PCTEL

ENABLING CONNECTIVITY

Maximizing Network Performance

- Utility Antenna Solutions
- EV Charging Station Antenna Solutions
- Industrial IoT Connectivity Solutions

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1 UTILITY ANTENNA SOLUTIONS

Utility operations need to stay connected in the harshest environments. Designed to ensure connectivity between work teams and Industrial IoT devices, PCTEL utility antenna solutions improve efficiency, generate revenue, and conserve enterprise resources in the utility and oil and gas industry.

30 EV CHARGING STATION ANTENNA SOLUTIONS

Secure and reliable connectivity is a must for EVSE networks, which require antenna solutions that provide superior functionality at each EV charging station. PCTEL's rugged, low-profile EV charging station antenna portfolio enables wireless connectivity that is critical to operations. Our diversity of products includes a variety of technology requirements and mounting options based on material type and colors.

66 INDUSTRIAL IoT CONNECTIVITY SOLUTIONS

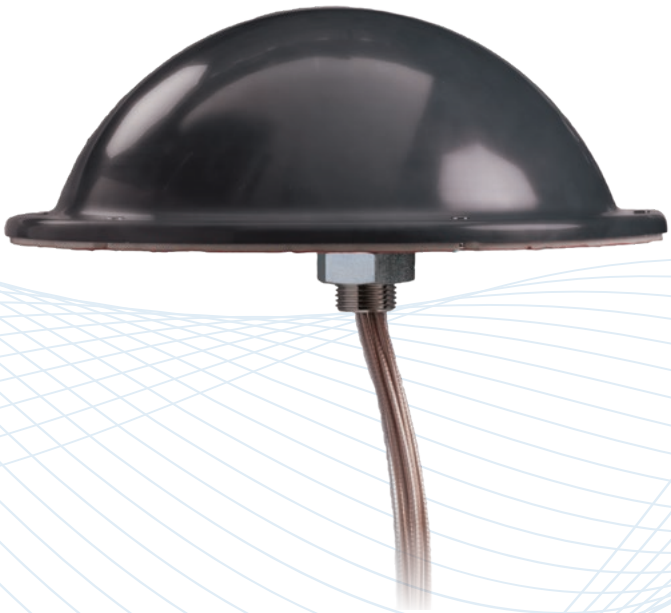
The Industrial Internet of Things (IIoT) is revolutionizing the way organizations operate. PCTEL Industrial IoT connectivity solutions enable you to leverage these advances in wireless technology, data analytics, and machine learning so that you can improve workforce productivity and safety, optimize costs, and maximize operational efficiency.

UTILITY ANTENNA SOLUTIONS

Cabinet Mount Multiband Antenna

Combination Antenna - 5G Cellular, Wi-Fi, and GNSS

GL7X1-IOTCM-5FT



Description

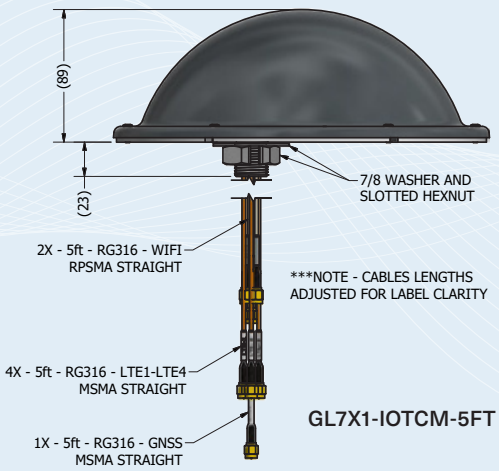
Multiband, multi-port combination antenna in a single impact resistant housing. Its design includes proprietary high rejection GNSS technology for optimal performance and support of multi-carrier voice and data networks.

Technologies

- 5G Cellular
- Wi-Fi
- GPS L1 C/A
- GLONASS L1 C/A
- GALILEO E1
- BEIDOU B1C
- QZSS L1C

Features

- 5G ready multiband, multi-port design
- UV-stable high impact glass fiber reinforced (GFR) radome
- IP67 compliant design
- Proprietary high rejection filtering
- Adhesive VHB tape



Cabinet Mount Multiband Antenna

Combination Antenna - 5G Cellular, Wi-Fi, and GNSS

The GL7X1-IOTCM-5FT antenna provides optimal 5G and 4G LTE and dual-band 802.11ac Wi-Fi coverage in a single, low-profile, impact resistant housing. The design includes proprietary high rejection GNSS technology for optimal performance and support of multi-carrier voice and data networks required for Intelligent Transportation Systems (ITS), remote monitoring, and industrial IoT applications.

Features

- 5G ready multiband, multi-port design – Highly efficient performance and reliable coverage of multiple cellular carriers and Wi-Fi networks
- UV-stable high impact glass fiber reinforced (GFR) radome
- IP67 compliant design provides maximum protection against water or dust ingress
- Proprietary high rejection filtering – Allows wide-band coverage while achieving superior out-of-band rejection for GNSS frequencies
- Adhesive VHB tape for permanent mount vandal resistant installations

Certifications

RoHS COMPLIANT

SPECIFICATIONS

Cabinet Mount Multiband Antenna

Combination Antenna - 5G Cellular, Wi-Fi, and GNSS

Standard Configurations

Model	Elements	Cables	Connectors	Mount
GL7X1-IOTCM-5FT	LTE (Primary) LTE (Receive) Wi-Fi (All Ports) GNSS	Two-5-ft RG-316 cable Two-5-ft RG-316 cable Two-5-ft RG-316 cable One-5-ft RG-316 cable	SMA Plug (Male) SMA Plug (Male) Reverse Polarity SMA Plug (Male) SMA Plug (Male)	7/8-inch OD, 14 UNS - 2B 3/4-inch long (.75") zinc stud mount with jam nut

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	SWR[2]	Gain (dB)[1] Max	Gain (dB)[1] Typical	Gain (dB)[1] Range (±)	Efficiency[1] Avg	Efficiency[1] Range (±)	Polarization	Nominal Impedance	Maximum Power
LTE Primary (1 & 3)										
617	698	3.4	2.0	1.0	1.0	38%	5%	Linear, vertical	50 ohms	25 watts
698	802	2.3	5.1	2.0	2.2	42%	10%			
824	894	1.8	5.9	4.1	1.9	53%	5%			
880	960	1.8	5.4	4.1	1.3	53%	5%			
1710	2200	1.6	5.9	5.1	0.8	50%	2%			
2300	2690	1.6	4.7	3.8	0.9	44%	5%			
3400	3800	1.6	2.7	2.2	0.5	35%	3%			
5150	5950	2.1	1.3	0.0	1.3	14%	3%			
LTE Secondary (2 & 4)										
617	698	6.1	0.6	-2.8	3.4	16%	18%	Linear, vertical	50 ohms	25 watts
733	802	2.7	4.5	3.3	1.2	53%	9%			
824	894	2.7	4.4	2.9	1.5	43%	14%			
880	960	3.3	3.6	2.3	1.3	32%	3%			
1805	2200	2.5	5.5	3.0	2.5	42%	9%			
2300	2690	1.5	5.4	4.4	0.9	45%	4%			
3400	3800	2.8	-3.1	-4.9	1.8	5%	2%			
5150	5950	2.1	4.5	1.5	3.0	15%	7%			
Wi-Fi										
2400	2500	1.5	9.1	6.3	2.8	44%	2%	Linear, vertical	50 ohms	25 watts
4900	5900	1.9	9.3	6.5	2.9	32%	5%			

Minimum Isolation (dB)[1]

	LTE Primary (1 & 3)		LTE Secondary (2 & 4)		Wi-Fi	
LTE (1 & 3)	617-960 MHz	16.9	617-960 MHz	14.0	617-960 MHz	28.0
	1.71-2.7 GHz	28.0	1.71-2.7 GHz	24.0	1.71-2.7 GHz	17.0
	3.4-3.8 GHz	33.0	3.4-3.8 GHz	39.0	3.4-3.8 GHz	37.0
	5.15-5.95 GHz	40.0	5.15-5.95 GHz	44.0	5.15-5.95 GHz	38.0
LTE (2 & 4)			617-960 MHz	16.0	617-960 MHz	32.0
			1.71-2.7 GHz	20.0	1.71-2.7 GHz	25.0
			3.4-3.8 GHz	50.0	3.4-3.8 GHz	50.0
			5.15-5.95 GHz	41.0	5.15-5.95 GHz	41.0
Wi-Fi					2.4-2.5 GHz	30.0
					4.9-5.9 GHz	35.0

[1] *VSWR and isolation values are measured at the end of 5-Ft cables without a ground plane.*

SPECIFICATIONS

Cabinet Mount Multiband Antenna

Combination Antenna - 5G Cellular, Wi-Fi, and GNSS

Electrical Specifications – GNSS Antenna

Specification	Measurement
Frequency Range	1565-1608 MHz
Amplifier Gain	@ 3.0 VDC: 26 dB (typical)
Nominal Impedance	50 ohms
Polarization	Right hand circular
Output VSWR	2.0:1 (maximum)
Noise Figure	< 2.0 dB (typical)
Nominal Gain	2 dBic @ 90° -3 dBic @ 20°
DC Voltage	2.8-6.0 V (operating) ≤ 12.0 V (survivability)
DC Current	25 mA (typical)
Out-of-Band Rejection	f0 = 1586 MHz f0 ± 50 MHz: ≥ 60 dBc f0 ± 60 MHz: ≥ 70 dBc

Mechanical and Environmental Specifications

Physical	
Dimensions	9.88" OD x 3.46" H (251 x 88 mm)
Radome Construction	Grey, UV-stable high impact reinforced (GFR) glass fiber radome
Operating / Storage Temperature	-40°C to +85°C
Gasket Design & Construction	Contour matching, conformable, thermoplastic-elastomer gasket designed to seal between radome and baseplate. Gasket flexes and conforms to contoured surfaces. Baseplate has a 3M® VHB mounting pad for anti-rotation.

Coach™ 5G Cellular Multiband and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antennas - GNSS, 5G Cellular, and Wi-Fi

GLHPDLTE-SF Series

Description

5G cellular multiband antenna with 802.11ac and PCTEL's unique high rejection GPS/GLONASS technology for high performance and support of carrier voice and data networks.

Technologies

- 5G cellular,
- Wi-Fi 6E
- GPS L1
- GLONASS L1

Features

- No tune, multiband coverage
- Proprietary filtering design allows wideband coverage for all GNSS frequencies
- UV-resistant black or white housing options
- Easy installation and/or replacement
- IP67 compliant design provides maximum protection against water or dust ingress

Coach™ 5G Cellular Multiband and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antennas - GNSS, 5G Cellular, and Wi-Fi

PCTEL's Coach™ GLHPDLTE-SF series multiband antenna platform supports the high speed requirements of complex RF communication systems used for Intelligent Transportation Systems (ITS), and industrial IoT applications. These antennas feature two 5G elements compatible with the world's leading cellular routers that support 600 MHz to 6 GHz frequencies. The platform also incorporates 802.11ac Wi-Fi MIMO connectivity, with dual band 2.4/5 GHz Wi-Fi elements supporting DSRC 5.99 GHz applications. In addition, PCTEL's proprietary high-rejection multi GNSS technology is included for high precision tracking and asset management.

Features

- No tune, multiband coverage – 5G cellular, Wi-Fi 6E, GPS L1, and GLONASS L1 frequencies
- RF system efficiency – High performance, low loss cable and high quality connectors
- Superior out-of-band rejection – Proprietary filtering design allows wideband coverage for all GNSS frequencies
- Withstands severe environmental conditions – IP67 compliant design protects against water or dust ingress
- Easy installation and/or replacement – Metal stud mount with slotted jam nut provides single cable exit

Certifications

RoHS COMPLIANT

SPECIFICATIONS

Coach™ 5G Cellular Multiband and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antenna - GNSS, 5G Cellular, and Wi-Fi

Standard Configurations

Model	Elements	Cable	Connector	Mount
GLHPDLTEMIMO-SF	LTE (1 & 2) Wi-Fi GNSS	Two-17 feet Pro-Flex™ Plus 195 (LTE Elements) Two-17 feet Pro-Flex Plus 195 (802.11ac Wi-Fi Elements) One-17 feet RG-174/U (GNSS Element)	SMA Plug (LTE) Reverse Polarity SMA Plug (Wi-Fi) SMA Plug (GNSS)	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
GLHPDLTE-SF	LTE (1 & 2) GNSS	Two-17 feet Pro-Flex Plus 195 (LTE Elements) One-17 feet RG-174/U (GNSS Element)	SMA Plug (LTE) SMA Plug (GNSS)	
GLHPDM3-SF	LTE Wi-Fi GNSS	Two-17 feet Pro-Flex Plus 195 (LTE Elements) Three-17 feet Pro-Flex Plus 195 (802.11ac Wi-Fi Elements) One-17 feet RG-174/U (GNSS Element)	SMA Plug (LTE) Reverse Polarity SMA Plug (Wi-Fi) SMA Plug (GNSS)	

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	SWR[1]	Gain (dB)[2]			Efficiency[2]		Polarization	Nominal Impedance	Maximum Power
			Max	Typical	Range (±)	Avg	Range (±)			
LTE 1 & 2										
617	698	2.4	3.8	2.4	1.4	55%	19%	Linear	50 ohms	50 watts
698	802	1.7	5.2	4.1	1.1	68%	6%			
824	960	1.3	6.2	4.3	1.9	61%	12%			
1710	2200	15	7.5	6.0	15	78%	11%			
2300	2690	1.6	8.9	7.1	1.8	78%	8%			
3400	3800	1.9	5.4	4.7	0.6	57%	5%			
5150	5950	1.7	8.1	6.8	1.3	59%	10%			
Wi-Fi										
2400	2500	1.1	9.4	9.0	0.4	81%	3%	Linear	50 ohms	50 watts
4900	5925	1.4	9.4	8.9	0.5	70%	12%			

Minimum Isolation (dB)[1]

Elements	LTE Primary (1&3)		Wi-Fi	
LTE 1 & 2	617-960 MHz	9	617-960MHz	20.0
	1.71-2.7 GHz	15	1.71-2.7GHz	17.0
	3.3-3.8 GHz	32	3.3-5.9 GHz	35.0
Wi-Fi			2.4-2.SGHz	25.0
			4.9-5.9GHz	32.0

[1] Measurements taken with 17-ft cable and 2-ft ground plane.
[2] Measurements taken with at the base of the antenna (no cable included).

SPECIFICATIONS

Coach™ 5G Cellular Multiband and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antenna - GNSS, 5G Cellular, and Wi-Fi

Electrical Specifications – GNSS Antenna (all bands)

Specification	Measurement
Frequency Range	1565-1608 MHz
Amplifier Gain	@ 3.0VDC: 26 dB (typical)
Output VSWR	2.0:1 (maximum)
DC Current	25mA (typical)
DC Voltage	2.8-6.0 V (operating) 12.0 V (survivability)
Noise Figure	< 2.0 dB (typical)
Out-of-Band Rejection	f0= 1586 MHz f0 ± 50 MHz: ≥ 60 dBc f0 ± 60 MHz: ≥ 70 dBc
Nominal Gain	3 dBic @ 90° -2 dBic @ 20°
Polarization	Right hand circular
Nominal Impedance	50 ohms

Mechanical and Environmental Specifications

Specification		Measurement
Dimensions (W x H)	All models	5.38 W x 3.53 H in (136.5 W x 89.7 H mm)
Weight	5 ports: GLHPDLTEMIMO-SF 3 ports: GLHPDLTE-SF	3 lbs (1.4 kg) 2.6 lbs (0.9 kg)
Housing Material		White or Black, UV-Stable Rugged Thermoplastics
Temperature Range		-40°C to +85°C
Gasket Design and Construction		Contour matching, conformable, thermoplasticelastomer gasket designed to seal between radome and baseplate. Gasket flexes and conforms to contoured surfaces. Baseplate has a 3M® VHB mounting pad for anti-rotation.

Trooper™ Multiband 5G Cellular and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antennas - GNSS, 5G Cellular, and Wi-Fi

GLHPD Platform

Description

Rugged multiband LTE MIMO and 802.11ac antennas with high rejection GPS/GLONASS, and compact footprint for high-speed Intelligent Transportation Systems and Industrial IoT applications.

Technologies

- 5G Cellular
- Wi-Fi
- GPS L1 / GLONASS
- GLONASS

Features

- No tune, multiband coverage
- Superior out-of-band rejection
- Easy installation and/or replacement
- Weather proof, IP67 housing
- Meets AAR certification requirements

Trooper™ Multiband 5G Cellular and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antennas - GNSS, 5G Cellular, and Wi-Fi

The Trooper™ GLHPD antenna platform supports the high speed requirements of complex RF communication systems used for Intelligent Transportation Systems (ITS), and IIoT applications. Its compact footprint makes this antenna platform ideal for installation on surfaces with limited surface space, including leading public safety vehicle rooftops and Industrial IoT (IIoT) cabinet installations. These antennas feature two 5G elements compatible with the world's leading cellular routers supporting 600 MHz to 6 GHz frequencies. In addition, PCTEL's proprietary high-rejection multi-GNSS technology is included for high precision tracking and asset management.

Features

- No tune, multiband coverage – Dual LTE, 802.11ac Wi-Fi and GPS L1/GLONASS frequencies
- Superior out-of-band rejection via proprietary filtering design
- Metal 3/4-inch stud mount with slotted jam nut provides single cable exit for easy installation and/or replacement
- IP67 compliant design provides maximum protection against water or dust ingress under severe environmental conditions[1]
- UV-resistant black or white housing options complement most vehicular aesthetic requirements
- Meets AAR certification requirements for rail applications

Certifications

RoHS COMPLIANT

[1] *When installed according to PCTEL's installation instructions.*

SPECIFICATIONS

Trooper™ Multiband 5G Cellular and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antennas - GNSS, 5G Cellular, and Wi-Fi

Standard Configurations

Model	Elements	Cable	Connector[2]	Mount	Housing Color
GLHPDLTE-LTB	LTE (2) GNSS (1)	Two-17 feet Pro-Flex™ Plus 195 (LTE) One-17 feet RG-174/U (GNSS)	SMA Plug (LTE) SMA Plug (GNSS)	1-inch (25.4 mm) hole, 3/4-inch long (19.05 mm) zinc stud mount with jam nut	Black
GLHPDLTE-LTW	LTE (2) GNSS (1)	Two-17 feet Pro-Flex Plus 195 (LTE) One-17 feet RG-174/U (GNSS)	SMA Plug (LTE) SMA Plug (GNSS)		White
GLHPDLTEMIMO-LTB	LTE (2) GNSS (1)	Two-17 feet Pro-Flex Plus 195 (LTE) Two-17 feet Pro-Flex Plus 195 (802.11ac Wi-Fi) One-17 feet RG-174/U (GNSS)	SMA Plug (LTE) Reverse Polarity SMA Plug (Wi-Fi) SMA Plug (GNSS)		Black
GLHPDLTEMIMO-LTW	LTE (2) Wi-Fi (2) GNSS (1)	Two-17 feet Pro-Flex Plus 195 (LTE) Two-17 feet Pro-Flex Plus 195 (802.11ac Wi-Fi) One-17 feet RG-174/U (GNSS)	SMA Plug (LTE) Reverse Polarity SMA Plug (Wi-Fi) SMA Plug (GNSS)		White
GLHPDM3-LTB	LTE (2) Wi-Fi (3) GNSS (1)	Two-17 feet Pro-Flex Plus 195 (LTE) Three-17 feet Pro-Flex Plus 195 (802.11ac Wi-Fi) One-17 feet RG-174/U (GNSS)	SMA Plug (LTE) Reverse Polarity SMA Plug (Wi-Fi) SMA Plug (GNSS)		Black
GLHPDM3-LTW	LTE (2) Wi-Fi (3) GNSS (1)	Two-17 feet Pro-Flex Plus 195 (LTE) Three-17 feet Pro-Flex Plus 195 (802.11ac Wi-Fi) One-17 feet RG-174/U (GNSS)	SMA Plug (LTE) Reverse Polarity SMA Plug (Wi-Fi) SMA Plug (GNSS)		White

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	SWR[3]	Gain (dB)[3] Max	Gain (dB)[3] Typical	Gain (dB)[3] Range (±)	Efficiency[3] Avg	Efficiency[3] Range (±)	Polarization	Nominal Impedance	Maximum Power
LTE Primary Port 1 & 2										
617	698	2.2	4.0	2.2	1.8	54%	19%	Linear	50 ohms	50 watts
698	802	1.4	5.0	4.0	0.9	68%	5%			
824	960	2.7	5.5	4.3	1.2	61%	5%			
1710	2200	1.7	6.5	5.5	0.9	78%	3%			
2300	2690	1.6	8.8	6.8	1.9	78%	4%			
3400	3800	1.9	6.8	6.1	0.7	73%	3%			
5150	5950	2.2	10.1	8.6	1.5	81%	13%			
Wi-Fi Port 3										
2400	2500	1.2	9.4	9.0	0.4	81%	3%	Linear	50 ohms	50 watts
4900	5900	1.4	9.4	8.9	0.5	70%	12%			

Minimum Isolation (dB)[3]

	LTE Primary (1 & 2)		Wi-Fi (3)	
LTE Primary (1 & 2)	690 - 960 MHz	9.0	698 - 960 MHz	20.0
	1.71 - 2.7 GHz	15.0	1.71 - 2.7 GHz	17.0
	3.3 - 5.9 GHz	32.0	3.3 - 5.9 GHz	35.0
Wi-Fi (3)			2.4 - 2.5 GHz	21.0
			4.9 - 5.9 GHz	27.0

[1] When installed according to PCTEL's installation instructions.
[2] Consult Customer Service for other connector options.
[3] Measurements taken with 3-ft cables on a 2-ft ground plane.

SPECIFICATIONS

Trooper™ Multiband 5G Cellular and 802.11ac Antennas with High Rejection GPS/GLONASS

Combination Antennas - GNSS, 5G Cellular, and Wi-Fi

Electrical Specifications – GNSS Antenna

Frequency Range	1565 - 1608 MHz
Amplifier Gain	@ 3.0 VDC: 26 dB (typical)
Output VSWR	2.0:1 (maximum)
DC Current	25 mA (typical)
DC Voltage	2.8 - 6.0 V (operating) ≤ 12.0 V (survivability)
Noise Figure	< 2.0 dB (typical)
Out-of-Band Rejection	f0 = 1586 MHz / f0 ± 50 MHz: ≥ 60 dBc / f0 ± 60 MHz: ≥ 70 dBc
Nominal Gain	3 dBic @ 90° -2 dBic @ 20°
Polarization	Right hand circular
Nominal Impedance	50 ohms

Mechanical Specifications

Physical

Dimensions (W x H)		4.05 W x 3.46 H inches (10.3 x 8.8 cm)
Weight	**3-Port Models** GLHPDLTE-LTB GLHPDLTE-LTW	2.3 lbs (36.8 oz)
	5-Port Models GLHPDLTEMIMO-LTB GLHPDLTEMIMO-LTW	2.9 lbs (46.4 oz)
	6-Port Models GLHPDM3-LTB GLHPDM3-LTW	3.1 lbs (49.6 oz)
Radome Construction		UV-Stable Rugged Thermoplastics
Operating / Storage Temperature		-40°C to +85°C
Gasket Design & Construction		Contour matching, conformable, thermoplastic-elastomer gasket designed to seal between radome and baseplate. Gasket flexes and conforms to contoured surfaces. Baseplate has a 3M® VHB mounting pad for anti-rotation.

