

# StartMesh Pro



**StartMesh Pro** is the premium version of our routers with built-in antennas. A key component of our HyMesh solution, StartMesh-Pro combines LTE capabilities with WiMesh technology to enable data, voice and video applications. With its automatic failover capability and long-range transmission, StartMesh Pro ensures an infrangible connectivity and broader coverage for your critical communication needs.

**StartMesh Pro** is equipped with a cellular interface, Wi-Fi interface, GPS, built-in antennas, SIM adapter, four Ethernet ports, three of which support IEEE 802.3af/at to connect directly three CCTV cameras.

**WIMESH + LTE/4G**

**BUILT-IN ANTENNAS**

**OUTDOOR RATED**

KEY FEATURES

2x2 MIMO 5GHz 802.11a/b/g/n/ac radio transceiver with useful throughput up to 500Mbps
LTE-A Cat-7 with up to 300Mbps downlink and 150Mbps uplink
Built-in 2x2 5GHz 20dBi dual-slant polarization directional antenna
Built-in 4dBi omnidirectional antenna
Automatic and intelligent switching between WiMesh and 4G to ensure reliable connectivity
4 x 10/100 Mbps Ethernet, three of which support IEEE 802.3af/at
GNSS interface (Galileo, Glonass, GPS, BeiDou)
SIM Adapter
MeshTool Suite software and web interface operate in tandem to configure, troubleshoot, and monitor the network architecture
Plug-and-Play installation
Outdoor rated: IP67, -40°C to +70°C temperature range

SYSTEM ELEMENTS



HARDWARE SPECIFICATIONS

CPU	Quad-core CPU ARM Cortex A7 up to 717MHz, 128 MB Nand Flash, 32MB Nor Flash and DDR3L 256 MB	
WLAN	Physical Layer	Complies with IEEE 802.11a/b/g/n/ac, supports 2x2 MIMO and provides a maximum rate of 866Mbps
	Frequency <sup>1</sup>	U-NII-1: 5180 – 5250 MHz U-NII-2A: 5250 – 5330 MHz U-NII-2C: 5470 – 5725 MHz U-NII-3: 5725 – 5825 MHz

	<b>Modulation</b>	OFDM : BPSK, QPSK, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM, 256-QAM		
	<b>Max. EIRP<sup>2,3</sup></b>	47 dBm		
	<b>RX Sensitivity<sup>4</sup></b>	nHT20	-96 dBm @ 6 Mb/s	-80 dBm @ 54 Mb/s
		HT20	-93 dBm @ MCS8	-76 dBm @ MCS15
		HT40	-90 dBm @ MCS8	-73 dBm @ MCS15
		VHT20	-93 dBm @ MCS0	-71 dBm @ MCS8
		VHT40	-90 dBm @ MCS0	-68 dBm @ MCS9
		VHT80	-88 dBm @ MCS0	-61 dBm @ MCS9
		<b>Integrated Antenna</b>	Gain	20 dBi
	Polarization		Slant X	
	Beamwidth		16°/16°	
<b>Cellular</b>	<b>Interface</b>	LTE-A Cat-7 2x2 MIMO		
	<b>Frequency Bands<sup>1</sup></b>	4G LTE	B1, B3, B7, B8, B20, B28, B32, B38,B40, B41, B42, B43	
		3G/ HSPA+	B1, B5, B8	
	<b>Data Rate</b>	Peak Downlink	300Mbps	
		Peak Uplink	150Mbps	
	<b>Max. EIRP<sup>2,3</sup></b>	27 dBm		
	<b>RX Sensitivity<sup>5</sup></b>	-100 dBm (Full RB on downlink; BW: 10 MHz)		
	<b>Integrated Antenna</b>	Gain <sup>6</sup>	4 dBi	
		Polarization	Vertical	
Beamwidth		360°		
<b>Navigation</b>	Multi-constellation GNSS (GPS, Galileo, GLONASS, Beidou)			
	Integrated Antenna			
<b>External Ports</b>	3x RJ45 output ports,10/100 Mbps Ethernet, auto MDI/MDIX, active POE 802.3af/at 1x RJ45 input port ,10/100 Mbps Ethernet, auto MDI/MDIX, passive POE 1 x SIM Adapter			
<b>LED Indicators</b>	1 x RGB LED for RSSI and Alarm status			
<b>Button</b>	1 x reboot or restore button			
<b>Power Supply</b>	44~60 VDC Passive POE			
<b>Power Consumption<sup>6</sup></b>	Max. 14 W			
<b>Dimensions</b>	269.8 x 269.8 x 76.9 mm 10.62 x 10.62 x 3.03 in.			
<b>Temperature</b>	Operating temperature: -40°C to 70°C   -40°F to 176° F Storage temperature: -45°C to 105°C   -49°F to 221° F			
<b>Humidity</b>	Operating Humidity : 5 to +95% (non-condensing) Storage Humidity : 0 to +90% (non-condensing)			
<b>Wind Resistance</b>	250Km/h			
<b>Weight</b>	1.8 Kg 3.97 lb.			

