Cisco Catalyst IW9165 Series

Contents

Product overview	3
Secure infrastructure	5
Features and benefits	5
Get reliable wireless connectivity for your mission-critical applications	6
Licensing	6
Product sustainability	7
Product specifications	7
Catalyst IW9165D Internal Antenna Pattern	15
Ordering information	16
Warranty information	16
Cisco and Partner Services	16
Smart account	17
Cisco Capital	17
Learn more	17

The Cisco® Catalyst® IW9165 Series provide reliable wireless connectivity for mission-critical applications in a state-of-the art platform. Connect moving assets or easily extend your network wirelessly wherever you need access.

Product overview

The Catalyst IW9165 Series addresses the growing need for reliable client wireless connectivity to mission-critical applications as organizations automate processes and operations. It comes with two 2×2 radios, features an industrial design, and is packed with advanced features.

The Catalyst IW9165 Series supports multiple operating modes:

- Cisco Ultra-Reliable Wireless Backhaul (URWB) software, which delivers high availability, low latency, and zero packet loss with seamless handoffs. URWB is ideal for connecting moving assets or extending your network where running fiber isn't feasible or affordable.
- Wi-Fi AP mode, to extend Wi-Fi 6/6E to more places where small form factor is important, like inside cabinets, or to easily provide coverage in the outdoors with a compact design.
- Catalyst IW9165E can also operate as a Wi-Fi client in Workgroup Bridge (WGB) mode, which allows you to connect operation-critical assets to your existing Wi-Fi infrastructure reliably.

The Catalyst IW9165 Series is designed to take advantage of the 6 GHz band expansion to deliver a network that is more reliable and secure, with higher throughput, more capacity, and less device interference. Support for the 6 GHz band will be available with a future software upgrade and is subject to approvals and regulations by each country's regulatory agencies for the use of the 6 GHz spectrum by standard outdoor power devices. Please refer to the Wi-Fi 6E white paper for more details on 6 GHz.

The Catalyst IW9165 Series comes in two models:

Cisco Catalyst IW9165E Rugged Access Point and Wireless Client

The Catalyst IW9165E is designed to add ultra-reliable wireless connectivity to moving vehicles and machines. Its compact form factor makes it very simple to integrate into industrial assets. It can operate in WGB, URWB and Wi-Fi AP mode to enable any use case and leverage the existing wireless environment.

The Catalyst IW9165E supports WGB mode, which allows it to connect to a Cisco access point infrastructure, and Universal WGB (uWGB) mode, which allows it to connect to a third-party access point infrastructure. Both of these modes help bridge the wired clients that are behind the WGB to the access point on the infrastructure side.

Low power consumption, rugged IP30 design, small form factor, and DIN rail mount capabilities make the Catalyst IW9165E an ideal product operating as a wireless client for automated guided vehicle (AGV) and Autonomous Mobile Robot (AMR) deployments, or as a Wi-Fi AP to be installed in cabinets and other places where size is a limiting factor. An M12 adapter and rail certifications make the Catalyst IW9165E a preferred choice for onboard train deployments as well.

Figure 1.
Catalyst IW9165E Rugged Access Point and Wireless Client

Cisco Catalyst IW9165D Heavy Duty Access Point

The Catalyst IW9165D is designed to make wireless backhaul deployment simple. It comes with a built-in directional antenna that enables long-range, high-throughput connectivity anywhere fiber is not an option, so you can create a fixed wireless infrastructure (point-to-point, point-to-multipoint, and mesh) as well as backhaul traffic from mobile devices along wayside or trackside deployments. The external antenna ports let you quickly extend your network to new places when needed and choose the right antenna based on the use cases and deployment architectures. With heavy-duty IP67 design, the Catalyst IW9165D is certified to operate under wet, dusty, and extreme temperature conditions.

