Antennas & Solutions for Smart Utilities

Laird™ CONNECTIVITY

Smart Utilities in Gas, Water and Electricity are for more than just convenience. A connected grid improves efficiency, safety and reduces costs through predictive maintenance and control. We have the tools for the ideal robust wireless solution.

Utility Provider Antennas
Omni-Directional
Directional
Sector
Yagi

Transmission Grid Antennas
Omni-Directional
Directional
Sector
Yagi
Multi-Port
Disk Puck Multi-Port

Local Distribution Grid Antennas
Omni-Directional
Directional
Sector
Yagi
Multi-Port

Mobile Data Collection Antennas
Multi-Port Vehicular
Disk Puck Multi-Port

Smart Metering Antennas
Internal/Embedded
Dipole
Disk Puck Multi-Port
Custom Designs

Smart Utilities or Smart Grids are a growing phenomenon and for a good reason. They offer real-time monitoring and analytics of multiple areas of a grids network. Data can be gathered and connected all the way from the consumer home or business location to the utility provider. This allows for rapid transmission of information from and to any point in the grid allowing for information gathering and early identification of risks or potential risks from equipment failure or fault.

They also reduce the human element meaning savings in labor cost, reductions in emissions from transportation required and improved safety.

The right antenna choice is critical to the reliability and performance of Smart networks and Laird Connectivity offers a full range of antenna products and accessories to enable this. Laird Connectivity's 70+ years of wireless design experience has produced a rich portfolio of high performance antennas that excel in their applications. This includes internal, vehicle-mounted, infrastructure and more.

Laird Connectivity is **THE** antenna authority on rugged, high-performance antennas that serve countless niche applications, so you'll never have to settle for a partial fit for your specific applications. They're available in indoor or outdoor enclosures, with fully customizable cable and connector options, and supporting multi-frequency, multi-wireless technology applications for some of today's most ambitious Smart designs.

This brochure includes a selection of the most popular Smart Utilities antennas from Laird Connectivity. The full range can be found on our website.
Supplementary brochure for additional IoT Products on our resources page.

Antennas for Smart Utilities

Today's Smart utilities are connected using several unique wireless protocols, each of which feature unique strengths and capabilities for their given applications and Laird Connectivity has solutions for each of these. Each brings something to the table: Bluetooth and Wi-Fi for gathering local/consumer end data; LoRaWAN to route data to the cloud over Low-Power WAN (LPWAN); cellular 4G/5G/LTE-M for nationwide blanket coverage; and even private networks incorporating high gain antennas for wireless backhaul. Every scenario has an ideal solution and our wide range of antennas gets critical data where it needs to go, securely.

Custom Antenna Solutions

Our decades of experience in antenna integration, optimizing antenna performance, and endless customization make Laird Connectivity the natural choice. Our expertize and experience has allowed us to create custom antenna solutions for challenging environments such as below ground or integrated into heavy metal meter covers.

- Design Expertise
- Design, Simulation, and Prototyping
- Testing & 3D Pattern Provision
- EMC/FCC Compliance Certification
- Low Cost, In-house Manufacturing in both USA and Malaysia

Internal Antennas for Metering and Consumer End Applications

Internal antenna designs need expert consideration and testing to produce designs that perform and last. Rely on us for the antenna support to deliver the performance you need and products you can depend on.

Laird Connectivity's diverse range of internal antennas are reliable, low cost and easy to install inside meters. The FlexPIFA has an integrated ground plane making it less sensitive to detuning than a dipole solution. The mFlexPIFA is designed and tuned ready to be placed directly on metal. For high end WiFi MIMO applications, take a look at the FlexMIMO solution. A variety of other PCB options are offered, as follows:

Laird Connectivity Family	Part Number	Frequency (MHz)
FlexPIFA	001-0014, 001-0022, 001-0025	2400-2480
FlexPIFA (Dual Band)	001-0016, 001-0021, EFB2455A3S-16MHF1	2400-2480, 4900-5900
mFlexPIFA	001-0030, EFA2400A3S-10MH4L	2400-2480
mFlexPIFA (Dual Band)	001-0034	2400-2480, 4900-5900
Mini NanoBlade (Flex)	MAF95310, EMF2449A1-10UFL	2400-2500, 4900-5875
FLexMIMO	EFD2455A3S-10MHF1	2400-2480, 4900-5900

LTE-M/NB-IoT/Cat M/Cellular Antennas

The Revie Flex can bend inside the application, and is available in several frequency/size options.

