



# Tsunami MP.11 Model 2411 and Model 5054

## Technical Specifications



### APPLICATIONS

- Last Mile Access**  
 Competitive broadband service alternative to DSL or cable modems for businesses and residences
- Security and Surveillance** Low cost connectivity for IP surveillance cameras
- Metropolitan Area Networks**  
 Secure and reliable connectivity between city buildings
- Enterprise Campus Connectivity**  
 Extend main network to remote branch offices, warehouses or other out buildings without leased lines

RF MODULATION	Model 2411	PSK/ DSSS (Direct Sequence Spread Spectrum) DBPSK @ 1 Mbps DQPSK @ 2 Mbps CCK @ 5.5 and 11 Mbps
	Model 5054	OFDM (Orthogonal Frequency Division Multiplexing) BPSK 6 and 9 Mbps QPSK 12 and 18 Mbps 16-QAM 24 and 36 Mbps
WIRELESS PROTOCOL	WORP (Wireless Outdoor Router Protocol)	
OVER THE AIR DATA RATES	Model 2411 Model 5054	11 Mbps, 5.5 Mbps, 2 Mbps, 1 Mbps 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps
WIRED INTERFACE	Ethernet	Auto-sensing 10/100BASE-TX Ethernet
	Antenna Connector for BSU and SU with Type-N Connector	Standard Type-N Male
NETWORK ARCHITECTURE TYPE	Infrastructure	
FREQUENCY RANGE AND CHANNELS	Model 2411	Unlicensed 2.4 GHz Band Americas (FCC): 2.4 to 2.4835 GHz (11 channels) Europe (ETSI): 2.4 to 2.4835 (13 channels) France: 2.4465 to 2.4835 GHz (4 channels) Japan: 2.4 to 2.497 GHz (14 channels)
	Model 5054	Unlicensed 5 GHz Band Americas (FCC): 5.25 to 5.35 GHz (3 channels) Americas (FCC): 5.725 to 5.850 GHz (5 channels) Europe (ETSI): 5.47 to 5.725 GHz (11 channels) Licensed 5 GHz Band (for the UK) 50 GHz supports 4 channels
RECEIVE SENSITIVITY	Model 2411	-81dBm for 11Mbps -86dBm for 5.5Mbps -90dBm for 2Mbps -93dBm for 1Mbps
	Model 5054 (BER=10 <sup>-6</sup> )	76dBm for 36Mbps -80dBm for 24Mbps -83dBm for 18Mbps -85dBm for 12Mbps -86dBm for 9Mbps -87dBm for 6Mbps
AVAILABLE TRANSMIT POWER SETTINGS	Model 2411	14dBm
	Model 5054	5.25-5.35 GHz 16 dBm (max) 5.47-5.725 GHz 16 dBm (max) 5.725-5.850 GHz 16 dBm (max) Attenuation Step Value 3dB, from 16 dBm
RANGE INFORMATION <sup>2</sup>	Model 2411	8 miles at peak performance (11Mbps) for FCC 0.9 miles at peak performance (11Mbps) for ETSI up to 17.3 miles maximum (1Mbps) for FCC up to 3 miles maximum (1Mbps) for ETSI
	Model 5054	5.25-5.35 GHz 1.1 miles at peak performance (36Mbps mode) using SUs with external antennas 3 miles maximum (6Mbps mode) using SUs with external antennas 5.47-5.725 GHz 1.0 miles at peak performance (36Mbps mode) using SUs with external antennas 2.9 miles maximum (6Mbps mode) using SUs with external antennas 5.725-5.850 GHz 4.4 miles at peak performance (36Mbps mode) using SUs with external antennas 12.2 miles maximum (6Mbps mode) using SUs with external antennas

