

**Exhibit A CRFQ VNF180000003**

**Closed Circuit Television System (CCTV)**

Item #	Specs	Description	Unit of Measure	Unit Cost	Quantity	Extended Cost
1	13.1.1	Dome Camera Indigo Vision or Equal/Internal	each	\$ 517.00	29	\$ 14,993.00
2	13.1.1	Dome Camera Indigo Vision or Equal/External	each	\$ 563.00	6	\$ 3,378.00
3	13.1.2	Dome Camera Indigo Vision or Equal/Internal	each	\$ 610.00	18	\$ 10,980.00
4	13.1.2	Dome Camera Indigo Vision or Equal/External	each	\$ 657.00	2	\$ 1,314.00
5	13.1.3	Dome Camera Indigo Vision or Equal/External	each	\$ 1,501.00	12	\$ 18,012.00
6	13.1.4	360 degree Fish Eye Cameras/Internal	each	\$ 798.00	3	\$ 2,394.00
7	13.1.4	360 degree Fish eye Cameras/External	each	\$ 798.00	4	\$ 3,192.00
8	13.1.5	Dome Camera Indigo Vision or Equal/External	each	\$ 657.00	8	\$ 5,256.00
9	13.1.6	PTZ Dome Camera Indigo Vision or Equal/Ext	each	\$ 1,548.00	1	\$ 1,548.00
10	13.1.7	Network Video Recorders	each	\$ 19,369.00	2	\$ 38,738.00
11	13.1.9	Video Management System	each	\$ 30,461.00	1	\$ 30,461.00
12	13.1.15.3	Mounting arms	each	\$ 49.00	4	\$ 196.00
13		Labor Fee for Installation to include cable	Lump Sum	\$ 98,051.00	1	\$ 98,051.00
<b>Total Bid Amount:</b>						<b>\$ 228,513.00</b>

Company: Horizon Information Services
Vendor Contact: Craig Hasley
Address: 1659 East Sutter Road Glenshaw PA, 15116
Phone: (412) 487-7071
Email: Chasley@HorizonIS.com
Fax: (412) 487-7072

09/19/17 11:55:16  
Purchasing Division

**BID BOND**

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned, Horizon Information Services, Inc.  
of Glenshaw, PA, as Principal, and Philadelphia Indemnity Insurance Company  
of Bala Cynwyd, PA, a corporation organized and existing under the laws of the State of  
PA with its principal office in the City of Bala Cynwyd, as Surety, are held and firmly bound unto the State  
of West Virginia, as Obligee, in the penal sum of Five Percent of Amount Bid (\$ 5% ) for the payment of which,  
well and truly to be made, we jointly and severally bind ourselves, our heirs, administrators, executors, successors and assigns.

The Condition of the above obligation is such that whereas the Principal has submitted to the Purchasing Section of the  
Department of Administration a certain bid or proposal, attached hereto and made a part hereof, to enter into a contract in writing for  
New CCTV/Surveillance System for the Department of Veterans Affairs, 1 Freedoms Way, Clarksburg, WV 26301,  
Solicitation No. CRFQ 0613 VNF1800000003

**NOW THEREFORE,**

- (a) If said bid shall be rejected, or
- (b) If said bid shall be accepted and the Principal shall enter into a contract in accordance with the bid or proposal  
attached hereto and shall furnish any other bonds and insurance required by the bid or proposal, and shall in all other respects perform  
the agreement created by the acceptance of said bid, then this obligation shall be null and void, otherwise this obligation shall remain in  
full force and effect. It is expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no  
event, exceed the penal amount of this obligation as herein stated.

The Surety, for the value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no  
way impaired or affected by any extension of the time within which the Obligee may accept such bid, and said Surety does hereby  
waive notice of any such extension.

WITNESS, the following signatures and seals of Principal and Surety, executed and sealed by a proper officer of Principal and  
Surety, or by Principal individually if Principal is an individual, this 19th day of September, 2017.

Principal Seal

Horizon Information Services, Inc.  
(Name of Principal)  
By [Signature]  
(Must be President, Vice President, or  
Duty Authorized Agent)  
V. President  
(Title)

Surety Seal



Philadelphia Indemnity Insurance Company  
(Name of Surety)  
By [Signature]  
Barbara A. Leeper Attorney-in-Fact

**IMPORTANT – Surety executing bonds must be licensed in West Virginia to transact surety insurance, must affix its seal, and must attach a power of attorney with its seal affixed.**



**PHILADELPHIA  
INSURANCE COMPANIES**

A Member of the Tokio Marine Group

**PHILADELPHIA INDEMNITY INSURANCE COMPANY**  
One Bala Plaza, Suite 100  
Bala Cynwyd, PA 19004-0950

**Power of Attorney**

**Surety Bond Number: Bid Bond**  
**Principal: Horizon Information Services, Inc.**  
**Obligee: State of West Virginia, Dept. of Administration**

KNOW ALL PERSONS BY THESE PRESENTS: That **PHILADELPHIA INDEMNITY INSURANCE COMPANY** (the Company), a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, does hereby constitute and appoint Barbara A. Leeper, its true and lawful Attorney-in-fact with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business and to bind the Company thereby, in an amount not to exceed \$75,000,000.

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of PHILADELPHIA INDEMNITY INSURANCE COMPANY on the 14<sup>th</sup> of November, 2016.

**RESOLVED:** That the Board of Directors hereby authorizes the the President or any Vice President of the Company: (1) Appoint Attorney(s) in Fact and authorize the Attorney(s) in Fact to execute on behalf of the Company bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof and to attach the seal of the Company thereto; and (2) to remove, at any time, any such Attorney-in-Fact and revoke the authority given. And, be it

**FURTHER RESOLVED:** That the signatures of such officers and the seal of the Company may be affixed to any such Power of Attorney or certificate relating thereto by facsimile, and any such Power of Attorney so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN TESTIMONY WHEREOF, PHILADELPHIA INDEMNITY INSURANCE COMPANY HAS CAUSED THIS INSTRUMENT TO BE SIGNED AND ITS CORPORATE SEAL TO BE AFFIXED BY ITS AUTHORIZED OFFICE THIS 14<sup>TH</sup> DAY OF NOVEMBER, 2016.



(Seal)

Robert D. O'Leary Jr., President & CEO  
Philadelphia Indemnity Insurance Company

On this 14<sup>th</sup> day of November, 2016, before me came the individual who executed the preceding instrument, to me personally known, and being by me duly sworn said that he is the therein described and authorized officer of the PHILADELPHIA INDEMNITY INSURANCE COMPANY; that the seal affixed to said instrument is the Corporate seal of said Company; that the said Corporate Seal and his signature were duly affixed.



Notary Public:

residing at:

Bala Cynwyd, PA

(Notary Seal)

My commission expires:

January 8, 2018

I, Edward Sayago, Corporate Secretary of PHILADELPHIA INDEMNITY INSURANCE COMPANY, do hereby certify that the foregoing resolution of the Board of Directors and this Power of Attorney issued pursuant thereto on this 14<sup>th</sup> day of November, 2016 are true and correct and are still in full force and effect. I do further certify that Robert D. O'Leary Jr., who executed the Power of Attorney as President, was on the date of execution of the attached Power of Attorney the duly elected President of PHILADELPHIA INDEMNITY INSURANCE COMPANY,

In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this 19<sup>th</sup> day of September, 2017.



Edward Sayago, Corporate Secretary  
PHILADELPHIA INDEMNITY INSURANCE COMPANY

**DESIGNATED CONTACT:** Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Craig Hasley, VP of Sales  
(Name, Title)  
Craig Hasley  
(Printed Name and Title)  
1659 East Sutter Rd., Glenshaw, PA 15116  
(Address)  
412-487-7071 412-487-7072  
(Phone Number) / (Fax Number)  
chasley@horizonis.com  
(email address)

**CERTIFICATION AND SIGNATURE:** By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Horizon Information Services  
(Company)  
C Hasley  
(Authorized Signature) (Representative Name, Title)  
Craig Hasley, VP of Sales  
(Printed Name and Title of Authorized Representative)  
9/18/17  
(Date)  
412-487-7071 412-487-7072  
(Phone Number) (Fax Number)



RFQ No. \_\_\_\_\_

STATE OF WEST VIRGINIA  
Purchasing Division

**PURCHASING AFFIDAVIT**

**MANDATE:** Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

**EXCEPTION:** The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

**DEFINITIONS:**

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

**AFFIRMATION:** By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

**WITNESS THE FOLLOWING SIGNATURE:**

Vendor's Name: Horizon Information Services  
Authorized Signatures: [Signature] Date: 9/18/17

State of Pennsylvania

County of Allegheny, to-wit:

Taken, subscribed, and sworn to before me this 18<sup>th</sup> day of September, 2017.

My Commission expires 6/29, 2018.

