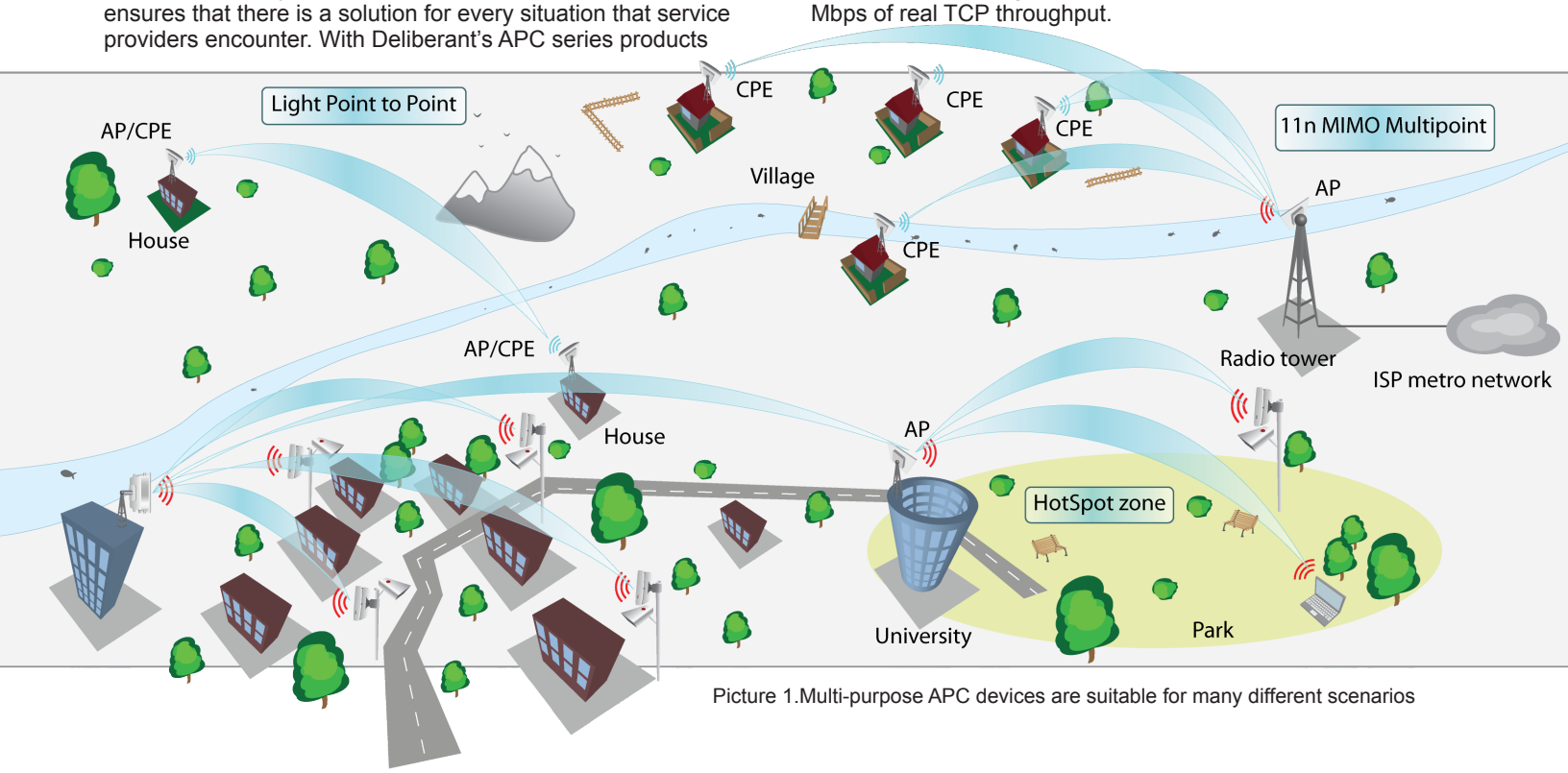
deliberant

APC series overview

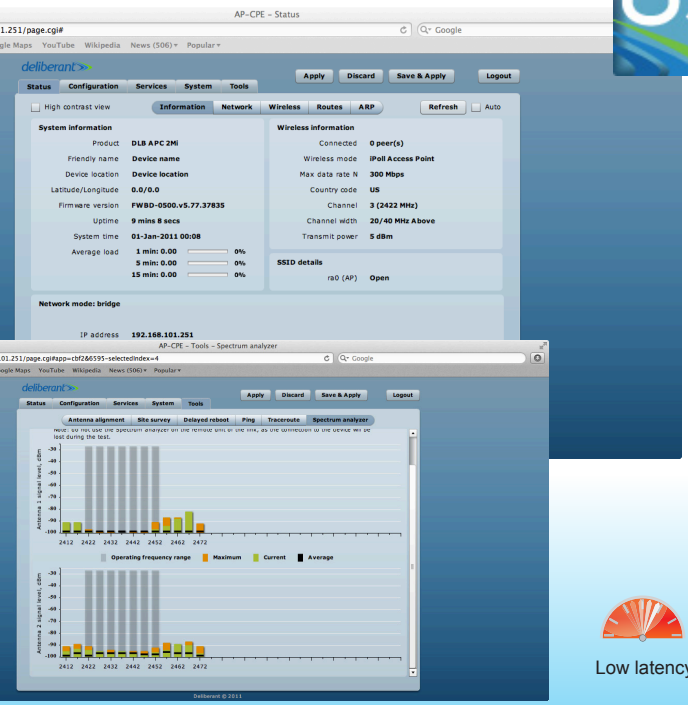
APC series - overview

Deliberant's APC series product line includes a comprehensive variety of devices to meet the most demanding of applications. All the products utilize unlicensed band frequencies (2.4 and 5 GHz) for data transmission. The wide range of devices along with their flexibility to perform both AP and CPE functions ensures that there is a solution for every situation that service providers encounter. With Deliberant's APC series products you can build short to long range point-to-point links, and use combinations of base stations and CPEs for business and residential connectivity, hotspots, security and video surveillance networks, and many more. All the products use 2x2 (MiMo) or 1x1 (SiSo) technologies. MiMo versions can reach up to 160 Mbps of real TCP throughput.



Picture 1.Multi-purpose APC devices are suitable for many different scenarios

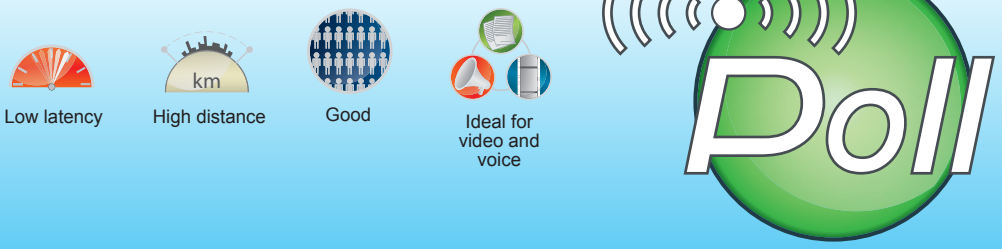
New software platform



In addition to being extremely fast and functional, the new Deliberant OS has all the features required for the WISP community including router and bridge modes, auto modulation, smart auto-channel, internal UAM (captive portal), WDS (compatible with 3rd party equipment), VLAN's, virtual AP's, traffic shaping, tools such as antenna alignment, site survey and many more.

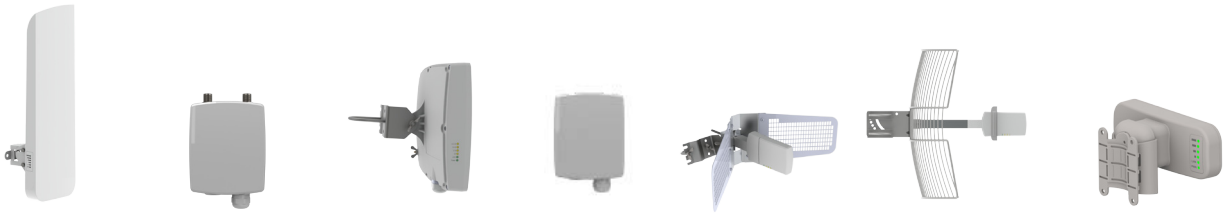
iPoll - new PTMP protocol

Deliberant APC series products have an option to use extremely efficient proprietary point-to-multipoint protocol called iPoll™. It eliminates mediated access by polling every subscriber sequentially. The data transmission arbitration is accomplished by the access point. The AP sends data and a poll frame to a station and receives data from the polled station before starting to poll other stations. Each station starts sending data once a poll frame is received. Proprietary iPoll™ protocol enables maximum bandwidth with the lowest possible latency.



