensor Bridge	LoRaWAN 900 MHz (US915) LoRaWAN 800 MHz (EU868) LoRaWAN 900 MHz (AU915)

## Product sustainability

Information about Cisco’s environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the “Environmental Sustainability Approach” section of Cisco’s Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the “Environmental Sustainability Approach” section of the CSR Report) are provided in the following table.

**Table 94.** Environmental sustainability information

Sustainability topic	Reference
Information on product-material-content laws and regulations	<a href="#">Materials</a>
Information on electronic waste laws and regulations, including products, batteries, and packaging	<a href="#">WEEE Compliance</a>

Reference links to product-specific environmental sustainability information that is mentioned in relevant sections of this data sheet are provided in the following table.

**Table 95.** Product-specific environmental sustainability information

Sustainability topic	Reference
<b>General</b>	
Eco-Design Compliance (EU ErP Lot, Etc.)	Table AA. Product Compliance
Environmental Certifications (EPEAT, Energy Star, Etc.)	Table BB. Product Compliance or Platform Features/Benefits
<b>Power</b>	
Idle, Typical or Max Product Power	Table CC. Product Specifications
Hardware Enabled Energy Features	Table DD. Platform Features/Benefits
Software Enabled Energy Features	Table EE. Platform Features/Benefits
Power Supply Information	Table FF. Product Specifications
Power Calculator	Table GG. Product Specifications
<b>Material</b>	
Unit Weight	Table HH. Product Specifications
System Weight (Product + Packaging)	Table II. Product Specifications
Recycled Content	Table JJ. Product Specifications

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

---

## Cisco Capital

### **Flexible payment solutions to help you achieve your objectives**

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. [Learn more](#).

### Learn more

Drive better, safer and more efficient operations - from anywhere

Learn more about Cisco Industrial Asset Vision at [www.cisco.com/go/iav](http://www.cisco.com/go/iav).

---

## Document history

New or revised topic	Described in	Date
AU and IN SKUs added	Wireless Vibration Monitoring Sensor	October 2021
Vibration Sensor and Sensor Bridge added	Industrial Sensor Bridge	January 2023

**Americas Headquarters**  
Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at <https://www.cisco.com/go/offices>.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <https://www.cisco.com/go/trademarks>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)