**AFFIX SEAL HERE**

NOTARY PUBLIC [Signature]

COMMONWEALTH OF PENNSYLVANIA  
NOTARIAL SEAL  
Karla A. Bildhauer, Notary Public  
Shaler Twp., Allegheny County  
My Commission Expires June 29, 2018  
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

**Subcontractor List Submission (Construction Contracts Only)**

**Bidder's Name:** *Horizon Information Services*

Check this box if no subcontractors will perform more than \$25,000.00 of work to complete the project.

Subcontractor Name	License Number if Required by W. Va. Code § 21-11-1 et. seq.

Attach additional pages if necessary

**REQUEST FOR QUOTATION  
CRFQ VNF1800000003  
Closed Circuit Television System**

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**11. FACILITIES ACCESS:** Performance of Contract Services may require access cards and/or keys to gain entrance to Agency's facilities. In the event that access cards and/or keys are required:

11.1 Vendor must identify principal service personnel which will be issued access cards and/or keys to perform service.

11.2 Vendor will be responsible for controlling cards and keys and will pay replacement fee, if the cards or keys become lost or stolen.

11.3 Vendor shall notify Agency immediately of any lost, stolen, or missing card or key.

11.4 Anyone performing under this Contract will be subject to Agency's security protocol and procedures.

11.5 Vendor shall inform all staff of Agency's security protocol and procedures.

**12. MISCELLANEOUS:**

12.1 **Contract Manager:** During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: Craig Hasley

Telephone Number: 412-487-7071

Fax Number: 412-487-7072

Email Address: chasley@horizonis.com

**ADDENDUM ACKNOWLEDGEMENT FORM**  
**SOLICITATION NO.: CRFQ VNF1800000003**

**Instructions:** Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

**Acknowledgment:** I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

**Addendum Numbers Received:**

*(Check the box next to each addendum received)*

- Addendum No. 1
- Addendum No. 2
- Addendum No. 3
- Addendum No. 4
- Addendum No. 5

- Addendum No. 6
- Addendum No. 7
- Addendum No. 8
- Addendum No. 9
- Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Horizon Information Services  
Company

*CAHaley*  
Authorized Signature

9/18/17  
Date

**NOTE:** This addendum acknowledgment should be submitted with the bid to expedite document processing.



West Virginia Ethics Commission

Disclosure of Interested Parties to Contracts

Contracting business entity: Horizon Information Services

Address: 1655 E. Sutter Rd. Glenshaw PA 15116

Contracting business entity's authorized agent: Craig Hasley

Address: Same

Number or title of contract: CRFQ 0613 VNF180000003

Type or description of contract: Closed Circuit Television System CCTV

Governmental agency awarding contract: Veterans Affairs

Names of each Interested Party to the contract known or reasonably anticipated by the contracting business entity (attach additional pages if necessary):

Craig Hasley

Brian Fowler

Dave Peterson

Signature: [Signature] Date Signed: 9/18/2017

Check here if this is a Supplemental Disclosure.

Verification

State of Pennsylvania, County of Allegheny

I, Craig Hasley, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledges that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 18th day of September, 2017.

[Signature] Notary Public's Signature

COMMONWEALTH OF PENNSYLVANIA NOTARIAL SEAL Karla A. Bildhauer, Notary Public Shaler Twp., Allegheny County My Commission Expires June 29, 2018 MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

To be completed by State Agency:

Date Received by State Agency:

Date submitted to Ethics Commission:

Governmental agency submitting Disclosure:



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
3/22/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b> Seubert & Associates Inc. 225 North Shore Drive Suite 300 Pittsburgh PA 15212	<b>CONTACT NAME:</b> Donna Rozniata <b>PHONE (A/C, No, Ext):</b> 412-223-1421 <b>E-MAIL ADDRESS:</b> drozniata@seubert.com	<b>FAX (A/C, No):</b> 412-734-5725
	<b>INSURER(S) AFFORDING COVERAGE</b>	
<b>INSURED</b> HORIN Horizon Information Services 1659 E. Sutter Road Glenshaw PA 15116	<b>INSURER A:</b> Harleysville Insurance Company <b>NAIC #</b> 64327	
	<b>INSURER B:</b>	
	<b>INSURER C:</b>	
	<b>INSURER D:</b>	
	<b>INSURER E:</b>	
	<b>INSURER F:</b>	

**COVERAGES** **CERTIFICATE NUMBER:** 896289024 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC	Y Y	SPP00000077650S	3/23/2017	3/23/2018	EACH OCCURRENCE	\$1,000,000
						DAMAGE TO RENTED PREMISES (Ea occurrence)	\$500,000
						MED EXP (Any one person)	\$15,000
						PERSONAL & ADV INJURY	\$1,000,000
						GENERAL AGGREGATE	\$2,000,000
						PRODUCTS - COMP/OP AGG	\$2,000,000
							\$
A	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS	Y Y	BA00000077649S	3/23/2017	3/23/2018	COMBINED SINGLE LIMIT (Ea accident)	\$1,000,000
						BODILY INJURY (Per person)	\$
						BODILY INJURY (Per accident)	\$
						PROPERTY DAMAGE (Per accident)	\$
							\$
A	<input checked="" type="checkbox"/> <b>UMBRELLA LIAB</b> <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> <b>EXCESS LIAB</b> <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$0	Y Y	CMB00000077647S	3/23/2017	3/23/2018	EACH OCCURRENCE	\$5,000,000
						AGGREGATE	\$5,000,000
							\$
A	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y N/A	WC00000077648S	3/23/2017	3/23/2018	<input checked="" type="checkbox"/> WC STATU-TORY LIMITS <input type="checkbox"/> OTH-ER	
						E.L. EACH ACCIDENT	\$1,000,000
						E.L. DISEASE - EA EMPLOYEE	\$1,000,000
						E.L. DISEASE - POLICY LIMIT	\$1,000,000
A	Blanket Bld & Contents Installation Floater		SPP00000077650S	3/23/2017	3/23/2018	\$2,621,411 Limit; Special; \$500 Ded \$500,000 Lmt; Spec;	Agreed Amount; \$500 Deductible

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

<b>CERTIFICATE HOLDER</b> Horizon Information Services, Inc. 1659 E Suter Rd Glenshaw PA 15116	<b>CANCELLATION</b> SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE <i>Kristie Lulich</i>
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# CONTRACTOR LICENSE

Authorized by the

**West Virginia Contractor Licensing Board**

**Number:** WV039098

**Classification:**  
COMMUNICATION & SOUND

HORIZON INFORMATION SERVICES INC  
DBA HORIZON INFORMATION SERVICES INC  
1659 EAST SUTTER ROAD  
GLENSHAW, PA 15116

**Date Issued**

**Expiration Date**

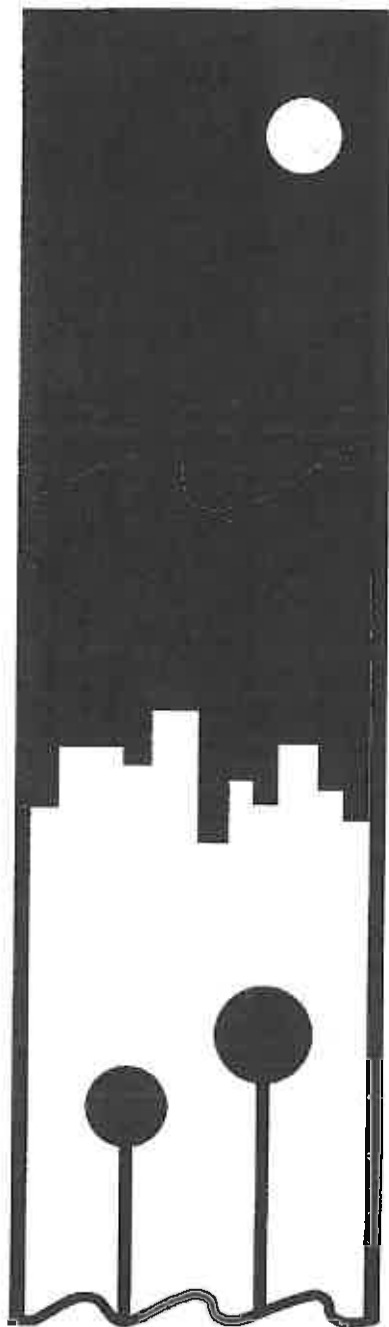
SEPTEMBER 22, 2017

SEPTEMBER 22, 2018

Authorized Company Signature

*Gene Projean*  
Chair, West Virginia Contractor  
Licensing Board

This license, or a copy thereof, must be posted in a conspicuous place at every construction site where work is being performed. This license number must appear in all advertisements, on all bid submissions and on all fully executed and binding contracts. This license cannot be assigned or transferred by licensee. Issued under provisions of West Virginia Code, Chapter 21, Article 11.