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Wind Resistance	250Km/h
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IP code	IP67
Materials	ABS, PTFE

<sup>1</sup>Channel, Frequency Channel, frequency and bandwidth options will vary based upon regional and local regulations

<sup>2</sup>Transmission power is governed by local regulations and varies by frequency

<sup>3</sup>EIRP Tolerance is  $\pm 2$  dB

<sup>4</sup>RX sensitivity Tolerance is  $\pm 2$  dB

<sup>5</sup>Cellular RX sensitivity depends on the LTE bands

<sup>6</sup>Power consumption depends on transceiver configuration

## SOFTWARE SPECIFICATIONS

Networking	Compliance with 802.11s Mesh networking
	Compliance with IEEE 802.1q
	Proactive link-state routing protocol for Mesh networking
	SSID-based VLAN assignment
	Service set identifier (SSID) hiding
	Automatic and manual rate adjustment
	Automatic channel scanning and interference avoidance
	Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx)
	Tunnel data forwarding and direct data forwarding
	STA isolation in the same VLAN
	Access control lists (ACLs)
	Link Layer Discovery Protocol (LLDP)
	Network Address Translation (NAT)
	Virtual Router Redundancy Protocol (VRRP)
	Supports IPv6/ IPv4, UDP, TCP, ICMP, Telnet, SNMP, HTTP and FTP protocols
Management	Static IP, dynamic IP or zero-configuration deployment
	Web local management through HTTP or HTTPS
	Real-time configuration monitoring and fast fault location using the NMS
	SNMPv2c and v3
	System status alarm
	Network Time Protocol (NTP)
	Control and Provisioning of Wireless devices
	Remote software update

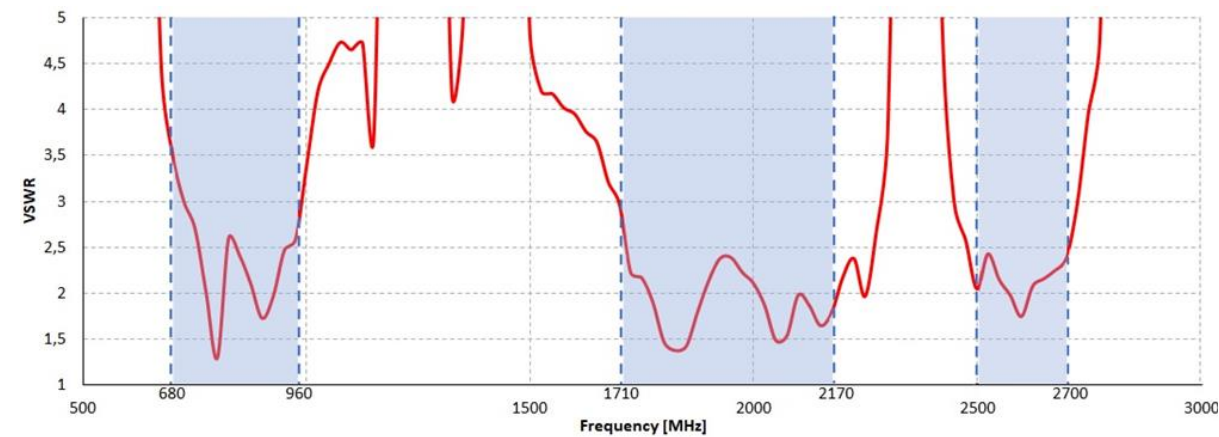
Security	Open system authentication
	WPA/WPA2/WPA-WPA2-PSK/WPA3 authentication and encryption
	Wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS)
	WPA/WPA2/WPA-WPA2-802.1x authentication and encryption
	IP Source Guard
	VPN with public key security (SSL/TLS mode) using client & server certificates.
	WPA, WPA2, and WPA-WPA2 support TKIP and CCMP encryption algorithms, where CCMP uses 256-bit advanced encryption standard (AES) encryption algorithm and has high security
QoS Features	Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding
	WMM parameter management for each radio
	WMM power saving
	Priority mapping for upstream packets and flow-based mapping for downstream packets
	Queue mapping and scheduling
	User-based bandwidth limiting
	Adaptive bandwidth management (automatic bandwidth adjustment based on the user quantity and radio environment)