AllDisc Combi 5G-Ready, 4-in-1 Antenna Platform

Combination Antennas - Cellular + GNSS + Wi-Fi

710526

Description

A low-profile, whipless combination antenna with durable design that delivers optimal performance and support of multi-carrier voice and data networks.

Technologies

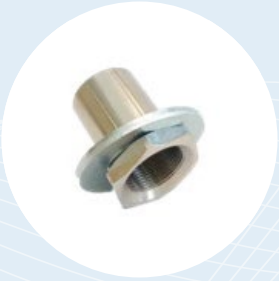
- 2G / 3G / 4G / 5G
- Wi-Fi 6E / Bluetooth®
- GNSS
- GPS L1
- Galileo E1
- Glonass L1
- BeiDou

Features

- 4-in-1 combination antenna
- 5G ready
- LNA gain 30dB with pre-filter
- Easy to install
- IP6K9K class
- Cable approved acc ECE-R118
- IATF 16949

710452 – AllDisc bracket

710598 – Slitted nut



710206 – Extension nut to be used on AllDisc with long screw enabling installation thickness 25-50mm

AllDisc Combi 5G-Ready, 4-in-1 Antenna Platform

Combination Antennas - Cellular + GNSS + Wi-Fi

The AllDisc Combi by Smarteq, a PCTEL company, antenna platform can be configured to support several antenna systems; Cellular bands 2G/3G/4G/5G, GPS/GLONASS/Galileo, Wi-Fi 2xMIMO 2.4/5GHz in a low profile casing with durable design IP6K9K. It is ground plane independent which enables flexible and easy installation, making it perfect for fleet management, track and trace, navigation, cargo handling and V2X. Dual-feed GNSS antenna enables excellent Axial ratio and gain. Pre-filtered LNA ensures functionality in a combination antenna. The superior RF performance enables high connectivity and throughput. The AllDisc Combi antenna platform has been successfully tested for durability according to Volkswagen automotive test standards.

Features

- 5G ready
- Cellular Main: 617-960 / 1710-2690 MHz and 3300-3800 MHz
- Wi-Fi 6E/BT: 2400-2485 MHz and 4900-7200 MHz
- GNSS: 1575-1610 MHz
- GPS: L1, Galileo: E1, Glonass: L1
- LNA gain 30dB
- IP6K9K class
- Approved according to ECE-R118
- Designed in Sweden with design registration

Applications

- Off-Highway Vehicle (OHV)
- Public safety
- Track and trace
- Fleet management
- Navigation / Positioning
- V2X
- Cargo/load handling

Certifications

RoHS COMPLIANT

QUALITY SYSTEM CERTIFICATION DNV·GL IATF 16949

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

SPECIFICATIONS

AllDisc Combi 5G-Ready, 4-in-1 Antenna Platform

Combination Antennas - Cellular + GNSS + Wi-Fi

Standard Configurations

Model	Elements	Cable	Cable Length	Code	Connector	Housing Color	Mount	Accessories
710260	LTE	RG316, grey	0.20m	D	FAKRA-Male	Black	Hole mount with center screw and adhesive tape	710452 – AllDisc bracket 710598 – Slitted nut 710206 – Extension nut
	GNSS	RG316, grey	0.25m	C				
710261	LTE	RG316, grey	0.20m	D	FAKRA-Male	Black	Hole mount with center screw and adhesive tape	710452 – AllDisc bracket 710598 – Slitted nut 710206 – Extension nut
	GNSS	RG316, grey	0.25m	C				
	Wi-Fi 6E (1)	RG316, grey	0.30m	I				
710501	LTE	RG316, grey	0.20m	D	FAKRA-Male	Black	Hole mount with center screw and adhesive tape	710452 – AllDisc bracket 710598 – Slitted nut 710206 – Extension nut
	GNSS	RG316, grey	0.25m	C				
	Wi-Fi 6E (1)	RG316, grey	0.30m	I				
	Wi-Fi 6E (2)	RG316, grey	0.35m	I				

Electrical Specifications – RF Antennas (All Models)

Frequency Ranges	VSWR*	Peak Gain*	Efficiency*	Correlation Factor	Nominal Impedance	Polarization	Radiation Characteristics	Max. Power*	DC Short
LTE / 5G									
617 - 698 MHz	< 3 :1	1 dBi	~40%	<0.02	50Ω	Linear, vertical	Omnidirectional	10 watts	Yes
698 - 960 MHz	< 2.7:1	5.5 dBi	~65%						
1710 - 2690 MHz	< 2.1:1	4.5 dBi	~77%						
3300 - 3800 MHz	< 1.9:1	6.5 dBi	~66%						
Wi-Fi 6E (1 & 2)									
2400 - 2485 MHz	1.5:1	8.5 dBi	85%	<0.02	50Ω	Linear, vertical	Omnidirectional	10 watts	
4900 - 6000 MHz	2:1	10.5 dBi	75%						
6000 - 7200 MHz	2,5:1	10 dBi	60%						

Electrical Specifications – GNSS Antennas (All Bands)

Frequency Range	VSWR*	Peak Gain*	Gain Active	Nominal Impedance	Polarization	DC Voltage	DC Current
1575 - 1610 MHz	≤ 2.0:1	-3.5dBic @ fc	30+2dB	50Ω	Right Hand Circular	2.8-5.5V	15-25mA

*Maximum power measured at ambient temperature of 25°C

SPECIFICATIONS

AllDisc Combi 5G-Ready, 4-in-1 Antenna Platform

Combination Antennas - Cellular + GNSS + Wi-Fi

Mechanical and Environmental Specifications (All Models)

Physical

Dimensions (D x H)	138 x 55 mm
Weight	~200g
Radome Construction	PC/PBT/Aluminum alloy
Operating / Storage Temperature	-40°C to +85°C
IP Class	IP6K9K

Extension Cables

Part Number	Cable Length	Connector	Gender	Code
LL58 Cable				
710606	2.5m	FAKRA/SMA	Female/Male	Z/
710608	2.5m	FAKRA	Female/Female	D
710609	2.5m	FAKRA	Female/Female	C
710610	2.5m	FAKRA	Female/Female	I
710607	5.0m	FAKRA/SMA	Female/Male	Z/
710611	5.0m	FAKRA	Female/Female	D
710612	5.0m	FAKRA	Female/Female	C
710613	5.0m	FAKRA	Female/Female	I

VenU® Dual-Polarization 4G/5G MIMO Directional Panel Antenna

Cellular Antennas - Omnidirectional

PLTE7027M

Description

Multiband coverage in a rugged housing

Technologies

- 4G/5G Cellular

Features

- Optimal coverage – MIMO broadband directional coverage
- Rugged – Heavy-duty articulating mount; IP67-compliant waterproof vented design; Indoor and outdoor rated
- Ease of installation and connection: Dual slant polarized or V/H polarization mounting options; N Female bulkhead connectors

VenU® Dual-Polarization 4G/5G MIMO Directional Panel Antenna

Cellular Antennas - Omnidirectional

The VenU® PLTE7027M panel antenna offers 4G/5G multiband coverage, high gain, and a rugged housing design, with a heavy-duty mounting bracket for mast or wall mount installations. It is ideal for small cells, indoor/outdoor DAS systems, and Oil and Gas/Utility sites requiring a rugged and reliable cellular antenna solution.

Features

- MIMO broadband directional coverage with DAS, ODAS, small cell, and industrial wireless applications
- N Female bulkhead connectors
- IP67* waterproof vented design
- Indoor and outdoor rated
- Dual-slant polarized or V/H polarization mounting options
- Includes heavy-duty articulating mount

Certifications

RoHS COMPLIANT

** When installed according to manufacturer's installation instructions.*

SPECIFICATIONS

VenU® Dual-Polarization 4G/5G MIMO Directional Panel Antenna

Cellular Antennas - Omnidirectional

Standard Configuration

Model	PLTE7027M
Connector	2 x Type N Female
Mounting Method	Heavy-duty articulating mount suitable for pipe or wall installation is included
Radome	White, UL 94 VHB Polycarbonate

Electrical Specifications – RF Antenna

PLTE7027M

Frequency Range	698-960 MHz / 1710-2700 MHz
Typical Gain	8.2 dBi / 8 dBi
VSWR	< 2.0:1
Azimuth Half Power Beamwidth	~80° / ~75°
Elevation Half Power Beamwidth	~55° / ~65°
Front to Back Ratio	~20 dB
Maximum Power	50 watts
Nominal Impedance	50 ohms
Polarization	Dual slant (±45°) or horizontal and vertical (mount dependant)
Port-to-Port Isolation	< - 22 dB

Mechanical and Enviornmental Specifications

PLTE7027M

Dimensions (L x W x H)	12" x 12" x 4.4" in (30.48 x 30.48 x 11.18 cm)
Weight	2.0 lbs (0.907 kg)
Rated Wind	125 mph
Radome color	White
Temperature Range	-40°C to +85°C
Ingress Protection	IP67

Heavy-Duty Omnidirectional Base Station Antennas

ISM/LoRa/LPWAN Antennas - Base Station

BOA Series

Description

Rugged and robust base station antenna deal for deployment in harsh environments

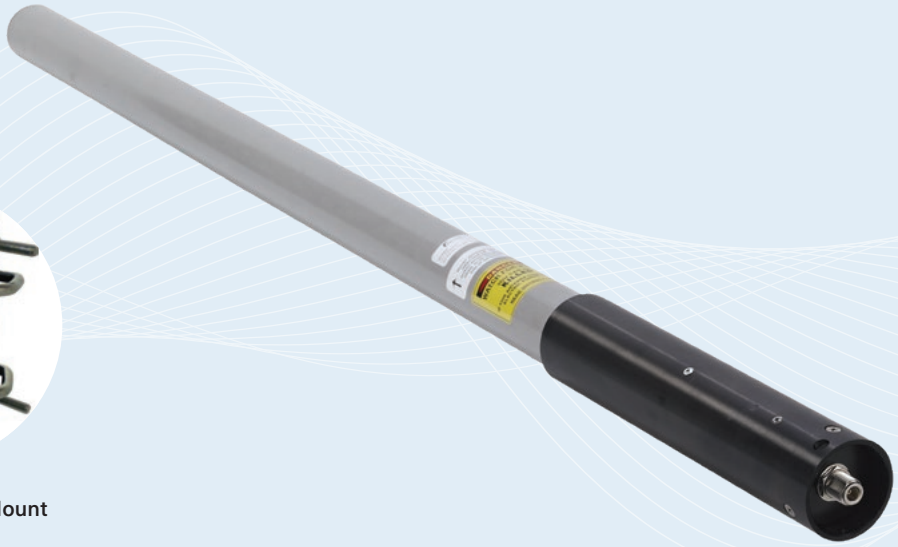
Technologies

- Cellular
- GPS

Features

- Made for harsh environments – Temperature range -40°C to +85°C; UV-stable gray fiberglass radome
- Durable – hard coat anodized finish on antenna base and mounting brackets; galvanized mounting hardware
- Adaptable – Movable drain plug for upright or inverted mounting; optional mount for wooden, concrete, or composite utility poles
- Reliable – Stable pattern and gain performance with no field tuning required

BAM1005 Mount



Heavy-Duty Omnidirectional Base Station Antennas

ISM/LoRa/LPWAN Antennas - Base Station

The rugged and robust design of PCTEL's BOA Series omnidirectional base station antennas makes them ideal for deployment in harsh environments where long term reliability and durability cannot be compromised. Each model features a linear array, encapsulated in a heavy-duty fiberglass radome.

Features

- UV-stable gray fiberglass radome
- Versatile mounting brackets included
- Black, hard coat anodized finish on antenna base and mounting brackets
- Galvanized mounting hardware
- Movable drain plug for upright or inverted mounting
- DC grounded for ESD protection
- Stable pattern and gain performance with no field tuning required
- Temperature range: -40°C to +85°C
- Optional BAM1017 mount compatible with wooden, concrete, or composite utility poles

Certifications

RoHS COMPLIANT

SPECIFICATIONS

Heavy-Duty Omnidirectional Base Station Antennas

ISM/LoRa/LPWAN Antennas - Base Station

Standard Configurations

Model	Connector	Mount
BOA9025	N Female bulkhead	BAM1005 mast mount included
BOA9028	N Female bulkhead	BAM1005 mast mount included
BOA90211	N Female bulkhead	MMK5 mast mount included
BOA4357	N Female bulkhead	BAM1005 mast mount included
BOA2177	N Female bulkhead	MMK5 mast mount included

Electrical Specifications - RF Antennas

Model	Frequency Ranges	Gain	VSWR	Elevation Half Power Beamwidth	Average Power	Nominal Impedance
BOA9025	902-928 MHz	5.1 dBi / 3 dBd	< 1.5	25°	250 watts	50 ohms
BOA9028	902-928 MHz	8.1 dBi / 6 dBd	< 1.5	13°	250 watts	50 ohms
BOA90211	902-928 MHz	11.1 dBi / 9 dBd	< 1.5	6°	250 watts	50 ohms
BOA4357	430-470 MHz	7.1 dBi / 5 dBd	< 1.7	18°	250 watts	50 ohms
BOA2177	217-222 MHz	7.1 dBi / 5 dBd	< 2.0	18°	250 watts	50 ohms

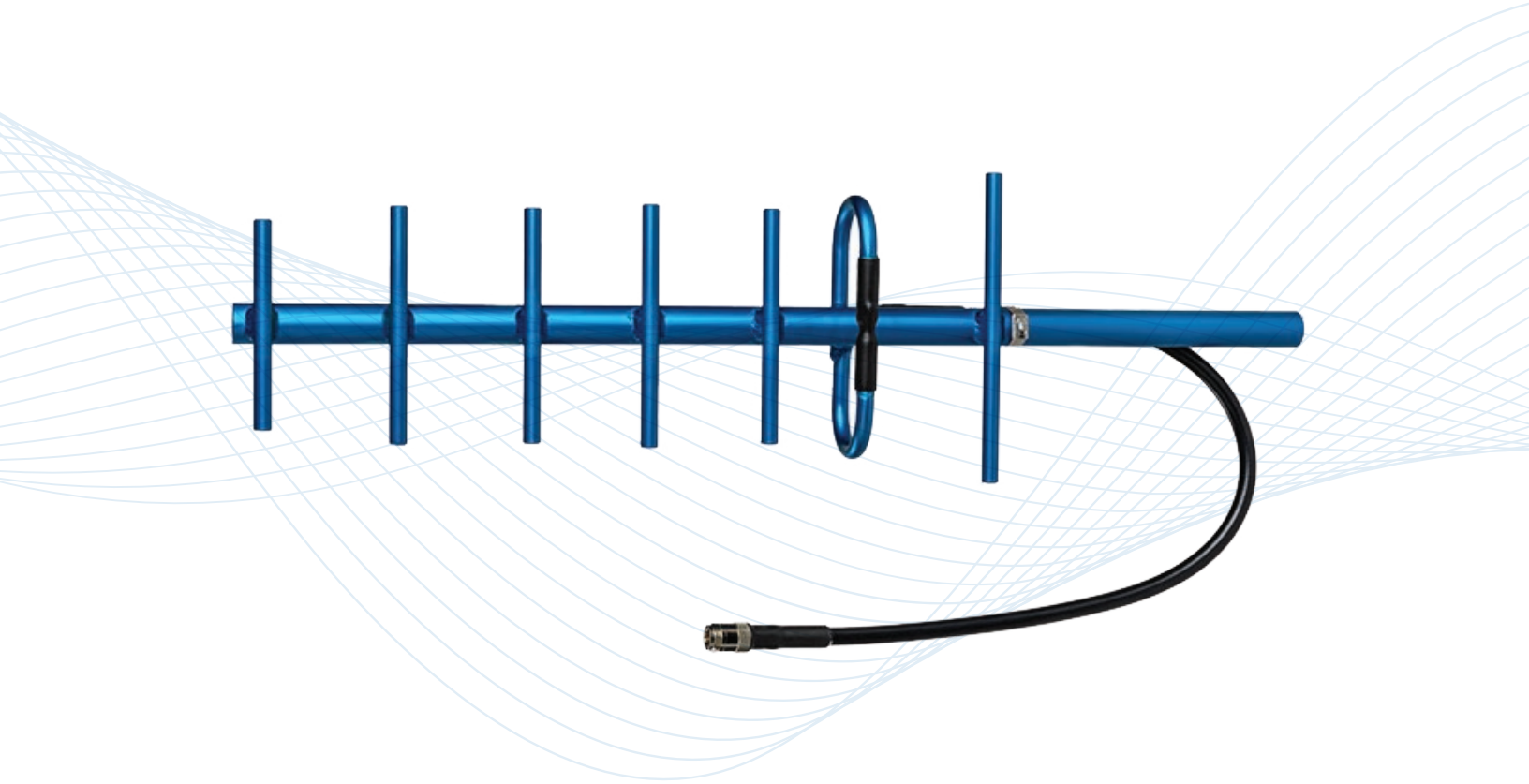
Mechanical and Environmental Specifications

Models	Dimensions	Weight	Housing Material	Rated Wind
BOA9025	2 OD x 55 in (5 x 139.7 cm)	5.0 lbs	Fiberglass	250 watts
BOA9028	2 OD x 68 in (5 x 172.7 cm)	6.0 lbs	Fiberglass	250 watts
BOA90211	2 OD x 122 in (5 x 309.9 cm)	10.0 lbs	Fiberglass	250 watts
BOA4357	2 OD x 83 in (5 x 210.8 cm)	7.0 lbs	Fiberglass	250 watts
BOA2177	2 OD x 151 in (5 x 383.5 cm)	12.0 lbs	Fiberglass	250 watts

Marathon Yagi Antennas

ISM/LoRa/LPWAN Antennas - Yagi

BMYD Series



Description

Premium quality, superior strength, 700/800/900 MHz series antennas for Industrial IoT applications

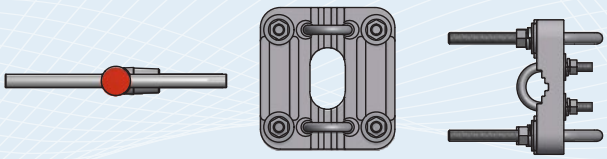
Technologies

- ISM
- LoRa

Features

- Optimum strength – Elements and boom are made from aircraft quality 6061-T6 aluminum
- Durable – Antenna is anodized for corrosion resistance and aesthetic appearance
- Ease of connection – Supplied with a 2' pigtail (RG213) and N Female connector
- Withstands extreme weather conditions – Temperature range -40°C to +85°C; wind survival rating ≥ 200 mph

BWC1001 Mount



BWC1001 Mount

Marathon Yagi Antennas

ISM/LoRa/LPWAN Antennas - Yagi

PCTEL's BMYD Yagi series is engineered to meet the requirements of a high gain, broadband, premium quality antenna. The antenna is manufactured using high strength 6061-T6 aluminum, and all elements are welded to the boom. The dipole design has an integral feed line welded to the boom for extra strength and electrical conductivity, and to eliminate misalignment or fastener problems.

Features

- Frequency range: 700/800/900 MHz
- Elements and boom are manufactured from aircraft quality 6061-T6 aluminum for optimum strength
- Antenna is anodized for aesthetic appearance and corrosion resistance
- Antenna is supplied with a 2' pigtail (RG213) and N Female connector
- Temperature range -40°C to +85°C
- Wind survival rating ≥ 200 mph

Certifications

RoHS COMPLIANT

SPECIFICATIONS

Marathon Yagi Antennas

ISM/LoRa/LPWAN Antennas - Yagi

Standard Configurations

Model	Cables	Connector	Elements	Mount
BMYD745K	2 ft RG213	N Female	7	BWC1001 Clamp bracket for 1/2"-7/8" diameter yagis. Mounts to masts 1.25"-2.4" OD (included with all models)
BMYD806G	2 ft RG213	N Female	3	
BMYD806K	2 ft RG213	N Female	7	
BMYD806M	2 ft RG213	N Female	11	
BMYD806O	2 ft RG213	N Female	18	
BMYD890G	2 ft RG213	N Female	3	
BMYD890K	2 ft RG213	N Female	7	
BMYD890M	2 ft RG213	N Female	11	
BMYD890O	2 ft RG213	N Female	18	

Electrical Specifications - RF Antenna

Model	Frequency Range	Gain	Azimuth Half Power Beamwidth	Elevation Half Power Beamwidth	Front to Back Ratio	Maximum Power	Nominal Impedance
BMYD745K	745-806 MHz	10 dBd	56°	47°	20 dB	200 watts	50 ohms
BMYD806G	806-896 MHz	6.5 dBd	100°	62°	15 dB	200 watts	50 ohms
BMYD806K	806-896 MHz	10 dBd	60°	46°	20 dB	200 watts	50 ohms
BMYD806M	806-896 MHz	12 dBd	44°	38°	20 dB	200 watts	50 ohms
BMYD806O	806-896 MHz	14 dBd	36°	30°	25 dB	200 watts	50 ohms
BMYD890G	890-960 MHz	6.5 dBd	100°	62°	15 dB	200 watts	50 ohms
BMYD890K	890-960 MHz	10 dBd	56°	46°	20 dB	200 watts	50 ohms
BMYD890M	890-960 MHz	12 dBd	40°	34°	20 dB	200 watts	50 ohms
BMYD890O	890-960 MHz	14 dBd	32°	26°	25 dB	200 watts	50 ohms

Mechanical and Envornmental Specifications

Model	Dimensions*	Weight	Cross Sectional Area	Lateral Thrust @ 150 mph	Lateral Thrust Bending Moment @ 150 mph	Lateral thrust @ 100 mph with 1/2" ice
BMYD745K	26" x 7.5"	2.2 lbs (1.0 kg)	0.28 sq ft	19.7 lbs	18.3 lb-ft	28.1 lb
BMYD806G	12" x 6.5"	1.5 lbs (0.7 kg)	0.106 sq ft	6.24 lbs	2.16 lb-ft	8.84 lb
BMYD806K	24" x 6.5"	2 lbs (0.9 kg)	0.223 sq ft	14.4 lbs	12.1 lb-ft	19.4 lb
BMYD806M	36" x 7.2"	2.1 lbs (.95 kg)	0.347 sq ft	14.4 lbs	12.1 lb-ft	19.4 lb
BMYD806O	60" x 7"	3.3 lbs (1.5 kg)	0.618 sq ft	51.5 lbs	108 lb-ft	63.7 lb
BMYD890G	12" x 6.75"	1.4 lbs (.64 kg)	0.103 sq ft	6.2 lbs	2.0 lb-ft	7.2 lb
BMYD890K	23.9" x 6.75"	2.1 lbs (.95 kg)	0.219 sq ft	16.8 lbs	14.1 lb-ft	24.3 lb
BMYD890M	36" x 6.75"	2.5 lbs (1.1 kg)	0.332 sq ft	26.7 lbs	35.5 lb-ft	35.5 lb
BMYD890O	63" x 6.6"	3.6 lbs (1.6 kg)	0.624 sq ft	45.5 lbs	119 lb-ft	50.6 lb

** Dimension do not include antenna cable.*

5G FR1 Multiband Base Station Omnidirectional Antenna with GNSSL125

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Base Station

BOA5G2X2L125PTNM

Description

5G FR1 multiband antenna with advanced GPS LNA technology for mobile data and video commnunications.

Technologies

- 5G FR1
- Cellular
- GSM
- PCS
- Wi-Fi

Features

- Wideband coverage
- High rejection GPS LNA technology
- Dual port MIMO design
- High quality low loss cable and connectors
- Easy to install
- Rugged, UV-resistant fiberglass housing

5G FR1 Multiband Base Station Omnidirectional Antenna with GNSSL125

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Base Station

The BOA5G2X2L125PTNM multiband antenna utilizes PCTEL's broadband element technology to achieve superior bandwidth performance. This platform offers multiband coverage, an easy-to-install design with ruggedized materials to provide maximum durability, and performance for mobile data and video communications.