Picture 2. New OS screenshots

Product summary (2 GHz outdoor)



	APC 2M-90	APC 2M	APC 2M-14	APC 2M-8	APC 2S-14	APC 2S-20	APC Propeller 2
Description	Extremely cost effective base station with an integrated high gain 90º sector antenna	High-power multi purpose device with 2 external N-connectors	Powerful and cost effective client device with an integrated high gain antenna for mid-range links	Small size and cost effective device for high capacity short distance links	Revolutionary dual-antenna technology based multi purpose device	Grid antenna with an extremely powerful radio integrated in the antenna feed. Ideal for mid to long distance links	Small size and high-gain wireless device with a patent pending mechanical antenna characteristics switching mechanism
Frequency	2.350-2.550	2.350-2.550	2.350-2.550	2.350-2.550	2.350-2.550	2.350-2.550	2.350-2.550
Radio channel size, MHz	20, 40	20, 40	20, 40	20, 40	20, 40	20, 40	20,40
Operating mode	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP
Wireless standard	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP
Max output power dBm	30*	30*	30*	30*	31*	31*	23*
Receive sensitivity at 20 MHz channel according to modulation, dBm	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-94@BPSK -89@QPSK -83@16QAM -76@64QAM
Max aggregated real data throughput	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	90 Mbps, 45 Mbps full-duplex	90 Mbps, 45 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex
Antenna gain	16 dBi (dual polarized)**	-/-	14 dBi (dual polarized)	8 dBi (dual polarized)	14 dBi (single polarity)	20 dBi (single polarity)	11 dBi (dual polarized)
Mounting	Wall/ pole	Wall/ pole	Wall/ pole	Wall/ pole	Wall/ pole	Wall/ pole	Wall/ pole
Power supply over Ethernet	12 - 48V	12 - 48V	12 - 48V	12 - 48V	12 - 24V	12-24V	12-24V
Max power consumption	7 W	7 W	7 W	7 W	4.5 W	4.5 W	3.96 W