Figure 2.
Catalyst IW9165D Heavy Duty Access Point

Secure infrastructure

Trustworthy systems built with Cisco Trust Anchor technologies provide a highly secure foundation for Cisco products. With the Catalyst IW9165 Series, these technologies help assure hardware and software authenticity for supply chain trust and strong defense against man-in-the-middle attacks that compromise software and firmware. Trust Anchor capabilities include:

- Image signing
- Secure Boot
- Cisco Trust Anchor module

Features and benefits

Table 1. Features and benefits

Feature	Benefit
Wi-Fi 6 (802.11ax)/Wi-Fi 6E ready	The IEEE 802.11ax standard, also known as High-Efficiency Wireless or Wi-Fi 6, builds on 802.11ac. Catalyst IW9165 can support 2×2 MIMO and up to two spatial streams. Wi-Fi 6E is Wi-Fi 6 "extended" into the 6 GHz frequency band, allowing the use of additional channels. Catalyst IW9165 is Wi-Fi 6E ready, subject to approvals and regulations for the use of the 6 GHz spectrum by each country's regulatory agencies.
Flexible multi-technology support	Three different technologies (WGB¥, URWB and WiFi AP†) provide the flexibility to choose a mode based on use case requirements. The ability to swap images in the field enables technicians to change modes between WGB, URWB, or WiFi AP without changing the hardware.
Dual-radio architecture	Catalyst IW9165 has the following two data radios: • 5-GHz 2×2 radio: 20, 40, and 80 MHz channels • 5/6-GHz 2×2 radio: 20, 40, 80, and 160 MHz channels (6 GHz availability subject to country approvals)
Multigigabit Ethernet	Multigigabit Ethernet supports speeds up to 2.5 Gbps. All speeds are supported on Category 5e cabling, as well as 10GBASE-T (IEEE 802.3bz) cabling.
Bluetooth 5†	The integrated Bluetooth Low Energy (BLE) 5 radio enables location-based use cases such as asset tracking, wayfinding, and analytics.
GNSS	A built-in GNSS (Global Navigation Satellite System) receiver provides coordinates to track the location of the access point.
M12 adapter	The M12 adapter accessories give the flexibility to convert interfaces on the base unit into M12 interfaces, while retaining all the certifications.
GPIO¥†	A 2-pin GPIO (general-purpose input output) enables control of external contacts.
Dying gasp¥	A temporary backup power supply on a capacitor allows graceful shutdown and generation of dying gasp messages.

Feature	Benefit
MultiPath Operations (MPO)¢	MPO can enhance reliability by sending duplicate copies of packets across multiple wireless paths.
WorkGroup Bridge (WGB)¥	WGB provides wireless connectivity to a lightweight access point infrastructure on behalf of wired clients that are connected via Ethernet behind the WGB access point.

† Available with a future software upgrade.

¥ Available only on the Catalyst IW9165E.

¢ Available only in URWB mode.

Get reliable wireless connectivity for your mission-critical applications

As you automate your processes and operations to increase safety and productivity, you also need to improve your situational awareness to control your systems. Moving assets involved in mission-critical applications, such as AGVs, AMRs, and tele remote devices, require reliable wireless connectivity. And sometimes you need to extend your network where running fiber isn't feasible or is too costly.

The Catalyst IW9165 Series gives you flexibility and reliability so you can extend reliable wireless connectivity to more places and applications, with features such as:

- One hardware, three modes of operation: Protect your investment and evolve your wireless networks without the added cost of purchasing a new device. Simply update the software to run the Catalyst IW9165E in WGB¥, URWB or Wi-Fi AP mode.
- MPO:¢ This patented technology extends URWB mode by duplicating your high-priority traffic up to 8x and works alongside hardware failures to increase availability, reduce latency, and lower the effects of interference and hardware failures.
- WGB¥ and uWGB¥: In WGB mode, the device associates to another access point as a client and provides a network connection for the equipment connected to its Ethernet ports.
- Supports industrial protocols and industrial certifications (such as EN50155 for railway applications¥).

¢ Available only in URWB mode

¥ Available only on Catalyst IW9165E.

Licensing

Table 2. Licensing

Item	Description
IW9165-URWB-NW-E	IW9165 Cisco URWB Network Essentials
IW9165-URWB-NW-A	IW9165 Cisco URWB Network Advantage
IW9165-URWB-NW-P	IW9165 Cisco URWB Network Premier
IOTOD-IW-E	IOT-OD Essentials for Cisco URWB
IOTOD-IW-A	IOT-OD Advantage for Cisco URWB

Product sustainability

Information about Cisco's Environmental, Social and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability reporting.