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COMPLIANCE AND STANDARDS	Safety	UL CSA IEC	60950, UL50 22.2 No. 60950-00 60950 3rd Ed (1999)
	Radio Approvals	USA  Canada Europe (ETSI)  ARIB	FCC 15.107, 15-109; 15-203-15.205, 15.207, 15.209; 15.247; 15.401-15.407  RSS-102; RSS-210; ICES-003 EN 301.893; EN 300.328; EN 301.489-1; EN 301.489-17; EN 300-440; EN50371  STD-T71, STD 33, STD
	EMI and Susceptibility (Class B)	USA Canada	FCC Part 15.107 ICES-00
SNMP COMPLIANCE	SNMPv1/v2 MIB-II Ethernet-like MIB Bridge MIB 802.3MAU 802.11 MIB Private MIB Orinoco MIB	RFC 1157 RFC 1213 RFC 1643 RFC 1493 RFC 2668	
AE (IEEE 802.3AF) POWER INJECTORS	AE 3af 12 Port DC Injector AE 3af 6 Port DC Injector AE 3af 1 Port DC Injector		
SECURITY	<p>WORP provides critical feature support for secure long-range wireless deployments in unlicensed frequency spectrum.</p> <p>Filter based on packet information such as unicast/multicast/ broadcast MAC or IP</p> <p>Secure "over the air encryption" with:</p> <ul style="list-style-type: none"> <li>• For 2411: WEP and WEP+</li> <li>• For 5054: WEP and AES</li> </ul> <p>Authentication via Radius</p> <p>Intracell blocking allows the BSU to act as the central policy enforcer for SU to SU communication</p>		
STATUS LEDs	Three indicators on the top panel indicate power, wireless traffic, Ethernet traffic		
REMOTE CONFIGURATION SUPPORT	Telnet, HTTP, TFTP, and SNMPv1/ v2c		
LOCAL CONFIGURATION SUPPORT	RS-232 Serial port, DB9 Female		
DIMENSIONS	Packaged	12 in x 9.44 in x 4.5 in (305 mm x 240 mm x 115 mm)	
	Unpackaged	8.46 in x 6.89 in x 1.57 in (215 mm x 175 mm x 40 mm)	
WEIGHT	Packaged weight	3.5 lbs (1.6 kg)	
	Unpackaged weight	2.38 lbs (1.08 kg) Unit-only, .45 lbs (.20 kg) for power supply	
ENVIRONMENTAL	Operating	0° to 55°C, 5-95% humidity non-condensin @ 5° to 55°C	
	Storage	-20° to 75°C, 5-95% humidity non-condensing @ 5° to 75°C	
SYSTEM PROCESSOR AND MEMORY	166MHz Motorola 8241 processor 16 Mbytes RAM 8 Mbytes FLASH		
SOFTWARE SPECIFICATION	Base Station and Subscriber Units	<p>Miscellaneous</p> <p>WORP protocol</p> <p>Dynamic Data Rate Selection</p> <p>Transmit Power Control</p> <p>Antenna Alignment</p> <p>Integrity Check for Software Upload</p> <hr/> <p>Satellite Density</p> <hr/> <p>Dynamic Frequency Selection</p> <hr/> <p>Redundancy</p> <hr/> <p>Spanning Tree (802.1D)</p> <hr/> <p>Bridging and Routing</p> <hr/> <p>Bridge (802.1d)                      ICMP (RFC 792)</p> <p>IP/RIPv1 (RFC 1058)                IP (RFC 791)</p> <p>IP/RIPv2(RFC 1388)                ARP (RFC 826)</p> <p>CIDR (RFC 1519)</p>	