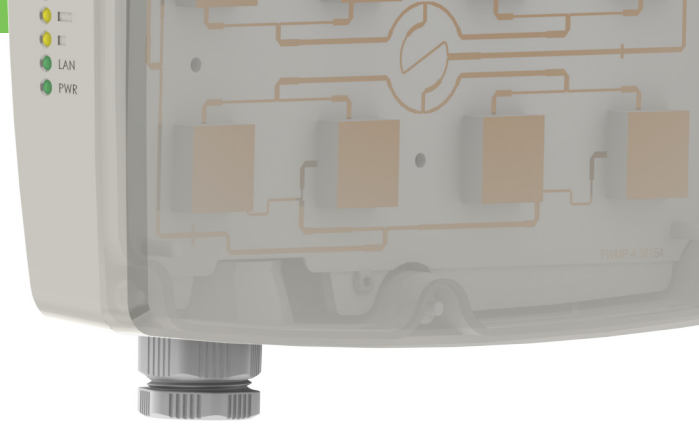
*Country dependent ** at 6 dB

Product summary (5 GHz outdoor)

	APC 5M-90	APC 5M	APC 5M-18	APC 5M-12	APC Mach 5	APC Propeller 5	APC ECHO 5D
Description	Extremely cost effective base station with an integrated high gain 90° sector antenna	High-power multi purpose device with 2 external N-connectors	Powerful and cost effective client device with an integrated high gain antenna for mid-range links	Small size and cost effective device for high capacity short distance links	High capacity 5 GHz device ideal for mid to long range distance links	Small size and high-gain wireless device with a patent pending mechanical antenna characteristics switching mechanism	Long-range and high-gain wireless device suitable to use with any standard offset satellite dish antenna
Frequency	4.920-5.915	4.920-5.915	4.920-5.915	4.920-5.915	4.920-5.915	4.920-5.915	4.920-5.915
Radio channel size, MHz	20, 40	20, 40	20, 40	20, 40	20,40	20,40	20,40
Operating mode	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP	PTP, PTMP
Wireless standard	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP	802.11N, proprietary PTMP
Max output power dBm	29*	29*	29*	29*	29*	28*	28*
Receive sensitivity at 20 MHz channel according to modulation, dBm	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-96@BPSK -93@QPSK -87@16QAM -80@64QAM	-96@BPSK -94@QPSK -89@16QAM -81@64QAM
Max aggregated real data throughput	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex
Antenna gain	18 dBi (dual polarized)**	-/-	18 dBi (dual polarized)	12 dBi (dual polarized)	23 dbi (dual polarized)	15 dbi (dual polarized)	27 dbi (dual polarized)
Mounting	Wall/ pole	Wall/ pole	Wall/ pole	Wall/ pole	Wall/ pole	Wall/ pole	Pole
Power supply over Ethernet	12 - 24V	12 - 24V	12 - 24V	12 - 24V	12 - 24V	12 - 24V	12 - 24V
Max power consumption	4.6 W	4.6 W	4.6 W	4.6 W	4.6 W	5 W	5 W

*Country dependent ** at 6 dB

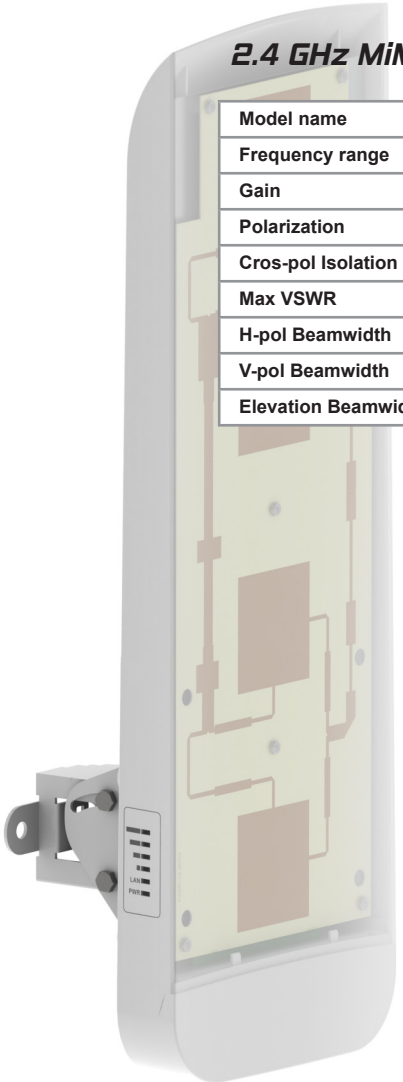
Antenna specs



All Deliberant antennas are designed with a customer in mind to cater the widest range of applications starting from a high-gain base stations to small size or longer distance client devices. The precise specifications of each antenna are outlined in the tables below.