**WEST VIRGINIA  
CONTRACTOR  
LICENSING  
BOARD**



1659 East Sutter Road  
Glenshaw PA 15116  
Voice 412-487-7071  
Fax 412-487-7072

## Contractor Qualifications Statement

### A. Organization

1. Horizon Information Services is a Corporation and became Incorporated in 2001 in the State of Pennsylvania. Horizon has been in business for 15 Years, Installing, Commissioning, and Servicing the following systems;

- a. Structured Data Cabling
- b. Fiber Optic Cabling
- c. Telephone and Voice Mail Systems
- d. CATV and Video Distribution Systems
- e. Intercom and Paging Systems
- f. Professional Sound Systems
- g. Audio Visual Systems
- h. Card Access and Security Systems
- i. Health Care Communications Systems
- j. AMX SchoolView A/V Systems

### 2. Relevant Projects

- a. Pine Richland High School - \$1.7 Million.  
Two architect requested change orders to date.  
Completed date 12/12. Horizon is a prime contractor and we are installing all of the communication systems for the project. Horizon is responsible for structured cabling, audio visual, and security systems design. Architect is Eckles Architecture.
- b. Montour Sports Complex - \$224,000. Horizon is the prime communications contractor for the new construction project. Project consists of providing arena style seating sound and HD Video system, and ancillary room audio visual systems including natatorium and weight/fitness rooms. Architect is Apostolou Associates.
- c. Mount Lebanon School District Theaters - \$434,000. Audio Visual Systems. No change orders to date, Small Theater Completed in March, 2013. Main Theater is still under construction. First Bose RoomMatch Complete System Designed, Specified in Pa. Horizon was the first company to do this and is the Prime Contractor for the AV Systems for this project. Architect is Celli-Flynn.
- d. California University Convocation Center - \$600,000.  
We have had \$200,000 in architect requested change orders. Completion was Sept/Oct 2011. Horizon was a subcontractor to A1 Electric, providing a complete installation of the Data Cabling and Security Systems. L.R. Kimball is the architect.

- e. Mansfield University Performing Arts. - \$314,000. Currently under construction. Horizon is a sub contractor to GR Noto Electric and we are providing a complete installation of the theater audio visual system. Eckles Architecture is the architect.
- f. Mt. Union University Performing Arts. - \$395,000. Currently under construction. Horizon is a sub contractor to Hilscher Clarke Electric and we are providing a complete installation of the theater audio visual system. Westlake, Reed, Leskosky is the consultant.

## B. References

### 1. Project and End User References

#### **PPG Industries**

Gary Hyek  
One PPG Place  
Pittsburgh, Pa 15272  
412-434-3809  
Corporate wide AV Contractor for Audio Visual Conference Room Control Systems in multiple facilities including CEO Board Room.

#### **Siemens Industry**

Kevin Minster  
500 Hunt Valley  
New Kensington, Pa 15068  
412-339-9264  
New data/voice cabling in new facility, fiber and copper backbone, and Audio Visual Conference Room Control Systems.

#### **Harrisburg University and Bedford Springs Hotel**

Reynolds Construction Management  
3300 North Third Street  
Harrisburg, PA 17110  
John Reichart (Harrisburg University) and Jim Paschke (Bedford Springs Hotel)  
814-624-0400  
Sound, Audio Visual, VOICE/ DATA CAT 6 cabling, Fiber Optic, CATV, CCTV, and Access Control  
Completed 2009 (Harrisburg University), 2007 (Bedford Springs Hotel)

#### **California University of Pennsylvania**

250 University Avenue  
California, PA 15419  
Kerry Clipper  
724-938-4239  
A-1 Electric (Prime Contractor)  
Mark Smith-A1 Electric  
724-969-0901

Structured Cabling and Security Video Management System for the Universities new Convocation Center.

**Gateway School District**

9000 Gateway Campus Blvd

Monroeville, PA 15146

Dennis Houlihan

(412) 372-5300

District Wide Video Surveillance System, structured cabling systems

Ongoing

**University of Pittsburgh**

378 Mervis Hall

Pittsburgh, PA 15260

Craig Muscato

(412) 648-9707

Various Audio Visual Projects

Ongoing

**Chartiers Valley School District**

Scott Kelly

(412) 429-2399

Voice, Data, and Fiber

**Quaker Valley School District**

Dr. Joseph Marrone

Sewickley, PA 15143

412-749-3600

Edgeworth Elementary School-New data/voice cabling, A/V wiring and equipment in classrooms

Osborne Elementary School-School Intercom, Classroom A/V Systems with LCD Projectors

Quaker Valley Middle School-CAT 6 Structured Cabling System, A/V Systems and classroom communication system control, and security systems.

**2. Architect References**

**Astorino Architecture**

227 Fort Pitt Blvd

Pittsburgh, PA 15222

Ron Mann, 412 765 1700

**Celli-Flynn Architecture**

606 Liberty Ave

Pittsburgh, PA 15222

Kathy Stoughton, 412 281 1395

**HHS DR**

Sharon, PA

Several Locations

Joe McLaughlin, 724 931 8820

Vincent Ordinario 724 931 8820

**CJL Engineering**

232 Horner Street  
Johnstown, PA 15902  
John Blickenderfer, 814 536 1651

**Graves & McLean Architects**

809 Bingham Street  
Pittsburgh, PA 15203  
Fort Couch and Boyce Middle Schools  
Dave McLean, 412 381 3300

**Tower Engineering**

115 Evergreen Heights Drive  
Suite 400  
Pittsburgh, PA 15229  
John West and Doug Cogley, 412-931-8888

**Eckles Architecture**

301 North Mercer Street  
New Castle, PA 16101  
Tim Brown, 724 652 5507

**HF Lenz**

1407 Scalp Ave  
Johnstown, PA 15904  
Bill Hartland/Craig Barnhart, 814 269 9300

**C. Trade, Bank, and Surety References**

**Trade References:**

1. Graybar 900 Ridge Ave. Pittsburgh, PA 15212  
Ph: 412-323-5200 Fax: 412-320-2859

Anixter (Daniel Murphy) 10 Parkway View Dr, Pittsburgh PA 15205  
Ph: 412-494-4300 Fax: 412-494-4332

Crestron 15 Volvo Dr, Rockleigh NJ 07647  
Ph: 201-767-3400 Fax: 201-767-7576

**Bank References:**

2. 1<sup>st</sup> National Bank  
100 Federal St, Pittsburgh PA 15212  
Ph: 412-359-2640 Fax: 412-316-2488

3. Current Bonding Co.: International Fidelity Insurance Co. through Seubert & Associates, 1010 Ohio River Blvd. Pittsburgh, PA 15202, Tel. 412 734 4900. Bonding limit is \$4,000,000 per job and \$8,000,000 aggregate.

Former Bonding Co.: Colonial Surety Co., Montvale, NJ 07645. Tel: 201 573 8788.

Current Insurance Co.: Westfield Insurance through Seubert and Associates, 1010 Ohio River Blvd., Pittsburgh, PA 15202. Tel. 412 734 4900.

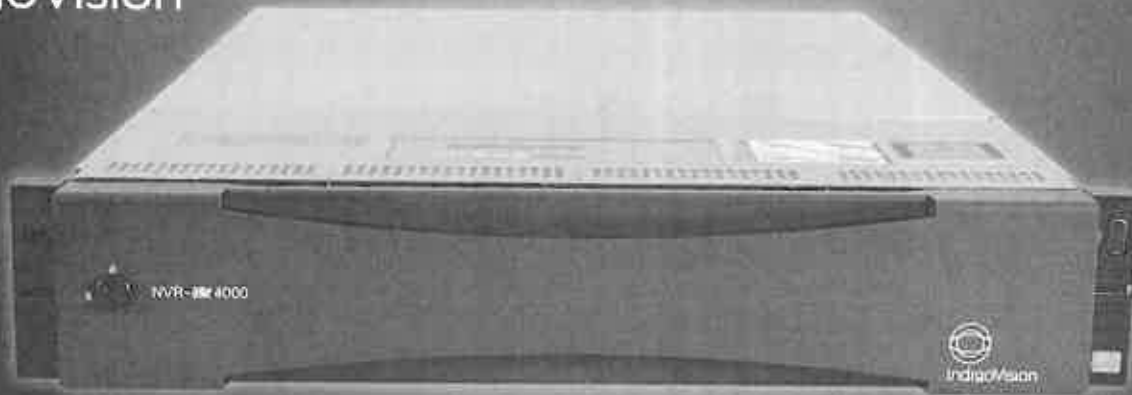
Former Insurance Co.: Erie Insurance through Slagel Insurance, 4489 Mount Royal Blvd, Allison Park, PA Tel. 412 487 7660.





IndigoVision

NVR-AS 4000 RANGE



# Enterprise NVR-AS

Enterprise Recording. Intelligently Designed.