Features

- Multiband coverage – Cellular, GSM, PCS, WiFi
- Versatile – Multiple network compatibility
- Powerful coverage – Dual port MIMO design, each with full broadband coverage
- Top quality – High performance, low loss cable and connectors
- Easy installation – Collar mount for pipes up to 1.66 inches OD
- Rugged – UV-resistant; tough fiberglass housing

Certifications

RoHS COMPLIANT

SPECIFICATIONS

5G FR1 Multiband Base Station Omnidirectional Antenna with GNSSL125

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Base Station

Standard Configuration

Model	Cables	Connector[1]	Mount
BOA5G2X2L125PTNM	PTFE RG58	N-Type Male	Collar mount (included) to fit schedule 40 (1.38-inch ID) or schedule 80 (1.278-inch ID) pipe sizes (pipe not included)

Electrical Specifications - RF Antenna

Frequency Range (MHz)	Peak Gain (dBi)	VSWR	Average Power (watts)	Nominal Impedance (ohms)	Polarization
617 - 960	3.5	< 2.0:1	50	50	Vertical, linear x 2
1710 - 2700	4	< 2.0:1			
3200 - 4200	4.5	< 2.25:1			
4900 - 6000	3.5	< 2.5:1			

Electrical Specifications - GNSS Antenna

Specification	Measurement
LNA Gain	28dB ± 3dB
Nominal Impedance	50 ohms
Polarization	Right Hand Circular
ESD Protection	>15kV
VSWR	<2.0:1 (typical)
Noise Figure	3.0 dB (typical)
DC Voltage	2.5 - 12.0 VDC
DC Current	37 mA (typical) <50 mA (maximum)
Out-of-Band Rejection	<1050 MHz >80 dB <1450 MHz >70dB <1125 MHz >30 dB >1690 MHz >30dB >1350 MHz >70 dB >1730 MHz >80dB

Mechanical and Environmental Specifications

Specification	Measurement
Dimensions	3.25" OD x 22.57" H in (8.26 OD x 57.33 H cm)
Weight	4.3 lbs
Package Weight	5.3 lbs
Housing Material	Black, UV-stable fiberglass
Temperature Range	-40°F to +185°F (-40°C to +85°C)
Ingress Protection	IP54

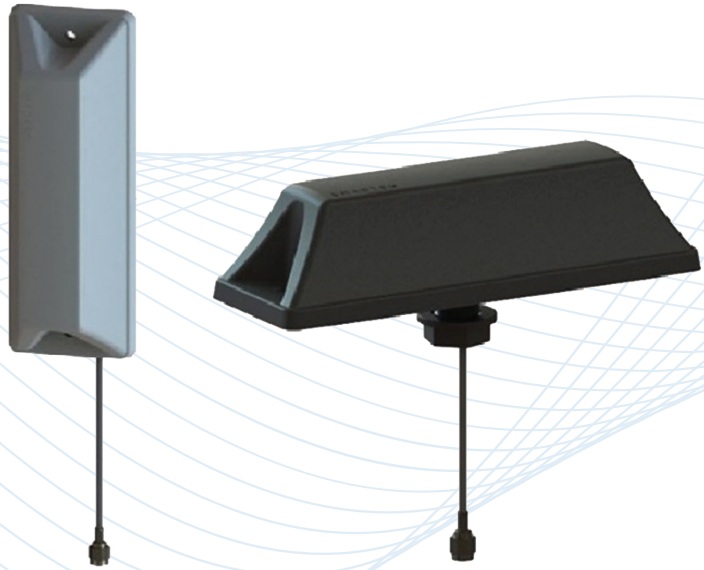
[1] *Consult customer service for other connector options.*

EV CHARGING STATION ANTENNA SOLUTIONS

LP70x-Series Low Profile Multiband Antennas

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Low Profile Whipless

710379, 710406, 710407



Description

Low-profile, multiband whipless antenna that delivers reliable LTE connectivity.

Technologies

- 2G / 3G / 4G LTE

Features

- Low profile, ergonomic style with sophisticated engineering
- Easy installations
- Combined 2G/3G/4G/LTE functionalities in one single housing
- Ground plane independent

LP70x-Series Low Profile Multiband Antennas

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Low Profile Whipless

The LP70x-Series by Smarteq, a PCTEL company, is a low-profile multiband antenna that operates simultaneously in the 698-960 MHz and 1710-2700 MHz bands with omnidirectional performance. It is designed to be a surface mount that performs well on metallic or non-metallic surfaces. The low-profile housing gives a high degree of vandal resistance, making it perfect for M2M and IoT applications where reliable communications are required.

Features

- Radio system: 2G/3G/4G
- Frequency: 698-960/1710-2690MHz
- Gain: 1.5 / 2.5dBi
- Color: Black or Gray
- Can be mounted on metal and non conductive surfaces
- LP701: Screw mounted / IP65
- LP702: Hole mounted / IP65, when installed
- DC shorted
- IATF 16949

Applications

- Smart Metering
- Smart City
- EV-chargers
- Vending machines
- Parking meters

Certifications

RoHS COMPLIANT

QUALITY SYSTEM CERTIFICATION DNV·GL IATF 16949

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

SPECIFICATIONS

LP70x-Series Low Profile Multiband Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Low Profile Whipless

Standard Configurations

Model	Cable	Cable Length	Connector	Housing Color
710379 (LP701)	RG316	1.5m	SMA-male	Grey
710406 (LP701)	RG316	1.5m	SMA-female	Grey
710407 (LP702)	RG316	1.5m	SMA-male	Black

Electrical Specifications – RF Antennas (All Models)[1]

	VSWR		Max. 3D Gain		Efficiency						
Frequency Ranges	In Free Space	On Metal Plane	In Free Space	On Metal Plane	In Free Space	On Metal Plane	**Nominal Impedance**	**Polarization**	**Radiation Pattern**	**Max Power[2]**	**DC Short**
698 - 760 MHz	< 2.5:1	< 2.5:1	1.5 dBi	2.5 dBi	75%	65%	50Ω	Linear	Omni-directional	20 watts	Yes
790 - 960 MHz	< 2.2:1	< 2.2:1	2.2 dBi	5 dBi	80%	80%					
1710 - 2690 MHz	< 2.0:1	< 2.0:1	4.8 dBi	6 dBi	75%	70%					

Mechanical and Environmental Specifications (All Models)

Physical

Dimensions (L x W x H)		168 x 56 x 42 mm
Weight		~135g
Color		Grey, black
Installation	**LP701**	2 screws/adhesive
	LP702	Center screw/adhesive. Material thickness ≤ 3.5mm, installation hole Ø 16-19mm
Operating / Storage Temperature		-40°C to +85°C
UL Certified		Tested according to EN45545:2013
IP Class		IP65

[1] Antenna measurement performed with 0.5 meter RG316 cable.
[2] Max power measured at ambient temp. of 25°C

SmartBlade™ Omnidirectional, Multiband Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

710376, 710399, 710408, 710418

Description

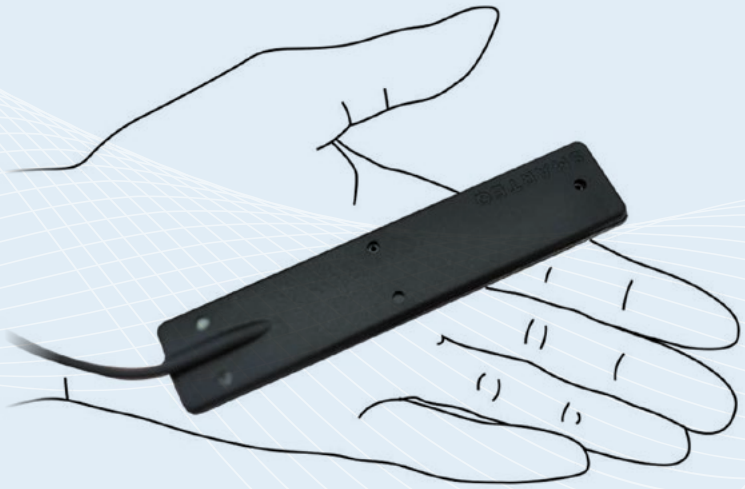
Slim and compact cellular antenna that delivers reliable connectivity.

Technologies

- 2G/3G/4G/5G

Features

- 5G ready
- Easy installations with adhesive mount on glass or non-conductive surface
- Slim and flexible design made it suitable for curved surface mounting



SmartBlade™ Omnidirectional, Multiband Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

SmartBlade™ by Smarteq, a PCTEL company, is an omnidirectional, multiband antenna with a slim and discreet design. It is 5G ready and designed to meet a constant need for improved and reliable communications in M2M, vehicle, and energy applications.

Features

- Easy installations with adhesive mount on glass or non-conductive surface
- Radio systems: 2G/3G/4G/5G
- Frequency ranges: 698-960MHz/1420-1520MHz/1710-2690MHz/3400-3800MHz
- Gain: 1.5 – 5.5dBi
- Color: Black or Grey
- IP67

Certifications

RoHS COMPLIANT

QUALITY SYSTEM CERTIFICATION DNV·GL IATF 16949

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

Applications

- Off-Highway Vehicle (OHV)
- ECU/Gateway
- M2M
- Public Safety
- Smart Metering
- Smart City
- EV-chargers
- Vending machines
- Parking meters

SPECIFICATIONS

SmartBlade™ Omnidirectional, Multiband Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

Standard Configurations

Model	Cable	Cable Length	Connector	Housing Color
710376	RG316	2.5m	FME-female	Black
710418	RG316	2.5m	SMA-male	Black
710399	RG316	0.5m	SMA-male	Black
710408	RG316	1.5m	RP SMA-male	Grey

Electrical Specifications – RF Antennas (All Models)[1]

Frequency Ranges	VSWR	Max. 3D Gain	Efficiency	Nominal Impedance	Polarization	Radiation Pattern	Max. Power[2]
698 - 780 MHz	< 2.2:1	1.5 dBi	55%	50Ω	Linear	Omnidirectional	10W
790 - 960 MHz	< 2:1	2.5 dBi	68%				
1427 - 1510 MHz	< 2:1	3 dBi	70%				
1710 - 2690 MHz	< 2:1	4.5 dBi	62%				
3300 - 4200 MHz	< 2:1	5.5 dBi	62%				
4400 - 5000 MHz	< 3:1	3 dBi	45%				

Mechanical and Environmental Specifications (All Models)

Physical

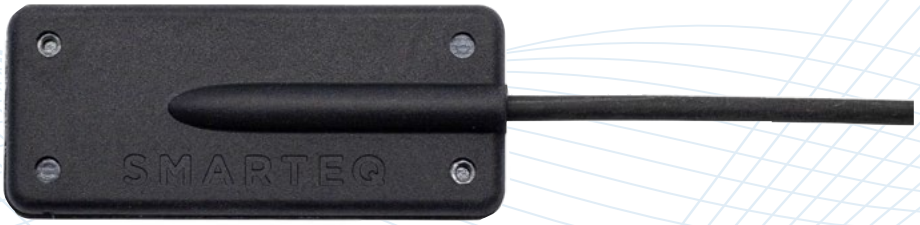
Dimensions (L x W x H)	114 x 24 x 4.4 (incl. 1.3mm 3M adhesive)
Weight	~20g (incl. 20cm cable with SMA connector)
Material	Dryflex, FR4
Operating / Storage Temperature	-40°C to +85°C
IP Class	IP65

[1] All RF data are performed on a 5mm thick glass with a 20cm long RG316 cable.
[2] Max power measured at ambient temp. of 25°C

MiniBlade Omnidirectional Wi-Fi 6E, CBRS 5G Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

710599, 710629, 710630, 710631



Description

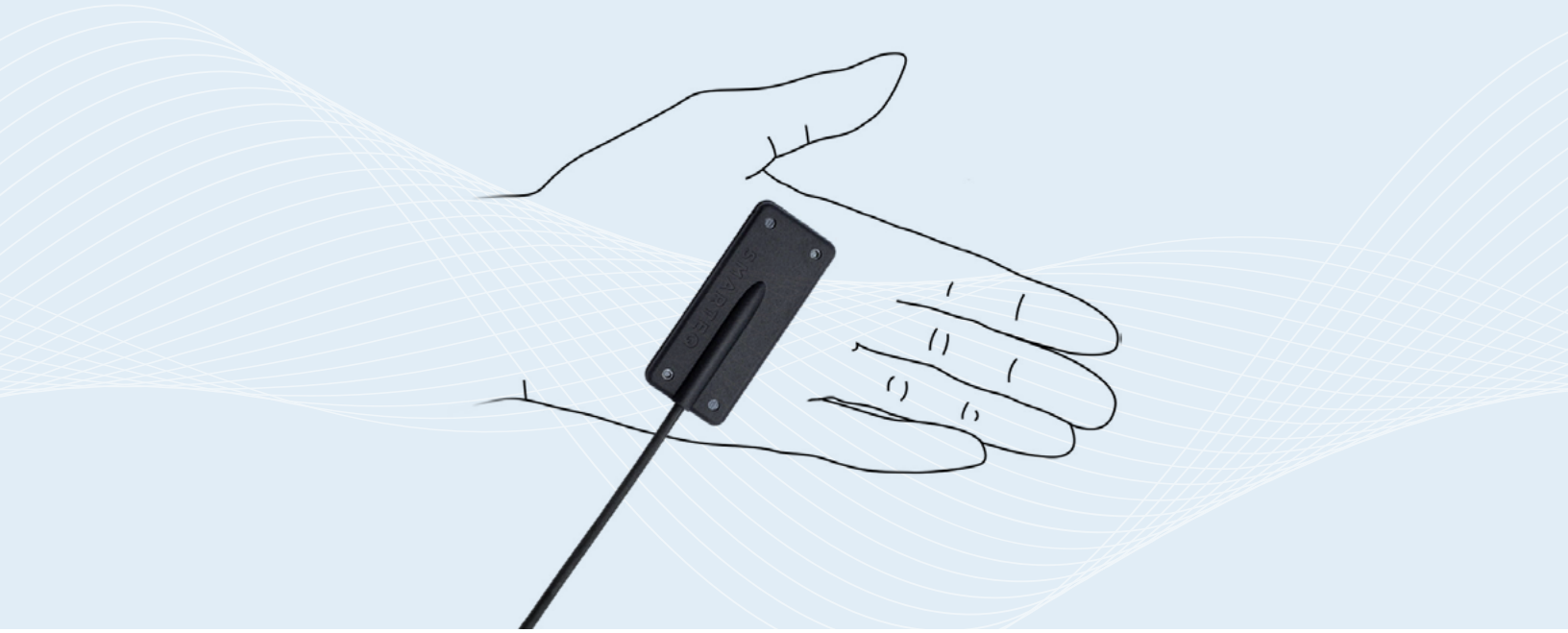
Slim and compact cellular antenna that delivers reliable connectivity.

Technologies

- 2.4 / 3.5 / 5 / 6GHz
- Wi-Fi 6E
- Bluetooth®

Features

- 5G ready
- Easy installations with adhesive mount on glass or non-conductive surface
- Slim and flexible design made it suitable for curved surface mounting



MiniBlade Omnidirectional Wi-Fi 6E, CBRS 5G Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

MiniBlade by Smarteq, a PCTEL company, is an adhesive mounted omnidirectional ultra-wideband antenna capable of supporting radio systems operating in the 2400 to 7200MHz spectrum. Wi-Fi 6E, Bluetooth®, V2X and 5G ready, the MiniBlade antenna is the perfect choice for applications such as indoor Wi-Fi coverage, internet onboard buses, EV-chargers, Wi-Fi zones, and Wi-Fi supported devices. Its superior RF performance enables high connectivity and throughput.

Features

- Wi-Fi 6E, Bluetooth®, V2X and 5G ready
- 2400 - 7200MHz
- Easy installations with adhesive mount on glass or non-conductive surface
- Slim and flexible design made it suitable for curved surface mounting
- IATF 16949

Applications

- Off-Highway Vehicle (OHV)
- ECU/Gateway
- Smart Metering
- Smart City
- EV-chargers
- Industrial IoT

Certifications

RoHS COMPLIANT

QUALITY SYSTEM CERTIFICATION DNV·GL IATF 16949

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

SPECIFICATIONS

MiniBlade Omnidirectional Wi-Fi 6E, CBRS 5G Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

Standard Configurations

Model	Cable	Cable Length	Connector	Housing Color
710599	RG316	1.5m	SMA-male	Black
710629	RG316	0.5m	SMA-male	Black
710630	RG316	0.2m	SMA-male	Black
710631	RG316	0.5m	RP SMA-male	Black

Electrical Specifications – RF Antennas (All Models)*

Frequency Ranges	VSWR	Max. 3D Gain	Efficiency	Nominal Impedance	Polarization	Radiation Pattern
2400 - 2485 MHz	2:1	3.8dBi	79%	50Ω	Linear	Omnidirectional
3400 - 3800 MHz	2:1	5dBi	71%			
4900 - 5050 MHz	2:1	7dBi	64%			
5925 - 7125 MHz	3:1	5dBi	33%			

Mechanical and Environmental Specifications (All Models)

Physical	
Dimensions (L x W x H)	55.6 x 23.6 x 6.6mm (incl. 1.1mm 3M adhesive)
Weight	~ 35g (incl. 1.5m cable with SMA connector)
Material	Dryflex, FR4
Operating / Storage Temperature	-40°C to +85°C
IP Class	IATF 16949

Extension Cables

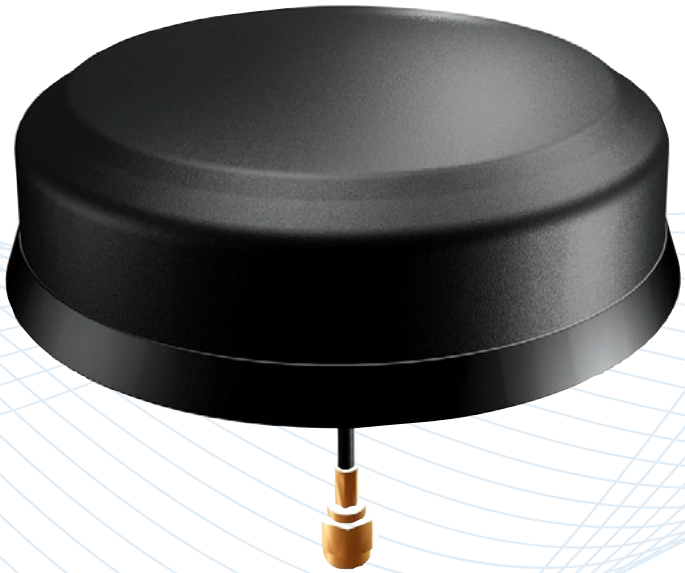
Part Number	Cable Length	Connector	Gender	Color
LL58 Cable				
201417-1	3m	SMA	Female/Male	White
201417-2	5m	SMA	Female/Male	White
201417-3	10m	SMA	Female/Male	White
201417-7	5m	SMA	Female/Male	Black
Low Loss Cable				
707220	3m	SMA	Female/Male	Black
710298	5m	SMA	Female/Male	Black
201417-3	10m	SMA	Female/Male	Black

** RF data with the antenna mounted on plastic 5mm thick and 20cm long cable*

SmartDisc™ Low Profile Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

710211, 710212, 710213, 710214



Description

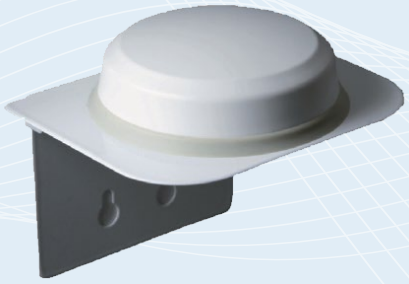
Low-profile, whipless cellular antenna that delivers reliable RF performance.

Technologies

- 2G/3G/4G
- NB IoT

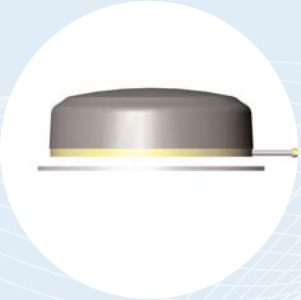
Features

- Easy installations with hole or adhesive mount
- Durable design for a range of M2M, IoT, and vehicle installations
- Patented technology



707154 – Optional white angled mounting bracket

Hole mount



Adhesive mount

SmartDisc™ Low Profile Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

SmartDisc™ by Smarteq, a PCTEL company, is a low-profile, whipless antenna with durable design. The antenna is ground plane independent enabling flexible and easy installation. It is ideal for smart city, smart metering and vehicle installations.

Features

- Discreet design with hole or adhesive mount
- Radio system: 2G/3G/4G
- Frequency: 790-960/1710-2690MHz and NB-IoT
- Gain: 2.15 dBi / 3.15 dBi
- Color: Black or White
- IP67
- DC-shorted
- IATF 16949

Applications

- Off-Highway Vehicle (OHV)
- ECU/Gateway
- M2M
- Public Safety
- Smart Metering
- Smart City
- EV-chargers
- Vending machines
- Parking meters

Certifications

RoHS COMPLIANT

QUALITY SYSTEM CERTIFICATION DNV·GL IATF 16949

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

SPECIFICATIONS

SmartDisc™ Low Profile Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G) - Omnidirectional

Standard Configurations

Model	Cable	Cable Length	Connector	Housing Color	Mount
710211	RG316, brown	2.5m	SMA-male	Black	Hole mount with center screw or adhesive mount
710212	RG316, brown	2.5m	SMA-male	White	
710213	RG316, brown	0.5m	SMA-male	Black	
710214	RG316, brown	0.5m	SMA-male	White	

Electrical Specifications – RF Antennas (All Models)

Frequency Ranges	VSWR	Peak Gain	Nominal Impedance	Polarization	Radiation Pattern	Max. Power*
790 - 960 MHz	3:1	2.15 dBi	50Ω	Linear, vertical	Omnidirectional	10W
1710 - 2690 MHz	3:1	3.15 dBi				

Mechanical and Environmental Specifications (All Models)

Physical	
Dimensions (D x H)	96 x 26mm
Weight	~190g
Material	PC/PBT/Aluminum alloy
Accessories	707154 – White angled bracket 201411 – Vertical bracket
Operating / Storage Temperature	-40°C to +85°C
IP Class	IP67

Extension Cables

Part Number	Cable Color	Installation Type	Cable Length (m)	Connector Type	Gender
710213	Black	Standard screw	0,5	SMA	Male
710214	White	Standard screw	0,5	SMA	Male
710215	Black	Adhesive tape	0,5	SMA	Male
710218	White	Adhesive tape	0,5	SMA	Male
710211 / 707201	Black	Standard screw	2,5	SMA	Male
710212	White	Standard screw	2,5	SMA	Male
710221	Black	Adhesive tape	2,5	SMA	Male
710219	White	Adhesive tape	2,5	SMA	Male
710237	Black	Standard screw	5,0	SMA	Male
710216	Black	Standard screw	2,5	FME	Female
710232	Black	Long screw	2,5	SMA	Male
710279	White	Standard screw	0,5	N-type	Female
710425	White	Long screw	2,5	SMA	Male
710201	Black	Standard screw	1,0	FAKRA	Female

AllDisc-S Small Cellular Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G)

710258, 710255

Description

Compact, low-profile, whipless cellular antenna with durable design that delivers optimal performance and support of multi-carrier voice and data networks.