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SOFTWARE SPECIFICATION (CONT'D)	Base Station and Subscriber Unit	<p>Filtering</p> <p>Ethernet protocol (Ethertype) Static MAC Storm threshold IP address Broadcast protocol</p> <p>Services</p> <p>DHCP Server (RFC 2131) DHCP Client (RFC 2131) Bi-Directional Bandwidth Control</p> <p>Management</p> <p>SNMPv1v2c (RFC 1157)      TFTP Client (RFC 783) SNMPv2c RFC 1907      SU/BSU statistics HTTP Server (RFC 2616)      Link test Telnet Server (RFC 855)      Remote reboot or reset to factory default via Power Injector Temperature Logging</p> <p>Security Features</p> <p>MAC Authentication Radius MAC Access Control WEP/AES-OCB encryption RADIUS (RFC 2138)</p> <p>Mobility</p> <p>Subscriber Unit Roaming</p>	
	Base Station Unit	<p>Filtering</p> <p>Intra Cell Blocking</p>	
	Subscriber Unit	<p>Services</p> <p>NAT (RFC 3022) DHCP Relay (RFC 2131)</p>	
	INPUT POWER REQUIREMENTS	<p>Wall Mount Unit (included)</p> <p>Power over Ethernet</p> <p>Power Consumption</p>	<p>Input: 100 to 240 VAC, 0.4 Watts Output: 12VDC, 1.5</p> <p>802.3af compliant1 (for BSU and SU only) Requires AE 3af Power Injector or other 802.3af device Input: Voltage 42 to 60 VDC Output: Current 200mA at 48V</p> <p>Maximum 10 Watt</p>
ANTENNA ALIGNMENT TOOLS	CLI output		
PACKAGING CONTENTS	<p>One Tsunami MP.11 Model 2411 or Model 5054 Base Station or (Residential) Subscriber Unit One metal base for ceiling/ desk mounting One wall-mount power supply One country specific power cord One Documentation and Software CD-ROM</p>		
MTBF	150,000 hrs		
WARRANTY	One year		
PART NUMBERS	<b>NORTH AMERICA REGION</b>		
	Model 2411	<p>Base Station Unit</p> <p>2411BSU-US      Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - USA/CAN PSU</p> <p>Residential Subscriber Unit</p> <p>2411RSU-US-WA      Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - USA/CAN PSU - w/12 dBi Window Antenna</p> <p>2411RSU-US-MP      Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - USA/CAN PSU - 5-pack</p> <p>5-packs contain: RSU (5), Power Supply (5); No software, No documentation, No Antennas</p> <p>Subscriber Unit</p> <p>2411SU-US      Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - USA/CAN PSU</p>	
		Model 5054	<p>Base Station Unit</p> <p>5054BSU-US      Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - USA/CAN PSU</p>

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PART NUMBERS (CONT'D)	Model 5054	Residential Subscriber Unit
		5054RSU-US-WA
	5054RSU-US-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - USA/CAN PSU - 5-pack
	5-packs contain: RSU (5), Power Supply (5); No software, No documentation, No Antennas	
	Subscriber Units	
	5054SU-US	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - USA/CAN PSU
	<b>EUROPE AND MIDDLE EAST REGIONS</b>	
	Model 2411	Base Station Unit
	2411BSU-EU-LP	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Europe PSU - 8 dBm
	2411BSU-UK-LP	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - UK PSU - 8 dBm
	2411BSU-EU	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Europe PSU
	2411BSU-UK	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - UK PSU
	Residential Subscriber Unit	
	2411RSU-EU-LP-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 8 dBm - w/12 dBi Window Antenna
	2411RSU-UK-LP-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 8 dBm - w/12 dBi Window Antenna
	Residential Subscriber Unit 5-packs	
	2411RSU-EU-LP-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 8 dBm - 5-pack
	2411RSU-UK-LP-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 8 dBm - 5-pack
	2411RSU-EU-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 5-pack
	2411RSU-UK-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 5-pack
	5-packs contain: RSU (5), Power Supply (5); No software, No documentation, No Antennas	
	Subscriber Units	
	2411SU-EU-LP	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Europe PSU - 8 dBm
	2411SU-UK-LP	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - UK PSU - 8 dBm
	2411SU-EU	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Europe PSU
	2411SU-UK	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - UK PSU
	Model 5054	Base Station Unit
	5054-BSU-EU	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - Europe PSU
	5054-BSU-UK	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - UK PSU
	Residential Subscriber Unit	
	5054-RSU-EU-WA	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - Europe PSU - w/13 dBi Window Antenna
	5054-RSU-UK-WA	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - UK PSU - w/13 dBi Window Antenna
	Residential Subscriber Unit 5-packs	
	5054-RSU-EU-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - Europe PSU - 5-pack
	5054-RSU-UK-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - UK PSU - 5-pack
	5-packs contain: RSU (5), Power Supply (5); No software, No documentation; No antennas	
	Subscriber Units	
	5054-SU-EU	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - Europe PSU
	5054-SU-UK	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - UK PSU