Table 3. Cisco environmental sustainability information

Sustainability Topic		Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries, and packaging	WEEE Compliance
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Sustainability Inquiries	Contact: csr_inquiries@cisco.com
	Environmental operating temperature range	Table 4. Product Specifications
Power	Power input	Table 4. Product Specifications
	Power consumption	Table 4. Product Specifications
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Physical dimensions and weight	Table 4. Product Specifications

Product specifications

Table 4. Product specifications

Item	Specification
Part numbers	**Cisco Catalyst IW9165E Rugged Access Point and Wireless Client** • **IW9165E-x:** Catalyst IW9165E for x domains • **IW9165E-ROW:** Catalyst IW9165E for 'Rest of the World' **Cisco Catalyst IW9165D Heavy Duty Access Point** • **IW9165DH-x:** Catalyst IW9165DH for x domains • **IW9165DH-ROW:** Catalyst IW9165DH for 'Rest of the World' **Regulatory domains: (x = A, B, E, F, Q or Z)** ROW is for 'rest of the world' that is not covered as part of above-mentioned specific domain list. Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/go/aironet/compliance.

Item	Specification	
Software	**IW9165E-WGB** • Cisco Unified Industrial Wireless Software Release 17.13.1 or later **IW9165E-URWB** • Cisco Unified Industrial Wireless Software Release 17.12.1 or later **IW9165E-AP** • Cisco IOS® XE Software Release 17.14.1 or later **IW9165DH-URWB** • Cisco Unified Industrial Wireless Software Release 17.12.1 or later **IW9165DH-AP** • Cisco IOS® XE Software Release 17.14.1 or later	
Antennas	**Catalyst IW9165E (external antenna)** • 4x RP-SMA antenna ports • 1x SMA GNSS antenna port • Certified for use with antenna gains up to 15 dBi (5 GHz) • Cisco offers the industry's broadest selection of antennas, delivering optimal coverage for a variety of deployment scenarios • Supports Self-Identifiable Antennas (SIA) **Catalyst IW9165D (directional and external antenna)** • Directional: ◦ Peak gain 15 dBi, internal antenna, dual polarization, azimuth beamwidth 30 deg, elevation beamwidth 30 deg, frequency: 4900 to 5925 MHz ◦ BLE antenna gain: 4 dBi, internal antenna, vertical polarization, omnidirectional • External: ◦ 2x N-Type antenna ports ◦ 1x TNC GNSS antenna port ◦ Certified for use with antenna gains up to 15 dBi (5 GHz) ◦ Cisco offers the industry's broadest selection of antennas, delivering optimal coverage for a variety of deployment scenarios. ◦ Supports Self-Identifiable Antennas (SIA)	
Interfaces	**IW9165E** • 1x 100M/1000M/2.5G Multigigabit Ethernet (RJ45)/M12 X-code autosensing PoE+ in (802.3af/at), Cisco UPOE® in • 1x 100M/1000M/1G (RJ45) • 2x GPIO ports • Management console port (RJ45) • Multicolor system LED • Received Signal Strength Indicator (RSSI) LED • Port LED • DC power input (micro-fit) • Reset button	**IW9165D** • 1x 100M/1000M/2.5G Multigigabit Ethernet (RJ45)/M12 X-code autosensing PoE+ in (802.3af/at), UPOE in • 1x 100M/1000M/1G (RJ45)/M12 X-code • Management console port (RJ45) • Multicolor system LED • DC power input (micro-fit/M12 A-code) • Reset button **Note:** PG 13.5 glands or M12 adapters shall be used with Ethernet and power interfaces to meet IP67 rating.
Dimensions (W x L x H)	**IW9165E** • 6.0 x 4.9 x 1.7 in (15.2 x 12.4 x 4.3 cm)	**IW9165D** • 7.2 x 3.6 x 7.1 in (18.3 x 9.1 x 18.0 cm)

