

**FITS STANDARD OFFSET SATELLITE DISH**

The APC ECHO 5 is a device made for cost-effective and long distance connectivity (up to 50 km). One main advantage of this new model is the unique mounting system designed to utilize standard satellite offset dish antennas to provide increased system gain and distance. These antennas are readily obtainable in most countries thereby reducing freight and inventory costs. The aluminum housing improves RF performance, allowing solid communications in interference laden environments as well as providing strength against the elements.

APC ECHO 5 is a universal device that can be used in a two different ways: with a 60 cm offset dish antenna provided by Deliberant or with a 3rd party offset dish antenna.

The product is equipped with a high output power MIMO radio (up to 28 dBm) and when coupled to Deliberant's 27 dBi dual-polarized, 60 cm, offset satellite dish antenna it is ideal for long range wireless communication.

Equipped with Deliberant's dual firmware image feature, remote software upgrades are assured even if a power failure interrupts the process. The device will restart using the prior firmware in the event of an upgrade failure.

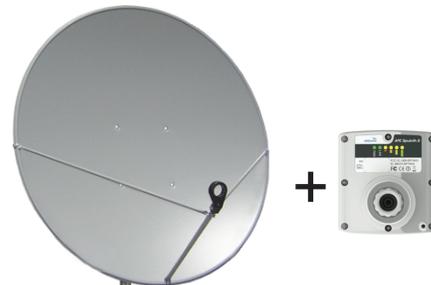
The APC ECHO 5 uses an advanced and feature-rich operating system that supports network bridge/router and wireless repeater modes (repeater mode allows the product to operate as an access point and as a station at the same time). Deliberant OS also supports Deliberant's iPoll; a proprietary wireless communication technology that increases throughput, packet per second rate, and stabilizes latency on your network. It has a user-friendly Adobe Flex based GUI with instant reconfiguration without a reboot, includes useful installation tools (site survey, delayed reboot, spectrum analyzer, ping, traceroute) and is compatible with our stand-alone and cloud based Wireless Network Management System (WNMS) - one of the most advanced management tools on the market.

## Usage examples

APC ECHO 5 can be used in a 2 different ways:



1. With a 60 cm offset dish antenna provided by Deliberant



2. With 3rd party offset dish antenna

Product/ distance recommendation	PTMP mode	PTP mode	PTP mode (full capacity)
APC ECHO 5 (with 60 cm offset dish)	20 km/ 12.43 mi	50 km/ 31.07 mi	26 km/ 16.16 mi

## Wireless

WLAN standard	IEEE 802.11 a/n, iPoll (proprietary)
Radio mode	MIMO 2x2
Operating modes	Access point (auto WDS), access point (repeater), access point (iPoll), station, station (WDS), station (auto iPoll)
Radio frequency band	5.1 - 5.9 GHz (country dependent - FCC 5.745 to 5.825 GHz)
Transmit power	Up to 28 dBm (country dependent)
Receive sensitivity	Varying between -96 and -74 dBm depending on modulation
Channel size	20, 40 MHz
Modulation schemes	802.11 a/n: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Data rates	802.11 n: 300, 270, 240, 180, 120, 90, 60, 30 Mbps 802.11 a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps
Error correction	FEC, Selective ARQ
Duplexing scheme	Time division duplex

Receive sensitivity (dBm)	802.11 N/ iPoll (20/ 40 MHz)	15 Mbps	30 Mbps	45 Mbps	60 Mbps	90 Mbps	120 Mbps	135 Mbps	150 Mbps
		-95	-93	-91	-88	-83	-80	-78	-77
802.11a	30 Mbps	60 Mbps	90 Mbps	120 Mbps	180 Mbps	240 Mbps	270 Mbps	300 Mbps	
	-92	-90	-87	-84	-81	-77	-76	-74	
Output power (dBm - combined)	802.11 N/ iPoll (20/ 40 MHz)	15 Mbps	30 Mbps	45 Mbps	60 Mbps	90 Mbps	120 Mbps	135 Mbps	150 Mbps
		28	28	27	27	26	25	24	23
802.11a	30 Mbps	60 Mbps	90 Mbps	120 Mbps	180 Mbps	240 Mbps	270 Mbps	300 Mbps	
	28	28	27	27	26	25	24	23	
802.11a	6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps	
	28	28	27	27	26	25	24	23	

## Antenna

Type	Directional offset dish antenna or an integrated panel antenna
Gain	Dish (27 dBi), panel (15 dBi)

## Wired

Interface	10/100 Base-T, RJ45
-----------	---------------------

## Networking

Operating modes	Bridge, Router
WAN	Static IP, DHCP client, PPPoE client
NAT	Routing w/ or w/o NAT
Static routing	Supported
DHCP	Client, Server, Relay
Port forwarding	Supported
VLAN	Supported for management and data
Wireless security	WEP, WPA/WPA2 Personal, WPA/WPA2 Enterprise, WACL
User isolation	Supported