5 GHz MiMo models

Model name	APC 5M-12	APC 5M-18	APC 5M-90	APC Mach 5	APC Propeller 5	APC ECHO 5D
Frequency range	4.9-5.9 GHz	4.9-5.9 GHz	4.9-5.9 GHz	4.9-5.9 GHz	4.9-5.9 GHz	4.9-5.9 GHz
Gain	12 dBi	18 dBi	18 dBi (6dB)	23 dBi	15 dBi	27 dBi
Polarization	Dual linear	Dual linear	Dual linear	Dual linear	Dual linear	Dual linear
Cros-pol Isolation	22 dB minimum	27 dB minimum	24 dB minimum	27 dB minimum	30 dB minimum	30 dB minimum
Max VSWR	1.9:1	1.8:1	1.7:1	1.5:1	1.4:1	1.4:1
H-pol Beamwidth	60 deg	16 deg	90 deg	6 deg	60 deg or 15 deg	6 deg
V-pol Beamwidth	40 deg	16 deg	90 deg	7 deg	60 deg or 15 deg	6 deg
Elevation Beamwidth	40 deg	16 deg	20 deg	9 deg	15 deg or 60 deg	6 deg



2.4 GHz MiMo models

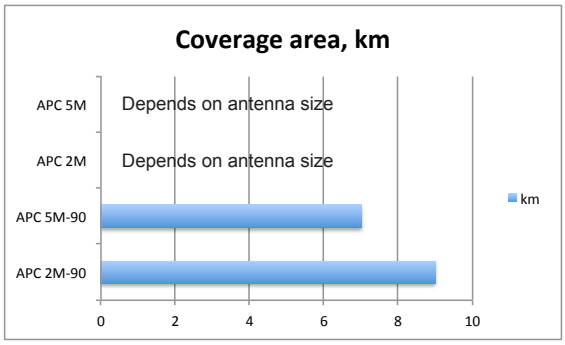
Model name	APC 2M-8	APC 2M-14	APC 2M-90	APC Propeller 2
Frequency range	2.4 - 2.5 GHz	2.4 - 2.5 GHz	2.4 - 2.5 GHz	2.4 - 2.5 GHz
Gain	8 dBi	14 dBi	16 dBi (6 dB)	11 dBi
Polarization	Dual linear	Dual linear	Dual linear	Dual linear
Cros-pol Isolation	22 dB minimmum	38 dB minimum	25 dB minimum	25 dB minimum
Max VSWR	1.9:1	1.8:1	1.7:1	1.5:1
H-pol Beamwidth	60 deg	34 deg	100 deg	70 deg or 35 deg
V-pol Beamwidth	60 deg	34 deg	100 deg	70 deg or 35 deg
Elevation Beamwidth	40 deg	36 deg	30 deg	35 deg or 70 deg