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	Model 2411	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="792 338 1523 369">Base Station Unit</th> </tr> </thead> <tbody> <tr> <td data-bbox="792 369 954 401">2411BSU-EU-LP</td> <td data-bbox="954 369 1523 401">Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Europe PSU – 8 dBm</td> </tr> <tr> <td data-bbox="792 401 954 432">2411BSU-UK-LP</td> <td data-bbox="954 401 1523 432">Tsunami MP.11 Model 2411(MP.11) Base Station Unit - UK PSU - 8 dBm</td> </tr> <tr> <td data-bbox="792 432 954 464">2411BSU-EU</td> <td data-bbox="954 432 1523 464">Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Europe PSU</td> </tr> <tr> <td data-bbox="792 464 954 495">2411BSU-UK</td> <td data-bbox="954 464 1523 495">Tsunami MP.11 Model 2411(MP.11) Base Station Unit - UK PSU</td> </tr> <tr> <td data-bbox="792 495 954 527">2411BSU-AU</td> <td data-bbox="954 495 1523 527">Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Australia PSU</td> </tr> <tr> <td data-bbox="792 527 954 558">2411BSU-US</td> <td data-bbox="954 527 1523 558">Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - US/CAN PSU</td> </tr> <tr> <td data-bbox="792 558 954 590">2411BSU-JP</td> <td data-bbox="954 558 1523 590">Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Japan PSU</td> </tr> <tr> <th colspan="2" data-bbox="792 590 1523 621">Residential Subscriber Unit</th> </tr> <tr> <td data-bbox="792 621 954 695">2411RSU-EU-LP-WA</td> <td data-bbox="954 621 1523 695">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 8 dBm - w/12 dBi Window Antenna</td> </tr> <tr> <td data-bbox="792 695 954 768">2411RSU-UK-LP-WA</td> <td data-bbox="954 695 1523 768">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 8 dBm - w/12 dBi Window Antenna</td> </tr> <tr> <td data-bbox="792 768 954 842">2411RSU-AU-WA</td> <td data-bbox="954 768 1523 842">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Australia PSU - w/12 dBi Window Antenna</td> </tr> <tr> <td data-bbox="792 842 954 915">2411RSU-US-WA</td> <td data-bbox="954 842 1523 915">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - US/CAN PSU - w/12 dBi Window Antenna</td> </tr> <tr> <td data-bbox="792 915 954 989">2411RSU-JP-WA</td> <td data-bbox="954 915 1523 989">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Japan PSU - w/12 dBi Window Antenna</td> </tr> <tr> <th colspan="2" data-bbox="792 989 1523 1020">Residential Subscriber Unit 5-packs</th> </tr> <tr> <td data-bbox="792 1020 954 1094">2411RSU-EU-LP-MP</td> <td data-bbox="954 1020 1523 1094">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 8 dBm - 5-pack</td> </tr> <tr> <td data-bbox="792 1094 954 1167">2411RSU-UK-LP-MP</td> <td data-bbox="954 1094 1523 1167">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 8 dBm - 5-pack</td> </tr> <tr> <td data-bbox="792 1167 954 1241">2411RSU-AU-MP</td> <td data-bbox="954 1167 1523 1241">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Australia PSU - 5-pack</td> </tr> <tr> <td data-bbox="792 1241 954 1314">2411RSU-US-MP</td> <td data-bbox="954 1241 1523 1314">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - US/CAN PSU - 5-pack</td> </tr> <tr> <td data-bbox="792 1314 954 1388">2411RSU-JP-MP</td> <td data-bbox="954 1314 1523 1388">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Japan PSU - 5-pack</td> </tr> <tr> <td data-bbox="792 1388 954 1461">2411RSU-EU-MP</td> <td data-bbox="954 1388 1523 1461">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 5-pack</td> </tr> <tr> <td data-bbox="792 1461 954 1535">2411RSU-UK-MP</td> <td data-bbox="954 1461 1523 1535">Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 5-pack</td> </tr> <tr> <td colspan="2" data-bbox="792 1535 1523 1566">5-packs contain: RSU (5), Power Supply (5); No software, No documentation, No Antennas</td> </tr> <tr> <th colspan="2" data-bbox="792 1566 1523 1598">Subscriber Units</th> </tr> <tr> <td data-bbox="792 1598 954 1629">2411SU-EU-LP</td> <td data-bbox="954 1598 1523 1629">Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Europe PSU - 8 dBm</td> </tr> <tr> <td data-bbox="792 1629 954 1661">2411SU-UK-LP</td> <td data-bbox="954 1629 1523 1661">Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - UK PSU - 8 dBm</td> </tr> <tr> <td data-bbox="792 1661 954 1692">2411SU-EU</td> <td data-bbox="954 1661 1523 1692">Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Europe PSU</td> </tr> <tr> <td data-bbox="792 1692 954 1724">2411SU-UK</td> <td data-bbox="954 1692 1523 1724">Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - UK PSU</td> </tr> <tr> <td data-bbox="792 1724 954 1755">2411SU-AU</td> <td data-bbox="954 1724 1523 1755">Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Australia PSU</td> </tr> <tr> <td data-bbox="792 1755 954 1787">2411SU-US</td> <td data-bbox="954 1755 1523 1787">Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - US/CAN PSU</td> </tr> <tr> <td data-bbox="792 1787 954 1818">2411SU-JP</td> <td data-bbox="954 1787 1523 1818">Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Japan PSU</td> </tr> <tr> <td data-bbox="423 1703 641 1988" rowspan="10"></td> <td data-bbox="641 1703 792 1734">Model 5054</td> <td data-bbox="792 1703 1523 1988"> <table border="1"> <thead> <tr> <th colspan="2" data-bbox="792 1703 1523 