<table>
<tr><th>Item</th><th colspan="6">Specification</th></tr>
<tr><td>Weight</td><td colspan="3">IW9165E
• 1.7 lb. (0.75 kg)</td><td colspan="3">IW9165D
• 4.4 lb. (2.0 kg)</td></tr>
<tr><td>Mounting Options</td><td colspan="3">IW9165E
• Wall/panel
• DIN Rail (vertical, horizontal and bottom)</td><td colspan="3">IW9165D
• Pole (± 25° vertical tilt and ± 45° slant)</td></tr>
<tr><td>Input power requirements</td><td colspan="6">• 802.3af (PoE), 802.3at (PoE+)
• DC power source: 24 to 48 VDC (maximum voltage range: 16.8 to 60 VDC)
• Cisco power AC-DC power adapter, IW-PWRADPT-MFIT4P=
• Cisco power injector, IW-PWRINJ-60RGDMG=</td></tr>
<tr><td rowspan="5">Power draw</td><td>Power input type</td><td>5 GHz radio</td><td>5/6 GHz radio</td><td>RJ45 Multigigabit</td><td>RJ45 1G</td><td>Power budget</td></tr>
<tr><td>24-48 VDC</td><td>2×2</td><td>2×2</td><td>2.5 Gbps</td><td>Yes</td><td>20W</td></tr>
<tr><td>802.3at (PoE+)</td><td>2×2</td><td>2×2</td><td>2.5 Gbps</td><td>Yes</td><td>20W</td></tr>
<tr><td>802.3af (PoE)</td><td>1×1</td><td>1×1</td><td>1 Gbps</td><td>No</td><td>12.95W</td></tr>
<tr><td colspan="6">Note: Power required at the Power Source Equipment (PSE) will depend on the cable length and other environmental issues.</td></tr>
<tr><td>Surge</td><td colspan="6">• Surge protection to ± 2 kV (line-earth) and ± 1 kW (line-line) on DC power input
• Surge protection to ± 4 kV on Ethernet ports</td></tr>
<tr><td>Environmental</td><td colspan="3">IW9165E
• Nonoperating (storage) temperature: -40° to +185°F (-40° to +85°C)
• Nonoperating (storage) altitude test: +25°C (77°F), 15,000 ft.
• Operating temperature: -40° to +158°F (-40° to +70°C) with still air
• Operating humidity: 5% to 95% (noncondensing)
• Operating altitude: 15,000 ft. (4,500 m)</td><td colspan="3">IW9165D
• Nonoperating (storage) temperature: -40° to +185°F (-40° to +85°C)
• Nonoperating (storage) altitude test: +25°C (77°F), 15,000 ft.
• Operating temperature: -40° to +140°F (-40° to +60°C) with solar load and still air
• Extended operating temperature (DC powered): -58° to +167°F (-50° to +75°C) without solar loading, still air, and cold start limited to -40°C (-40°F)
• Operating type test: +85°C (185°F) for 16 hours
• Operating humidity: 0% to 95% (non-condensing)
• Operating altitude: 15,000 ft. (4,500 m)
• Wind resistance: Up to 160 mph (257 km/h) sustained winds</td></tr>
<tr><td>Environmental ratings</td><td colspan="3">IW9165E
• IP30</td><td colspan="3">IW9165D
• EN/IEC 60529 (IP66 and IP67)</td></tr>
<tr><td>System memory</td><td colspan="6">• 2048 MB DRAM
• 1024 MB flash</td></tr>
</table>