Laird Connectivity Family	Part Number	Frequency (MHz)
Revie Flex	EFF6925A3S-15MHF1	698-875, 1710-2500
Revie 600	EFF6060A3S-xxMHF1	600-6000
Revie 700	EFF6989A3S-19MHF1	698-6000

ISM/LoRa/SigfoxAntennas

The Revie Pro, Prime and Plex are rigid PCB solutions with high efficiency and excellent gain.

Laird Connectivity Family	Part Number	Frequency (MHz)
Revie Pro	MAF95256	868 / 880-960/ 1710-1990
Revie Prime	EPR8221A1-xxUFL	824-960 / 1710-2170
Revie Plex	EPL8221A1-xxUFL	824-960 / 1710-2170

CBRS Antennas for Self-Contained Networks

Many utilities are now migrating to the recently opened CBRS Bands taking advantage of the benefits of added security and lower cost of these self-contained networks. Laird Connectivity has a variety of solutions in various form-factors to meet your needs.

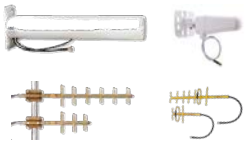
Type	Coverage	Application	Laird Connectivity Family
Infrastructure Baton Antennas	CBRS, Cellular + CBRS Combo	Distribution Networks, Wide Area Networking, Substations	OC69421-FNF, OC35506P-FNF
In-Building DAS Antennas	Cellular + CBRS	In-Building Communication	CFSA69383P
Vehicular Multi-Port Antennas	Multi-Port: CBRS, Cellular, Wi-Fi , GPS(GNSS)	Utility Vehicles	VFH69383x22JU
High Gain Outdoor Sector	CBRS	Defined Coverage Areas	SJS330065-17-001

High Gain Antennas for Long Range Transmission

Laird Connectivity has a range of infrastructure antennas to establish your IoT network. The families below cover point to point, omnidirectional and directional antennas.

Yagi Antennas

Our line of high-performance infrastructure yagi antennas are perfect for building out the backbone of your Smart Utilities network deployment. Optimized for long range and reliable connection, Laird has models covering VHF, UHF, ISM, Cellular/CBRS and WiFi bands. The following are just a few of the many available models.



Laird Connectivity Family	Frequency (MHz)	Description
PC2415N	2400-2500	Yagi, Enclosed, 13.9 dBi
PC9013N	902-928	Yagi, 13 dBi, 13 element
YA9-13	860-960	Yagi, 13 dBi, 15 element
YS2165	216-225	Yagi, 11 dBi, 5 element
YB4506	450-480	Yagi, 12 dBi, 6 element

High Gain Outdoor Omni Antennas

Our high gain line of omnidirectional baton antennas pushes infrastructure connectivity to wide-reaching outdoor areas, providing broad coverage for remote locations. Offered with gain as high as +13 dBi.

Laird Connectivity Family	Frequency (MHz)	Description
OD24M-12	2400-2485	13dBi Omni, 7 deg. BW, 10 Watt
OD35M-10	3400-3600	10dBi Omni, 14 deg. BW, 10 Watt
OD9-11	860-960	11dBi Omni, 7 deg. BW, 100 Watt
OF86315	863-876 / 902-928	5.3 / 5.6 dBi Omni, 28/28 deg BW
FG9023	902-928	5dBi Omni, 70 deg. BW, 200 Watt
OC24527-FNF	2400-2500 / 5150-5875	4/7 dBi Omni, 28/15 deg BW, 10W

Directional Panel Antennas

Expand your network coverage with high performance directional antennas. Ideal for applications such as large industrial campus, plant and factory settings.

Laird Connectivity Family	Frequency (MHz)	Description
PDM245115	2400-2500 / 5150-5900	WLAN Panel, 4-Port MIMO, 15dBi
PSQ24495	2400-2490 / 4900-6000	WLAN Panel, 4-Port MIMO, +/-45 deg. X-POL
MD24-12	2400-2485	12dBi Dir., 4"x4"x4"
PAV692780	698-960 / 1710-2700	7/8 dBi LTE Dir. Panel

Dipoles & Monopoles for Gateways

A range of swivel and fixed dipole and monopole solutions with gain levels up to 6dBi. Extensive options exist for various frequency bands, connector types, fixed vs swivel, and weatherproofing levels.