With double the performance of the nearest alternative, the IndigoVision Enterprise NVR-AS can record up to 200 cameras, has data throughput of 2 Gbps and up to 112TB usable storage. Guaranteed tamper free evidence, automatic failover and integrated backup. Available with Windows or Linux, the Enterprise NVR-AS can also integrate other security systems for complete alarm management and has recording support for multiple camera manufacturers.

## Key Features

**COMPRESSION**

- H.264
- H.264
- JPEG 2000
- MJPEG
- MPEG-4

**OTHER**

- GUARANTEED 30fps
- AAC
- G.711
- DNA
- Firewall
- Windows
- Linux

**PHYSICAL**

- 1U Height
- 2U Height
- 19" Rack
- Power
- Video

**STORAGE**

- RAID5
- RAID6
- SATA

## Product Codes

100 Channel	Windows	Linux
Enterprise NVR-AS RA6TB	980455	980555
Enterprise NVR-AS RA12TB	980456	980556
Enterprise NVR-AS RA24TB	980458	980558
200 Channel	Windows	Linux
Enterprise NVR-AS RA40TB	980450	N/A
Enterprise NVR-AS RA60TB	980451	980578
Enterprise NVR-AS RA112TB	980453	980553

# Specification

General Specification	100 Channel			200 Channel		
<b>Form Factor</b>	1U	1U	1U	2U	2U	2U
<b>Disk Space (TB)</b>	6	12	24	40	60	112
<b>Recording Hard Drive Bays</b>	4 (Hot-swappable)			12 (Hot-swappable)		16 (Hot-swappable)**
<b>Operating System Hard Drive Bays</b>	On recording hard drives			Dual redundant separate mirrored drives configured as RAID1		
<b>RAID Controller</b>	Hardware RAID Controller configured as RAID5			Hardware RAID Controller with Flash Backed Cache configured as RAID6		
<b>Performance (Streams)</b>	100 Recording plus simultaneous playback of 25 streams <sup>A</sup>			200 Recording plus simultaneous playback of 25 streams <sup>A</sup>		
<b>Performance (Throughput)</b>	128 Mbps in; 200 Mbps out; 328 Mbps total <sup>A</sup>			100/1000 Mbps Ethernet: 500 Mbps in; 200 Mbps out; 700 Mbps total <sup>A</sup> 10 Gbps Ethernet: 1.6 Gbps in; 400 Mbps out; 2.0 Gbps total <sup>A</sup>		
<b>Network Interface</b>	Dual Port Redundant 100/1000 BaseT RJ-45 Connections, configured as an 802.1ax LACP aggregated group			Windows: Dual Port Redundant 10GB DA/SFP+ and Dual Port Redundant 100/1000 BaseT RJ-45 Connections, configured as an 802.1ax LACP aggregated group Linux: Quad Port Redundant 100/1000 BaseT RJ-45 configured as an 802.1ax LACP aggregated group		
<b>Dimensions/Weight</b>	497mm (d) x 434mm (w) x 43.0mm (h) and 9.51Kg / 19.57in (d) x 17.09in (w) x 1.69in (h) and 20.96lb			719.5mm (d) x 444mm (w) x 87.5mm (h) and 36.5Kg / 28.33in (d) x 17.48in (w) x 3.44in (h) and 80.469lb		
<b>Electrical</b>	250W, 100-240VAC, 50/60 Hz, Auto Switching, Single PSU. Secondary Dual-Redundant Hot Swap PSU not supported			750W, 100-240VAC, 50/60 Hz, Auto Switching, Single Hot Swappable PSU, Secondary Dual-Redundant Hot Swap PSU support		
<b>Processor</b>				100 Channel - Intel Xeon E3 200 Channel - Intel Xeon E5		

	Windows	Linux
<b>Operating System</b>	Windows Server® 2012 R2 for Embedded Systems Essentials	IndigoVision NVR Appliance Operating System
<b>System Management</b>	100 Channel - iDRAC8 Basic 200 Channel - iDRAC8 Express	
<b>Memory</b>	Windows 100 Channel - 8GB RAM DDR4, 200 Channel - 16GB RAM DDR4	8GB RAM DDR4
<b>Automatic Storage Management</b>	Policy based management options for automatic deletion or protection of old footage	
<b>Recording Hard Drive</b>	3.5in Nearline SATA	
<b>Network Security</b>	Enhanced Windows Server 2012 Firewall, Network Access Protection (NAP)	SSH, SFTP, Embedded Linux Firewall
<b>Regulatory</b>	EN 60950-1, IEC 60950-1, EN 55022, CISPR 22, EN 61000-3-2, EN 55024, IEC 61000-3-2 (Class D), EN 61000-3-3, IEC 61000-3-3, CISPR 24	
<b>Housing</b>	Mild Steel Chassis and Fascia	
<b>Operating Temperature</b>	10°C to 35°C (50°F to 95°F)	
<b>Supplied Accessories</b>	Rack Mount Kit (brackets, static rails and mounting hardware), removable lockable fascia, PDU power cord and USB restore media <sup>***</sup>	
<b>Onboard Diagnostics</b>	Fault alarm notification within Control Center for RAID degradation, fans, redundant power supplies and redundant network faults. Additionally, embedded monitoring tools provide detailed fault diagnosis for RAID arrays, controllers, enclosures and temperature faults.	

## Control Center Licensed Features

The availability of the following NVR features varies based on the Control Center software product the NVR is connected to\*\*

<b>Licensing</b>	IndigoVision NVR appliances do not need a separate license. Video from any connected camera or encoder to the system can be recorded
<b>Video</b>	Simultaneously record and playback full frame rate, full resolution video streams from any connected IndigoVision IP Camera or Encoder. Record and playback from other devices including ONVIF Profile S conformant cameras and encoders as well as devices integrated via Camera Gateway™
<b>Audio</b>	Recording and playback of AAC and G.711 audio*
<b>Thumbnails</b>	Indexed recordings for rapid display of time-based, alarm-based or motion-based thumbnails
<b>Alarms</b>	Recording and logging of alarms and events
<b>Bookmarks</b>	Recording and logging of bookmarks in association with recordings
<b>Integrated Data</b>	Recording and logging of millions of data records from LPR, EPOS and other integrations
<b>Analytics</b>	Recording and playback of motion analysis data from cameras*
<b>Redundancy and Failover</b>	Full DNA support, sophisticated failover and mirroring strategies amongst multiple NVRs for increased resilience and redundancy
<b>Digital Watermarking</b>	Digital signing at point of recording and at export

\* Features may vary based on capabilities of camera model. \*\* Please check the Control Center datasheets for more information. <sup>A</sup> With or without Digital Watermarking enabled.

<sup>\*\*</sup> 16 Bay Chassis has 12 Hard Drive Bays accessible from front of chassis and 4 Internal Hard Drive Bays accessible from the top panel of chassis.

<sup>\*\*\*</sup> 16 Bay Chassis Rack Mount Kit includes sliding rail system with cable management.

## Accessories

Accessories	Product Code
Enterprise NVR-AS 2TB SATA Hard Disk Caddy & Disk	110302
Enterprise NVR-AS 3TB SATA Hard Disk Caddy & Disk	110303
Enterprise NVR-AS 4TB SATA Hard Disk Caddy & Disk	110304
Enterprise NVR-AS 6TB SATA Hard Disk Caddy & Disk	110306
Enterprise NVR-AS 8TB SATA Hard Disk Caddy & Disk	110308
Enterprise NVR-AS 8TB SATA Hard Disk Caddy & Disk (Internal Bay)	110328
Enterprise NVR-AS 200 Channel Redundant PSU	110016
Direct Attach twinax cable kit with SFP+ connectors - 1m	110351
Direct Attach twinax cable kit with SFP+ connectors - 3m	110352
Direct Attach twinax cable kit with SFP+ connectors - 5m	110353
10GBASE-SR fibre optic SFP+ transceiver	110361
Sliding rack rails with cable management arm	110300



IndigoVision



# Control Center IndigoUltra®

Your security solution of choice.

Control Center IndigoUltra® merges your choice of products, allowing a custom-tailored integrated system design. Performing reliably on any scale IndigoUltra® allows for quickest response times and accurate incident management.

With IndigoVision's Distributed Network Architecture, IndigoUltra® supports an unlimited number of client workstation installs and NVRs connected to the system; supporting continuous system growth whatever the future might bring.

Control Center is IndigoVision's effective, scalable and robust security management solution. It has an intuitive interface that provides easy system setup and efficient administration which save you both time and money. Relentless testing and quality control 365 days a year ensure strong foundations for a robust, trusted security management offering.