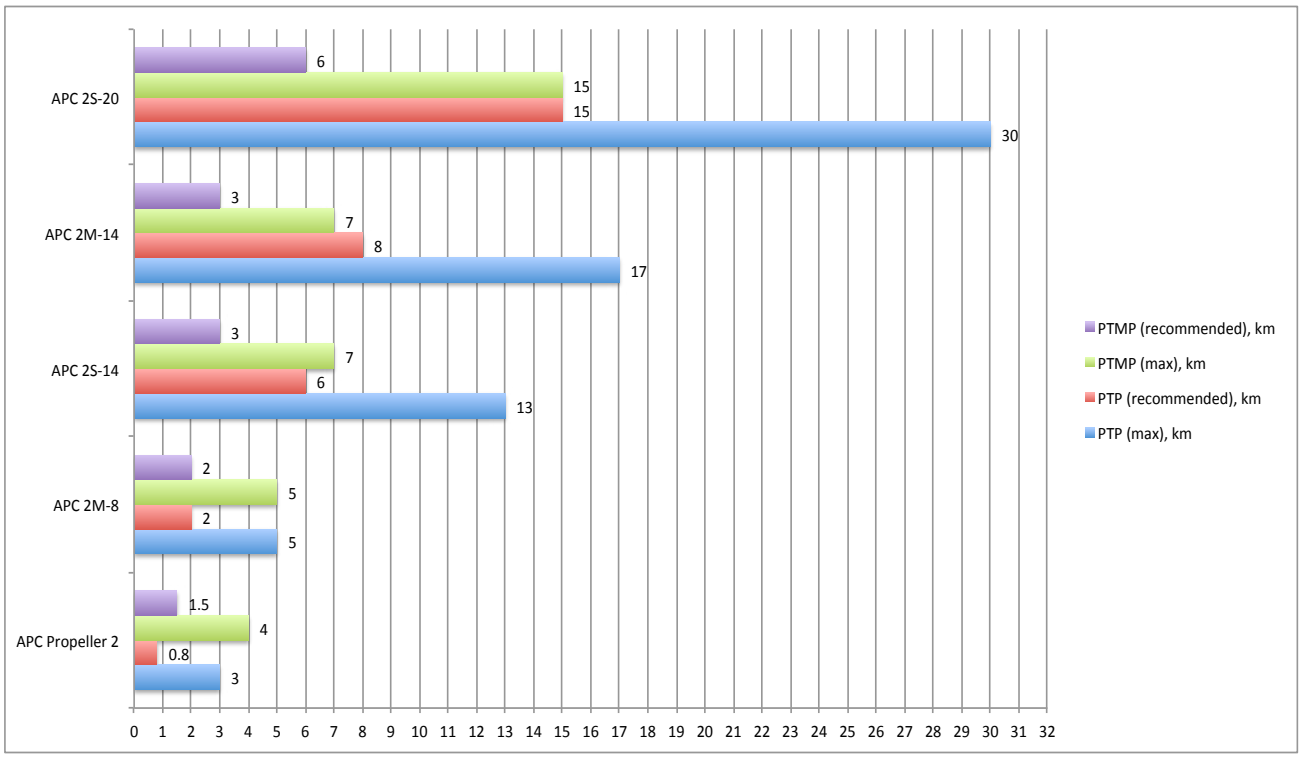
2.4 GHz SiSo models

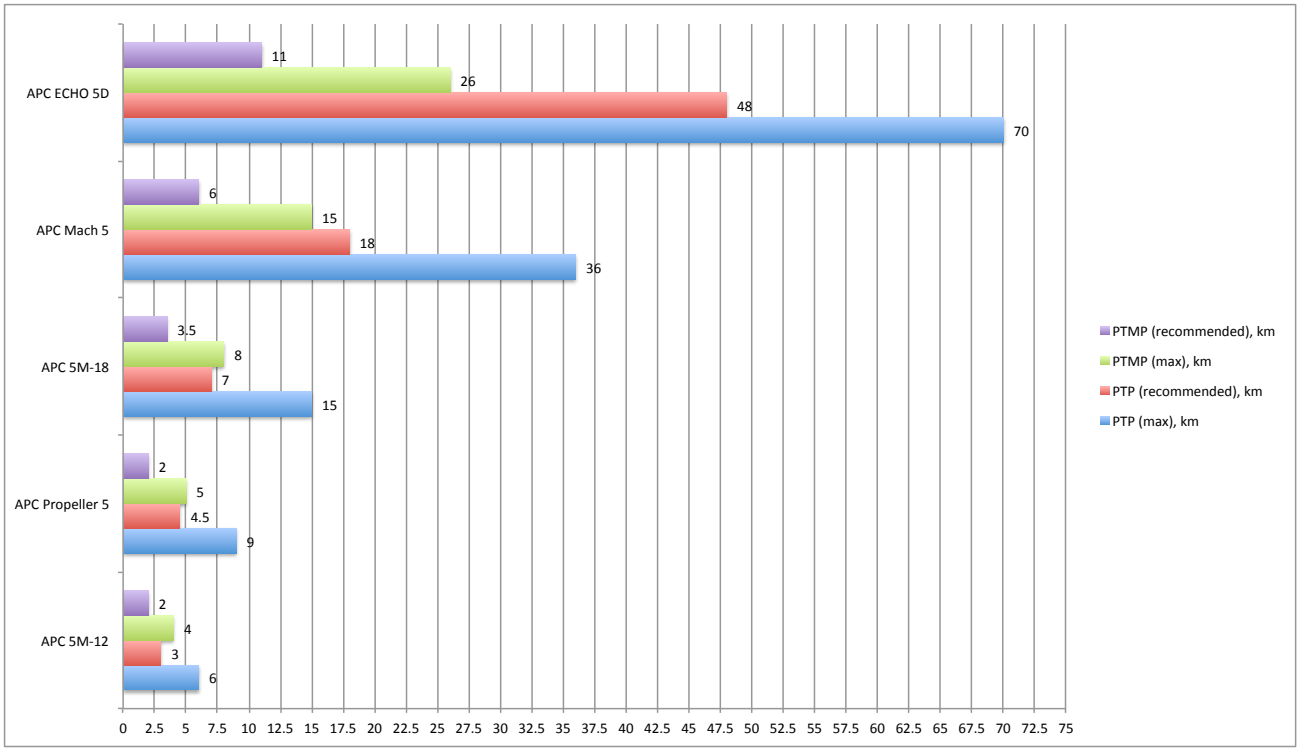
Model name	APC 2S-14	APC 2S-20
Frequency range	2.4 - 2.5 GHz	2.4 - 2.5 GHz
Gain	14/ 10 dBi	20 dBi
Polarization	Single linear	Single linear
Cros-pol Isolation	27 dB minimmum	38 dB minimum
Max VSWR	1.9:1	1.8:1
H-pol Beamwidth	20 deg	12 deg
V-pol Beamwidth	54 deg	16 deg
Elevation beamwidth	54 deg	17 deg