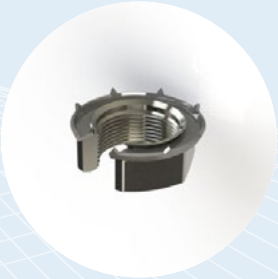
Technologies

- 2G / 3G / 4G / 5G
- NB-IoT

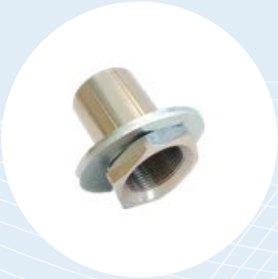
Features

- Durable, low-profile design
- 5G ready
- Easy to install
- IP6K9K class
- Cable approved acc ECE-R118
- IATF 16949

710452 – AllDisc bracket



710598 – Slitted nut



710206 – Extension nut to be used on AllDisc with long screw enabling installation thickness 25-50mm

AllDisc-S Small Cellular Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G)

The AllDisc-S Small by Smarteq, a PCTEL company, is a 5G-ready, low-profile antenna platform with durable design. Its small physical size enables a flexible and easy installation, making it perfect for Smart City, Smart Metering, EV charging, M2M applications, and load handling. The superior RF performance enables high connectivity and throughput. The AllDisc-S has been successfully tested for durability according to Volkswagen automotive test standards.

Features

- Cellular: 617-960 MHz,1710-2690 MHz, and 3300-3800 MHz
- 5G ready
- IP6K9K class
- Cable approved according to ECE-R118
- Designed in Sweden with design registration

Certifications

RoHS COMPLIANT

QUALITY SYSTEM CERTIFICATION DNV·GL IATF 16949

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

Applications

- Off-Highway Vehicle (OHV)
- ECU/Gateway
- M2M
- Pubic safety
- Smart Metering
- Smart City
- EV-chargers
- Vending machines
- Parking meters

SPECIFICATIONS

AllDisc-S Small Cellular Antenna

Cellular Antennas (5G, LTE, CBRS, 3G, 2G)

Standard Configurations

Model	Elements	Cable	Cable Length	Connector	Housing Color	Mount	Accessories
710258	LTE/5G	RG316, grey	0.5m	SMA-Male, Other connector type upon request	Black	Hole mount with center screw and adhesive tape	710452 – AllDisc bracket 710598 – Slitted nut 710206 – Extension nut
710255	LTE/5G	RG316, grey	2.5m		Black		

Electrical Specifications – RF Antennas (All Models)

Frequency Ranges	VSWR	Peak Gain[1]	Efficiency	Nominal Impedance	Polarization	Radiation Characteristics	Maximum Power	DC Short
LTE / 5G								
617 - 698 MHz	≤ 4.5:1	1 dBi	50%	50Ω	Linear, vertical	Omnidirectional	10 watts	Yes
698 - 880 MHz	≤ 2:1	4.5 dBi	89%					
880 - 960 MHz	≤ 2.5:1	5 dBi	89%					
1710 - 1880 MHz		5 dBi	89%					
1710 - 2690 MHz	≤ 2.5:1		89%					
1920 - 2170 MHz		4.5 dBi	89%					
2500 - 2690 MHz		3.5 dBi	88%					
3400 - 3800 MHz	≤ 2.5:1	7 dBi	82%					

Mechanical and Environmental Specifications

Physical	
Dimensions (D x H)	96 x 55 mm
Weight	~150g
Radome Construction	PC/PBT/Aluminum alloy
Operating / Storage Temperature	-40°C to +85°C
IP Class	IP6K9K

Extension Cables

Part Number	Cable Length	Connector	Gender	Color
LL58 Cable				
201417-1	3m	SMA	Female/Male	White
201417-2	5m	SMA	Female/Male	White
201417-3	10m	SMA	Female/Male	White
201417-7	5m	SMA	Female/Male	Black
Low Loss Cable				
707220	3m	SMA	Female/Male	Black
710298	5m	SMA	Female/Male	Black
201417-3	10m	SMA	Female/Male	Black

[1] *Peak Gain values measured on ground plane (excluding cable)*

5G NR (FR1), Wi-Fi 6E Low Profile Vertical Antenna

Cellular, Wi-Fi, Bluetooth®, & BLE Antennas - Low Profile Whipless

BMLPV5000

Description

Attractive multiband antenna with low profile, compact housing antenna supports the world's leading 5G NR devices and is ideal for indoor or outdoor applications requiring minimum antenna visibility. The antenna also covers Wi-Fi 6E frequencies for maximum application flexibility.

Technologies

- 5G Cellular
- Wi-Fi 6E
- Bluetooth®

Features

- Attractive, low-profile design
- Multiband coverage
- Environmentally tested to MIL-STD-810-G, SAE J1455 and IEC 68-2-32
- N female termination option (-VP) available

GMLFML195C or GMLFML240C
high efficiency magnetic mount
(sold separately)

MLFML195C or MLFML240C
MLF high efficiency mount
(sold separately)

5G NR (FR1), Wi-Fi 6E Low Profile Vertical Antenna

Cellular, Wi-Fi, Bluetooth®, & BLE Antennas - Low Profile Whipless

The BMLPV5000 low profile vertical antenna supports the high speed requirements of complex RF communication systems used for Intelligent Transportation Systems (ITS), and IIoT applications. This antenna supports the world's leading 5G NR or Wi-Fi 6E devices supporting frequencies from 600 MHz to 7.1 GHz frequencies. It features an attractive, compact housing that makes the antenna ideal for indoor or outdoor applications requiring minimum visibility to the antenna. PCTEL's high efficiency permanent mount is recommended for most efficient performance.

Features

- Attractive, low-profile design
- Multiple band coverage with no tuning required
- Can be used for mobile and fixed base applications
- Environmentally tested to MIL-STD-810G
- N female termination option (-VP) available

Certifications

RoHS COMPLIANT

SPECIFICATIONS

5G NR (FR1), Wi-Fi 6E Low Profile Vertical Antenna

Cellular, Wi-Fi, Bluetooth®, & BLE Antennas - Low Profile Whipless

Standard Configurations

Model	Cable	Connector[1]	Mount	Housing Color
BMLPV5000	Pro-Flex™ Plus 195 or PFP240 high frequency cables are recommended with this antenna. Cable assemblies or mount/cable assemblies are sold separately.	Various connector options are offered with PCTEL high frequency mounts (sold separately)	For optimal performance, use higher frequency rated mounts (e.g. MLFML195C or GMLFML195C). Mounts sold separately.	Black
BMLPV5000-VP		N Female	Built-in N connector accommodates surfaces up to 1/2-in thick	Black

Electrical Specifications – All frequencies

Frequency Ranges	Max. Gain[1]	Maximum Power	Polarization	Nominal Impedance	VSWR[1]	Average Efficiency
618 - 960 MHz	2.6 dBi	150 watts	Vertical, linear	50 ohms	< 2.0	60%
1427 - 1518 MHz	-0.2 dBi				< 2.5	30%
710 - 2170 MHz	1.0 dBi				< 2.5	46%
2300 - 2700 MHz	1.6 dBi				< 3.0	61%
3300 - 4200 MHz	2.3 dBi				< 1.5	31%
4400 - 5000 MHz	1.2 dBi				< 3.0	26%
4900 - 5985 MHz	3.1 dBi				< 2.5	40%
5925 - 7125 MHz	9.6 dBi				< 2.5	68%

Mechanical and Environmental Specifications

Model	Dimensions	Weight (Mass)	Temperature Range	Ingress Protection[2]	Housing Color
BMLPV5000	2.36″ x 1.73″ (60 x 44 mm)	0.29 lbs (0.13 kg)	-40°F to +158°F (-40°C to +70°C)	IP67[3]	Black
BMLPV5000-VP	0.1 lbs (50 g)	0.31 lbs (0.14 kg)			

[1]Measured on a 1x1 ft ground plane, when installed on GMLFML195 high frequency magnetic mount with 12-ft Pro-Flex Plus 195 cable. Gain is ground plane dependent.
[2]When installed per PCTEL installation instructions on a roof top surface.

Coach™ II 5G Cellular GNSS Multiband Antenna

Combination Antenna - GNSS, 5G Cellular, and Wi-Fi

GL125-DLTEMIMO-SM

Description

5G cellular multiband antenna with multi-GNSS compatibility and 802.11ac MIMO connectivity for Positive Train Control (PTC) networks and high precision location tracking.

Meets EN 50155:2007 requirements for rail and transit installations.

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Technologies

- 5G Cellular
- Wi-Fi
- GNSS L1, L2, L5
- GLONASS L1, L2, L3
- GALILEO E5A/E5B/E6
- BEIDOU B1, B2, B3
- QZSS L6

Features

- Covers global GNSS systems
- Proprietary filtering design allows wideband coverage for all GNSS frequencies
- Easy installation and/or replacement
- IP67 compliant design protects against water or dust ingress
- EN 50155:2007; AAR compliant

Coach™ II 5G Cellular GNSS Multiband Antenna

Combination Antenna - GNSS, 5G Cellular, and Wi-Fi

PCTEL's Coach™ II GL125-DLTEMIMO-SM multiband antenna meets the stringent requirements of complex RF communication systems in rail transportation applications. This antenna features two 4G LTE elements that facilitate the high-speed data transmissions needed in dense RF environments used for Positive Train Control (PTC) networks. The platform incorporates dual band 802.11ac Wi-Fi MIMO connectivity with two Wi-Fi elements. PCTEL's proprietary high-rejection, multi-constellation GNSS L1 L2 L5 technology is included for high precision location tracking. This antenna platform also meets EN 50155:2007 and AAR requirements for ITS rail and roadway applications.

Features

- Full multi-GNSS compatibility – covers global GNSS Systems
- Superior out-of-band rejection – proprietary filtering design allows wideband coverage for all GNSS frequencies
- Easy installation and/or replacement – metal stud mount with slotted jam nut provides single cable exit
- Withstands severe environmental conditions – IP67 compliant design with custom overmolded gasket protects against water or dust ingress
- Meets EN 50155:2007 and AAR certification requirements for rail applications

Certifications

RoHS COMPLIANT

SPECIFICATIONS

Coach™ II 5G Cellular GNSS Multiband Antenna

Combination Antenna - GNSS, 5G Cellular, and Wi-Fi

Standard Configurations

Model	Elements	Cable	Connector	Mount
GL125-DLTEMIMO-SM	LTE (All Ports) Wi-Fi (All Ports) GNSS	Two 2-ft RG-316 Two 2-ft RG-316 One 2-ft RG-316	SMA Plug (Male) Reverse Polarity SMA Plug (Male) SMA Plug (Male)	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	Max SWR[1]	Gain (dB)[1]			Efficiency[1]		Polarization	Nominal Impedance	Maximum Power
			Max	Typical	Range (±)	Avg	Range (±)			
LTE										
600	698	< 3.5	2.5	1.5	1.1	55%	7%	Linear, vertical	50 ohms	25 watts
698	802	< 3.0	2.5	2.0	0.5	55%	10%			
824	960	< 2.5	1.8	1.4	0.9	55%	10%			
1710	2200	< 2.5	5.5	3.5	2.0	65%	11%			
2300	2690	< 2.0	6.2	5.1	0.6	68%	9%			
3400	3800	< 2.0	4.1	3.1	1.0	55%	15%			
Wi-Fi										
2400	2500	< 2.0	5.0	2.7	2.2	55%	5%	Linear, vertical	50 ohms	25 watts
4900	5925	< 2.5	6.0	4.0	2.0	45%	25%			

Minimum Isolation (dB)

Elements	LTE Primary (1&3)		Wi-Fi	
LTE	600-960 MHz	11.5	600-960 MHz	20.0
	1.71-2.7 GHz	23.0	1.71-2.7 GHz	17.0
	3.3-3.8 GHz	24.0	3.3-3.59 GHz	35.0
Wi-Fi			2.4-2.5 GHz	19.0
			4.9-5.9 GHz	30.0

[1] *Measurements taken with 3-ft cables and no ground plane.*

SPECIFICATIONS

Coach™ II 5G Cellular GNSS Multiband Antenna

Combination Antenna - GNSS, 5G Cellular, and Wi-Fi

Electrical Specifications – GNSS Antenna (all bands)

Specification	Measurement
Frequency Ranges	1150-1290 MHz 1500-1615 MHz
LNA Gain	28dB±3 dB
Nominal Impedance	50 ohms
Polarization	Right hand circular
ESD	> 15kV
VSWR	< 3.0 (L2-L5 bands) < 2.5 (L1 band)
Noise Figure	3.0 dB (typical)
Nominal Gain	3 dBic @ 90° -2 dBic @ 20°
DC Voltage	2.5-12.0 VDC
DC Current	37mA (typical) < 50mA (max.)
Out-of-Band Rejection	< 1050MHz > 80 dB <1450MHz > 70 dB < 1125MHz > 30 dB > 1690MHz > 30 dB > 1350MHz > 70 dB > 1730MHz > 80 dB

Electrical Specifications – GNSS Antenna

Band	Gain @ 10° Elevation	Gain @ 90° Elevation	Axial Ratio @ 90° Elevation
GPS L1	-5 dBic	2 dBic	≤ 2.5 dB
GPS L2	-6 dBic	3 dBic	
GPS L5	-7 dBic	1 dBic	
GLONASS L1	-7 dBic	0 dBic	
GLONASS L2	-8 dBic	0 dBic	
GLONASS L3	-4 dBic	3 dBic	
GALILEO E1	-5 dBic	2 dBic	
GALILEO E5	-4 dBic	3 dBic	
GALILEO E6	-4 dBic	3 dBic	
BEIDOU B1	-4 dBic	3 dBic	
BEIDOU B1-2	-4 dBic	3 dBic	
BEIDOU B2	-5 dBic	2 dBic	
BEIDOU B3	-8 dBic	0 dBic	
QZSS L6	-4 dBic	3 dBic	

Mechanical and Environmental Specifications

All Models

Dimensions (W x H)	5.1 W x 3.6 H in (130 W x 92 H mm)
Weight	2.3 lbs (1.04 kg)
Housing Material	Black, UV-Stable Rugged Thermoplastics
Temperature Range	-40°C to +85°C

Coach™ II Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi, and GNSS

GL9X1AX-SF, GL7X1AX-SF, GL4X4-SF-PLK, GL6X1AX-SF

Description

Multiband combination antenna offers a rugged design and is configurable up to 9x1ports (4x4 Cellular, 4x4 Wi-Fi 7 and GNSS). The Cellular 4x4 MIMO ports cover the LTE/5G sub 6 GHz bands down to 600 MHz. The Wi-Fi 6E 4x4 MIMO port up to 7150 MHz. This antenna platform can also be equipped with a pre-filtered GNSS antenna.

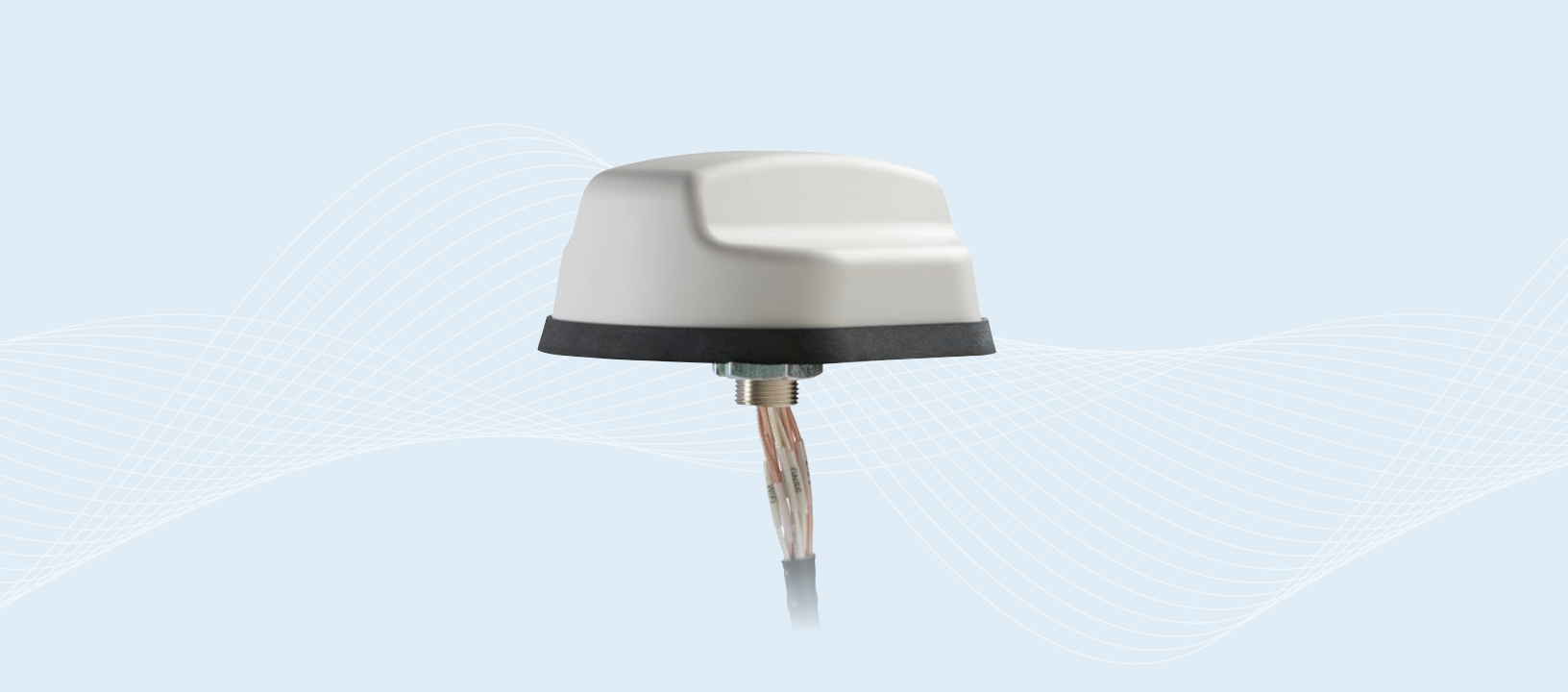
The platform meets EN 50155:2007 and AAR requirements for ITS rail and roadway applications.

Technologies

- MIMO Cellular
- MIMO Wi-Fi
- LTE
- 5G
- NB-IoT
- Wi-Fi 6E, 7
- V2X
- GNSS

Features

- Compatible with the world's leading multi-carrier cellular routers
- Superior out-of-band rejection
- Easy installation and/or replacement
- Withstands severe environmental conditions
- EN 50155:2007; AAR compliant



Coach™ II Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi, and GNSS

The Coach™ II multiband combination antenna offers a rugged design and it is configurable up to 9x1ports (4x4 Cellular, 4x4 Wi-Fi 7 and GNSS). The Cellular 4x4 MIMO ports cover the LTE/5G sub 6 GHz bands down to 600 MHz. The Wi-Fi 6E 4x4 MIMO port up to 7150 MHz. This antenna platform can also be equipped with a pre-filtered GNSS antenna.

The Coach™ II platform supports the high speed requirements of complex RF communication systems used for Intelligent Transportation Systems (ITS) and Industrial IoT applications. These low-profile, high endurance antennas feature four 5G elements compatible with the world's leading multi-carrier cellular routers that support 600 MHz to 6 GHz frequencies.

The platform meets EN 50155:2007 and AAR requirements for ITS rail and roadway applications.

Features

- Wideband coverage – 4G LTE, 5G and dual-band 802.11ac Wi-Fi coverage in a single, low-profile housing
- Superior out-of-band rejection – Proprietary filtering design allows wideband coverage for all GNSS frequencies
- Easy installation and/or replacement – Metal stud mount with slotted jam nut provides single cable exit
- Withstands severe environmental conditions – IP67 compliant design with overmolded gasket protects against water or dust ingress (when installed on sealed surface)
- Meets EN 50155:2007 and AAR certification requirements for rail applications

Certifications

RoHS COMPLIANT

SPECIFICATIONS

Coach™ II Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi, and GNSS

Standard Configurations

Model	Elements	Cable	Connector	Mount
GL9X1AX-SF	LTE (All Ports) Wi-Fi (All Ports) GNSS	Four-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195) Four-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195) One-17 feet RG-316	SMA Plug (Male) Reverse Polarity SMA Plug (Male) SMA Plug (Male)	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
GL7X1AX-SF	LTE (All Ports) Wi-Fi (All Ports) GNSS	Four-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195) Two-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195) One-17 feet RG-316	SMA Plug (Male) Reverse Polarity SMA Plug (Male) SMA Plug (Male)	
GL4X4-SF-PLK	LTE (All Ports) GNSS	Four-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195) One-17 feet RG-316	SMA Plug (Male) SMA Plug (Male)	
GL6X1AX-SF[1]	LTE (All Ports) Wi-Fi (All Ports) GNSS	Two-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195) Three-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195) One-17 feet RG-316	SMA Plug (Male) Reverse Polarity SMA Plug (Male) SMA Plug (Male)	

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	SWR[2]	Gain (dB)[3]			Efficiency[3]		Polarization	Nominal Impedance	Maximum Power
			Max	Typical	Range (±)	Avg	Range (±)			
LTE Primary (1&3)										
617	698	2.5	-0.2	-0.9	0.7	33%	3%	Linear	50 ohms	50 watts
698	802	1.9	1.1	-0.3	1.4	34%	6%			
824	960	2.0	2.1	0.6	1.6	36%	4%			
1710	2200	1.6	4.4	2.6	1.9	31%	3%			
2300	2690	1.4	4.8	2.7	2.1	29%	2%			
3400	3800	1.4	4.7	2.5	2.2	26%	1%			
5150	5950	1.3	5.8	1.9	3.9	16%	3%			
LTE Secondary (2&4)										
617	698	3.4	-1.4	-3.0	1.6	16%	8%	Linear	50 ohms	50 watts
733	802	2.0	0.0	-1.0	0.9	31%	4%			
824	960	2.7	0.0	-1.6	1.5	28%	8%			
1805	2200	1.6	1.7	0.9	0.8	29%	4%			
2300	2690	2.0	1.5	-0.5	2.0	20%	6%			
3400	3800	1.9	2.2	0.4	1.8	20%	3%			
5150	5950	1.4	2.6	1.3	1.4	16%	1%			
Wi-Fi										
2400	2500	1.3	9.1	7.2	1.9	74%	4%	Linear	50 ohms	50 watts
4900	5900	1.5	11.4	9.1	2.3	59%	14%			

[1] *This model is not dual carrier and only includes two primary LTE ports.*
[2] *Gain and efficiency measured with no cable and no ground plane.*
[3] *SWR measured with 17-ft cables and no ground plane.*

SPECIFICATIONS

Coach™ II Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi, and GNSS

Electrical Specifications – RF Antennas (continued)

Minimum Isolation (dB)[4]

Elements	LTE Primary (1&2)		LTE Primary (1&2)		Wi-Fi	
LTE Primary (1&3)	617-960 MHz	14.0	698-960 MHz	14.0	698-960 MHz	20.0
	1.71-2.7 GHz	25.0	1.71-2.7 GHz	25.0	1.71-2.7 GHz	17.0
	3.3-3.59 GHz	35.0	3.3-3.59 GHz	27.0	3.3-5.9 GHz	35.0
LTE Secondary (2&4)			698-960 MHz	18.0	698-960 MHz	22.0
			1.71-2.7 GHz	30.0	1.71-2.7 GHz	16.0
			3.3-3.59 GHz	32.0	4.9-5.9 GHz	32.0
Wi-Fi					2.4-2.5 GHz	25.0
					4.9-5.9 GHz	32.0

Electrical Specifications – GNSS Antenna

Specification	Measurement
Frequency Band	1565-1608 MHz
Amplifier Gain	@ 3.0 VDC: 26 dB (typical)
Output VSWR	2.0:1 (maximum)
DC Current	25 mA (typical)
DC Voltage	2.8-6.0 V (operating) ≤ 12.0 V (survivability)
Noise Figure	< 2.0 dB (typical)
Out-of-Band Rejection	f0 = 1586 MHz f0 ± 50 MHz: ≥ 60 dBc f0 ± 60 MHz: ≥ 70 dBc
Nominal Gain	3 dBic @ 90° -2 dBic @ 20°
Polarization	Right hand circular
Nominal Impedance	50 ohms

Mechanical and Environmental Specifications

All Models

Dimensions (L x W x H)	6.93 L x 6.09 W x 3.01 H in (176.0 x 154.8 x 76.5 mm)
Weight (9 ports)	4.8 lbs (2.2 kg)
Housing Material	Black or White[5], UV-Stable Rugged Thermoplastics
Temperature Range	-40°C to +85°C
Gasket Design & Construction	Contour matching, conformable, thermoplastic-elastomer gasket designed to seal between radome and baseplate. Gasket flexes and conforms to contoured surfaces. Baseplate has a 3M® VHB mounting pad for anti-rotation.