IndigoUltra® delivers:

- Unlimited Device Connections
- Unlimited Client Workstations
- Unlimited NVR Connections

## Product Codes

Control Center	
IndigoVision Product CD - Control Center Software	340003
IndigoUltra® Single Device Connection License	340000-U
IndigoPro® to IndigoUltra® - Upgrade Single Device Connection License	345000-PU
IndigoLite® to IndigoUltra® - Upgrade Single Device Connection License	345000-LU
IndigoUltra® - Migration with active SUP - Single Device Connection License	341003-U
IndigoUltra® - Migration - Single Device Connection License	341000-U
IndigoUltra® - Demo - Single Device Connection License	346003-U



# Specification

General Specification	
Number of Device Connections	Unlimited
Number of Client Workstations	Unlimited
Number of NVR-AS Connections	Unlimited
Live Video	100 video streams (25 per screen)
PTZ Control	✓
Audio	Receive / Record / Transmit*
Video Resolutions	up to 20MP*
Video Compression Formats	MPEG-4* / H.264* / MJPEG* / JPEG2000*
Audio Compression Formats	AAC* / G.711*
Snapshots	BMP / JPEG
Privacy Zones	✓
Sequences, Salvos and Guard Tours	✓
Pursuit Mode	✓
Video Wall	✓
Playback	25 streams
Synchronised Playback	✓
Reverse Playback	✓
Thumbnail Overview	Time / Alarm / Bookmark / Motion* / Audio*
Incident Export	Incident Player / 3rd Party Player (.mp4)*
Recording Schedules	✓
Failover / Redundancy	✓
Automatic NVR Switching	✓
Watermarking	Digital watermarking on recording and export
Maps	Multi-layered maps (BMP / JPEG / PNG / DWG), Tile Server
Webpages	✓
Zones	Group multiple inputs into a single alarm
Event Inputs	Binary* / Analytics* / Network Loss / Video Loss* / Motion Detection*
Alarm Video	Live and looped replay / Pre-alarm video / Alarm Groups
Actions on Event	Record / Email / Snapshot* / Move to Preset / Relay Output* / Audio*
Alarm Schedules	✓
Alarm Reports	✓
Bookmarking	✓
Motion and Audio Search	✓
Alarm and Bookmark Search	✓
Third Party Inputs	Through IndigoVision Integration Modules or IndigoVision Binding Kit
Integrated Data	Manage millions of data records from LPR, EPOS and other integrations
Alarm Escalation	✓
Alarm Procedure Documents	HTML / Text / URL
System Alerts	✓
Audit Log	✓
Architecture	DNA (Distributed Network Architecture)
Segmented Databases	✓
User Groups	✓
Access Permissions	Object and function based permissions
User Authentication	Windows authentication / Basic password
PC Monitors	4
Keyboard Support	IndigoVision / Pelco / American Dynamics / Panasonic
Multiple Languages	10+ languages including, English, Chinese, French, German, Spanish
Matrix Numbering	1 - 9,999,999
Network Connection Types	TCP / UDP Unicast / UDP Multicast
Device Discovery	✓
Timezones	✓
Supported Cameras and Encoders	IndigoVision Ultra, BX and GX camera ranges, 9000 Range Encoders, FrontLine, Camera Gateway and 3rd Party Cameras**
Industry Open Standards	ONVIF Profile S
License Mechanism	Software License Key
Control Center Supported Operating Systems	Windows 10 64-bit, Windows 8 1 64-bit, Windows 8 64-bit, Windows 7 64-bit
Windows NVR-AS Supported Operating Systems	Windows Server 2012 R2 64-bit, Windows Server 2012 64-bit, Windows Server 2008 R2 64-bit, Windows 10 64-bit, Windows 7 64-bit
License Server Supported Operating Systems	Windows Server 2012 R2 64-bit, Windows Server 2012 64-bit, Windows Server 2008 R2 64-bit, Windows 10 64-bit, Windows 7 64-bit. The License Server is also available as part of the IndigoVision NVR-AS 4000 Linux appliances.

\* Features may vary based on capabilities of the camera or encoder model. Please refer to the relevant product datasheets for details.

\*\* Please see our Control Center Supported 3rd Party Cameras list for full details.

BX RANGE



IndigoVision



# Minidome Cameras

High-end: performance, not price tag.

With BX HD, 4MP and 4K Minidome Cameras you get supreme connectivity and flexibility, combined with great video and audio. You also get maximum reliability, and the other significant benefits of IndigoVision's Distributed Network Architecture. BX HD, 4MP and 4K Minidome Cameras deliver a different dimension of safety when combined with IndigoVision's Control Center.

## Key Features

SENSOR



COMPRESSION



INTELLIGENCE



OTHER



PHYSICAL

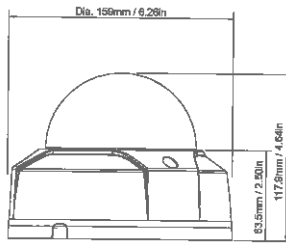


## Product Codes

Minidome Camera	Camera
Vandal Resistant HD Minidome Camera	610440
Environmental Vandal Resistant HD Minidome Camera	610460
Vandal Resistant 4MP Minidome Camera	611440
Environmental Vandal Resistant 4MP Minidome Camera	611460
Environmental Vandal Resistant 4K Minidome Camera	614460

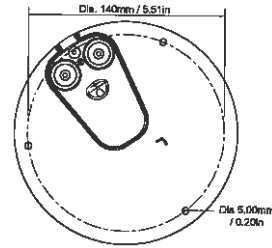
Product Code 66xxxx also available to order consisting of 61xxxx Product Code plus Enhanced Management Software License.

## Dimensions - Minidome Camera



View on Side Face

## Dimensions - Hole Mounting Pattern



View on Bottom Face

## Specification

Camera Features	HD	4MP	4K
<b>Sensor</b>	1/3" Progressive CMOS	1/3" Progressive CMOS	1/1.7" Progressive CMOS
<b>Active Pixels</b>	HD (1920x1080)	4 MP (2560x1440)	12 MP (4000 x 3000)
<b>Horizontal Resolution</b>	> 800 TVL	> 1000 TVL	> 1200 TVL
<b>Minimum Sensitivity</b>	Day: 0.01 Lux (colour), Night: 0.001 Lux (mono) 30 IRE, F1.4, 1/30s shutter	Day: 0.01 Lux (colour), Night: 0.001 Lux (mono) 30 IRE, F1.4, 1/15s shutter	Day: 0.05 Lux (color), Night: 0.005 Lux (mono) 30 IRE, F1.4, 1/15s shutter
<b>Dynamic Range</b>	WDR > 120dB		WDR > 100dB
<b>Gain Control</b>	Auto/Manual setting		
<b>Back Light Compensation</b>	On/Off		
<b>White Balance Mode</b>	Auto/Manual		
<b>Day/Night</b>	True Day/Night with Mechanical IR Cut Filter		
<b>IR Illuminator</b>	Built-in IR Illuminator 350nm wavelength, effective distance >50m		
<b>Video Resolution</b>	4000x3000 pixels (12MP)**; 4096x2160 pixels (8MP)**; 3840x2160 pixels (8MP)**; 3072x2048 pixels (6MP)**; 2560x1440 pixels (4MP)*; 2304x1296 pixels (3MP)*; 1920x1080 pixels (HD); 1280x960 pixels (1.3MP); 1280x720 pixels (720p); 704x576 pixels (D1); 704x480 pixels (D1) 352x288 pixels (SIF); 352x240 pixels (SIF)		
<b>Signal/Noise Level</b>	> 50dB		
<b>Lens Options</b>	HD & 4MP: 2.7mm - 12mm, Horizontal view angle 100° (W) 33° (T), F1.4, Vari-focal, M14 mount with Remote Zoom/Focus 4K: 4.1mm - 16.4mm, Horizontal view angle 106° (W) 32° (T), F1.4, Vari-focal, M14 mount with Remote Zoom/Focus		
<b>Shutter</b>	Rolling, Auto from 1/3 - 1/10,000 sec		
<b>Exposure Control</b>	Auto/Low Noise/Low Motion Blur/Manual		
<b>Video Compression</b>	Full frame rate, full colour: H.264/MJPEG, up to 30fps (ISO 14496-10)		
<b>Privacy Zones</b>	4 User Defined		
<b>Video Bit Rate</b>	User-configurable bit rates from 64Kbps up to 10Mbps		
<b>Video Multi-Streaming</b>	Up to 32Mbps total video output; Unlimited multicast connections. Up to four 8Mbps unicast connections; Up to sixteen 1Mbps unicast connections		
<b>Video Multi-Encoder</b>	Up to two simultaneous resolutions including 12MP (20fps)**, 4K(30fps)**, 4MP(30fps)**, 4MP (20fps)*, 3MP (30fps)*, 1080p (30fps), 720p (30fps), D1 (30fps), SIF (30fps)		
<b>Video Analytics</b>	Motion Detection, Hooded, Tripwire, Intrusion, Abandoned, Missing		
<b>Audio Compression</b>	G.711		
<b>Audio Bit Rate</b>	32Kbps per channel		
<b>Audio Resolution</b>	Full Duplex 8kHz or 16kHz sample rate, Mono Input, Mono Output		
<b>Audio Analytics</b>	Audio Detection		
<b>Audio Input</b>	Line in, terminal block connector		
<b>Audio Output</b>	Line out, terminal block connector		
<b>Binary Input/Output</b>	1 Pull up input for non powered contacts. 1 Solid state open collector output, Max 5.0V, 30mA		
<b>Network Interface</b>	IEEE802.3 and IETF standards: 10/100 Base-T Ethernet, IPv4/IPv6, TCP, UDP, RTP, RTSP, ICMP, IGMP, SNMP, HTTP, HTTPS, SSH, PPPoE, uPnP, QoS, DHCP	IEEE802.3 and IETF standards: 100/1000 Base-T Ethernet, IPv4/IPv6, TCP, UDP, RTP, RTSP, ICMP, IGMP, SNMP, HTTP, HTTPS, SSH, PPPoE, uPnP, QoS, DHCP	
<b>Network Security</b>	HTTPS / IP Filter / IEEE 802.1x		
<b>Time</b>	Embedded real-time clock, NTP client		
<b>SD Storage</b>	microSDHC 128GB support (card not included)***		
<b>Dimension/Weight</b>	159mm (dia) x 117.9mm (h) and 0.8Kg / 6.26in (dia) x 4.64in (h) and 1.764lb		
<b>Regulatory</b>	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A, EN 50130-4, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11 IEC60068-2-27 (Shock) IEC60068-2-6 (Sine Vibration), UL60950		
<b>Housing</b>	White vandal resistant aluminium alloy with clear polycarbonate dome		
<b>Protection Rating</b>	IP67, IK10 (IEC 52262)		
<b>IndigoVision Software Requirements</b>	Control Center v14.1 or later (4K); Control Center v13.2 or later (HD & 4MP)		
<b>ONVIF</b>	Profile S		