Item	Specification
Data rates supported	5 GHz radio: • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: HT20 and HT40, MCS0 to 15 • 802.11ac: ◦ VHT20 MCS0 to 8, 1 or 2 spatial streams ◦ VHT40 and VHT80 MCS0 to 9, 1 or 2 spatial streams • 802.11ax: ◦ HE20, HT40, and HE80 MCS0 to 11, 1 or 2 spatial streams 5/6 GHz radio: • 802.11a (5 GHz band only): 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n (5 GHz band only): HT20 and HT40, MCS0 to 15 • 802.11ac (5 GHz band only): ◦ VHT20 MCS0 to 8, 1 or 2 spatial streams ◦ VHT40, VHT80, VHT160 MCS0 to 9, 1 or 2 spatial streams • 802.11ax: ◦ HE20, HT40, HE80, and HE160 MCS0 to 11, 1 or 2 spatial streams
Frequency band and 20-MHz operating channels	A (A regulatory domain): • 5.260 to 5.320 GHz; 4 channels • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) • 5.745 to 5.825 GHz; 5 channels B (B regulatory domain): • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.720 GHz; 12 channels • 5.745 to 5.825 GHz; 5 channels E (E regulatory domain, outdoor): • 5.500 to 5.700 GHz; 11 channels E (E regulatory domain, indoor, IW9165E only): • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 11 channels F (F regulatory domain): • 5.745 to 5.805 GHz; 4 channels Q (Q regulatory domain): • 5.500 to 5.720 GHz; 12 channels Z (Z regulatory domain): • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) • 5.745 to 5.825 GHz; 5 channels **Note:** This varies by regulatory domain. Customers are responsible for verifying approval for use in their individual countries. To verify approval and to determine availability of the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/c/dam/assets/prod/wireless/wireless-compliance-tool/index.html

<table>
<tr><th>Item</th><th colspan="6">Specification</th></tr>
<tr><td>Maximum number of nonoverlapping channels</td><td colspan="3">5 GHz
802.11a:
20 MHz: 25
802.11n:
20 MHz: 25
40 MHz: 12
802.11ac/ax:
20 MHz: 25
40 MHz: 12
80 MHz: 6
160 MHz: 2</td><td colspan="3">6 GHz*
802.11ax:
20 MHz: 41
40 MHz: 20
80 MHz: 9
160 MHz: 4</td></tr>
<tr><td></td><td colspan="6">Note: This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.</td></tr>
<tr><td>Available transmit power settings (max/min), all antennas active</td><td colspan="3">5 GHz
23 dBm (200 mW)
-7 dBm (0.2 mW)</td><td colspan="3">5/6 GHz
20 dBm (100 mW)
-7 dBm (0.2 mW)</td></tr>
<tr><td>Conducted transmit (Tx) power and receive (Rx) sensitivity</td><td colspan="2"></td><td colspan="2">5 GHz radio</td><td colspan="2">5/6 GHz radio</td></tr>
<tr><td colspan="2">Spatial streams</td><td>Total Tx power (dBm)</td><td>Rx sensitivity (dBm)</td><td>Total Tx power (dBm)</td><td>Rx sensitivity (dBm)</td></tr>
<tr><td colspan="6">802.11a/g</td></tr>
<tr><td>6 Mbps</td><td>1</td><td>23</td><td>-92</td><td>20</td><td>-92</td></tr>
<tr><td>24 Mbps</td><td>1</td><td>23</td><td>-86</td><td>20</td><td>-86</td></tr>
<tr><td>54 Mbps</td><td>1</td><td>21</td><td>-78</td><td>18</td><td>-78</td></tr>
<tr><td colspan="6">802.11n HT20</td></tr>
<tr><td>MCS0</td><td>1</td><td>23</td><td>-92</td><td>20</td><td>-92</td></tr>
<tr><td>MCS7</td><td>1</td><td>20</td><td>-76</td><td>17</td><td>-76</td></tr>
<tr><td>MCS8</td><td>2</td><td>23</td><td>-89</td><td>20</td><td>-89</td></tr>
<tr><td>MCS15</td><td>2</td><td>20</td><td>-73</td><td>17</td><td>-73</td></tr>
<tr><td colspan="6">802.11n HT40</td></tr>
<tr><td>MCS0</td><td>1</td><td>23</td><td>-88</td><td>20</td><td>-88</td></tr>
<tr><td>MCS7</td><td>1</td><td>20</td><td>-73</td><td>17</td><td>-72</td></tr>
<tr><td>MCS8</td><td>2</td><td>23</td><td>-85</td><td>20</td><td>-85</td></tr>
<tr><td>MCS15</td><td>2</td><td>20</td><td>-70</td><td>17</td><td>-69</td></tr>
</table>