## Software

General	Ability to define/limit frequency, channel width, EIRP, modulation
Advanced wireless functionality	ATPC (automatic transmit power control), auto-channel, auto-modulation
Operating mode	Router, bridge
Wireless operating modes	Access point (auto WDS), access point (repeater), access point (iPoll), station, station (WDS), station (auto iPoll)
Wireless security	WPA/WPA2 personal, WPA/WPA2 enterprise, WACL, user isolation, UAM (web portal authentication)
Wireless QoS	WMM
WAN protocols	Static IP, DHCP client, PPPoE client
Network	NAT, static routing, firewall, port forwarding, VLAN, traffic shaping
Services	DHCP server, SNMP server, NTP client, alerts, remote syslog, wireless and ethernet statistics, bandwidth limiting, DHCP proxy
Management	HTTP(S) GUI, SSH CLI, SNMP read, WNMS, troubleshooting file, reset via reset tool
Tools	Site survey, link test, ping, traceroute, spectrum analyzer, delayed reboot

## Physical

Dimensions (head)	Length 90 mm (3.54 "), width 70 mm (2.6 "), height 90 mm (3.54 ")
Weight	Unit: 185 g (6.53 oz), offset dish: 3000 g (105.82 oz)
Power supply	12 - 24 VDC passive PoE (24 V passive PoE adapter is included in the package)
Power source	100 – 240 VAC
Power consumption (max)	5 W

## Environmental

Operating temperature	-40°C (-22 F) ~ +65°C (+149 F)
Humidity	0 ~ 90 % (non-condensing)

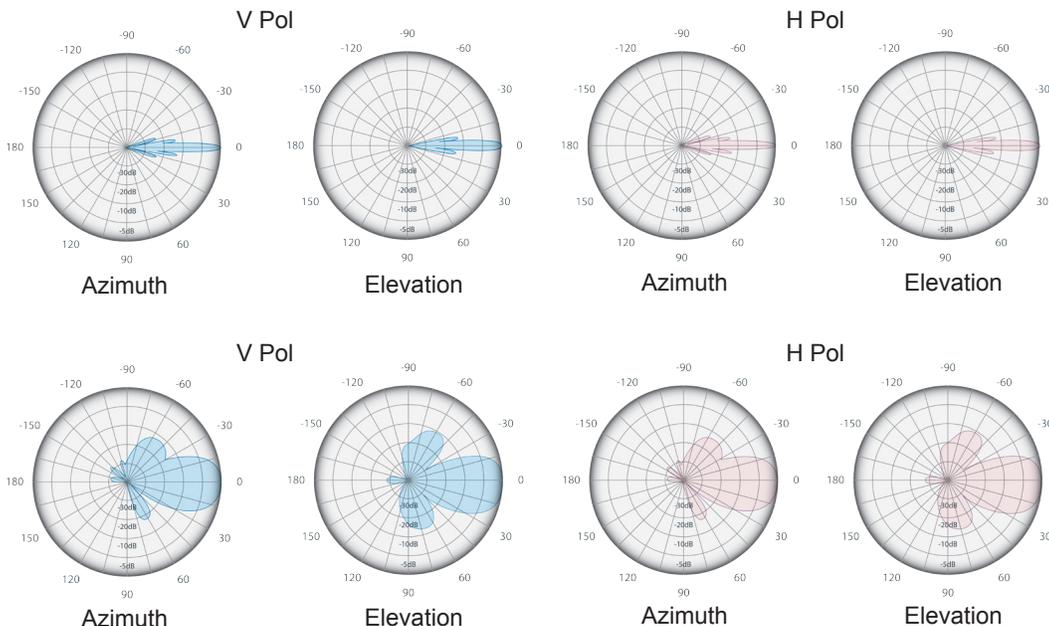
## Management

System monitoring	SNMP v1/2c/3 server, Syslogs, system alerts via e-mail and SNMP trap
-------------------	--

## Regulatory

Certification	FCC/CE/Safety/RoHS compliance
---------------	-------------------------------

## Antenna specifications



Offset dish antenna provided by Deliberant

<b>Frequency range</b>	5.1 - 5.9 GHz
<b>Gain</b>	27 dBi
<b>Polarization</b>	Dual linear
<b>Cross-pol Isolation</b>	30 dBi
<b>VSWR</b>	<1.4
<b>Azimuth beamwidth (H pol)</b>	6 deg
<b>Azimuth beamwidth (V pol)</b>	6 deg
<b>Elevation beamwidth</b>	6 deg

Internal antenna

<b>Frequency range</b>	5.1 - 5.9 GHz
<b>Gain</b>	15 dBi
<b>Polarization</b>	Dual linear
<b>Cross-pol Isolation</b>	27 dBi
<b>VSWR</b>	<1.4
<b>Azimuth beamwidth (H pol)</b>	35 deg
<b>Azimuth beamwidth (V pol)</b>	35 deg
<b>Elevation beamwidth</b>	35 deg



[www.deliberant.com](http://www.deliberant.com)

Copyright © 2013 Deliberant LLC. All rights reserved. Deliberant, the Deliberant logo, are trademarks of Deliberant LLC. All other company and product names may be trademarks of their respective companies. While every effort is made to ensure the information given is accurate, Deliberant does not accept liability for any errors or mistakes which may arise. Specifications and other information in this document may be subject to change without notice.



To learn more about Deliberant products, visit [www.deliberant.com](http://www.deliberant.com).