Product comparison

Each Deliberant APC series device was buit for a specific scenario to address distance, capacity, and type of services that will be provided. The tables below outline the distances that can be reached when using Deliberant devices in a point-to-point and point-to-multipoint scenario.



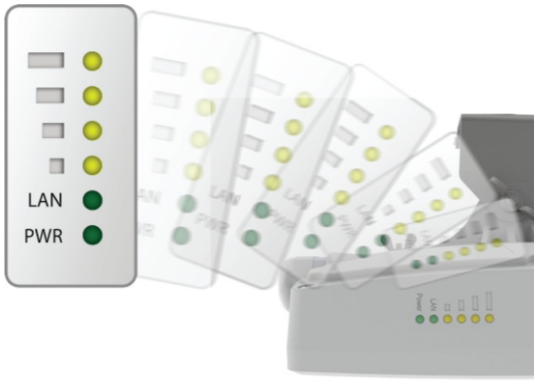




Additional Advantages

Integrated Spectrum Analyzer

All Deliberant APC series devices have an integrated spectrum analyzer. It is a real-time spectrum scanning tool, which provides a graphical signal representation and displays maximum, average, and current signal (noise) levels. This makes the instalation of devices very easy and allows spectrum pre-scanning to avoid interference problems.



The Deliberant APC series equipment has external LEDs that can be used for:

- Antenna alignment (RSSI level) in a client mode
- Seeing average RSSI level on the base-station side
- Seeing lowest RSSI level on the base-station side
- Seeing number of clients connected on a base-station side

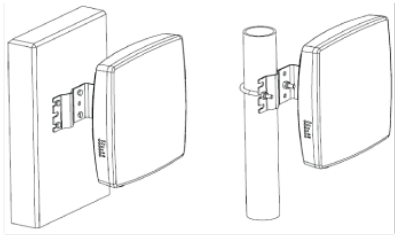
Thresholds can be specified in the GUI for each mode.

IP Standard Compliance

Deliberant APC series equipment are tested against harsh weather conditions to perform well in extreme temperature conditions. Each of the products has an IP standards based rating.

Wall and Pole Mounting Options

Wall and pole mouting options are available for each of the APC series products and there is no need to buy any additional hardware to be able to mount the unit on the wall.

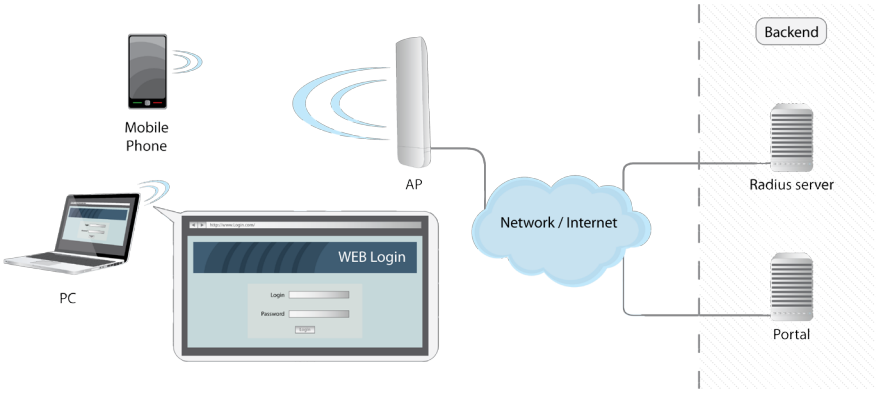


Small Size and Light Packaging

All the products are very light and small in size to ensure low shipping costs for the end-users.

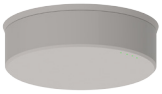
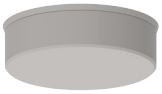
Integrated Hotspot functionality

- Web based authorization (internal or external UAM)
- Additional encryption (WEP, WPA) (more security)
- Customizable internal UAM page
- Traffic shaping
- Time and volume based account management
- Multiple UAM support over multiple SSID (8 UAM and 8 SSID)
- Local user authorization (no Radius)