Camera Features	HD & 4MP Vandal Resistant	HD & 4MP Environmental Vandal Resistant	4K Environmental Vandal Resistant
<b>Operating Temperature</b>	-20°C to 60°C (-4°F to 140°F)	-40°C to 60°C (-40°F to 140°F)	-40°C to 60°C (-40°F to 140°F)
<b>Cold Start</b>	-20°C (-4°F)	-30°C (-22°F)	-30°C (-22°F)
<b>Electrical</b>	Camera only: PoE (802.3af Class 0) or 12V DC @ 0.33A, 4W. Power supply ordered separately (Product code: 110064; 130176)	Camera only: PoE (802.3af Class 0) or 12V DC @ 0.33A, 4W. Camera including heater: PoE (802.3af Class 0) or 12V DC @ 1.0A, 12W. Power supply ordered separately (Product code: 110064; 130176)	Camera only PoE+ (802.3af Class 4) or 12V DC/24V AC, 9W Camera including heater: PoE+ (802.3af Class 4) or 12V DC/24V AC, 19W. Power supply ordered separately (Product code: 110064; 130176)

\* 4MP and 3MP resolution only available on 4MP variant \*\* 12MP, 4K and 4MP (30fps) resolution only available on 4K variant \*\*\* SDCard Storage independent of IndigoVision's NVRs.

BX RANGE



IndigoVision



# Fisheye Camera

Amazing Megapixel video that delivers detail from every angle

Part of IndigoVision's professional BX Range, the Fisheye Camera delivers 360° visibility with pin-sharp detail. When used as part of IndigoVision's end-to-end system, any single point of failure is removed through IndigoVision's Distributed Network Architecture (DNA) technology.

## Key Features

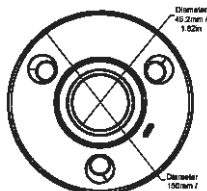
SENSOR	6MP	12MP	Day/Night	WDR	
	COMPRESSION	H.264	UP TO 30fps	G.711	
		INTELLIGENCE	Analytics	Motion Detection	
			OTHER	DNA	PoE
PHYSICAL	Outdoor	IR		IK10	Integral Mic

## Product Codes

Fisheye Camera	Camera
6MP Fisheye Camera with Built-In IR Illuminator	612740
12MP Fisheye Camera with Built-In IR Illuminator	614740

Product Code 6bxxxx also available to order consisting of 6xxxx Product Code plus Enhanced Management Software License

# Dimensions



View on Top Face



View on Side Face

# Specification

Camera Features	6MP	12MP
<b>Sensor</b>	1/1.8" Progressive CMOS	1/2.3" Progressive CMOS
<b>Active Pixels (HxV)</b>	6 MP (3072x2048)	12 MP (4000x3000)
<b>Horizontal Resolution</b>	> 800 TVL	> 1000 TVL
<b>Minimum Sensitivity</b>	Day: 0.01 lux (color) Night: 0.005 lux (mono), 30 IRE, F2.0, 1/30s shutter	Day: 0.01 lux (color). Night: 0.005 lux (mono). 30 IRE, F2.2, 1/30s shutter
<b>Lens Options</b>	1.55mm, Horizontal view angle 185°x185°, F2.0, Fixed Iris	1.57mm, Horizontal view angle 185°x185°, F2.2, Fixed Iris
<b>Dynamic Range</b>	WDR 100dB Max	
<b>Gain Control</b>	Auto/Manual setting	
<b>Back Light Compensation</b>	On/Off	
<b>White Balance Mode</b>	Auto/Manual	
<b>Day/Night</b>	True Day/Night with Mechanical IR Cut Filter	
<b>IR Illuminator</b>	Built-in IR Illuminator 850nm wavelength, effective distance >10m	
<b>Video Resolution</b>	4000x3000 pixels (12MP)*, 2880x2880 pixels (8MP)*, 2880x2160 pixels (6MP); 2048x1536 pixels (3MP); 704x576 pixels (D1); 704x480 pixels (D1) 352x288 pixels (SIF); 352x240 pixels (SIF)	
<b>Signal/Noise Level</b>	> 50dB	
<b>Shutter</b>	Rolling: Auto from 1/3 - 1/10,000 sec	
<b>Exposure Control</b>	Auto/Low Noise/Low Motion Blur/Manual	
<b>Video Compression</b>	Full frame rate, full color: H.264/MJPEG, up to 30fps (ISO 14496-10)	
<b>Privacy Zones</b>	4 User Defined	
<b>Video Bit Rate</b>	User-configurable bit rates from 40Kbps up to 10Mbps	
<b>Video Multi-Streaming</b>	Up to 32Mbps total video output; Unlimited multicast connections. Up to four 8Mbps unicast connections; Up to sixteen 1Mbps unicast connections	
<b>Video Multi-Encoder</b>	Edge Dewarping Dual Streaming 3MP (2048 x 1536) @ 30fps + D1/SIF @ 30fps Native: Dual Streaming 12MP (4000x3000)* @ 15fps + D1/SIF @ 30fps or 3MP 2048x1536 pixels + or 6MP (3072 x 2048) @ 30fps + 720P @ 30fps Motion Detection, Hooded, Tripwire, Intrusion	
<b>Video Analytics</b>	G.711	
<b>Audio Compression</b>	32Kbps per channel	
<b>Audio Bit Rate</b>	Full Duplex: 8kHz or 16kHz sample rate. Mono Input, Mono Output	
<b>Audio Resolution</b>	Audio Detection	
<b>Audio Analytics</b>	Built-in microphone or Line in, RCA connector	
<b>Audio Input</b>	Line out, RCA connector	
<b>Audio Output</b>	2 Pull up inputs for non powered contacts. 1 solid state opto-isolated relay output, Max 24V, 500mA	
<b>Binary Input/Output</b>	IEEE802.3 and IETF standards: 100/1000 Base-T Ethernet, IPv4/IPv6, TCP, UDP, RTP, RTSP, ICMP, IGMP, SNMP, HTTP, HTTPS, SSH, PPPoE, uPnP, QoS, DHCP	
<b>Network Interface</b>	HTTPS / IP Filter / IEEE 802.1x	
<b>Network Security</b>	Embedded real-time clock, NTP client	
<b>Time</b>	microSDHC 128GB support (card not included)**	
<b>SD Storage</b>	150mm (dia) x 47.7mm (h) and 0.58Kg / 5.91in (dia) x 1.88in (h) and 1.28lb	
<b>Dimension/Weight</b>	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A, EN 50130-4, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11, IEC60068-2-27 (Shock), IEC60068-2-6 (Sine Vibration), UL60950-1	
<b>Regulatory</b>	White vandal resistant aluminium alloy including 500mm cable bundle	
<b>Housing</b>	IP67, IK10 (IEC 62262)	
<b>Protection Rating</b>	Camera only: PoE (802.3af Class 0) or 12V DC @ 1.1A; 13W Power supply ordered separately (Product code: 110064; 130176)	
<b>Electrical</b>	-30°C to 60°C (-22°F to 140°F)	
<b>Operating Temperature</b>	-30°C (-22°F)	
<b>Cold Start</b>	Control Center v13.2 or later	
<b>IndigoVision Software Requirements</b>	Profile S	
<b>ONVIF</b>		

\* 12MP and 8MP resolution only available on 12MP variant. \*\*SDCard Storage independent of IndigoVision's NVRs.