Item	Specification					
	802.11ac VHT20					
	MCS0	1	23	-92	20	-92
	MCS8	1	18	-72	16	-70
	MCS0	2	23	-89	20	-89
	MCS8	2	18	-69	16	-67
	802.11ac VHT40					
	MCS0	1	23	-88	20	-88
	MCS9	1	18	-68	15	-68
	MCS0	2	23	-85	20	-85
	MCS9	2	18	-65	15	-65
	802.11ac VHT80					
	MCS0	1	23	-88	20	-86
	MCS9	1	18	-64	16	-64
	MCS0	2	23	-85	20	-83
	MCS9	2	18	-61	16	-61
	802.11ax HE20					
	MCS0	1	23	-92	20	-92
	MCS11	1	13	-64	14	-64
	MCS0	2	23	-89	20	-89
	MCS11	2	13	-61	14	-61
	802.11ax HE40					
	MCS0	1	23	-88	20	-88
	MCS11	1	13	-60	14	-62
	MCS0	2	23	-85	20	-85
	MCS11	2	13	-57	14	-59
	802.11ax HE80					
	MCS0	1	23	-88	20	-86

Item	Specification					
	MCS11	1	13	-58	14	-59
	MCS0	2	23	-85	20	-83
	MCS11	2	13	-55	14	-56
	802.11ax HE160					
	MCS0	1	-	-	20	-83
	MCS11	1	-	-	14	-56
	MCS0	2	-	-	20	-80
	MCS11	2	-	-	14	-53
	Note: Values in this table assume that both antennas are used.					

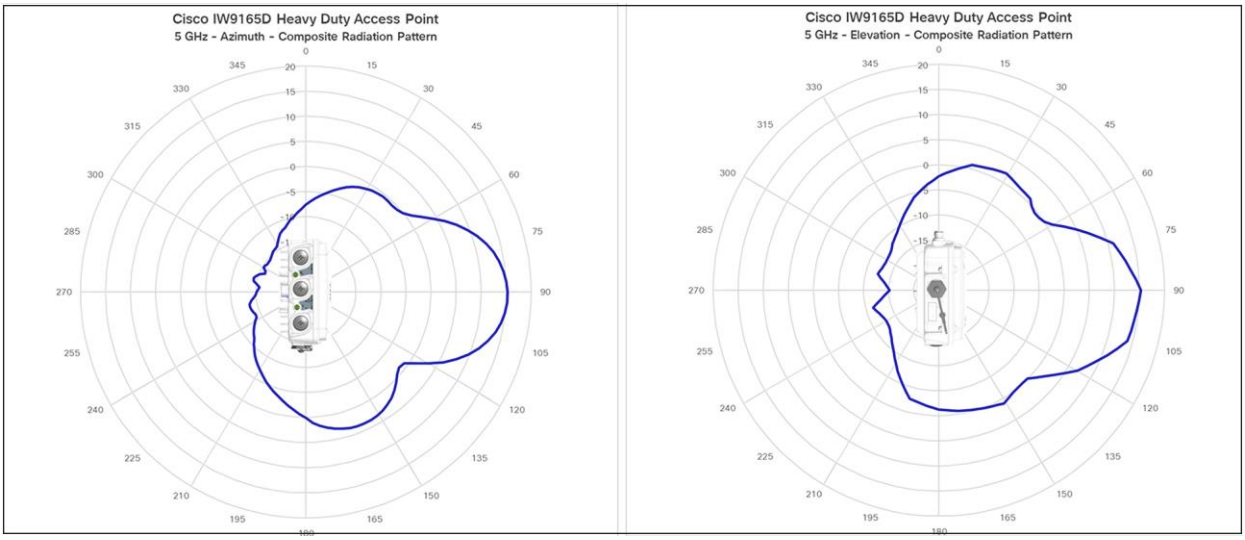
Compliance standards	IW9165E	IW9165D
	Environmental • IEC 60068-2-1 (Cold) • IEC 60068-2-2 (Dry Heat) • IEC 60068-2-14 (Change of Temperature) • IEC 60068-2-30 (Damp Heat) • IEC 60068-2-6 (Vibration) • IEC 60068-2-27 (Shock) • IEC 60068-2-30 (Humidity) • IEC 60068-2-32 (Freefall) • IEC 60068-3-3 (Seismic) **Electromagnetic compatibility** • FCC 47 CFR Part 15 Class A • EN 55032 Class A • VCCI Class A • AS/NZ CISPR 32 Class A • CISPR 11, 16 and 32 Class A • ICES 003 Class A • CNS13438 Class A • EN 300 386 • KS C 9832:2019 • EN 301 489-1 v2.2.3 • EN 301 489-17 v3.2.4 • EN 301 489 – 19 • EN 55035 • CISPR35 • KS C 9835:2019 • KS X 3124 • KS X 3126	**Environmental** • EN 60529 IP67 • UL50E Type 4X • IEC 60068-2-1 (Cold) • IEC 60068-2-2 (Dry Heat) • IEC 60068-2-14 (Change of Temperature) • IEC 60068-2-30 (Damp Heat) • IEC 60068-2-6 (Vibration) • IEC 60068-2-27 (Shock) • IEC 60068-2-30 (Humidity) • IEC 60068-2-32 (Freefall) • IEC 60068-3-3 (Seismic) **Electromagnetic compatibility** • FCC 47 CFR Part 15 Class A • EN 55032 Class A • VCCI Class A • AS/NZ CISPR 32 Class A • CISPR 32 Class A • ICES 003 Class A • CNS13438 Class A • EN 300 386 • KS C 9832:2019 • EN 301 489-1 v2.2.3 • EN 301 489-17 v3.2.4 • EN 301 489 – 19 • EN 55035 • CISPR35 • KS C 9835:2019 • KS X 3124