## STANDARDS AND CERTIFICATIONS

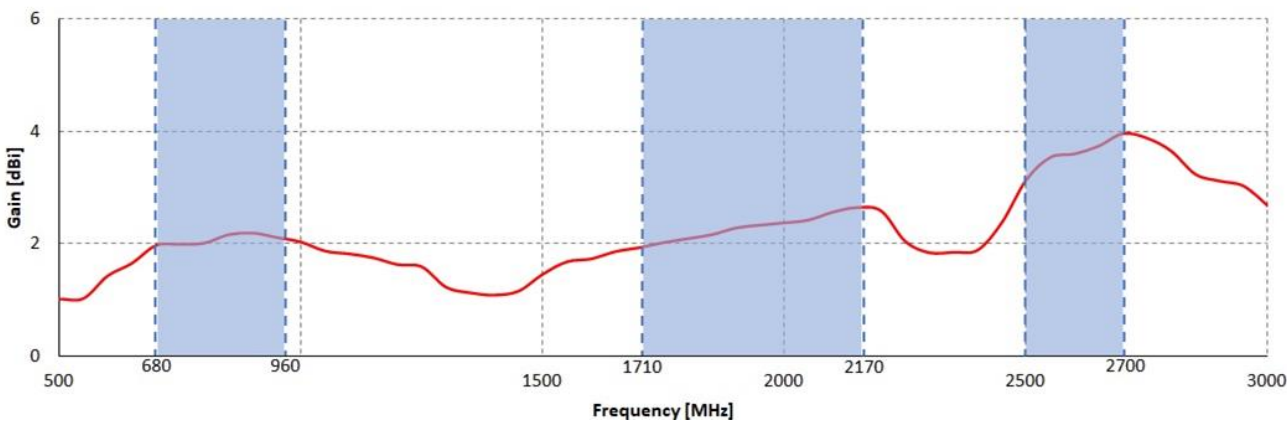
FCC	Part 15.C
	Part 15.E
	Part 15.247
	Part 15.407
	Part 1.1310 & 2.1091
	Part 15.203
	Part15.207
	Part 15.205
	Part 15.209
Environmental	IEC 60529 (IP67)
	RoHS compliance



LTE Antenna VSWR



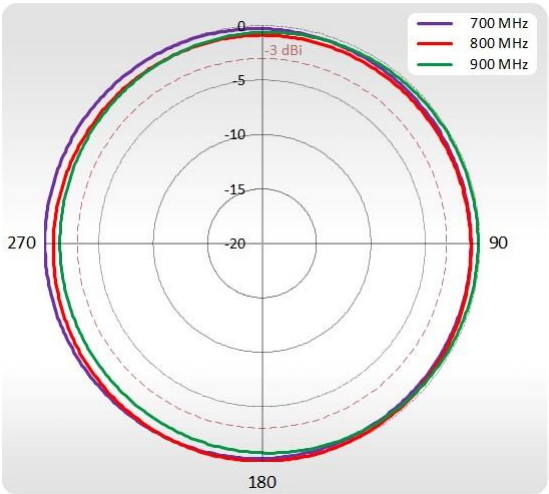
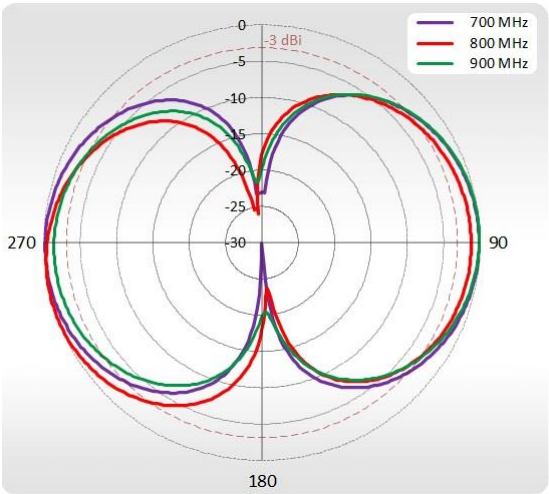
LTE Antenna Gain