[4] *Isolation measured with 17-ft cables and no ground plane.*
[5] *For black radome, order P/N GL9X1AX-SF; for white radome, order P/N GL9X1AX-SFW.*

Coach™ II FAKRA Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi 6E, and GNSS

Description

Multiband combination antenna, fitted with FAKRA connectors. It offers a rugged design configurable up to 9x1 ports (4x4 Cellular, 4x4 Wi-Fi 7 and GNSS).

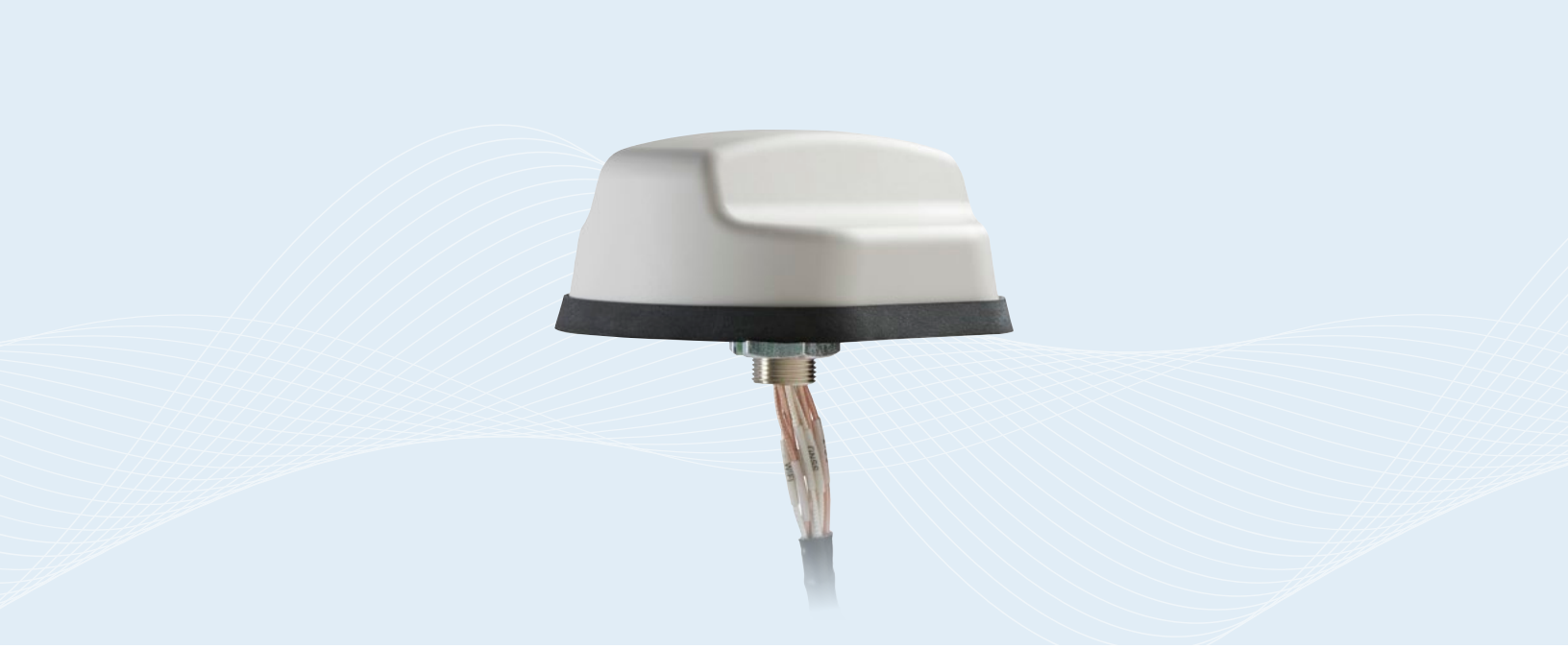
This low-profile, high endurance antenna platform features four 5G elements compatible with the world's leading multi-carrier cellular routers that support 600 MHz to 6 GHz frequencies and meets EN 50155:2007 and AAR requirements for ITS rail and roadway applications.

Technologies

- MIMO Cellular
- MIMO Wi-Fi
- LTE
- 5G
- NB-IoT
- Wi-Fi 6E, 7
- V2X
- GNSS

Features

- Compatible with the world's leading multi-carrier cellular routers including Sierra XR90 and XR80 5G Radios
- Superior out-of-band rejection
- Easy installation and/or replacement
- Withstands severe environmental conditions
- EN 50155:2007; AAR compliant



Coach™ II FAKRA Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi 6E, and GNSS

The Coach™ II multiband combination antenna, fitted with FAKRA connectors offers a rugged design configurable up to 9x1 ports (4x4 Cellular, 4x4 Wi-Fi 7 and GNSS). The Cellular 4x4 MIMO port covers the LTE/5G sub 6 GHz bands down to 600 MHz. The Wi-Fi 6E 4x4 MIMO port covers up to 7150 MHz. It can also be equipped with a pre-filtered GNSS antenna.

FAKRA connectors enable fast "Poka-Yoke" installation on routers/gateways equipped with FAKRA and supports the high speed requirements of complex RF communication systems used for Intelligent Transportation Systems (ITS) and Industrial IoT applications. These low-profile, high endurance antennas feature four 5G elements compatible with the world's leading multi-carrier cellular routers that support 600 MHz to 6 GHz frequencies. The platform also incorporates 802.11ax Wi-Fi MIMO connectivity, with four dual band 2.4/5 GHz Wi-Fi elements supporting DSRC 5.99 GHz applications. In addition, PCTEL's proprietary high-rejection multi-GNSS technology is included for high precision tracking and asset management. The platform meets EN 50155:2007 and AAR requirements for ITS rail and roadway applications.

Features

- Wideband coverage – 4G LTE, 5G and dual-band 802.11ac Wi-Fi 6E coverage in a single, low-profile housing
- Superior out-of-band rejection – Proprietary filtering design allows wideband coverage for all GNSS frequencies
- Easy installation and/or replacement – Metal stud mount with slotted jam nut provides single cable exit
- Withstands severe environmental conditions – IP67 compliant design with overmolded gasket protects against water or dust ingress (when installed on sealed surface)
- Meets EN 50155:2007 and AAR certification requirements for rail applications

Compatibility

Routers	Models
Sierra Wireless	XR90 XR80

Certifications

RoHS COMPLIANT

SPECIFICATIONS

Coach™ II FAKRA Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi 6E, and GNSS

Standard Configurations

Model	Elements	Cable	Code	Connector	Mount
COACH2-5X1-17FT-FAKRA	Cellular (LTE/5G)	Two-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195)	Code D	FAKRA-Female	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
	Wi-Fi	Two-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195)	Code I	FAKRA-Female	
	GNSS	One-17 feet RG-316	Code C	FAKRA-Female	
COACH2-5X1-1.5FT-FAKRAM	Cellular (LTE/5G)	Two-1.5 feet	Code D	FAKRA-Male	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
	Wi-Fi	Two-1.5 feet	Code I	FAKRA-Male	
	GNSS	One-1.5 feet RG-316	Code C	FAKRA-Male	
COACH2-7X1-17FT-FAKRA	Cellular (LTE/5G)	Four-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195)	Code D	FAKRA-Female	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
	Wi-Fi	Two-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195)	Code I	FAKRA-Female	
	GNSS	One-17 feet RG-316	Code C	FAKRA-Female	
COACH2-7X1-1.5FT-FAKRAM	Cellular (LTE/5G)	Four-1.5 feet	Code D	FAKRA-Male	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
	Wi-Fi	Two-1.5 feet	Code I	FAKRA-Male	
	GNSS	One-1.5 feet RG-316	Code C	FAKRA-Male	
COACH2-9X1-17FT-FAKRA	Cellular (LTE/5G)	Four-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195)	Code D	FAKRA-Female	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
	Wi-Fi	Four-17 feet (2-ft RG-316/15-ft Pro-Flex™ Plus 195)	Code I	FAKRA-Female	
	GNSS	One-17 feet RG-316	Code C	FAKRA-Female	
COACH2-9X1-1.5FT-FAKRAM	Cellular (LTE/5G)	Four-1.5 feet	Code D	FAKRA-Male	1-inch OD, 3/4-inch long (.75") zinc stud mount with jam nut (all models)
	Wi-Fi	Four-1.5 feet	Code I	FAKRA-Male	
	GNSS	One-1.5 feet RG-316	Code C	FAKRA-Male	

SPECIFICATIONS

Coach™ II FAKRA Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi 6E and GNSS

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	SWR[1]	Gain (dB)[2]			Efficiency[2]		Polarization	Nominal Impedance	Maximum Power
			Max	Typical	Range (±)	Avg	Range (±)			
LTE Primary (1&3)										
617	698	2.5	-0.2	-0.9	0.7	33%	3%	Linear	50 ohms	50 watts
698	802	1.9	1.1	-0.3	1.4	34%	6%			
824	960	2.0	2.1	0.6	1.6	36%	4%			
1710	2200	1.6	4.4	2.6	1.9	31%	3%			
2300	2690	1.4	4.8	2.7	2.1	29%	2%			
3400	3800	1.4	4.7	2.5	2.2	26%	1%			
5150	5950	1.3	5.8	1.9	3.9	16%	3%			
LTE Secondary (2&4)										
617	698	3.4	-1.4	-3.0	1.6	16%	8%	Linear	50 ohms	50 watts
733	802	2.0	0.0	-1.0	0.9	31%	4%			
824	960	2.7	0.0	-1.6	1.5	28%	8%			
1805	2200	1.6	1.7	0.9	0.8	29%	4%			
2300	2690	2.0	1.5	-0.5	2.0	20%	6%			
3400	3800	1.9	2.2	0.4	1.8	20%	3%			
5150	5950	1.4	2.6	1.3	1.4	16%	1%			
Wi-Fi										
2400	2500	1.3	9.1	7.2	1.9	74%	4%	Linear	50 ohms	50 watts
4900	5900	1.5	11.4	9.1	2.3	59%	14%			

Minimum Isolation (dB)[3]

Elements	LTE Primary (1&2)		LTE Primary (1&2)		Wi-Fi	
LTE Primary (1&3)	617-960 MHz	14.0	698-960 MHz	14.0	698-960 MHz	20.0
	1.71-2.7 GHz	25.0	1.71-2.7 GHz	25.0	1.71-2.7 GHz	17.0
	3.3-3.59 GHz	35.0	3.3-3.59 GHz	27.0	3.3-5.9 GHz	35.0
LTE Secondary (2&4)			698-960 MHz	18.0	698-960 MHz	22.0
			1.71-2.7 GHz	30.0	1.71-2.7 GHz	16.0
			3.3-3.59 GHz	32.0	4.9-5.9 GHz	32.0
Wi-Fi					2.4-2.5 GHz	25.0
					4.9-5.9 GHz	32.0

[1] Gain and efficiency measured with no cable and no ground plane.
[2] SWR measured with 17-ft cables and no ground plane.
[3] Isolation measured with 17-ft cables and no ground plane.

SPECIFICATIONS

Coach™ II FAKRA Permanent Mount

Combination Antennas - 5G Cellular, Wi-Fi 6E and GNSS

Electrical Specifications – GNSS Antennas

Specification	Measurement
Frequency Band	1565-1608 MHz
Amplifier Gain	@ 3.0 VDC: 26 dB (typical)
Output VSWR	2.0:1 (maximum)
DC Current	25 mA (typical)
DC Voltage	2.8-6.0 V (operating) ≤ 12.0 V (survivability)
Noise Figure	< 2.0 dB (typical)
Out-of-Band Rejection	f0 = 1586 MHz f0 ± 50 MHz: ≥ 60 dBc f0 ± 60 MHz: ≥ 70 dBc
Nominal Gain	3 dBic @ 90° -2 dBic @ 20°
Polarization	Right hand circular
Nominal Impedance	50 ohms

Mechanical and Environmental Specifications

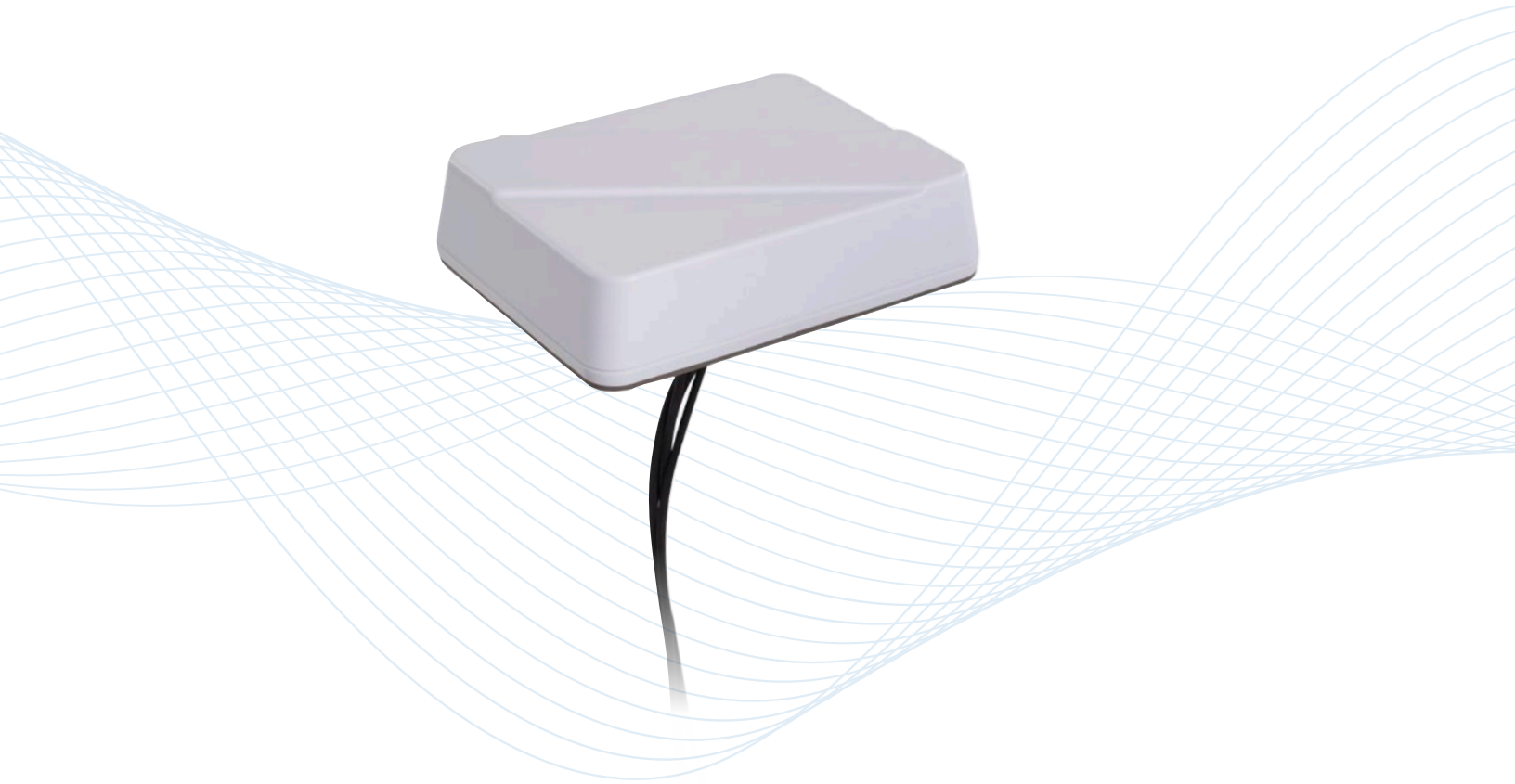
Specification	
Dimensions (L x W x H)	6.93 L x 6.09 W x 3.01 H in (176.0 x 154.8 x 76.5 mm)
Weight (9 ports)	4.8 lbs (2.2 kg)
Housing Material	Black or White, UV-Stable Rugged Thermoplastics
Temperature Range	-40°C to +85°C
Gasket Design & Construction	Contour matching, conformable, thermoplastic-elastomer gasket designed to seal between radome and baseplate. Gasket flexes and conforms to contoured surfaces. Baseplate has a 3M® VHB mounting pad for anti-rotation.

PRELIMINARY DATASHEET COMBINATION ANTENNA

Medallion™ II Permanent Mount

Combination Antennas - 5G Cellular, WiFi, and GNSS

GLLPDLTE-B, GLLPDLTE-W, GLLPDLTEWI-B, GLLPDLTEWI-W



Description

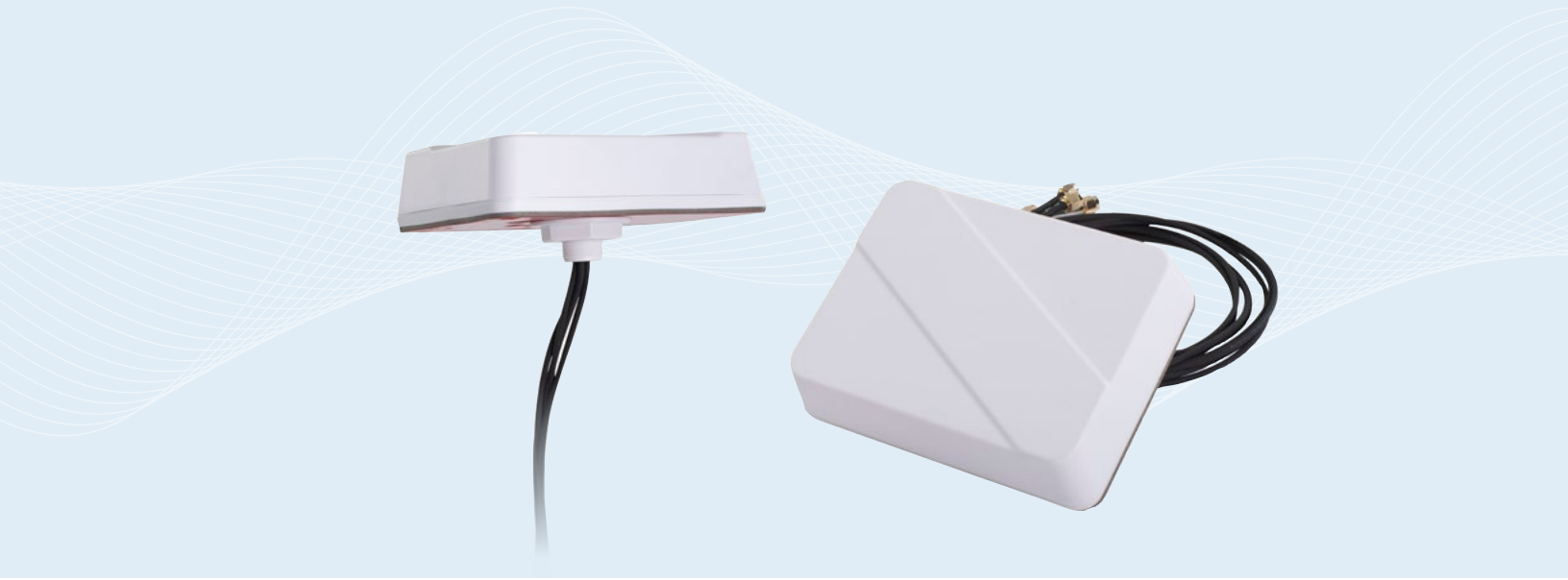
Low profile dual port 5G/4G GNSS multiband antenna covering sub 6 GHz 5G FR1 upper frequencies, with a dual band WiFi port option. Includes a built-in ground plane for maximum installation flexibility.

Technologies

- 5G FR1
- CBRS
- 4G LTE
- Dual band WiFi
- GNSS L1

Features

- Durable 1-1/3-inch tall housing for permanent mount IIoT installations requiring minimum overhead clearance
- Proprietary GNSS technology with superior out-of-band rejection
- Easy through-hole mount installation for fixed indoor or outdoor cabinet-top IIoT or Enterprise networks



Medallion™ II Permanent Mount

Combination Antenna - 5G Cellular, WiFi, and GNSS

The Medallion™ II 5G FR1 low profile antenna is ideal for cabinet mount industrial IoT applications. This GNSS multiband antenna includes two 5G FR1 ready ports, and an optional dual band 2.4/5 GHz port for WiFi coverage. Its proprietary, built-in GNSS technology features superior out-of-band rejection filtering for optimal operation with industrial IoT wireless networks. This antenna platform is housed in a rugged, UV-stable housing, available in black or white color options.

Features

- Dual cellular ports for 5G FR1 networks, including CBRS bands
- Low Profile 1-1/3-inch tall housing for permanent mount installations with limited overhead clearance
- GNSS compatibility, covering global systems: 1565-1608 MHz (GPS L1; GALILEO E1; GLONASS L1; QZSS L1; BEIDOU B1)
- Superior rejection of out-of-band signals with proprietary filtering technology for optimal GNSS performance
- Optional dual band 2.4/5 GHz WiFi port
- Simple through-hole mount installation for fixed indoor or outdoor, cabinet-top IIoT or Enterprise networks
- Durable, UV-stable white or black radome options
- Ingress protection: IPX7 rating

SPECIFICATIONS

Medallion™ II Permanent Mount

Combination Antenna - 5G Cellular, WiFi, and GNSS

Standard Configurations

Model	Elements	Cable	Connector[2]	Mount	Housing Color
GLLPDLTE-W	LTE (2) GNSS (1)	Two- 3 foot RG-316 pigtails (Cellular) One- 3 foot RG-316 (GNSS)	SMA Plug (Cellular) SMA Plug (GNSS)	M18X2 threaded stud (18 mm long)	White
GLLPDLTE-B	LTE (2) GNSS (1)	Two- 3 foot RG-316 pigtails (Cellular) One- 3 foot RG-316 (GNSS)	SMA Plug (Cellular) SMA Plug (GNSS)		Black
GLLPDLTEWI-B	LTE WiFi GNSS	Two- 3 foot RG-316 pigtails (Cellular) One- 3 foot RG-316 pigtails (WiFi) One- 3 foot RG-316 (GNSS)	SMA Plug (Cellular) Reverse Polarity SMA Plug (WiFi) SMA Plug (GNSS)		Black
GLLPDLTEWI-W	LTE WiFi GNSS	Two- 3 foot RG-316 pigtails (Cellular) One- 3 foot RG-316 pigtails (WiFi) One- 3 foot RG-316 (GNSS)	SMA Plug (Cellular) Reverse Polarity SMA Plug (WiFi) SMA Plug (GNSS)		White

Electrical Specifications – RF Antennas

F1 (MHz)	F2 (MHz)	SWR[3]	Gain (dB)[3] Peak	Efficiency Avg	Polarization	Nominal Impedance	Maximum Power
LTE Primary Port 1							
617	698	<4	3	40	Linear	50 ohms	50 watts
698	790	<2	4.5	45			
790	960	<3.5	5	55			
1710	2170	<2	5	60			
2300	2690	<2	4	55			
3300	4200	<2.5	7	45			
4400	5000	<3	5	40			
4900	5950	<2.5	4.5	35			
LTE Primary Port 2							
617	698	<4.5	3	40	Linear	50 ohms	50 watts
698	790	<2	4.5	50			
790	960	<3.5	4.5	55			
1710	2170	<2	4.5	55			
2300	2690	<2	5.5	50			
3300	4200	<2.5	7	55			
4400	5000	<3	6	45			
4900	5950	<3	7.5	45			
WiFi							
2400	2485	<3	5.5	55			
4900	5950	<2	6	45			

[1] When installed according to PCTEL's installation instructions.
[2] Consult Customer Service for other connector options.
[3] Measurements taken with 3-ft cables on a 2-ft ground plane.