1734">Base Station Unit</th> </tr> </thead> <tbody> <tr> <td data-bbox="792 1734 954 1766">5054-BSU-EU</td> <td data-bbox="954 1734 1523 1766">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - Europe PSU</td> </tr> <tr> <td data-bbox="792 1766 954 1797">5054-BSU-UK</td> <td data-bbox="954 1766 1523 1797">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - UK PSU</td> </tr> <tr> <td data-bbox="792 1797 954 1829">5054-BSU-AU</td> <td data-bbox="954 1797 1523 1829">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - Australia PSU</td> </tr> <tr> <td data-bbox="792 1829 954 1860">5054-BSU-SK</td> <td data-bbox="954 1829 1523 1860">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - South Korea PSU</td> </tr> <tr> <td data-bbox="792 1860 954 1892">5054-BSU-CN</td> <td data-bbox="954 1860 1523 1892">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - China PSU</td> </tr> <tr> <td data-bbox="792 1892 954 1965">5054-BSU-US-WORLD</td> <td data-bbox="954 1892 1523 1965">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - US/CAN PSU - WORLD</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	Base Station Unit		2411BSU-EU-LP	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Europe PSU – 8 dBm	2411BSU-UK-LP	Tsunami MP.11 Model 2411(MP.11) Base Station Unit - UK PSU - 8 dBm	2411BSU-EU	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Europe PSU	2411BSU-UK	Tsunami MP.11 Model 2411(MP.11) Base Station Unit - UK PSU	2411BSU-AU	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Australia PSU	2411BSU-US	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - US/CAN PSU	2411BSU-JP	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit - Japan PSU	Residential Subscriber Unit		2411RSU-EU-LP-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 8 dBm - w/12 dBi Window Antenna	2411RSU-UK-LP-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 8 dBm - w/12 dBi Window Antenna	2411RSU-AU-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Australia PSU - w/12 dBi Window Antenna	2411RSU-US-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - US/CAN PSU - w/12 dBi Window Antenna	2411RSU-JP-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Japan PSU - w/12 dBi Window Antenna	Residential Subscriber Unit 5-packs		2411RSU-EU-LP-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 8 dBm - 5-pack	2411RSU-UK-LP-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 8 dBm - 5-pack	2411RSU-AU-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Australia PSU - 5-pack	2411RSU-US-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - US/CAN PSU - 5-pack	2411RSU-JP-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Japan PSU - 5-pack	2411RSU-EU-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - Europe PSU - 5-pack	2411RSU-UK-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - UK PSU - 5-pack	5-packs contain: RSU (5), Power Supply (5); No software, No documentation, No Antennas		Subscriber Units		2411SU-EU-LP	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Europe PSU - 8 dBm	2411SU-UK-LP	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - UK PSU - 8 dBm	2411SU-EU	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Europe PSU	2411SU-UK	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - UK PSU	2411SU-AU	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Australia PSU	2411SU-US	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - US/CAN PSU	2411SU-JP	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - Japan PSU		Model 5054	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="792 1703 1523 1734">Base Station Unit</th> </tr> </thead> <tbody> <tr> <td data-bbox="792 1734 954 1766">5054-BSU-EU</td> <td data-bbox="954 1734 1523 1766">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - Europe PSU</td> </tr> <tr> <td data-bbox="792 1766 954 1797">5054-BSU-UK</td> <td data-bbox="954 1766 1523 1797">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - UK PSU</td> </tr> <tr> <td data-bbox="792 1797 954 1829">5054-BSU-AU</td> <td data-bbox="954 1797 1523 1829">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - Australia PSU</td> </tr> <tr> <td data-bbox="792 1829 954 1860">5054-BSU-SK</td> <td data-bbox="954 1829 1523 1860">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - South Korea PSU</td> </tr> <tr> <td data-bbox="792 1860 954 1892">5054-BSU-CN</td> <td data-bbox="954 1860 1523 1892">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - China PSU</td> </tr> <tr> <td data-bbox="792 1892 954 1965">5054-BSU-US-WORLD</td> <td data-bbox="954 1892 1523 1965">Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - US/CAN PSU - WORLD</td> </tr> </tbody> </table>	Base Station Unit		5054-BSU-EU	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - Europe PSU	5054-BSU-UK	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - UK PSU	5054-BSU-AU	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - Australia PSU	5054-BSU-SK	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - South Korea PSU	5054-BSU-CN	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - China PSU	5054-BSU-US-WORLD	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit - US/CAN PSU - WORLD
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# Tsunami MP.11 Model 2411 and Model 5054 Technical Specifications