IndigoVision

BX RANGE

30x  
Optical



# 4MP PTZ Dome Camera

High-end: performance, not price tag.

With BX 4MP PTZ Dome Cameras you get supreme connectivity and flexibility, combined with great video and audio. You also get maximum reliability, and the other significant benefits of IndigoVision's Distributed Network Architecture. BX 4MP PTZ Dome Cameras deliver a different dimension of safety when combined with IndigoVision's Control Center.

## Key Features

SENSOR



COMPRESSION



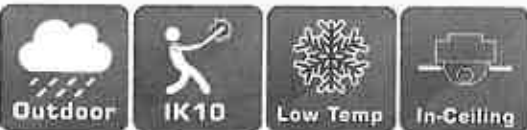
INTELLIGENCE



OTHER



PHYSICAL

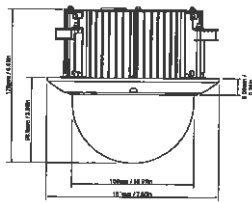


## Product Codes

BX520 4MP PTZ Dome Camera	Camera
In-Ceiling 4MP PTZ Dome	611500
Environmental Pendant 4MP PTZ Dome	611560

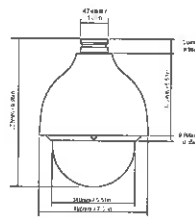
Product Code 66xxxx also available to order, consisting of 61xxxx Product Code plus Enhanced Management Software License

## Dimensions - In-Ceiling PTZ Dome



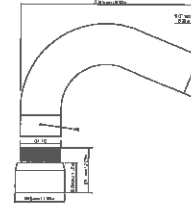
View on Side Face

## Dimensions - Environmental Pendant PTZ Dome

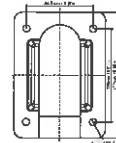


View on Side Face

## Dimensions - Wall Mount



View on Side Face



View on Front Face

## Specification

Camera Features	
<b>Sensor</b>	1/2.8" Progressive CMOS
<b>Active Pixels (HxV)</b>	4MP (2560 x 1440)
<b>Horizontal Resolution</b>	> 900 TVL
<b>Minimum Sensitivity</b>	Day: 0.05 Lux (colour), Night: 0.01 Lux (mono) 30 IRE, F1.6, 1/10s shutter
<b>Dynamic Range</b>	WDR 100dB Max
<b>Gain Control</b>	Auto/Manual setting
<b>Back Light Compensation</b>	On/Off
<b>White Balance Mode</b>	Auto/Manual
<b>Day/Night</b>	True Day/Night with Mechanical IR Cut Filter
<b>Video Resolution</b>	2560 x 1440 pixels (4MP); 1920x1080 pixels (1080p); 1280x720 pixels (720p); 720x576 pixels (D1); 352x288 pixels (SIF)
<b>Signal/Noise Level</b>	> 50dB
<b>Lens Options</b>	4.3mm - 129mm Horizontal view angle 66.5°(W) 3.25° (T), F1.6 to F4.4, Auto focus with manual override
<b>Zoom</b>	30x optical + 10x digital
<b>Iris Control</b>	Auto with manual override
<b>Shutter</b>	Rolling; Auto from 1 - 1/10000 sec
<b>Exposure Control</b>	Auto/Manual/Slow AE/Shutter-priority/Iris-priority
<b>Video Compression</b>	Full frame rate, full colour: H.264/MJPEG; up to 60fps (ISO 14496-10)
<b>Video Bit Rate</b>	User-configurable bit rates from 64Kbps up to 8Mbps
<b>Video Multi-Streaming</b>	Up to 32Mbps total video output; Unlimited multicast connections. Up to four 8Mbps unicast connections; Up to sixteen 1Mbps unicast connections
<b>Video Multi-Encoder</b>	Up to three simultaneous resolutions including: 4MP (30fps), 1080p (60fps), 720p (30fps), D1 (30fps), SIF (30fps)
<b>Video Analytics</b>	Motion Detection, Hooded, Tripwire, Intrusion
<b>Audio Compression</b>	G.711
<b>Audio Bit Rate</b>	32Kbps per channel
<b>Audio Resolution</b>	Full Duplex 8kHz sample rate Mono Input. Mono Output
<b>Audio Input</b>	Line in
<b>Audio Output</b>	Line out
<b>Binary Input/Output</b>	2 Pull up inputs for non powered contacts; 1 solid state opto-isolated relay output, Max 24V, 500mA
<b>Network Interface</b>	IEEE802.3 and IETF standards. 10/100 Base-T Ethernet, TCP, UDP, RTP, RTSP, ICMP, IGMP, SNMP, HTTP, HTTPS, PPPoE, uPnP, QoS, DHCP
<b>Network Security</b>	HTTPS / IP Filter / IEEE 802.1x
<b>Time</b>	Embedded real-time clock, NTP client
<b>SD Storage</b>	microSDHC 128GB support (card not included)*
<b>Regulatory</b>	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, AS/NZS CISPR 22, FCC Part 15 Subpart B Class A, EN 50130-4, UL 60950-22, AS/NZS CISPR 24, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11
<b>IndigoVision Software Requirements</b>	Control Center v13.2 or later
<b>ONVIF</b>	Profile S

PTZ Control			
<b>Preset</b>	300	<b>Pan Range</b>	360° Continuous Rotation
<b>Preset Tours</b>	8	<b>Tilt Range</b>	180°
<b>Pattern/Mimic Tours</b>	5	<b>Pan/Tilt Speed</b>	Pan Speed - 0.5-350°/s, Tilt Speed - 0.5-250°/s
<b>Privacy Zones</b>	24 User Defined	<b>Pan/Tilt Warranty</b>	Moving part warranty limited to 2 million Pan and Tilt Operations

Camera Features	In-Ceiling	Environmental Pendant
<b>Dimensions/Weight</b>	198mm (dia) x 170mm (h) and 2.2Kg / 7.80in (dia) x 6.69in (h) and 4.850lb	186mm (dia) x 253mm (h) and 2.5Kg / 7.32in (dia) x 9.25in (h) and 5.512lb
<b>Housing</b>	Vandal resistant aluminium alloy and Polycarbonate/ABS housing and clear polycarbonate dome including 400mm cable bundle	Vandal resistant aluminium alloy housing and clear polycarbonate dome including 500mm cable bundle
<b>Protection Rating</b>	IK10 (IEC62262)	IP67/IK10 (IEC 62262)
<b>Electrical</b>	PoE + (802.3at Class 4) or 24V AC, 13W. Power supply ordered separately (Product code: 130176)	Camera Only PoE + (802.3at Class 4) or 24V AC, 13W. Power supply ordered separately (Product code: 130176) Camera with Heater: PoE + (802.3at Class 4) or 24V AC, 23W. Power supply ordered separately (Product code: 130176)
<b>Operating Temperature</b>	-10°C to 60°C (14°F to 140°F)	-20°C to 60°C (-4°F to 140°F) (PoE+ Power); -40°C to 60°C (-40°F to 140°F) (24V AC Power)
<b>Cold Start</b>	-10°C (14°F)	-20°C (-4°F)
<b>Supplied Accessories</b>	N/A	Wall Mount bracket

\* SD Card Storage independent of IndigoVision's NVRs.



IndigoVision



# Surveillance Keyboard

Who needs a mouse?

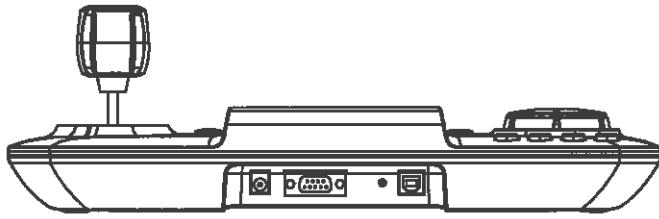
IndigoVision's Surveillance Keyboard is used to access Control Center's Virtual Matrix and IP Video Wall. The Control Center Virtual Matrix allows the Surveillance Keyboard to control IndigoVision and most third party PTZ cameras including Pelco and Panasonic.