SPECIFICATIONS

Medallion™ II Permanent Mount

Combination Antenna - 5G Cellular, WiFi, and GNSS

Electrical Specifications – GPS Antenna

Frequency Band	1565-1608 MHz
Amplifier Gain	@ 3.0 VDC: 26 dB (typical)
Output VSWR	2.0:1 (maximum)
DC Current	25 mA (typical)
DC Voltage	2.8-6.0 V (operating) ≤ 12.0 V (survivability)
Noise Figure	< 2.0 dB (typical)
Out-of-Band Rejection	f0 = 1586 MHz / f0 ± 50 MHz: ≥ 60 dBc / f0 ± 60 MHz: ≥ 70 dBc
Nominal Gain	3 dBic @ 90° -2 dBic @ 20°
Polarization	Right hand circular
Nominal Impedance	50 ohms

Mechanical Specifications

Physical

Dimensions (W x H)	5.19 L x 4.0 W x 1.3 H inches (13.2 x 10.2 x 3.4 cm)
Weight	0.67 lbs (10.8 oz)
Radome Construction	UV-Stable Rugged Thermoplastics
Operating / Storage Temperature	-40°C to +85°C

INDUSTRIAL IoT CONNECTIVITY SOLUTIONS

Industrial IoT Access Point

Rugged Dual-Band 2x2 802.11ac Wave 2 WiFi

AP-WiFi-1200-US, AP-WiFi-1200-EU, AP-WiFi-1200-CA

Bands

- 2.4 GHz: 20/40 MHz
- 5 GHz: 20/40/80 MHz

Connectivity

- WiFi
- Bluetooth®

Features

- Dual-radio 2.4 and 5 GHz combined throughput up to 1 Gbps
- 4 external WiFi antenna ports
- Bluetooth® 5.0 radio with dedicated external antenna port
- Small, lightweight form factor for ease of installation
- Install your own software or firmware

Industrial IoT Access Point

Rugged Dual-Band 2x2, 802.11ac Wave 2 WiFi

PCTEL's AP-WiFi-1200 Industrial IoT Access Point is ideal for demanding industrial and outdoor applications. Housed in a compact, easy-to-deploy enclosure and offering external antenna connectors, it can be used in a wide variety of applications and environments. With a wide temperature range it is ideal for outdoor deployments with a single Power-over-Ethernet (PoE) connection for power and backhaul. Capable of a total aggregate dual-radio rate of up to 1Gbps, this level of performance provides mobile users with a wireless experience that is equivalent to a wired connection.

Rugged Design

Designed to meet the demands of any outdoor environment, the AP-WiFi-1200 Industrial IoT Access Point weighs just over 3.2 pounds (1.45 kg) with a footprint of only 7.84" x 5.79" x 2.50" (199 x 148 x 64 mm). Suitable for deployments between -40°C and +55°C including full solar loading of 1200 W/m^2 and it's able to withstand wind gusts up to 165 mph and with an IP67 rating, making it safe to operate in most types of weather. The low power consumption and high TX output power make it an ideal choice for all types of outdoor deployments where high-performance access points are required.

ADVANTAGES

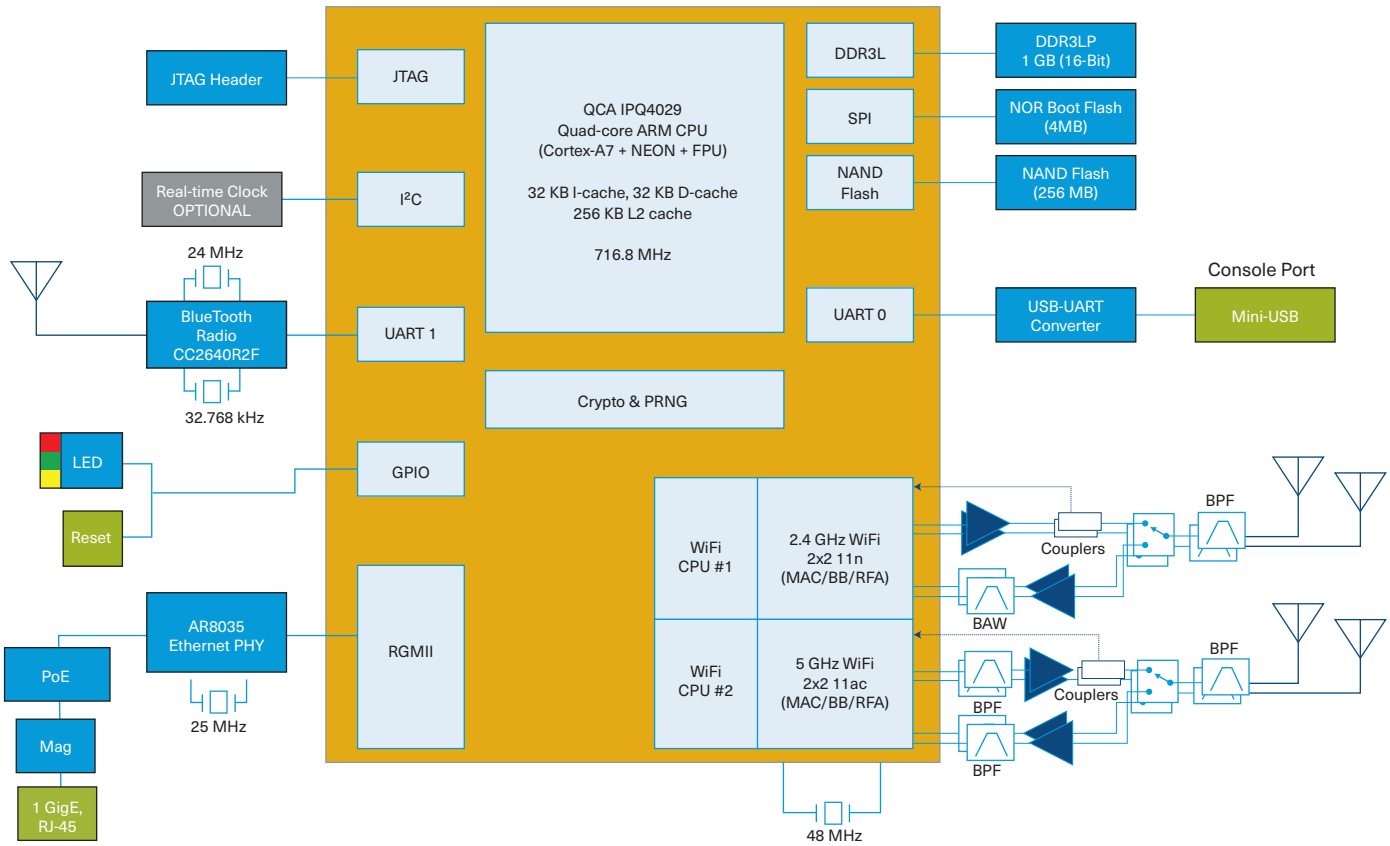
Industrial IoT Access Point

Rugged Dual-Band 2x2, 802.11ac Wave 2 WiFi

Features and Benefits

Feature	Benefit
Small Size and Weight	Can be easily mounted to walls or light poles where aesthetics is a concern.
802.11ac Wave 2 Radio	The 5 GHz radio can operate at high data rates up to 867 Mbps data rates, taking advantage of multi-user MIMO with up to 2 spatial streams.
Bluetooth® 5.1	On-board Bluetooth® radio with dedicated external antenna port.
4 External WiFi Antenna Ports	Provides flexibility in deploying approved PCTEL antennas listed below
Accessible Console Port	Console port for configuration and debugging. Accessible behind easily removable cover.
Simple Connection and Powering	Powered using a single Power-over-Ethernet (PoE) 1 Gbps Ethernet connection.
Hardware That Is Software Ready	Shipped pre-loaded with U-boot, the popular open-source bootloader for embedded Linux. The radios are calibrated, and the unit is tested and ready to be programmed with user code.

Block Diagram AP-WiFi-1200 PCTEL Access Point Platform



SPECIFICATIONS

Industrial IoT Access Point

Rugged Dual-Band 2x2, 802.11ac Wave 2 WiFi

Specifications

PCTEL Model Numbers	AP-WiFi-1200-US AP-WiFi-1200-EU AP-WiFi-1200-CA
Radios (Dual Band Concurrent)	2.4 GHz: 802.11b/g/n, 2x2:2 5 GHz: 802.11a/n/ac Wave 2, 2x2:2
Channel Bandwidth	2.4 GHz: 20 MHz, 40 MHz 5 GHz: 20/40/80 MHz
TX Power (Preliminary)	2.4 GHz: 26 dBm Total, 23 dBm per path 5 GHz: 24 dBm Total, 21 dBm per path
PHY Rate	2.4 GHz: 300 Mbps (40 MHz) 5 GHz: 866.7 Mbps (80 MHz)
Bluetooth	5.1
Memory (DRAM / NAND / NOR)	1 GB / 256 MB / 4 MB
CPU Clock Speed	717 MHz
CPU Cores	Quad-Core CPU / 4x ARM Cortex A7 (IPQ4029)
Power Consumption	< 13 W
Antenna Ports	WiFi: 4 Single Band Ports, N-connectors Bluetooth: 1 Single Band Port, N-connector
Ethernet Interface	1 GbE (PoE, 802.3at Type 1 Class 3): -13 W
Mode Button	Software defined function
Console Port	USB 2.0 Type-B Mini
Dimensions (L x W x D)	7.84" x 5.79" x 2.50" (199 x 148 x 64 mm)
Temperature Range (Operational)	-40°C to +65°C -40°C to +55°C with Full Sun Load
Temperature Range (Storage)	-40°C to +85°C
Water / Dust Intrusion	IP67
Color	Pantone 428C
LED Status Indicator	Software defined operation status
Compliance	FCC, ISED, ETSI

SPECIFICATIONS

Industrial IoT Access Point

Rugged Dual-Band 2x2, 802.11ac Wave 2 WiFi

Transmit Power and Receive Sensitivity

Data Rate/ MCS	Spatial Streams	Single Path TX Power (dBm)	Total TX Power (dBm)	RX Sensitivity (dBm)
802.11a				
6 Mbps	1	21	21	-87
9 Mbps	1	21	21	-87
12 Mbps	1	21	21	-85
18 Mbps	1	21	21	-84
24 Mbps	1	21	21	-81
36 Mbps	1	21	21	-78
48 Mbps	1	21	21	-73
54 Mbps	1	21	21	-72
802.11n HT20				
MCS0	1	22	21	-86
MCS1	1	22	21	-84
MCS2	1	22	21	-83
MCS3	1	22	21	-79
MCS4	1	22	21	-76
MCS5	1	22	21	-72
MCS6	1	22	21	-70
MCS7	1	22	21	-69
MCS8	2		21	-88
MCS9	2		21	-85
MCS10	2		21	-83
MCS11	2		21	-79
MCS12	2		21	-76
MCS13	2		21	-72
MCS14	2		21	-71
MCS15	2		21	-69
802.11n HT40				
MCS0	1	22	21	-83
MCS1	1	22	21	-82
MCS2	1	22	21	-79
MCS3	1	22	21	-77
MCS4	1	22	21	-73
MCS5	1	22	21	-69
MCS6	1	22	21	-68
MCS7	1	21	21	-66
MCS8	2		21	-85
MCS9	2		21	-82
MCS10	2		21	-79
MCS11	2		21	-77
MCS12	2		21	-73
MCS13	2		21	-69
MCS14	2		21	-68
MCS15	2		21	-66

Industrial IoT Access Point

Rugged Dual-Band 2x2, 802.11ac Wave 2 WiFi

Transmit Power and Receive Sensitivity

Data Rate/ MCS	Spatial Streams	Single Path TX Power (dBm)	Total TX Power (dBm)	RX Sensitivity (dBm)
802.11ac VHT20				
MCS0	1	22	21	-87
MCS1	1	22	21	-84
MCS2	1	22	21	-83
MCS3	1	22	21	-79
MCS4	1	22	21	-76
MCS5	1	22	21	-72
MCS6	1	22	21	-70
MCS7	1	22	21	-69
MCS8	1	21	21	-64
MCS9	1	20	21	-64
MCS0	2		21	-88
MCS1	2		21	-85
MCS2	2		21	-83
MCS3	2		21	-79
MCS4	2		21	-76
MCS5	2		21	-71
MCS6	2		21	-70
MCS7	2		21	-69
MCS8	2		21	-64
MCS9	2		20	-64
802.11ac VHT40				
MCS0	1	22	19	-83
MCS1	1	22	19	-82
MCS2	1	22	19	-79
MCS3	1	22	19	-76
MCS4	1	22	19	-73
MCS5	1	22	19	-69
MCS6	1	22	19	-68
MCS7	1	21	19	-66
MCS8	1	20	19	-61
MCS9	1	19	19	-59
MCS0	2		19	-85
MCS1	2		19	-82
MCS2	2		19	-79
MCS3	2		19	-77
MCS4	2		19	-73
MCS5	2		19	-69
MCS6	2		19	-67
MCS7	2		19	-66
MCS8	2		19	-61
MCS9	2		19	-59

Data Rate/ MCS	Spatial Streams	Single Path TX Power (dBm)	Total TX Power (dBm)	RX Sensitivity (dBm)
802.11ac VHT80				
MCS0	1	22	19	-80
MCS1	1	22	19	-79
MCS2	1	22	19	-76
MCS3	1	22	19	-73
MCS4	1	22	19	-70
MCS5	1	22	19	-66
MCS6	1	22	19	-64
MCS7	1	22	19	-63
MCS8	1	21	19	-57
MCS9	1	20	19	-53
MCS0	2		19	-82
MCS1	2		19	-79
MCS2	2		19	-76
MCS3	2		19	-73
MCS4	2		19	-70
MCS5	2		19	-66
MCS6	2		19	-64
MCS7	2		19	-63
MCS8	2		19	-58
MCS9	2		19	-56

Industrial IoT Access Point

Rugged Dual-Band 2x2, 802.11ac Wave 2 WiFi

Compliance (FCC, ISED, ETSI) - Preliminary

Safety	IEC 62368-1 UL/CSA 62368-1
Radio Approvals	FCC Part 15.247, 15.407 EN 300 328 EN 301 893 RSS-210 RSS-247
EMI and Susceptibility	FCC Part 15.107, 15.109 EN 301 489-1, 489-17 ICES-003

FCC Compliance Statement
This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Canadian Compliance Statements
This device contains license-exempt transmitters/receivers that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
(1) L'appareil ne doit pas produire de brouillage;
(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fontionnement

This radio transmitter, 26584-WIFIAP1200, has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

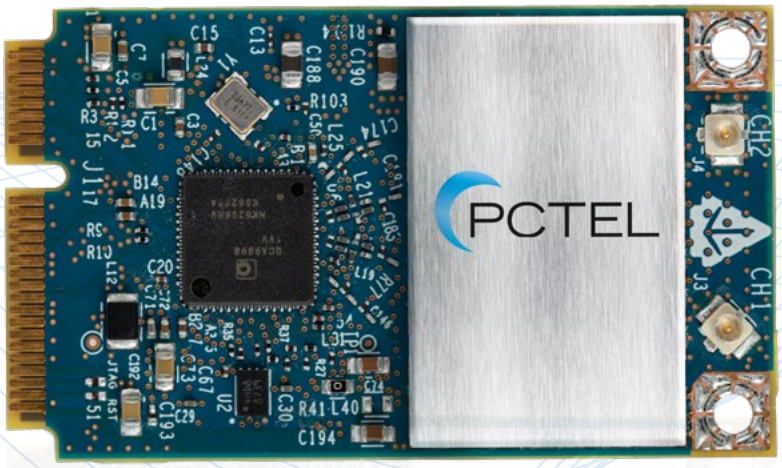
Le présent émetteur radio, 26584-WFIAP1200, a été approuvé par Innovation, Sciences et Développement Économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

PCTEL Model Number	Antenna Type	Gain at 2.4 GHz	Gain at 5 GHz
MHODB24490507NM-IP	Dual-band omni-directional antenna	5 dBi	7 dBi
BOA24006NM	2.4 GHz omni-directional antenna	6 dBi	NA

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

RM-WIFI-AC-2X2-HP-US, RM-WIFI-AC-2X2-HP-EU, RM-WIFI-AC-2X2-HP-CA



Bands

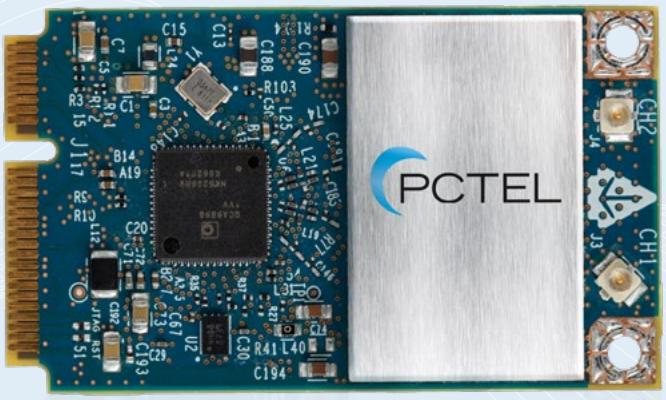
- 5 GHz: supports 20/40/80 MHz channels (up to 256-QAM)

Technologies

- WiFi

Features

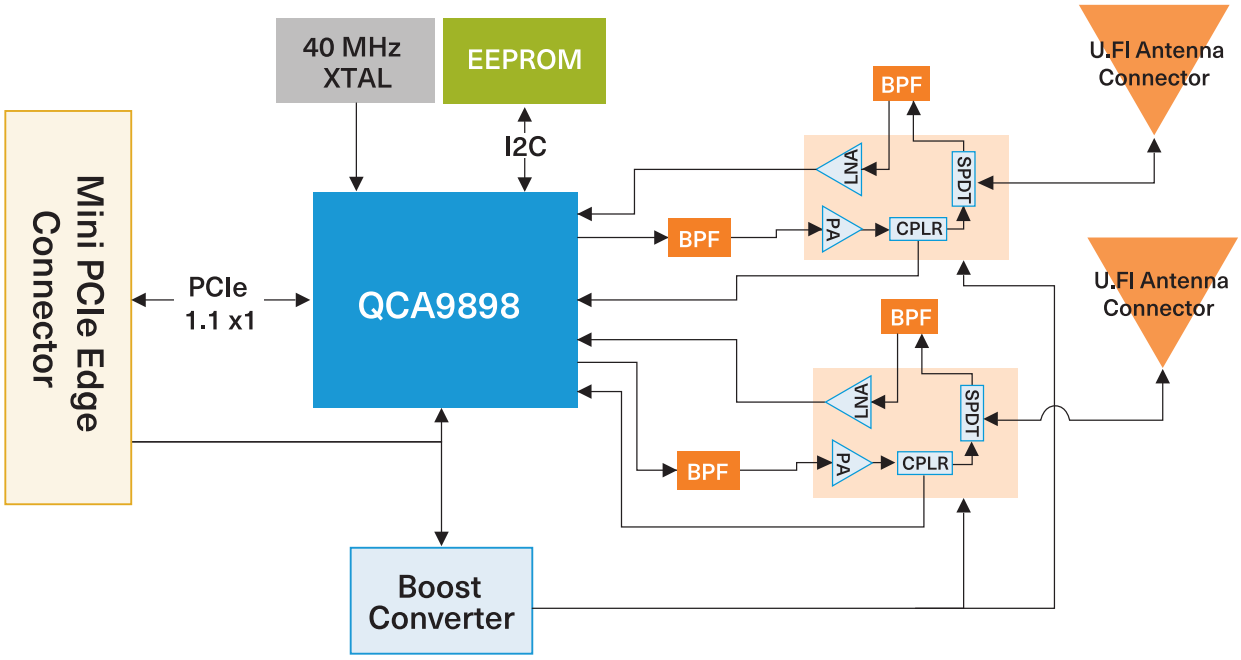
- High TX output power of 23 dBm per path, 26 dBm total
- IEEE 802.11ac compliant, supporting legacy 802.11a and 802.11n operating modes
- 2x2 MU-MIMO with up to 867 Mbps data rate
- Standard mini-PCI Express 1.1 interface
- Standard mini-card form factor 30 mm x 50.95 mm
- U.FL antenna connectors



Industrial IoT Radio Module

2x2, 802.11ac Wave 2

The PCTEL RM-WIFI-AC-2X2-HP 802.11ac Wave 2 is a device built in a standard mini-card form factor and a standard mini-PCIe interface featuring true enterprise-class specifications with high TX output power and support for all 802.11ac channel definitions including 80 MHz channels. Low power consumption and a small form factor make this radio module ideal for integration into a wide variety of platforms.



SPECIFICATIONS

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

Features and Benefits

Feature	Benefit
Small form-factor	Ease of integration into a variety of platforms following PCI Express Mini Card mechanical specification
802.11ac Wave 2	• Uses QCA9898 chipset to produce 802.11ac Wave 2 compliant radio module. • Incorporates 2 RF paths for downlink MU-MIMO and operates over all supported channel configurations including 80 MHz channels. • Backward compatible with 802.11n and 802.11a standards.
2 antenna ports	Simple integration to your antenna system with 2 on-board U.FL antenna connectors
Operating temperature	-40ºC to +85ºC with the addition of appropriate thermal pad between the radio module and the host PCB
High transmit power	Designed for high TX output power with low EVM even at high data rates.

Specifications

WiFi radio	2x2:2 Stream 802.11ac/n/a
Chipset	QCA9898
Frequency range	5150 - 5825 MHz
Channels	All UNII-1, UNII-2, UNII-2-Ext, UNII-3
Channel bandwidth	5 GHz: 20/40/80 MHz
Maximum TX Power, per path	23 dBm (See table below for more details)
Peak PHY rate (80 MHz, MCS9, 2 Spatial Streams)	867 Mbps
RX sensitivity	See table below
Power consumption	Nominal 7 W
Antenna ports	2 single band ports, U.FL type
Electrical interface	PCI Express Mini Card Electromechanical Specification Revision 1.1
Size	Standard 30 mm x 50.95 mm mini PCIe form-factor
Storage temperature	-40ºC to +85ºC

Maximum Conducted Transmit Power

• 23 dBm per path with 2 RF paths (2 antennas).

Note: The maximum power is set per specific channel and limited per specific regulations of each approved countries. See PCTEL for additional information.