PART NUMBERS (CONT'D)	Model 5054	Residential Subscriber Unit
		5054-RSU-EU-WA
	5054-RSU-UK-WA	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - UK PSU - w/13 dBi Window Antenna
	5054-RSU-AU-WA	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - Australia PSU - w/13 dBi Window Antenna
	5054-RSU-SK-WA	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - South Korea PSU - w/13 dBi Window Antenna
	5054-RSU-CN-WA	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - China PSU - w/13 dBi Window Antenna
	5054-RSU-US-WORLD	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - US/CAN PSU - w/13 dBi Window Antenna - WORLD
		Residential Subscriber Unit 5-packs
	5054-RSU-AU-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - Australia PSU - 5-pack
	5054-RSU-US-MP-WORLD	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - US/CAN PSU - 5-pack WORLD
	5054-RSU-SK-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - South Korea PSU - 5-pack
	5054-RSU-CN-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - China PSU - 5-pack
	5054-RSU-EU-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - Europe PSU - 5-pack
	5054-RSU-UK-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - UK PSU - 5-pack
		5-packs contain: RSU (5), Power Supply (5); No software, No documentation; No antennas
		Subscriber Units
	5054-SU-EU	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - Europe PSU
	5054-SU-UK	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - UK PSU
	5054-SU-AU	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - Australia PSU
	5054-SU-SK	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - South Korea PSU
	5054-SU-CN	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - China PSU
	5054-SU-US-WORLD	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - US/CAN PSU - WORLD
<b>CARIBBEAN AND LATIN AMERICA REGION</b>		
	Model 2411	Base Station Unit
	2411BSU-US	Tsunami MP.11 Model 2411 (MP.11) Base Station Unit – USA/CAN PSU
		Residential Subscriber Unit
	2411RSU-US-WA	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - USA/CAN PSU - w/12 dBi Window Antenna
	2411RSU-US-MP	Tsunami MP.11 Model 2411 (MP.11) Residential Subscriber Unit - USA/CAN PSU - 5-pack
		5-packs contain: RSU (5), Power Supply (5); No software, No documentation, No Antennas
		Subscriber Unit
	2411SU-US	Tsunami MP.11 Model 2411 (MP.11) Subscriber Unit - USA/CAN PSU
	Model 5054	Base Station Unit
	5054BSU-US	Tsunami MP.11 Model 5054 (MP.11a) Base Station Unit – USA/CAN PSU
		Residential Subscriber Unit
	5054RSU-US-WA	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - USA/CAN PSU - w/12 dBi Window Antenna
	5054RSU-US-MP	Tsunami MP.11 Model 5054 (MP.11a) Residential Subscriber Unit - USA/CAN PSU - 5-pack
		5-packs contain: RSU (5), Power Supply (5); No software, No documentation, No Antennas
		Subscriber Units
	5054SU-US	Tsunami MP.11 Model 5054 (MP.11a) Subscriber Unit - USA/CAN PSU