Indoor produtcs



	APC 2Mi	APC 5Mi	APC Button	APC Button af
Description	The APC 2Mi is a small but robust and high performance 2.4 GHz access point designed for indoor applications.	The APC 5Mi is a small but robust and high performance 5 GHz access point designed for indoor applications.	The APC Button is a small and high performance 2.4 GHz indoor access point designed for SOHO and small to medium size enterprise applications.	The APC Button is a small and high performance 2.4 GHz indoor access point with 802.3af support designed for SOHO and small to medium size enterprise applications.
Frequency	2.402 - 2.484	5.150 - 5.825	2.402 - 2.484	2.402 - 2.484
Radio channel size, MHz	20, 40	20, 40	20, 40	20, 40
Operating mode	Access point, repeater, station	Access point, repeater, station	Access point, repeater, station	Access point, repeater, station
Wireless standard	802.11b/g/n	802.11a/n	802.11b/g/n	802.11b/g/n
Max output power dBm	30*	29*	23*	23*
Receive sensitivity at 20 MHz channel according to modulation, dBm	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-95@BPSK -88@QPSK -81@16QAM -75@64QAM	-94@BPSK -89@QPSK -86@16QAM -78@64QAM	-94@BPSK -89@QPSK -86@16QAM -78@64QAM
Coverage distance	200 m/ 650 ft**	170 m/ 550 ft**	100 m/ 320 ft**	100 m/ 320 ft**
Max aggregated real data throughput	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex	160 Mbps, 80 Mbps full-duplex
Dual firmware image	No	No	Yes	Yes
802.3 af support	No	No	No	Yes
Antenna gain	2 x 3 dBi omni-directional antennas	2 x 3 dBi omni-directional antennas	3 dBi integrated omni-directional antenna	3 dBi integrated omni-directional antenna
Mounting	Wall	Wall	Wall/ ceiling	Wall/ ceiling
Power supply (PoE)	12 - 48V	12 - 48V	12 - 24V	48V (802.3af)
Power consumption	7 W	6.5 W	3.6 W	3.6 W

*Country dependent **Coverage area is calculated in ideal environment

WNMS - Easy Way to Control Your Network

WNMS is a FREE enterprise grade Wireless Network Management System available for download on the Deliberant website. A single software solution simplifies a large number of management and monitoring tasks for network administrators. Comprehensive network management software supports up to several thousand nodes. Main WNMS tasks:

- Multiple OS support (Windows, Virtual Machine, Linux)
- Network visualization on Google Maps
- Configuration and maintenance
- Monitoring and alerting
- Smart discovery and provisioning
- Statistical data collection and reporting

WNMS Cloud

WNMS Cloud is an easy way to manage your LigoWave and Deliberant powered wireless networks from anywhere. Setup is simple and you can get your own dedicated WNMS server up and running in a matter of minutes!

You can try it by visiting **http://www.wnmscloud.com**

WNMS Cloud key advantages:

- Quick & easy registration and setup
- World-wide availability
- High reliability (runs on Amazon EC2)
- Strong security (HTTPS-only)
- No hardware and maintenance costs
- Reduced CAPEX and OPEX

WNMS mobile

WNMS Mobile is an Android based client application for devices monitored by WNMS (Wireless Network Management System) server. WNMS Mobile is designed for network operating center coordinators, maintenance and support engineers. It identifies network and node problems and can delegate a responsible person to help resolve the issues quickly. This WNMS client program provides mobile convenience and also reduces OPEX of the company.

WNMS mobile version 1.0 does the following:

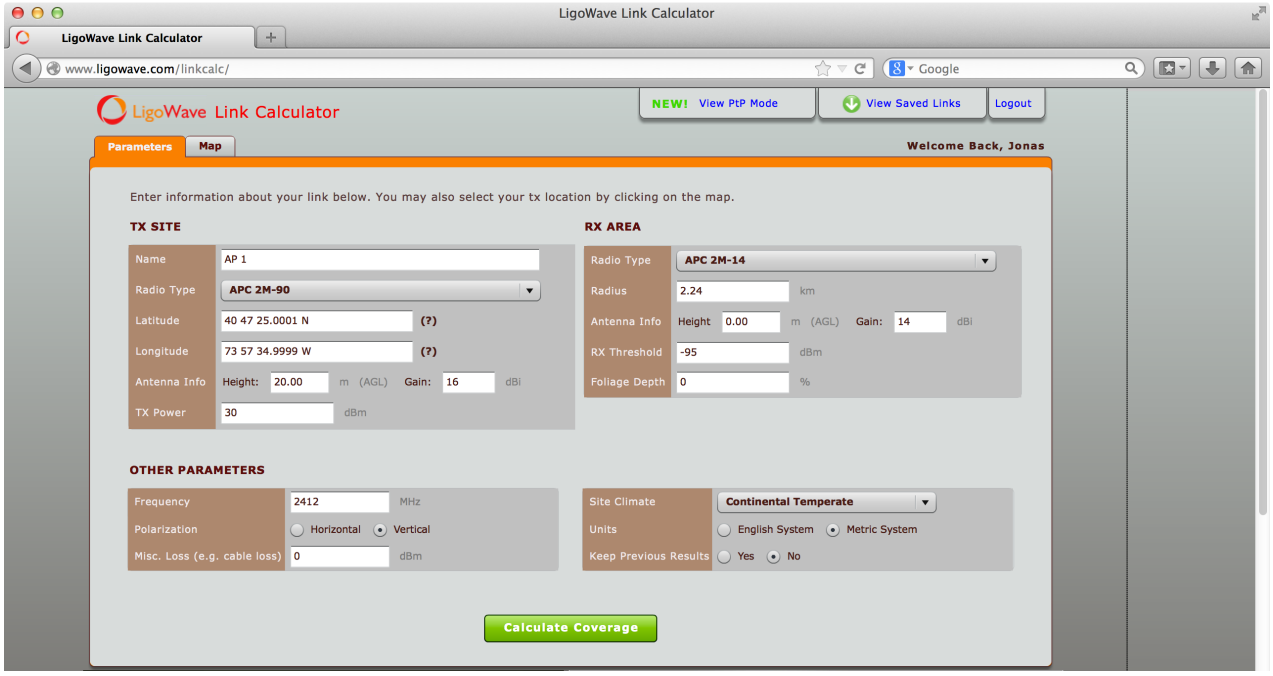
- Lists the availability of networks and devices
- Marks each device location on a map
- Registers the devices into WNMS. The program can read the coordinates from an Android device if necessary
- Lists all devices' alerts
- Allows the ability to assign a task (ToDo) for another user
- Notifies responsible person though push notification service when a task is assigned, reassigned, completed, or rejected
- Provides flexible data filtering capabilities

