

Government and Defense Applications

Use Cases at a Glance



FreeWave Vision

To enable a world where implementing the Internet of Things (IoT) is effortless through universal wireless access to data from any Machine to Machine (M2M) device from any location.

Application	Use Case Description	Generally-Used Frequencies	Specific Products
Unmanned Air Vehicles (UAV)	<ul style="list-style-type: none"> Command & Control Intelligence Surveillance and Reconnaissance 	900 MHz, 2.4 GHz, 1.3 GHz	<ul style="list-style-type: none"> GXM Series MM2-M13 Series ZumLink™ 900 Series MM2 Series
Unmanned Ground Vehicles (UGV)	<ul style="list-style-type: none"> Robotics Weapon and IED Detection 	900 MHz, 1.3 GHz	<ul style="list-style-type: none"> ZumLink 900 Series MM2-M13 Series
Unattended Ground Sensors (UGS)	<ul style="list-style-type: none"> Real-Time Remote Monitoring Physical and Perimeter Security Border Security 	900 MHz, 2.4 GHz	<ul style="list-style-type: none"> ZumLink 900 Series GXM Series
Unmanned Underwater Vehicles (UUV)	<ul style="list-style-type: none"> Command & Control Intelligence Surveillance and Reconnaissance 	900 MHz, 2.4 GHz	<ul style="list-style-type: none"> MM2 Series GXM Series
Training	<ul style="list-style-type: none"> Soldier Training Infantry Small Unit Tactics 	900 MHz, 1.3 GHz	<ul style="list-style-type: none"> MM2-9X5W MM2-13X5W
Targeting / Range	<ul style="list-style-type: none"> Small Arms Ranges 	900 MHz, 1.3 GHz	<ul style="list-style-type: none"> MM2 Series MM2-M13 Series
Guided Parachutes	<ul style="list-style-type: none"> Guided Cargo/Pallet Drops 	900 MHz, 1.3 GHz	<ul style="list-style-type: none"> MM2 Series MM2-M13 Series
Navy Surface Targets	<ul style="list-style-type: none"> Aircraft Gunnery Ship to Shore 	900 MHz	<ul style="list-style-type: none"> MM2-9X5W MM2 Series MM2-13X5W ZumLink 900 Series
Base Infrastructure	<ul style="list-style-type: none"> Electric Power Smart Grid Control Infrastructure Processes 	900 MHz	<ul style="list-style-type: none"> MM2 Series ZumLink 900 Series

Frequency	Serial Interface	Ethernet Interface	Security & Notes
900 MHz	X	X	Small Form Factor, Wideband, Optional AES and TDMA, 5 Watt Amplified
1.3 GHz	X	X	Small Form Factor, Wideband, FIPS 140-2, Optional AES and TDMA, 5 Watt Amplified
2.4 GHz	X		Various Form Factors, Wideband, Optional AES and TDMA, FIPS 140-2

Additional Benefits
<ul style="list-style-type: none"> American-made in Boulder, CO 25 years of experience 1+ million radios shipped Line of sight up to 210 km ISO 9001:2015 certified
<ul style="list-style-type: none"> 2+ million hours of combat flight time on UAS programs of record Cost, Size, Weight, and Power (CSWaP) advantages vs. traditional DoD radio suppliers



Commercial and Enterprise Applications

Use Cases at a Glance



Primary Application	How FreeWave Is Used	
Oil & Gas	<ul style="list-style-type: none"> Supervisory Control and Data Acquisition (SCADA) Sensor communication (C1D1, C1D2) Plunger lift Tank levels and water meters Pumps, valves, and flow lines Auto Vehicle Location (AVL) 	<ul style="list-style-type: none"> Flare stacks Dehydrator temperature Separator pressure Emergency Shut Down (ESD) Cathodic protection Network resiliency (mesh to re-route, cell for backup)
Water/Wastewater	<ul style="list-style-type: none"> Storage tank levels Master meters – turbines, magnetic flow Pumping stations Sewer lift stations 	<ul style="list-style-type: none"> Treatment plants Chemical injection sites Specialty process control devices
Smart Grid & Solar	<ul style="list-style-type: none"> Distribution Management (DMS) Distribution Automation (DA) Substation Automation (SSA) Load Management (LM) 	<ul style="list-style-type: none"> Demand Response (DR) Energy Management (EMS) Supervisory Control and Data Acquisition (SCADA)
Environmental Monitoring	<ul style="list-style-type: none"> Seismic monitoring Geothermal monitoring Subsea monitoring Water level monitoring 	<ul style="list-style-type: none"> River flow monitoring Leak detection Levee performance testing
Electric Power & Utilities	<ul style="list-style-type: none"> Power generation stations Infrastructure Emissions control Fault Condition Indicator (FCI) Supervisory Control and Data Acquisition (SCADA) 	<ul style="list-style-type: none"> Auto Meter Infrastructure (AMI) backhaul Capacitor bank monitoring Recloser communications Regulator monitoring
Location Tracking	<ul style="list-style-type: none"> Food & beverage communication Irrigation control 	<ul style="list-style-type: none"> Golf, distance from pin
Precision Agriculture	<ul style="list-style-type: none"> Precision steering and guidance Irrigation 	<ul style="list-style-type: none"> Fertilizer and pesticide application Feedlot controls
Turf & Pivot Irrigation	<ul style="list-style-type: none"> Center pivot mobile water system Water control above ground for canals 	<ul style="list-style-type: none"> Ground based water source

Other Applications	How FreeWave Is Used
Mine Safety & Rescue	Emergency communications, video monitoring
Wind Turbine	Gas content, radon, vibration monitoring
Asset Management	Stationary asset monitoring, predictive analytics
Fleet Management	Mobile asset monitoring, predictive analytics
Traffic Control	Traffic control, video monitoring
Education	School campus – last mile, remote research, video monitoring/surveillance
Healthcare	Virtual medicine, remote diagnostics and diagnosis, last mile connectivity
Public Safety	Police, EMS, 1st responders, video monitoring/surveillance



5395 Pearl Parkway
Boulder, CO 80301

TF: 1.866.923.6168
Tel: 303.381.9200

www.freewave.com