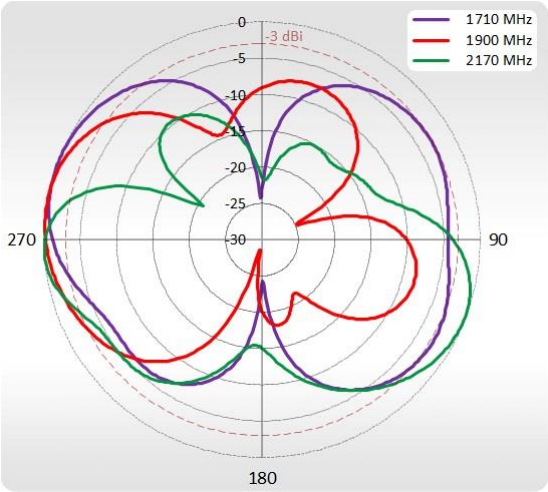
LTE ANTENNA PATTERNS

700-900 MHz Elevation

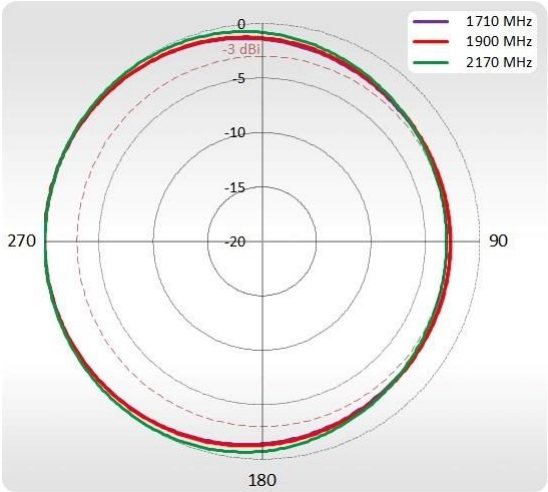
700-900 MHz Azimuth



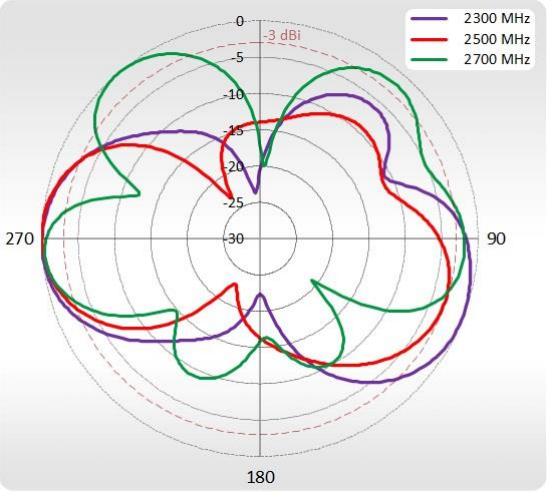
1710-2170 MHz Elevation



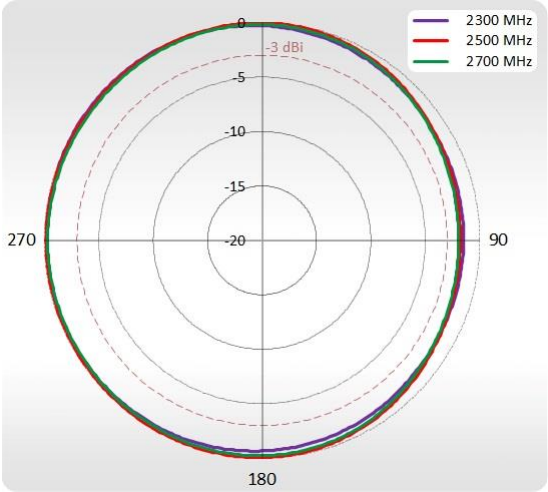
1710-2170 MHz Azimuth



2500-2700 MHz Elevation