# Tsunami MP.11 Model 2411 and Model 5054 Technical Specifications

PART NUMBERS (CONT'D)	UNIVERSAL
	Accessories
848 274 163	Surge Arrestor - Standard-N Female to Female
5054-SURGE	Surge Arrestor 5 GHz - Standard-N Female to Female
848 274 171	20 ft Low Loss Antenna Cable St-N - Male-Male LMR 200
848 332 789	20 ft Low Loss Antenna Cable St-N - Male-Male LMR 400
848 274 197	50 ft Low Loss Antenna Cable St-N - Male-Male LMR 400
848 274 205	75 ft Low Loss Antenna Cable St-N - Male-Male LMR 400
69828	6 ft Low Loss Antenna Cable St-N - Male-Male LMR 600
5054-LMR600-50	50 ft Low Loss Antenna Cable St-N - Male-Male LMR 60
	Model 2411 2.4 GHz Antennas
848 515 722	5 dBi Omni-Directional Vehicle Antenna w/Integrated 250 cm cable
848 312 591	7 dBi Omni-Directional Base Station Antenna - Standard N
848 515 698	10 dBi Omni-Directional Base Station Antenna - St-N Female
848 515 706	12 dBi Directional Wide Angle Antenna (120 degrees) - St-N Female
2411WA12-STN	12 dBi Wide Angle Antenna with Integrated 2 m cable (st-N) Mountable on Window or Flat Surface
848 274 221	14 dBi Directional Antenna (Yagi) - St-N -Female
848 515 714	24 dBi Directional Antenna (Parabolic Grid) - St-N Female
	Model 5054 5 GHz Antennas
5054-WA-15-STN	15 dBi Window Antenna - St-N Female - 5.25 - 5.875 GHz
5054-PA-18	18 dBi Panel Antenna - St-N Female - 5.25 - 5.875 GHz
5054-PA-23	23 dBi Panel Antenna - St-N Female - 5.725 - 5.875 GHz
5054-OA-8	8 dBi Omni Directional Antenna - St-N Female - 5.47-5.850 GHz
5054-OA-10	10 dBi Omni Directional Antenna - St-N Female - 5.47-5.850 GHz
5054-SA120-14	14 dBi Sector Antenna - St-N Female - 5.25-5.850 GHz - 120 degrees
5054-SA60-17	17 dBi Sector Antenna - St-N Female - 5.25-5.850 GHz - 60 degrees
	AE (IEEE 802.3af) Power Injectors
4312-XX	AE 3af 12 Port DC Injector
4306-XX	AE 3af 6 Port DC Injector
4301-XX	AE 3af 1 Port DC Injector
	Outdoor Ethernet Cables
69819	25m outdoor, terminated CAT5 cable for MP.11 with three RJ-45 and one weather-proof Ethernet port cap
69820	50m outdoor, terminated CAT5 cable for MP.11 with three RJ-45 and one weather-proof Ethernet port cap
69821	75m outdoor, terminated CAT5 cable for MP.11 with three RJ-45 and one weather-proof Ethernet port cap

1 IEEE 802.3ad is not included for RSU. Power Injector is sold separately

2 Assumptions for Model 5054 Range Calculation

- PMP configuration using USA regulations for L and U bands, ETSI regulations for M bands
- Clear LOS
- Sector antenna (17dBi, 60-degrees) at BSU with short 1dB jumper cable
- 3' parabolic dish (31.4dBi) with short 1dB jumper cable for SUs with external antennas
- Fade margin minimum of 10dB to 2 miles, 0.2dB additional fade margin for every 0.1 mile to 15dB

Assumptions for Model 2411 Range Calculation

- PMP configuration using USA regulations and ETSI regulations
- Clear LOS, no unusual multipath
- Sector antenna (60-degrees) at BSU with 20' LMR-600 cable
- 3' parabolic dish (31.4dBi) at SU with 20' LMR-600 cable for USA
- 14dBi panel antenna at SU with 20' LMR-600 cable for ETSI
- Fade margin minimum of 10dB to 2 miles, 0.2dB additional fade margin for every 0.1 mile) to 15dB, then availability >99.990%

AIRLINX Communications, Inc.  
Box 253  
Greenville, NH 03048  
E-mail: sales@airlinx.com  
Tel: (888) 224-6814  
Fax: (603) 878-0530