SPECIFICATIONS

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

Transmit Power and Receive Sensitivity

Data Rate / MCS	Spatial Streams	Total TX Power (dBm)	RX Sensitivity (dBm)
802.11a			
6 Mbps	1	23	-92
24 Mbps	1	23	-86
54 Mbps	1	21	-76
802.11n HT20			
MCS0	1	23	-92
MCS4	1	23	-81
MCS7	1	21	-73
MCS8	2	23	-92
MCS12	2	23	-81
MCS15	2	21	-73
802.11n HT40			
MCS0	1	23	-90
MCS4	1	23	-78
MCS7	1	21	-71
MCS8	2	23	-90
MCS12	2	23	-78
MCS15	2	21	-71
802.11ac VHT20			
MCS0	1	23	-92
MCS4	1	23	-81
MCS7	1	21	-73
MCS8	1	18	-69
MCS0	2	23	-92
MCS4	2	23	-81
MCS7	2	21	-73
MCS8	2	18	-69
802.11ac VHT40			
MCS0	1	23	-90
MCS4	1	23	-78
MCS7	1	21	-71
MCS8	1	18	-67
MCS9	1	17	-65
MCS0	2	23	-90
MCS4	2	23	-78
MCS7	2	21	-71
MCS8	2	18	-67
MCS9	2	17	-65
802.11ac VHT80			
MCS0	1	23	-87
MCS4	1	23	-75
MCS7	1	21	-68
MCS8	1	18	-64
MCS9	1	17	-62
MCS0	2	23	-87
MCS4	2	23	-75
MCS7	2	21	-68
MCS8	2	18	-64
MCS9	2	17	-62

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

Compliance

Figure 1. Compliance

Safety
IEC 62368-1
UL/CSA 62368-1

Radio Approvals
FCC Part 15.407
EN 301 893
RSS-210
RSS-247

EMI and Susceptibility
FCC Part 15.107, 15.109
EN 301 489-1, 301 489-17
ICES-003

6.1. Manufacturer's Federal Communication Commission (FCC) Compliance Statements

Model: RM-WIFI-AC-2X2-HP-US **FCC ID:** NYPRMWIFIAC2X2

Manufacturer:
PCTEL, Inc.
471 Brighton Dr.
Bloomingdale, IL 60108-3102
USA

To ensure regulatory compliance, when integrating the RM-WIFI-AC-2X2-HP-US radio module into a host device, it is required to meet the documentation and operational requirements set forth by the applicable regulatory agency. The following sections outline the information that must be considered and included in the user's guide and external labels for the host device that includes the RM-WIFI-AC-2X2-HP radio module.

6.1.1. Antenna Information

The RM-WIFI-AC-2X2-HP-US radio module has been designed and approved to operate with the antennas listed below.

Table 3. Approved Antennas

PCTEL Part Number	Description	Gain
		5150 - 5850 MHz
BOA51004NM	Heavy-Duty Omnidirectional Antenna	4 dBi
MPAMB24495804-RPSMA	Portable Omnidirectional Antenna	4 dBi
MHODB24490507NM-IP	Dual-Band High-Performance Omnidirectional Antenna	7 dBi
AEMH51PT155UFL	Circuit-board-based 5 GHz horizontally ploraized monopole with 155 mm U.FL pigtail cable	4.3 dBi
AED2451PT155UFL	Circuit-board-based dual-band dipole with 155 mm U.FL pigtail cable	2.8 dBi
AEMV2451PT155UFL	Bent metal dual -band monopole with 155mm U.FL pigtail cable	2.4 dBi
AEPV2451PT155UFL	Bent metal dual -band PIFA with 155mm U.FL pigtail cable	4.8 dBi

In addition, two antenna cables are required.

Important Note: For use as a client device, (not DFS master), the integrator can choose or specify a different antenna of like type and equal or lesser gain as an antenna appearing in the above table and still maintain compliance. Reference FCC Part 15.204(c)(4) for further information on this topic.

Important Note: For use in a host system that is a DFS master, the minimum, net antenna gain allowed is 1.1 dBi, including all other cable loss. Any antenna/cable combination whose gain is lower than 1.1 dBi, including all other cable loss, is not approved for use with a DFS master device without additional testing and approval.

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

6.1.2. FCC Declaration of Conformity Statement

These paragraphs must be included in any end-user documentation.

This device complies with Part 15 rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential or office environment. This equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference. However, there is no guarantee that interference will not occur. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

   - Reorient or relocate the receiving antenna.
   - Increase the distance between the equipment and receiver.
   - Connect the equipment to an outlet on a circuit different from which the receiver is connected.
   - Consult the dealer or an experienced radio/TV technician

WARNING: This Part 15 radio device operates on a non-interference basis with other devices operating at this frequency when using PCTEL approved antennas. The Federal Communications Commission warns that any changes or modifications to this radio module not expressly approved by PCTEL, Inc. could void the user's authority to operate this device.

6.1.3. FCC Radiation Exposure Statement

This paragraph must be included in any end-user documentation.

The PCTEL RM-WIFI-AC-2X2-HP-US has been evaluated for RF exposure for Humans in reference to ANSI C 95.1 (American National Standards Institute) limits. The evaluation was based on ANSI C 95.1 and FCC OET Bulletin 65C Rev 1.01. To comply with FCC's RF radiation exposure requirements, the antennas used for this device must be installed such that the minimum separation distance of 7.87 inches (20 cm) is maintained between the radiating elements (antennas) and any users or general bystanders at all times and the antennas must not be co-located or operating in conjunction with any other antennas or transmitters.

Further RF exposure reduction can be achieved if the product/antennas are kept as far as possible from the user's body or is set to a lower RF output power if such a function is available.

6.1.4. Factors Affecting Module Usage Related to FCC Compliance

The RM-WIFI-AC-2X2-HP-US radio module has been certified by the FCC under the rules for a Modular Transmitter. There are some considerations that are important for the end user or integrator of the module:

1. A module extends to the host manufacturer the ability to market an end-product without the burden of filing a certification application for the RM-WIFI-AC-2X2-HP-US, which has already been certified as a modular transmitter per FCC 15.407. It does not allow a host manufacturer or integrator the convenience to simply use the module without any further testing and evaluation. The combination of host + radio module must be evaluated for continued compliance in that specific configuration. It is the responsibility of the integrator to carry out the required host product verification testing. PCTEL can advise the integrator on test setup and utilities for the and test that require radio control.
2. The RM-WIFI-AC-2X2-HP-US has been certified with its shield in place on the top side of the circuit board. The shield cannot be removed.

3. Note that per FCC Part 15 rules pertaining to unlicensed transmitters, the host device must be equipped with a unique antenna connector. Compliance with 47 CFR 15.203 does not permit the use of standard connectors such as N, BNC, SMA, TNC, etc.
4. The modular transmitter has been tested to the following FCC rules:

   a. FCC 15.212
   b. FCC 15.407
   c. KDB 447498
   d. CFR 47 Part 1.1310
5. The RM-WIFI-AC-2X2-HP-US radio module has been certified with the antennas listed in the table above. For use as a client device (DFS non-master), the integrator can choose or specify a different antenna of like type and equal or lesser gain as an antenna appearing in the above table and still maintain compliance. Reference FCC Part 15.204(c)(4) for further information on this topic. Note that the highest antenna gain used for approval is 7 dBi.
6. **Important Note:** For use in a host system that is a DFS master, the minimum, net antenna gain allowed is 1.1 dBi, including all other cable loss. Any antenna/cable combination whose gain is lower than 1.1 dBi, including all other cable loss, is not approved for use with a DFS master device without additional testing and approval. Note that the highest antenna gain used for approval is 7 dBi.
7. The transmitter module has been evaluated for RF exposure on its own and therefore should not be co-located with any other transmitter or antenna without further testing and approval.
8. If deployed in the USA, any end-product using the RM-WIFI-AC-2X2-HP-US radio module must be visibly labeled with the following:

   Contains FCC ID: NYPRMWIFIAC2X2
9. The integrator or host manufacturer must not provide information to the end user regarding the installation or removal of this modular transmitter from the host device in the user's manual of the end-product.
10. Any end-user manual shall include all required regulatory information/warnings as shown in this manual.
11. Even though the PCTEL RM-WIFI-AC-2X2-HP-US radio module has been FCC certified, the host product (i.e., the integrated product of radio module + host device) needs to be evaluated for continued compliance in that specific configuration. Contact PCTEL for any tools that may be required for such an evaluation.
12. If any of these conditions cannot be met (for example by using a unique antenna type), then the FCC certification is no longer considered valid, and the FCC ID cannot be used on the host/final product. In these circumstances, the integrator of the module is responsible for the re-evaluation of the end-product (including the transmitter) and obtaining a separate FCC certification.

6.2. Manufacturer's Innovation, Science and Economic Development (ISED) Canada Compliance Statements

Model: RM-WIFI-AC-2X2-HP-CA **IC ID:** 26854-RMWIFIAC2X2

Manufacturer:
PCTEL, Inc.
471 Brighton Dr.
Bloomingdale, IL 60108-3102
USA

To ensure regulatory compliance, when integrating the RM-WIFI-AC-2X2-HP-CA radio module into a host device, it is required to meet the documentation and operational requirements set forth by the applicable regulatory agency. The following sections outline the information that must be considered and included in the user's guide and external labels for the host device that includes the RM-WIFI-AC-2X2-HP radio module.

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

6.2.1. Antenna Information

The radio transmitter (IC: 26854-RMWIFIAC2X2) was approved by Innovation, Science and Economic Development (ISED) Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Le présent émetteur radio (IC: 26854-RMWIFIAC2X2) a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne no inclus dans cette liste, et don't le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émmetteur.

Table 3. Approved Antennas

PCTEL Part Number	Description	Gain
		5150 - 5850 MHz
BOA51004NM	Heavy-Duty Omnidirectional Antenna	4 dBi
MPAMB24495804-RPSMA	Portable Omnidirectional Antenna	4 dBi
MHODB24490507NM-IP	Dual-Band High-Performance Omnidirectional Antenna	7 dBi
AEMH51PT155UFL	Circuit-board-based 5 GHz horizontally ploraized monopole with 155 mm U.FL pigtail cable	4.3 dBi
AED2451PT155UFL	Circuit-board-based dual-band dipole with 155 mm U.FL pigtail cable	2.8 dBi
AEMV2451PT155UFL	Bent metal dual -band monopole with 155mm U.FL pigtail cable	2.4 dBi
AEPV2451PT155UFL	Bent metal dual -band PIFA with 155mm U.FL pigtail cable	4.8 dBi

In addition, two antenna cables are required.

Important Note: For use as a client device, (not DFS master), the integrator can choose or specify a different antenna of like type and equal or lesser gain as an antenna appearing in the above table and still maintain compliance.

Important Note: For use in a host system that is a DFS master, the minimum, net antenna gain allowed is 1.1 dBi, including all other cable loss. Any antenna/cable combination whose gain is lower than 1.1 dBi, including all other cable loss, is not approved for use with a DFS master device without additional testing and approval.

6.2.2. ISED (Canada) Compliance Statement

The following paragraphs must be included in any end-user documentation.

This device contains license-exempt transmitters/receivers that comply with Innovation, Science and Economic Development Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement Économic Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. *L'appareil ne doit pas produire de brouillage.*
2. *L'appareil doit accepter tour brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

6.2.3. ISED Canada Radiation Exposure Statement

These paragraphs must be included in any end-user documentation.

This transmitter/receiver has been evaluated for RF exposure for humans in reference to ANSI C 95.1 (American National Standards Institute) limits. This evaluation was based on RSS-102 Rev 5. To maintain compliance, the minimum separation distance for RM-WIFI-AC-2X2-HP-CA is 7.87 inches (20 cm) from users or general bystanders. Further RF exposure reduction can be achieved if the product/antennas are kept as far as possible from the user's body or is set to a lower RF output power if such a function is available.

Cet émetteur/récepteur a été évalué quant à l'exposition aux RF pour les personnes en référence aux limites ANSI C 95.1 (American National Standards Institute). Cette évaluation est basée sur la norme RSS-102 Rév 5. Pour maintenir la conformité, la distance minimale de séparation pour le RM-WIFI-AC-2X2-HP-CA est de 7,87 pouces (20 cm) par rapport aux personnes présentes. Une réduction supplémentaire de l'exposition aux RF peut être obtenue si le produit/les antennes sont maintenus aussi loin que possible du corps de l'utilisateur ou s'ils sont réglés sur une puissance de sortie RF inférieure, si une telle fonction est disponible.

6.2.4. Factors Affecting Module Usage Related to ISED Compliance

The RM-WIFI-AC-2X2-HP-CA radio module has been certified by the ISED under the rules for a Modular Transmitter. There are some considerations and limitations that are important for the end user or integrator of the module:

1. A module extends to the host manufacturer the ability to market an end-product without the burden of filing a certification application for the RM-WIFI-AC-2X2-HP-CA, which has already been certified as a modular transmitter. It does not allow a host manufacturer or integrator the convenience to simply use the module without any further testing and evaluation. The combination of host + radio module must be evaluated for continued compliance in that specific configuration. It is the responsibility of the integrator to carry out the required host product verification testing. PCTEL can advise the integrator on test setup and utilities for the and test that require radio control.
2. The RM-WIFI-AC-2X2-HP-CA has been certified with its shield in place on the top side of the circuit board. The shield cannot be removed.
3. Note that per RSS-247 rules pertaining to unlicensed transmitters, the host device must be equipped with a unique antenna connector. Compliance with these rules does not permit the use of standard connectors such as N, BNC, SMA, TNC, etc.
4. The modular transmitter has been tested to the following ISED rules:
   a. RSS 210
   b. RSS 247
   c. ICES-003, Issue 7
   d. RSS 102, Rev 5
5. The RM-WIFI-AC-2X2-HP-CA radio module has been certified with the antennas listed in the table above. For use as a client device (DFS non-master), the integrator can choose or specify a different antenna of like type and equal or lesser gain as an antenna appearing in the above table and still maintain compliance. Reference FCC Part 15.204(c)(4) for further information on this topic. Note that the highest antenna gain used for approval is 7 dBi.
6. For use in a host system that is a DFS master, the minimum antenna gain allowed is 1.1 dBi. Any antenna whose gain is lower than 1.1 dBi is not approved for use with a DFS master device without additional testing and approval. Note that the highest antenna gain used for approval is 7 dBi.
7. The transmitter module has been evaluated for RF exposure on its own and therefore should not be co-located with any other transmitter or antenna without further testing and approval.
8. If deployed in Canada, any end-product using the RM-WIFI-AC-2X2-HP-CA radio module must be visibly labeled with the following:
   Contains IC: 26854-RMWIFIAC2X2

9. The integrator or host manufacturer must not provide information to the end user regarding the installation or removal of this modular transmitter from the host device in the user's manual of the end-product.
10. Any end-user manual shall include all required regulatory information/warnings as shown in this manual.
11. Even though the PCTEL RM-WIFI-AC-2X2-HP-CA radio module has been ISED certified, the host product (i.e., the integrated product of radio module + host device) needs to be evaluated for continued compliance in that specific configuration. Contact PCTEL for any tools that may be required for such an evaluation.
12. If any of these conditions cannot be met (for example by using a unique antenna type), then the ISED certification is no longer considered valid, and the IC number cannot be used on the host/final product. In these circumstances, the integrator of the module is responsible for the re-evaluation of the end-product (including the transmitter) and obtaining a separate ISED certification.

6.2.4. Limites d'utilisation du module liées à la conformité ISED

Le module radio RM-WIFI-AC-2X2-HP-CA a été certifié par l'ISED selon les règles applicables aux émetteurs modulaires. Il existe certaines considérations et limitations qui sont importantes pour l'utilisateur final ou l'intégrateur du module:

1. *Un module offre au fabricant hôte la possibilité de commercialiser un produit final sans avoir à déposer une demande de certification pour le RM-WIFI-AC-2X2-HP-CA, qui a déjà été certifié en tant que transmetteur modulaire. Il ne permet pas au fabricant ou à l'intégrateur hôte d'utiliser simplement le module sans autre test ni évaluation. La combinaison hôte + module radio doit faire l'objet d'une évaluation de conformité continue dans cette configuration spécifique. Il est de la responsabilité de l'intégrateur d'effectuer les tests de vérification du produit hôte requis. PCTEL peut conseiller l'intégrateur sur la configuration des tests et les utilitaires pour les tests qui nécessitent une commande radio.*
2. *Le RM-WIFI-AC-2X2-HP-CA a été certifié avec son blindage en place sur la face supérieure de la carte de circuit imprimé. Le blindage ne peut pas être retiré.*
3. *Notez que selon les règles RSS-247 relatives aux émetteurs sans licence, le dispositif hôte doit être équipé d'un connecteur d'antenne unique. La conformité à ces règles ne permet pas l'utilisation de connecteurs standard tels que N, BNC, SMA, TNC, etc.*
4. *L'émetteur modulaire a été testé selon les règles ISDE suivantes :*

   a. RSS 210 *c. ICES-003, version 7*
   b. RSS 24 *d. RSS 102, rév 5*

5. *Le module radio RM-WIFI-AC-2X2-HP-CA a été certifié avec les antennes indiquées dans le tableau ci-dessus. Pour une utilisation en tant que dispositif client (DFS non-maître), l'intégrateur peut choisir ou spécifier une antenne différente de même type et de gain égal ou inférieur à une antenne figurant dans le tableau ci-dessus et demeurer conforme. Reportez-vous à la partie 15.204(c)(4) de la FCC pour plus d'informations à ce sujet. Notez que le gain d'antenne le plus élevé utilisé pour l'approbation est de 7 dBi.*
6. *Pour une utilisation dans un système hôte qui est un maître DFS, le gain d'antenne minimum autorisé est de 1,1 dBi. Toute antenne dont le gain est inférieur à 1,1 dBi n'est pas approuvée pour une utilisation avec un dispositif maître DFS sans tests et approbation supplémentaires. Notez que le gain d'antenne le plus élevé utilisé pour l'approbation est de 7 dBi.*
7. *Le module émetteur a été évalué pour l'exposition RF tout seul et ne doit donc pas être co-localisé avec un autre émetteur ou antenne sans test et approbation supplémentaires.*
8. *S'il est déployé au Canada, tout produit final utilisant le module radio RM-WIFI-AC-2X2-HP-CA doit être visiblement étiqueté comme suit :*

   Contient IC : 26854-RMWIFIAC2X2

9. *L'intégrateur ou le fabricant hôte ne doit pas fournir d'informations à l'utilisateur final concernant l'installation ou le retrait de cet émetteur modulaire du dispositif hôte dans le manuel d'utilisation du produit final.*
10. *Tout manuel de l'utilisateur final doit inclure toutes les informations/avertissements réglementaires requis, comme indiqué dans ce manuel.*

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

11. *Même si le module radio RM-WIFI-AC-2X2-HP-CA de PCTEL a été certifié ISDE, le produit hôte (à voire le produit intégré du module radio + le dispositif hôte) doit être évalué pour une conformité continue dans cette configuration spécifique. Veuillez contacter PCTEL pour obtenir les outils nécessaires à une telle évaluation.*
12. *Si l'une de ces conditions ne peut pas être remplie (par exemple en utilisant un type d'antenne unique), la certification ISDE ne sera plus considérée comme valide, et le numéro IC ne pourra pas être utilisé sur le produit hôte/final. Dans ces circonstances, l'intégrateur du module est responsable de la réévaluation du produit final (y compris l'émetteur) et de l'obtention d'une certification ISDE distincte.*

6.3. Manufacturer's European Union (EU) and United Kingdom (UK) Compliance Statements

6.3.1. EU and UK Declaration of Conformity

Manufacturer: PCTEL, Inc.

Model Number/Type: RM-WIFI-AC-2X2-HP-EU/WiFi Radio Module (A WiFi Transceiver)

Description: 2 x 2, 802.11ac, 5 GHz, mPCIe radio module

EU Directives: Radio Equipment Directive 2014/53/EU, ROHS Directive 2011/65/EU + (EU)2015/863

Standards Considered, Full or In Part, used for presumption of conformity

- EN IEC 62368-1:2018-1:2020 + A11:2020
- EN 301 489-17, v3.2.4:2020-09
- EN 301 893, v2.2.1:2017-05
- EN 63000:2018
- EN 62479:2010

Declaration: PCTEL, Inc. declares under its sole responsibility that the Industrial IoT Radio Module, model RM-WIFI-AC-2x2-HP-EU, is in conformity with the Radio Equipment Directive 2014/53/EU and the ROHS Directive 2011/65/EU + (EU)2015/863.

Place of Issue:
PCTEL, Inc.
471 Brighton Dr.
Bloomingdale, IL 60108-3102 USA
Tel: 1-630-372-6800

Date of Issue: May 3, 2022

Name of Authorized Person: Stephen V. Saliga, Vice-President, Engineering

Signature of Authorized Person:

To ensure regulatory compliance, when integrating the RM-WIFI-AC-2X2-HP radio module into a host device, it is required to meet the documentation and operational requirements set forth by the applicable regulatory agency. The following sections outline the information that must be considered and included in the user's guide and external labels for the host device that includes the RM-WIFI-AC-2X2-HP radio module.

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

6.3.2. Antenna Information

This radio transmitter has been approved under RED 2014/53/EU to operate the antenna types listed below with the maximum gain indicated. The usage of different antennas in the final host device may need a new assessment of host conformity to RED 2014/53/EU.

Table 3. Approved Antennas

PCTEL Part Number	Description	Gain
		5150 - 5850 MHz
BOA51004NM	Heavy-Duty Omnidirectional Antenna	4 dBi
MPAMB24495804-RPSMA	Portable Omnidirectional Antenna	4 dBi
MHODB24490507NM-IP	Dual-Band High-Performance Omnidirectional Antenna	7 dBi
AEMH51PT155UFL	Circuit-board-based 5 GHz horizontally ploraized monopole with 155 mm U.FL pigtail cable	4.3 dBi
AED2451PT155UFL	Circuit-board-based dual-band dipole with 155 mm U.FL pigtail cable	2.8 dBi
AEMV2451PT155UFL	Bent metal dual -band monopole with 155mm U.FL pigtail cable	2.4 dBi
AEPV2451PT155UFL	Bent metal dual -band PIFA with 155mm U.FL pigtail cable	4.8 dBi

In addition, two antenna cables are required.

6.3.3. European Union and UK Radiation Exposure Statement

This radio transmitter has been evaluated for RF exposure for humans in reference to ICNIRP (International Commission on Non-Ionizing Radiation Protection) limits. The evaluation was based on the EN 62479 in conjunction with IEEE C95.1. To maintain compliance, the minimum separation distance from the antennas is 7.87 inches (20 cm) from end users and general bystanders.

6.3.4. EU and UK Compliance Statement

Any integrator must include specific information in the user-s guide for the device into which the RM-WIFI-AC-2X2-HP-EU is integrated. In addition to FCC and ISED statements outlined above, the following Radio Equipment Directive (RED) statements must be added in their entirety and without modification into a prominent place in the end-user's documentation. This device, RM-WIFI-AC-2X2-HP-EU complies with the essential requirements of the 2014/53/EU - Radio Equipment Directive (RED). The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the 2014/53/EU - Radio Equipment Directive (RED):

- **EN 62368-1:2020 + A11:2020**
  Safety requirements for audio/video, information, and technology equipment
- **EN 62479:2010**
  RF Exposure
- **EN 301 489-17 v3.2.4 (2020-09)**
  Electromagnetic Compatibility (EMC) Standard for Radio Equipment and Services; Part 17: Specific Conditions for Broadband Data Transmission Systems; Harmonised Standard for Electromagnetic Compatibility
- **EN 301 893 v2.1.1 (2017-05)**
  5 GHz RLAN; Harmonised Standard Covering the Essential Requirements of Article 3.2 of Directive 2014/53/EU
- **EU 2015/863 (ROHS 3)**
  Declaration of Compliance – EU Directive 2015/863; Reduction of Hazardous Substances (ROHS)

Industrial IoT Radio Module

2x2, 802.11ac Wave 2

This device is a 5 GHz wideband transmission system (transceiver), intended for use in all EU member states and the UK.