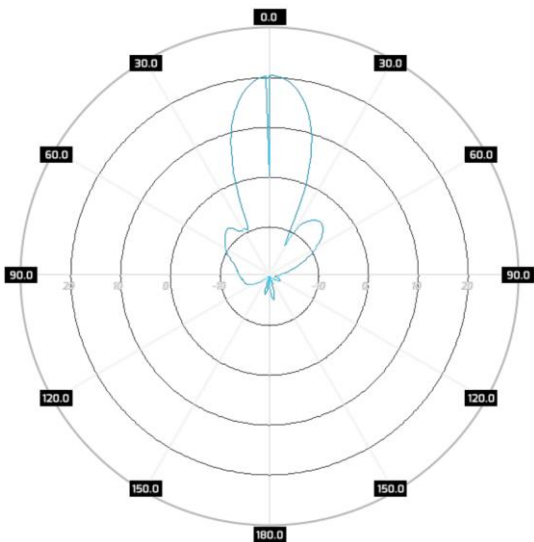


2500-2700 MHz Azimuth

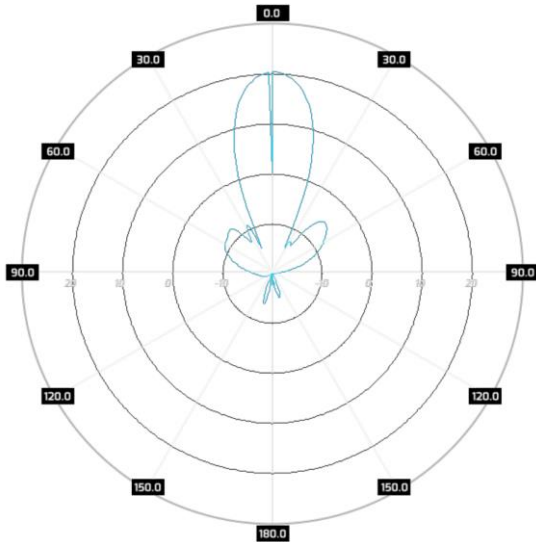


5GHz ANTENNA PATTERNS

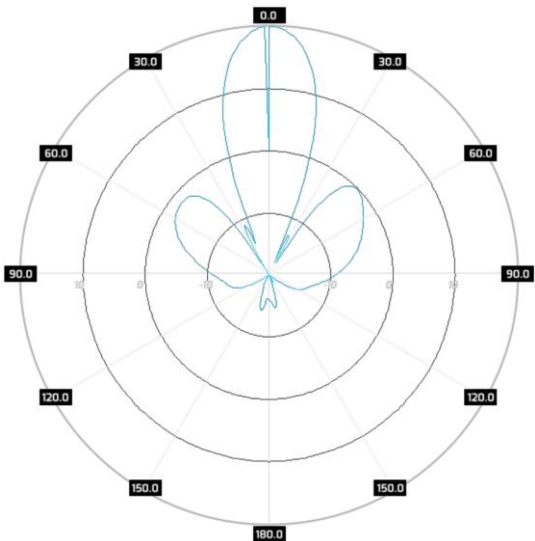
Port 1 Elevation



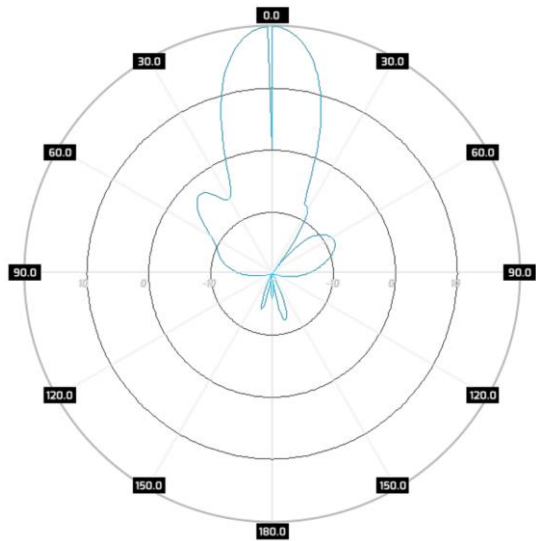
Port 1 Azimuth



Port 2 Elevation

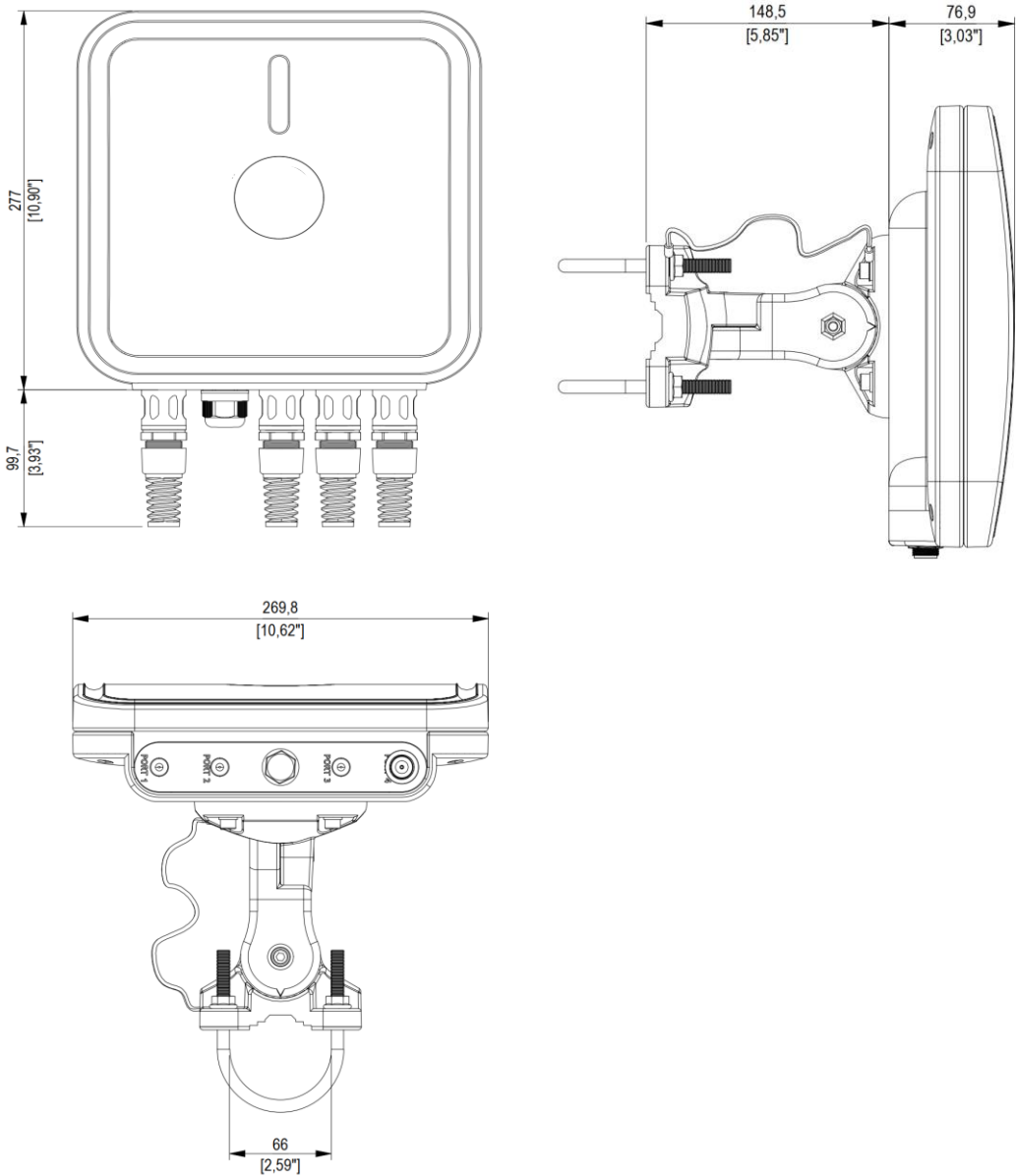


Port 2 Azimuth





DIMENSIONS



ORDERING INFORMATION

OWC-100AC-C-I20

StartMesh Pro with one 5GHz, 2x2 MIMO, 802.11a/b/g/n/ac and one LTE-A Cat-7, 2x2 MIMO transceivers and one integrated antenna, 20dBi.

AL-0011: 100-240VAC IN 0.8A Max 50/60HZ / 56VDC OUT 1A passive POE power supply