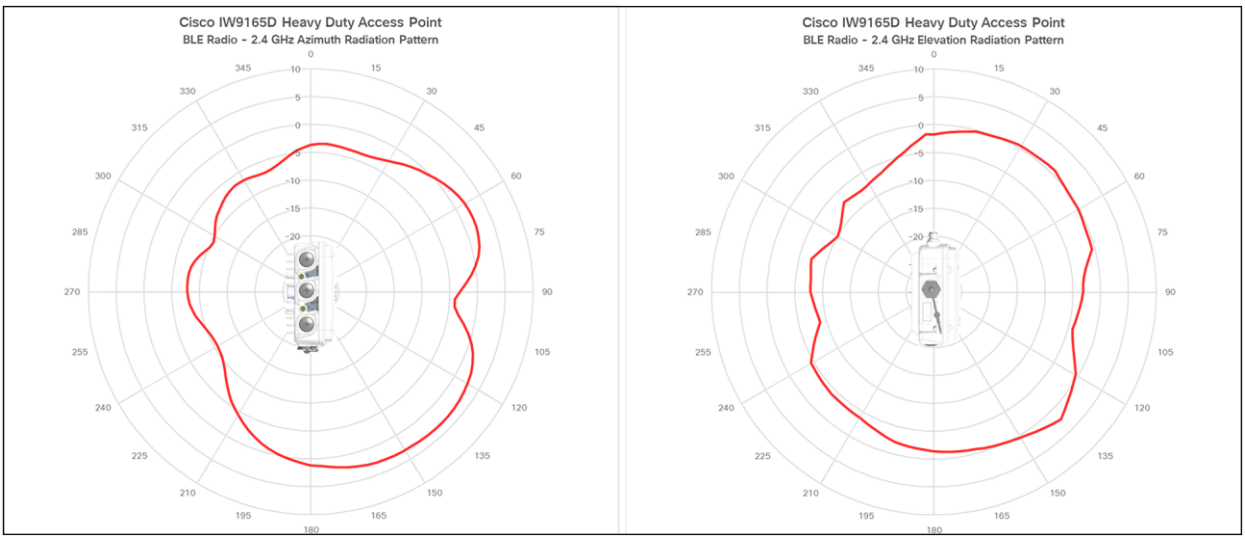
Item	Specification	
	• IEC/EN 61000-4-2 - Electro Static Discharge • IEC/EN 61000-4-3 - Radiated RF Immunity • IEC/EN 61000-4-5 - Surge • IEC/EN 61000-4-6 - Conducted RF Immunity • IEC/EN 61000-4-8 - Power Frequency Magnetic Field • IEC 61000-4-9 – Pulsed Magnetic Field • IEC 61000-4-18 - Damped Oscillatory Wave • IEC 61000-4-17 - DC Voltage Ripple • EN-61000-4-29 - DC Voltage Dips **Safety** • IEC 62368-1 • EN 62368-1 • EN 62311 **Flammability** • EN 45545-3 • DIN 5510-2 **Industrial** • EN 61000-6-2 – Industrial • EN 61000-6-4 - Industrial • EN 61000-6-1 - Light Industrial **Rail** • AREMA C&S Manual Section 11.5.1 • AAR S9401 Rail - Rolling stock cab, wayside outside • EN 50155 Rail - Electronic Equipment on Rolling Stock Class TX (EMC, Environmental) • EN 61373 Rail - Environmental • EN 50121-4 Rail - Signaling and Telecommunications Apparatus • EN 50121-3-2 Rail - Apparatus for Rolling Stock • EN 61373 - Shock and Vibration	• KS X 3126 • IEC/EN 61000-4-2 - Electro Static Discharge • IEC/EN 61000-4-3 - Radiated RF Immunity • IEC/EN 61000-4-5 - Surge • IEC/EN 61000-4-6 - Conducted RF Immunity • IEC/EN 61000-4-8 - Power Frequency Magnetic Field • IEC 61000-4-9 – Pulsed Magnetic Field • IEC 61000-4-18 - Damped Oscillatory Wave • EN-61000-4-29 - DC Voltage Dips **Safety** • IEC 62368-1 • EN 62368-1 • EN 62311 **Industrial** • EN 61000-6-2 – Industrial • EN 61000-6-4 - Industrial • EN 61000-6-1 - Light Industrial