Dansk (Danish)	Hermed erklærer PCTEL, Inc., at denne 5 GHz modtager overholder de generelle krav og andre retningslinjer af direktiv 2014/53/EU.
Deutsch (German)	Hiermit erklärt PCTEL, Inc., dass dieser 5-GHz-Transceiver den grundlegenden Anforderungen und anderen relevanten Bestimmungen der Richtlinie 2014/53/EU entspricht.
English	Hereby, PCTEL, Inc., declares that this 5 GHz transceiver is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.
Español (Spanish)	Por la presente, PCTEL, Inc., declara que este transceptor de 5 GHz cumple los requisitos esenciales y otras disposiciones pertinentes de la Directiva 2014/53/UE.
Français (French)	Par la présente, PCTEL, Inc, déclare que cet émetteur-récepteur 5 GHz est conforme aux exigences essentielles et autres dispositions pertinentes de la directive 2014/53/UE.
Italiano (Italian)	Con la presente, PCTEL, Inc. dichiara che questo ricetrasmettitore da 5 GHz è conforme ai requisiti essenziali e ad altre pertinenti disposizioni della direttiva 2014/53/UE.
Nederlands (Dutch)	Hierbij verklaart PCTEL, Inc. dat deze 5 GHz zendontvanger in overeenstemming is met de essentiële eisen en andere relevante bepalingen van de Richtlijn 2014/53/EU.
Norsk (Norwegian)	PCTEL, Inc. erklærer herved at denne 5 GHz-mottakeren samsvarer med de nødvendige kravene og andre relevante bestemmelser i direktiv 2014/53/EU.
Português (Portuguese)	A PCTEL, Inc. declara que este transceptor de 5 GHz está em conformidade com os requisitos essenciais e outras disposições relevantes da Diretiva 2014/53/UE.
Suomalainen (Finnish)	Täten PCTEL, Inc. ilmoittaa, että tämä 5 GHz:n lähetin-vastaanotin on yhdenmukainen direktiivin 2014/53/EU keskeisten vaatimusten ja muiden olennaisten säännösten kanssa.
Svenska (Swedish)	PCTEL, Inc. intygar härmed att denna 5 GHz-transceiver uppfyller de grundläggande kraven och andra relevanta bestämmelser i direktiv 2014/53/EU.

Safety Notices

This section lists the product safety notices for the RM-WIFI-AC-2X2-HP. Please follow all safety notices to ensure proper installation and operation.

A. Only trained and qualified personnel should be allowed to install, replace or service this product.

B. Before connecting the product to the power source, read all installation instructions.

C. Product installation must comply with all national and local electrical codes.

D. Do not install or remove the product, and do not connect or disconnect any cables or antennas during the time when lightning activity is present.

E. Product disposal should be handled in accordance with all laws and regulations.

Wireless Sensor Endpoint

Sensor Connectivity Solution

WSE-1450

Connectivity

- Cellular Cat M1/NB-IoT
- LoRa
- Bluetooth® 5
- NFC
- 802.15.4

Features

- Cortex M4F 32-bit application processor with 1MB flash memory / 256K RAM
- 4MB external flash memory
- GPS receiver included in cellular radio
- LED indicator
- Lithium-Ion Polymer battery pack

Sensors

- Relative Humidity and Temperature
- 6-axis / 9-axis Inertial Measurement Unit
- Gas, Air Quality, Pressure, Temperature and Humidity
- Time-of-Flight Ranging
- Microphone

Wireless Sensor Endpoint

Sensor Connectivity Solution

The PCTEL® Wireless Sensor Endpoint (WSE) family are versatile Industrial IoT products that offer multiple radio connectivity options including cellular, LoRa, Bluetooth® 5, NFC as well as 802.15.4 support.

In addition to several radios, the PCTEL WSE family includes several sensors to monitor a variety of physical conditions. These sensors can detect air quality, temperature, relative humidity, acceleration, angular rate of change, magnetic field, range, and sound.

The PCTEL WSE is powered by a high capacity Lithium-Ion Polymer battery pack. The enclosure also has two mounting tabs for easy installation.

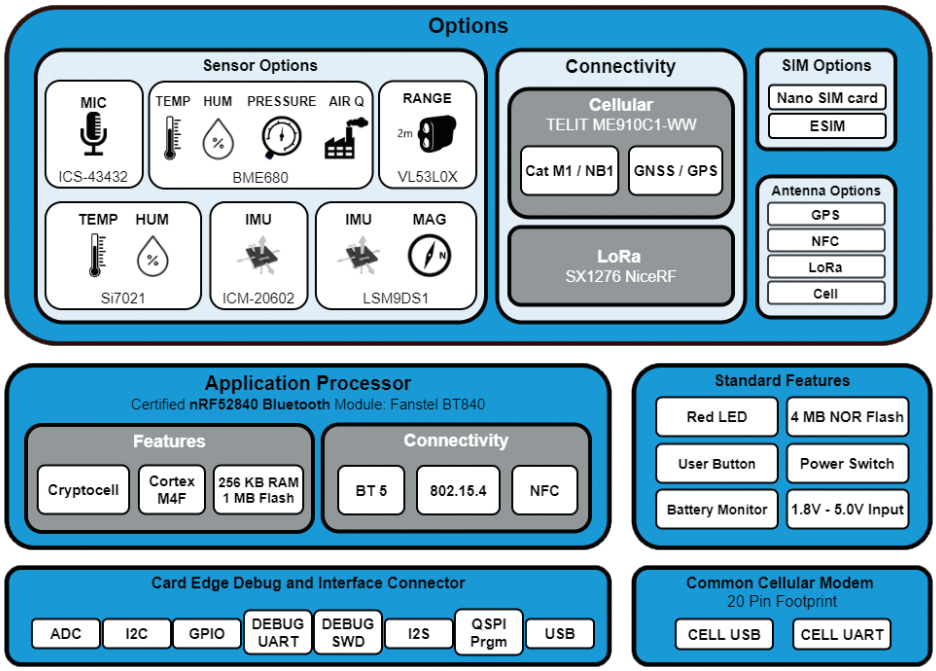
ADVANTAGES

Wireless Sensor Endpoint

Sensor Connectivity Solution

Features and Benefits

Feature	Benefit
ARM Mbed Enabled	Faster time to market leveraging ARM Mbed OS to accelerate application software development.
Arm Pelion Enabled	Provides for the secure provisioning, connecting and managing of the endpoint reducing development time.
Internal Radio Antennas	No external connections with each radio having an individual antenna.
Rechargeable Battery Pack	Easily recharge the battery via USB Micro-B connector.
Mounting Tabs	Enclosure with two integrated tabs for easy installation.
Integrated Debug Interface	Ease of software development using the Wireless Sensor Development System.
Nano-Sim Card Holder	Easy installation of preferred cellular provider SIM card.
Power Switch	WSE can be turned on and off as needed.
Push Button	User defined operation.



Wireless Sensor Endpoint

Sensor Connectivity Solution

General Specifications

Parameter	Specification
Operating Temperature	-20°C to +60°C
Charging Temperature	0°C to +45°C
Storage Temperature	-20°C to +45°C (1-month) -20°C to +35°C (6-months)
Battery Pack	Li-Ion Polymer, 3.7V @ 4400mAh
Dimensions	60mm x 103mm x 43mm

Sensor Specifications

Device	Specification
Relative Humidity / Temperature	±3% RH (max) 0-80% RH / ±0.4°C (max) -10°C to +85°C
6-Axis IMU Motion Tracking Device	3-axis Accelerometer: ±2/±4/±8/±16 g linear 3-axis Gyroscope: ±250/±500/±1000/±2000 dps
9-Axis Inertial Measurement Unit	3-axis Accelerometer: ±2/±4/±8/±16 g (linear) 3-axis Angular rate: ±245/±500/±2000 dps 3-axis Magnetic position: ±4/±8/±12/±16 gauss
Time-of-Flight	Absolute range up to 2m (3% conditional accuracy)
Microphone	Frequency response: 50 Hz to 20 kHz SNR: 65 dBA, Sensitivity -26 dB FS
Environmental Gas / Air Quality	Gas (VOC): 20% tolerance; 5% accuracy
	Pressure: 300 to 1100 hPa (±0.6 hPa)
	Humidity: 10% to 90% RH (±3%) at 0°C to +65°C
	Temperature: -40°C to +85°C (±1°C), 25°C (±0.5°C)
	Air Quality Score: 0 to 500 (±15%)

SPECIFICATIONS

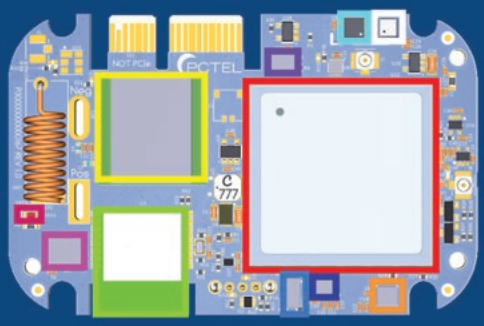
Wireless Sensor Endpoint

Sensor Connectivity Solution

Component Identification Diagram

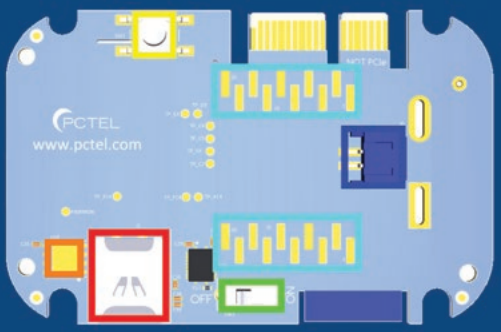
Top

Component	Function	COLOR
Telit ME910C1-WW	Cat-M1 / NB-IoT / GNSS	
TDK ICM-20602	Accelerometer - Gyro	
NiceRF Lora1276	LoRa - 802.15.4 - <GIg	
BT840	MCU - BT5 - 802.15.4 - NFC	
BOSCH BME680	Temp - Hum - Pres - Air Q	
Si7021	Temp - Humidity	
ST VL53L0X	Range Finding (ToF)	
ST LSM9DS1	Accel - Gyro - Mag	
TDK ICS-43432	Microphone	
Winbond	4MB QSPI NOR Flash	
RED LED	Indicator	



Bottom

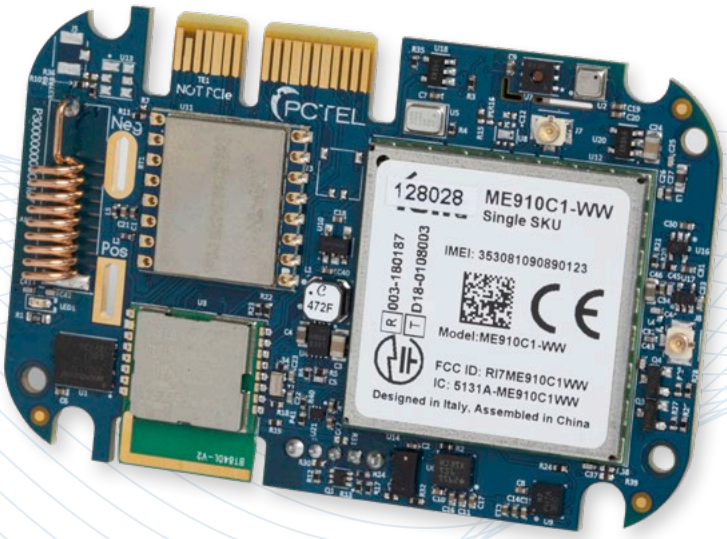
Component	Function	COLOR
Nano-SIM Holder	Size 4FF	
eSIM	Embedded SIM IC	
Push Button	User button	
Power Switch	Slide Switch	
Battery Connector	JST	
Modem Connector	Common Footprint for Cellular	



Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

WSC-1450



Connectivity

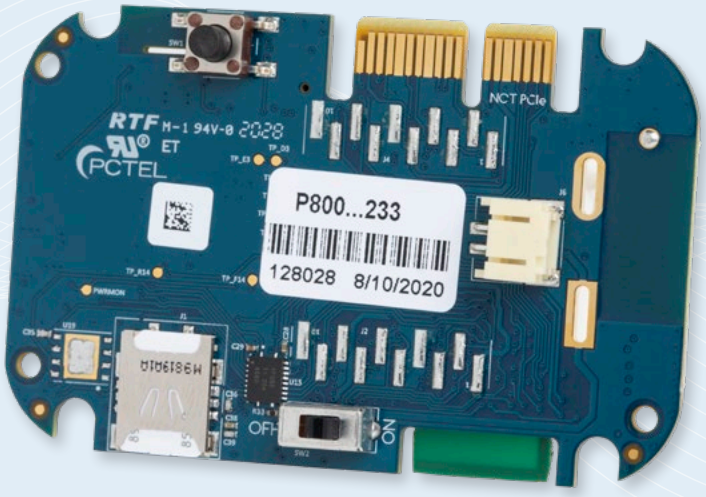
- Cellular Cat M1/NB-IoT
- Bluetooth® 5
- LoRa
- 802.15.4
- NFC

Features

- Cortex M4F 32-bit application processor with 1MB flash memory / 256K RAM
- 4MB external flash memory
- GPS receiver included in cellular radio
- LED indicator
- Card edge debug and interface connector

Sensors

- Relative Humidity and Temperature
- 6-axis / 9-axis Inertial Measurement Unit
- Gas, Air Quality, Pressure, Temperature and Humidity
- Time-of-Flight Ranging
- Microphone



Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

The PCTEL® Wireless Sensor Core (WSC) family is a versatile Industrial IoT product line that offers multiple radio connectivity options including cellular, LoRa, Bluetooth® 5, NFC as well as 802.15.4 support.

In addition to several radios, the PCTEL WSC family includes several sensors to monitor a variety of physical conditions. These sensors can detect gas, air quality, temperature, relative humidity, acceleration, angular rate of change, magnetic field, range, and sound. For solution optimization, the PCTEL WSC can be ordered with a subset of radios and sensors.

With the PCTEL WSC, there is a card edge connector that provides the interfaces for external SPI and I2C devices. Also available on the connector are GPIO pins, an ADC channel, I2S, QSPI and USB. Programming and debugging through a UART and SWD are included as well.

ADVANTAGES

Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

Features and Benefits

Feature	Benefit
ARM Mbed Enabled	Faster time to market leveraging ARM Mbed OS to accelerate application software development.
ARM Pelion Enabled	Provides for the secure provisioning, connecting and managing of the endpoint reducing development time.
Integrated Debug Interface	Ease of software development using the Wireless Sensor Development System.
20-pin Common Cellular Modem Header	Core can be plugged into a variety of existing systems with this popular connector.
Nano-SIM Card Holder	Easy installation of preferred cellular provider SIM card.

Card Edge Debug and Interface Connector

WSC [generic function]	WSC [signal]	Pin	Pin	WSC [signal]	WSC [generic function]
MISO/TRACEDATA1	LoRa_MISO	B1	A1	CELL_TX	TX [from Processor]
MOSI/TRACEDATA2	LoRa_MOSI	B2	A2	CELL_RTS	RTS
SCLK/TRACECLK	LoRa_SCLK	B3	A3	CELL_RX	RX [to Processor]
SS#/TRACEDATA3	LoRa_SS#	B4	A4	CELL_CTS	CTS
GND	GND	B5	A5	GND	GND
I2C_SCL	SCL	B6	A6	I2S_WS	GPIO04
I2C_SDA	SDA	B7	A7	I2S_SCK	GPIO05
GND	GND	B8	A8	GND	GND
GPIO01/Analog1	CELL_ON_OFF	B9	A9	BT840_USB_P	USB_P
GPIO02/Analog2	SENSOR_PWR_EN	B10	A10	BT840_USB_N	USB_N
GPIO03	I2S_SD	B11	A11	BT840_VBUS	VBUS
DEBUG_TX [from Processor]	DEBUG_TX	B12	A12	VCC_33	VCC
DEBUG_RX [to Processor]	DEBUG_RX	B13	A13	VBAT	VBAT
GND	GND	B14	A14	GND	GND
QSPI_CSn	QSPI_CS#	B15	A15	BT840_SWDIO	SWDIO
QSPI_DATA1	QSPI_IO1	B16	A16	BT840_SWDCLK	SWDCLK
QSPI_DATA0	QSPI_IO0	B17	A17	BT840_RESET#	RESET#
QSPI_CLK	QSPI_CLK	B18	A18	BT840_SWO/TRACEDATA0	SWO/TRACEDATA0

SPECIFICATIONS

Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

General Specifications

Parameter	Specification
Operating Temperature	-40°C to +85°C (without Time of Flight sensor) -20°C to +70°C (with Time of Flight sensor)
Storage Temperature	-40°C to +85°C
Dimensions	45mm x 70mm x 18.5mm with LoRa antenna (14mm without LoRa antenna)

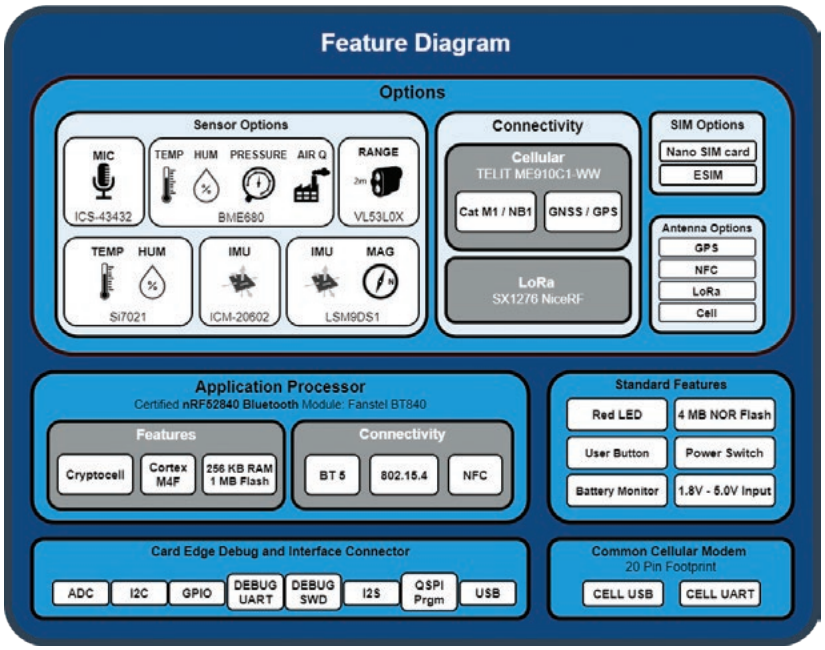
Sensor Specifications

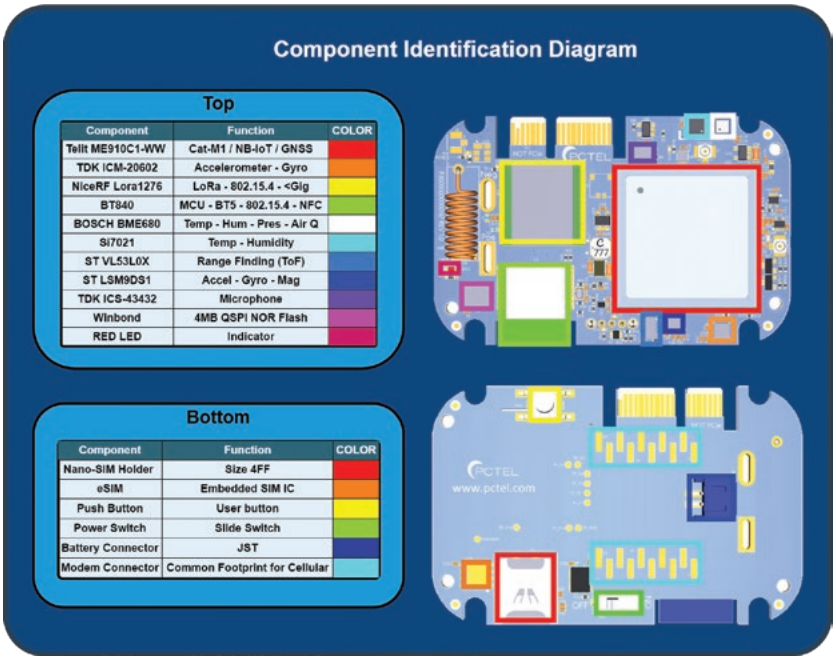
Device	Specification
Relative Humidity / Temperature	±3% RH (max) 0-80% RH / ±0.4°C (max) -10°C to +85°C
6-Axis IMU Motion Tracking Device	3-axis Accelerometer: ±2/±4/±8/±16 g linear 3-axis Gyroscope: ±250/±500/±1000/±2000 dps
9-Axis Inertial Measurement Unit	3-axis Accelerometer: ±2/±4/±8/±16 g (linear) 3-axis Angular rate: ±245/±500/±2000 dps 3-axis Magnetic position: ±4/±8/±12/±16 gauss
Time-of-Flight	Absolute range up to 2m (3% conditional accuracy)
Microphone	Frequency response: 50 Hz to 20 kHz SNR: 65 dBA, Sensitivity -26 dB FS
Environmental Gas / Air Quality	Gas (VOC): 20% tolerance; 5% accuracy
	Pressure: 300 to 1100 hPa (±0.6 hPa)
	Humidity: 10% to 90% RH (±3%) at 0°C to +65°C
	Temperature: -40°C to +85°C (±1°C), 25°C (±0.5°C)
	Air Quality Score: 0 to 500 (±15%)

SPECIFICATIONS

Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors





Product Usage

THE PRODUCTS ARE NOT DESIGNED, MANUFACTURED, OR INTENDED FOR USE, ALONE OR WITH OTHER PRODUCTS, IN ANY APPLICATION REQUIRING FAIL-SAFE PERFORMANCE OF THE PRODUCTS AND/OR IN WHICH A MALFUNCTION OR A FAILURE OF THE PRODUCTS COULD LEAD TO DEATH, PERSONAL INJURY, OR SERIOUS PHYSICAL OR ENVIRONMENTAL DAMAGE, INCLUDING BUT NOT LIMITED TO (A) SURGICALLY IMPLANTED DEVICES, LIFE SUPPORT MACHINES, LIFE PRESERVING MEDICAL DEVICES OR SYSTEMS, OTHER MEDICAL AND SURGICAL APPLICATIONS, OR ANY DEVICES, MACHINES, SYSTEMS, PRODUCTS, OR PROCESSES REQUIRING APPROVAL, TESTING OR CERTIFICATION BY THE U.S. FOOD AND DRUG ADMINISTRATION OR A SIMILAR GOVERNMENTAL ENTITY; (B) AIR TRAFFIC CONTROL OR AIRCRAFT SYSTEMS; (C) CONTROL EQUIPMENT FOR NUCLEAR OR OTHER POWER GENERATION FACILITIES; OR (D) MISSILE, NUCLEAR, BIOLOGICAL, OR CHEMICAL WEAPONS, OR OTHER MILITARY APPLICATIONS (EACH A **"PROHIBITED USE"**).

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CONTACT US

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Solving Complex Wireless Challenges

PCTEL is a leading global provider of wireless technology solutions, including purpose-built Industrial IoT devices, antenna systems, and test and measurement products. Trusted by our customers for over 25 years, we solve complex wireless challenges to help organizations stay connected, transform, and grow.

PCTEL, Inc.

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