Laird Connectivity Family	Wireless Type	Frequency (MHz)	Connector Type	Description
DBA6927C1-FSMAM	Cellular	698-2700	SMA	LTE Swivel Dipole
DBA6927C1-FTNCM	Cellular	698-2700	TNC Male	LTE Swivel Dipole
DBA6927C1-FRNCM	Cellular	698-2700	RP-TNC Male	LTE Swivel Dipole
RD2458-5-SMA	Wi-Fi, BT/BLE, Zigbee	2400-2500 / 5100-5925	SMA Male	High Performance Swivel Dipole
RD2458-5-RSMA	Wi-Fi, BT/BLE, Zigbee	2400-2500 / 5100-5925	TNC Male	High Performance Swivel Dipole
RD2458-5-RTNC	Wi-Fi, BT/BLE, Zigbee	2400-2500 / 5100-5925	RP-TNC Male	High Performance Swivel Dipole
001-0001	Wi-Fi, BT/BLE, Zigbee	2400-2500	RP-SMA Male	Stubby Swivel Dipole
001-0009	Wi-Fi, BT/BLE, Zigbee	2400-2500 / 5150-5850	RP-SMA Male	Stubby Swivel Dipole
001-0010	Wi-Fi, BT/BLE, Zigbee	2400-2500	RP-SMA Male	Stubby Swivel Dipole (IP67)
001-0012	Wi-Fi, BT/BLE, Zigbee	2400-2500 / 4910-5850	RP-SMA Male	Stubby Swivel Dipole (IP67)
EXD312SM	ISM 315	312-318	SMA	Stubby Flexible Monopole
EXD420SM*	ISM 433	420-450	SMA Male	Stubby Flexible Monopole
EXC821SM*	ISM868	821-902	SMA Male	Flexible Monopole
EXE821SM*	ISM868	821-902	SMA Male	Flexible Monopole
001-0002	ISM 915	902-928	RP-SMA Male	Swivel Dipole
001-0011	ISM 915	902-928	RP-SMA MALE	Swivel Dipole
EXC902SM*	ISM 915	902-960	SMA	Flexible Monopole

* Various connector options available

Gar Multiport Antennas for Infrastructure

Laird Connectivity's Gar VFx69383x antenna is a multiport and multiband solution to support a complete communications hub. The Gar family offers up to 5 different port assignments including LTE, WiFi, GPS/GNSS. It features an attractive IP67 low-profile aerodynamic housing that makes it a fantastic choice for any outdoor application such as haulage, transportation or remote monitoring.

Laird Connectivity Family	No. of Ports	Port Type	Frequency (MHz)	VSWR	Isolation (dB)	Peak Gain (dBi)	Cable Type (Length) *	Connector	Color
VFP69383x22JN	5	2x LTE	698- 960/ 1690- 3800	< 2.0:1	-16/-21	1/6/7.2	LMR 100 (5.18 m/17.0 ft)	J or L- SMA male N- Mini UHF	B - Black W - White
		2x WiFi	2400- 2500/ 4900- 6000		-21/-40	3.1/7.5		J- SMA male L- RPSMA male N- RPTNC male	
		GNSS	1559-1606		-42	30	RG174 (5.18 m/17.0 ft)	J or L- SMA male N- TNC male	
VFQ69383x21JN	4	2x LTE	698- 960/ 1690- 3800	< 2.0:1	-19/-24	1.8/7.4	LMR 100 (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		WiFi	2400- 2500/ 4900- 6000		-34/-49	3.1/7		RPSMA- male	
		GNSS	1559-1606		-27	30	RG174 (5.18 m/17.0 ft)	SMA- male	
VFT69383x11JN	3	LTE	698- 960/ 1690- 3800	< 2.0:1	-36/-30	2.3/7.3	LMR 100 (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		WiFi	2400- 2500/ 4900- 6000		-26/-44	3.9/5.4		RPSMA- male	
		GNSS	1559-1606		-29	30	RG174 (5.18 m/17.0 ft)	SMA- male	
VFT69383x2NJN	3	2x LTE	698- 960/ 1690- 3800	< 2.0:1	-18/-23	1.3/7.5	LMR 100 (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		GNSS	1559-1606		-24	30	RG174 (5.18 m/17.0 ft)	SMA- male	
VFD69383x1NJN	2	LTE	698- 960/ 1690- 3800	< 2.0:1	-38/-26	1.9/5.3	LMR 100 (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		GNSS	1559-1606		-24	30	RG174 (5.18 m/17.0 ft)	SMA- male	
VFD69383x2NNN	2	2x LTE	698- 960/ 1690- 3800	< 2.0:1	-18/-24	1.8/7.2	LMR 100 (5.18 m/17.0 ft)	SMA- male	B - Black W - White

Disk Puck Multi-Port for Infrastructure

Our Disk Puck antennas come in a mechanically robust, impact and UV resistant radome and are IP67-rated. These antennas provide excellent coverage for both fleet and fixed asset applications.