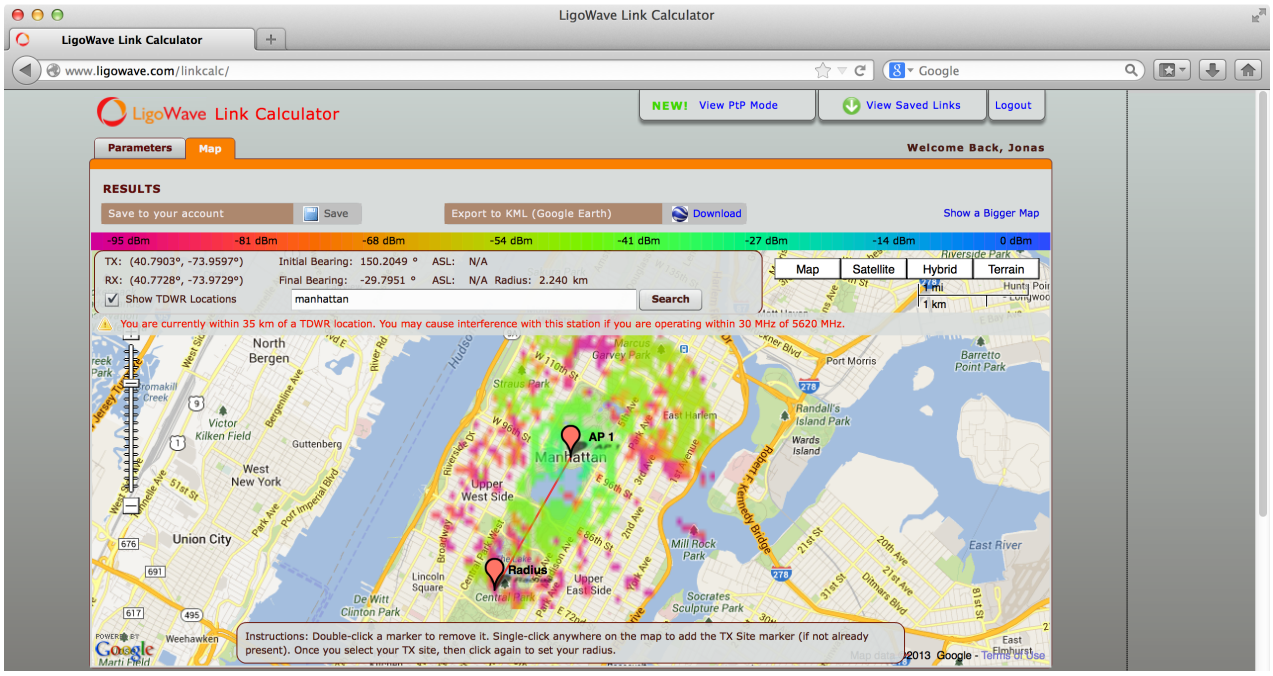
LinkCalc

LinkCalc is a free online application available to all registered users. LinkCalc conveniently populates the main parameters for all Deliberant products but also allows them to be edited or replaced entirely in order to use other manufacturers' equipment. The main highlights of the LinkCalc tool are:

- Easy and quick planning
- Support for PTP and PTMP modes
- Free online application that can be used with any wireless equipment
- Integration with Google Maps
- Allows storing, downloading and publishing data about the links online
- Downloadable PDF reports can be used by the equipment installer teams in the field

Screenshots from the LinkCalc in PTMP mode can be seen below.





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