Item	Specification
Wireless communication standards	**Radio approvals** • FCC CFR Part 15.247, 15.407 • RSS 247 Issues 5 • EN 300 328, EN 301 893 • AS/NZ 4268:2018 • 2018.7 (MSIT notice 2018-38), 2017.9 (MSIT notice # 2017-10) • NOTACNCANEH N° 14/2013, NOTACNCANEH N° 14/2013 • Act n° 14448 (2017-12-04) • MIIT R-2002-353, MIIT R-2002-277, MIIT R-2012-620 • LP0002;2018 • Resolution 1985/2017 + Res. 1517/2018 + Res. 855/2019 **Extensible Authentication Protocol (EAP) types** • EAP-Transport Layer Security (TLS) • EAP-Tunneled TLS (TTLS) or Microsoft Challenge Handshake Authentication Protocol Version 2 (MSCHAPv2) • Protected EAP (PEAP) v0 or EAP-MSCHAPv2 • EAP-Flexible Authentication via Secure Tunneling (FAST) • PEAP v1 or EAP-Generic Token Card (GTC) • EAP-Subscriber Identity Module (SIM) **Multimedia** • Wi-Fi Multimedia (WMM) **Other** • FCC Bulletin OET-65C • RSS-102

*6 GHz usage subject to each country's regulatory approval.

Catalyst IW9165D Internal Antenna Pattern





Ordering information

Table 5. Ordering Information

Part number	Product description
IW9165E-x-WGB	Industrial Wireless 9165E, 11ax 6E, 4 RF ports, x domain, WGB software
IW9165E-x-URWB	Industrial Wireless 9165E, 11ax 6E, 4 RF ports, x domain, URWB software
IW9165E-x-AP	Industrial Wireless 9165E, 11ax 6E, 4 RF ports, x domain, Wi-Fi AP software
IW9165DH-x-URWB	Industrial Wireless 9165D, 11ax 6E, 2 RF ports, x domain, URWB software
IW9165DH-x-AP	Industrial Wireless 9165D, 11ax 6E, 2 RF ports, x domain, Wi-Fi AP software

x = regulatory domain

Warranty information

The Catalyst IW9165 Series products come with a 1-year limited warranty. The warranty includes 10-day advance hardware replacement and ensures that software media are defect-free for 90 days. For more details, visit Product Warranties.

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