VH/VL Series - Optimum performance

VM Series - Wi-Fi Multiport/MIMO solutions

LPS Series - LTE SISO Low profile puck style antennas

Laird Connectivity Family	No. of Ports	Port Type	Frequency (MHz)	VSWR	Isolation (dB)	Peak Gain (dBi)	Cable Type (Length) *	Connector	Color
LPS69223NT-61xxxx	1	LTE	698-960/ 1710-2170	< 3.0:1	*	2.4/4.5	RG316 (0.61 m/ 2ft)	SMAM - SMA male RTNM - RTNC male	Black
LPS69273NT- 61xxxx	1	LTE	698-960/ 1690-2700		*	2.1/5.4			
LPS69863NT-61xxxx	1	LTE	698-960/ 1690-2700		*	4.0/6.6	LMR100 (0.61 m/ 2ft)		
VLQ69273x22N	4	2x LTE	698-960/ 1710-2700	< 2.0:1	-14/-19	3.2/4.5	LMR 195M (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		2x WiFi	2300-2700/ 4900-5900		-20/-26	5.5/6.3		RPSMA- male	
VLQ24593xN4N-518x	4	4x WiFi	2400-2500/ 4900-5925	<2.0:1	-20/-26	2.2/3.5	LMR 195M (5.18 m/17.0 ft)	B - RPSMA male G - SMA male	B - Black W - White
					-21/-26				
					-20/-26				
					-20/-26				
VMT24493RSM-366	3	3x WiFi	2400-2500/ 4900-5875	<2.0:1	*	4.5/5.4	LMR 195 (3.65m/12 ft)	RPSMA- male	Black
VMD24493RSM-366	2	2x WiFi	2400-2500/ 4900-5900	<2.0:1	*	4	LMR240 (3.65m/12 ft)	RPSMA- male	Black
					*				
VHP69273x22J	5	2x LTE	698-960/ 1710-2700	< 2.0:1	-14/-27	4.1/5.9	LMR195M (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		2x WiFi	2300-2700/ 4900-5900		-20/-33	6.2/6.5		RPSMA- male	
		1x GNSS	1561.098/ 1575.42/1602.0		*	28	RG174 (5.18 m/17.0 ft)	SMA- male	
VMJ24493x	3	2x WiFi	2400-2500/ 4900-6000	< 2.0:1	-20	5.1	LMR240 (5.18 m/17.0 ft)	RPSMA- male	B - Black W - White
		1x GNSS	1561.098/ 1575.42/1602.0		-20	6.9	RG174 (5.18 m/17.0 ft)	SMA- male	
VLQ69273x21J	4	2x LTE	698-906/ 1710-2700	< 2.0:1	-13/-24	4.6		SMA- male	B - Black W - White
		1x WiFi	2300-2700/ 4900-5900		-23/-39	5.5		RPSMA- male	
		1x GNSS	1561.098/ 1575.42/1602.0		*	28	RG174 (5.18 m/17.0 ft)	SMA- male	
VLT69273x11J	3	1x LTE	698-906/ 1710-2700	< 2.0:1	-25	4.7	LMR195M (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		1x WiFi	2300-2700/ 4900-5900		-25/-38	6.0		RPSMA- male	
		1x GNSS	1561.098/ 1575.42/1602.0		*	28	RG174 (5.18 m/17.0 ft)	SMA- male	
VLT69273x2NJ	3	2x LTE	698-906/ 1710-2700	< 2.0:1	-14/-25	3.3/4.6	LMR195M (5.18 m/17.0 ft)	SMA- male	B - Black W - White
		1x GNSS	1561.098/ 1575.42/1602.0		-19/-25	28	RG174 (5.18 m/17.0 ft)	SMA- male	

Multi-Port Canister and Ceiling Mount Antennas

Industry leading low-profile ceiling mount and canister antennas create reliable infrastructure networks for Smart Utilities coverage

Laird Connectivity Family	Frequency (MHz)	Description
CMD69423	698 - 4200	LTE 2x2 MIMO, Ceiling Mt.
OP24516	2400-2500 / 5150-5875	6-Port WLAN, Canister
S2451DBT	2400-2500 / 5150-5850	6-Port WLAN, Ceiling Mt. Omni.

Phantom Series for Infrastructure

Laird Connectivity's single and multi-band Phantom antennas are known industry-wide for their IP67 weather resistance, rugged construction and excellent performance. They're the antenna of choice whether you need cellular, LTE M/NB-IoT, ISM868/915, UHF, or Wi-Fi. These antennas offer excellent performance with superior gain across the horizon vs competitor antennas. Many Phantoms are available for small and no-ground-plane applications.

Laird Connectivity Family	Frequency (MHz)	VSWR	Peak Gain (dBi)	Color
TRA(B)3803P	380-400	<2.0:1	0.0	B - Black No B - White
TRA(B)4103P	410-430	<2.0:1	3.0	
TRA(B)4303P	430-450	<2.0:1	3.0	
TRA(B)4503P	450-470	<2.0:1	3.0	
TRA(B)4703P	470-490	<2.0:1	3.0	
TRA(B)4903P	490-512	<2.0:1	3.0	
TRA(B)8213P	821-896	<2.0:1	3.0	
TRA(B)8903P	890-960	<2.0:1	3.0	
TRA(B)9023P	902-928	<2.0:1	0.0	
TRA(B)18503P	1850-1990	<2.0:1	3.0	
TRA(B)58003P	4900-6000	<2.0:1	3.0	
TRA(B)806/17103P	806-960 / 1575.42 / 1710-2500	<2.0:1	5.9/5.1/4.4	
TRA(B)821/18503P	821-896 / 1850-1990	<2.0:1	3.0/3.0	
TRA(B)24/49003P	2400-2500 /4900-5850	<2.0:1	5.7	
TRA6927M3Px-001	698-960 / 1710-2700	<2.5:1	3.5/5.5	B - Black, W - White
TRA6927M3Px-002	698-960 / 1710-2700	<2.5:1	3.5/5.5	
TRA6927M3Px-003 (No Logo)	698-960 / 1710-2700	<2.5:1	3.5/5.5	
TRA6927M3PxN-001	698-960 / 1710-2700	<2.5 / <2.0	0 / 2.9	
TRA8063M3Px-001	806-896 / 1850-1990 / 2500-2700	<2.0:1	4.0/3.5/3.0	
HCF69273xN-60A	698-2700	<2.6 / <2.0	1.5 / 3.8	

MIMO Phantom

The 2-Port MIMO Phantom antenna is a multi-protocol, wide-bandwidth antenna designed to support the latest and most demanding Smart Utilities applications. Supporting 2x2 MIMO – choose from cellular (4G/LTE, 5G), Bluetooth, ISM 868 and 900, Sigfox, LoRaWAN and 2.4GHz. The Laird Connectivity MIMO Phantom offers excellent omni-directional gain with minimum uptilt to optimize coverage, even when installed on small or no ground-plane devices.

Laird Connectivity Family	Frequency (MHz)	VSWR	Peak Gain (dBi)	Cable Type (Length)	Connector	Color
MTRA61274Cx2*	617-960MHz & 1350-2700MHz	<2.5:1	4.2	LMR 195M (610mm / 24 in)	SMA Male	B - Black W - White

* Various connector options available

Cable Assemblies and Accessories

Laird Connectivity's coaxial cable assemblies are engineered for peak performance up to 6 GHz and manufactured in one of our state-of-the-art production facilities. They are tested 100% and certified to meet performance specifications and minimize system losses to within known parameters and these cable assemblies meet those requirements.

Laird Connectivity Family	Frequency	Cable Type	Connector Options	Description
MicroCoax	DC to 6GHz	0.81mm Dia., 1.13mm Dia., and others.	u.FL/MHF1; w.FL/MHF4; SMA, RP-SMA, Bulkhead	-40 to +85 C; Waterproof models available
CA178	700 MHz- 6 GHz	LMR100-Equiv., RG58/U, RG178, LMR400-Equiv.	N-Fem., N-Male(Bulkhead), SMA, RP-SMA, TNC, R/A-SMA, U.FL, MCX, and others	-40 to +125 C; Waterproof models available
CA195, CAN, CAS	450 MHz- 6 GHz	RG-58 "Ultralink", LMR195-Equiv., RG316, WBC240 (LMR240-Equiv.)	N-Male, N-Male (Bulkhead), SMA, RP-SMA, BNC, and others	High Performance, Extensive combinations available
ATX400	Various to 6 GHz	LMR400-Equiv.	N-Female, N-Male, N-Male(Bulkhead), UHF, and others	Very low-loss for telematics and infrastructure applications

Connected. No Matter What.

Laird Connectivity simplifies wireless connectivity with market-leading modules, antennas, IoT devices, and customer-specific wireless solutions. THE Antenna Authority whose products are trusted by companies around the world for their performance and reliability. With best-in-class support and comprehensive design services, we reduce your risk and improve your time-to-market. When you need unmatched wireless performance to connect your applications with security and confidence, Laird Connectivity Delivers – No Matter What.

Laird™

CONNECTIVITY

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