- Seamless control of live and recorded video
- Desktop keyboard with 3-axis joystick (pan/tilt/zoom)
- Full variable PTZ control of speed domes
- Full control of Control Center virtual matrix
- Multi-function keys
- LCD graphic display

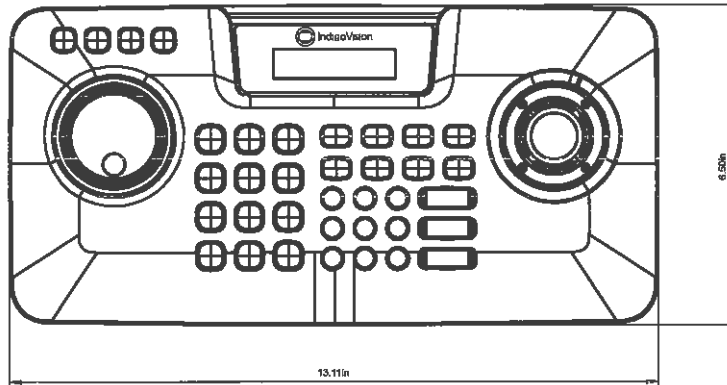
## Product Code

Surveillance Keyboard	
Surveillance Keyboard	110078

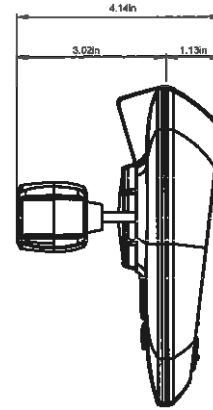
# Dimensions



View on Behind



View on Top Face



View on Right Side

# Specification

General Specification	
Control	Proportional 3 axis joystick plus jog / shuttle dial
Numeric Keypad	12 Keys
Multi-function Keypad	24 Keys
LCD Graphic Display	16x2 LCD Screen
LCD Backlit	Yes
Keyboard Power Supply	5v DC USB / 12V DC Power supply (included)
Power Consumption	1.1W
Operating Temperature	32°F to +104°F
Dimensions/Weight	6.50in (d) x 13.11in (w) x 4.14in (h) x and 1.76lb
RS232 connections	1 Senal Line (COM) Female DB9 Connector (Included)
Regulatory	CE, FCC

Specifications are correct at the datasheet date of issue and are subject to change without prior notice.

ULTRARANGE



IndigoVision



# Ultra 2K Fixed Dome Camera

Capture every detail with ultra-high resolution

With best in class performance, the IndigoVision Ultra 2K Fixed Dome Camera delivers rich, Full HD video and image clarity, in all lighting conditions. IndigoVision's SMART.core technology gives highly optimised H.264 compression and ACF+, reducing storage costs by up to 95%.

## Key Features

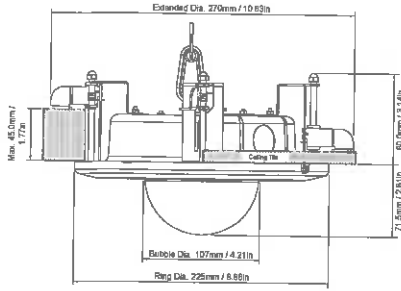
SENSOR	ULTRA 2K	Day/Night	Low Light	WDR	
COMPRESSION	H.264	GUARANTEED 30fps	FPGA	AAC	
INTELLIGENCE	ACF	ACF+	Analytics	Motion Detection	
OTHER	DNA	PoE	Firewall	ONVIF	
PHYSICAL	Outdoor	IK10	Low Temp	High Temp	In-Ceiling

## Product Codes

Ultra 2K Fixed Dome Camera (NTSC)	Camera
Ultra 2K In-Ceiling Fixed Dome, 3-9mm Lens	512426
Ultra 2K In-Ceiling Fixed Dome, 10-23mm Lens	512428
Ultra 2K Internal Fixed Dome, 3-9mm Lens	512416
Ultra 2K Internal Fixed Dome, 10-23mm Lens	512418
Ultra 2K Environmental Vandal Resistant Fixed Dome, 3-9mm Lens	512446
Ultra 2K Environmental Vandal Resistant Fixed Dome, 10-23mm Lens	512448

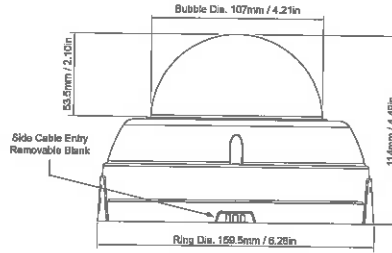
Product Code 56xxxx also available to order consisting of 51xxxx. Product Code plus Enhanced Management Software License

## Dimensions: In-Ceiling



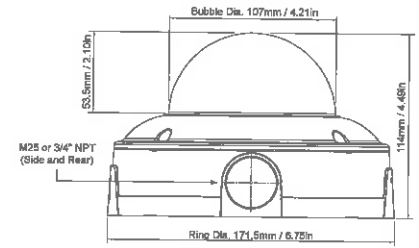
View on Side Face

## Dimensions: Internal



View on Side Face

## Dimensions: Environmental Vandal Resistant



View on Side Face

## Specification

Camera Features	
Sensor	1/3" Progressive CMOS
Active Pixels (HxV)	2MP (1920 x 1080)
Horizontal Resolution	> 850 TVL
Minimum Sensitivity	Day: 0.05 lux (color) Night: 0.005 lux (mono) 30 IRE, F1.2, 1/15s shutter. Day: 0.3 lux (color), Night: 0.03 lux (mono) 50 IRE, F1.2, 1/30s shutter
Dynamic Range	WDR 120dB Max
Gain Control	Auto setting across a 42dB range
Back Light Compensation	On/Off
White Balance Mode	Auto/Indoor/Outdoor/Manual/Auto One Push
Day/Night	True Day/Night with Mechanical IR Cut Filter
Video Resolution	HD 1080p 1920 x 1080 pixels, 720p 1280 x 720 pixels, SD 960 x 540 pixels, 640 x 360 pixels; 16:9 ratio
Signal/Noise Level	> 39dB
Lens Options	Standard 3 to 9mm, Horizontal view angle 108.6° (W) 34.8° (T), F1.2, P-Iris, Remote Zoom/Focus Telephoto 10-23mm Horizontal view angle 30.8° (W) 13.6° (T), F1.6, P-Iris, Remote Zoom/Focus
Zoom	3x optical standard; 2.3x optical telephoto
Iris Control	Automatic P-Iris with Manual override
Shutter	Rolling; Auto from 1/1 to 1/50,000 sec
Exposure Control	Auto Iris/Auto Shutter/Slow AE
Gimbal Adjustment	3 axis adjustment
Video Compression	Full frame rate, full color, H.264 (ISO 14496-10), 30fps guaranteed
Video Bit Rate	User-configurable from 32Kbps up to 8Mbps
Video Multi-Streaming	Up to 32Mbps total video output. Unlimited multicast connections. Up to seven 4Mbps unicast connections, Up to sixteen 1Mbps unicast connections
Video Multi-Encoder	Up to two simultaneous resolutions with guaranteed frame rate including: 1080p (30fps), SD (30fps)
Video Analytics	Standard ACF, ACF+ Motion Detection, Hooded Advanced Dual Tripwire, Congestion, Counterflow, Museum*
Audio Compression	AAC-LC (ISO 14496-3)
Audio Bit Rate	User-configurable bit rates from 32Kbps to 160Kbps per channel
Audio Protocol	RTP (RFC 3640)
Audio Dual Encoder	Encoder A: 1 Stream Configuration plus Encoder B: 1 Stream Configuration
Audio Resolution	Full Duplex 16kHz, 16 Bit Mono/Stereo Input, Mono Output
Audio Input	Stereo / Mono line in terminal block connector. Nominal voltage: 1V p-p, Mic 30mV p-p. Mic type: dynamic or electret
Audio Output	Mono line out terminal block connector. 1V p-p, Minimum load impedance: 16 Ohms
Binary Input/Output	2 Pull up inputs for non powered contacts; 1 solid state opto-isolated relay output @500mA, LED output @20mA
Data Input/Output	1 Console port: RS232 up to 115.2 Kbps*
Privacy Zones	8 User Defined
Network Interface	IEEE802.3 and IETF standards: 10/100 Base-T Ethernet, TCP, UDP, RTP, ICMP, IGMP, SNMP, DHCP, NTP, DNS, HTTP, HTTPS, SSH
Network Security	HTTPS / Embedded Linux Firewall. Salted passwords, with MD5 encryption / IEEE 802.1x
Time	Embedded real-time clock, NTP client with battery backup
Regulatory	EN 55022 - Class A, EN 55024, EN 60068-2-29, EN 60068-2-1 & 2, EN 60068-2-30, EN 60068-2-6 & 64, CFR47 Part 15 subpart B -Class A, UL60950-1*, UL2043**, UL60950-22***, UL2802
IndigoVision Software Requirements	Control Center v11.0 or later
ONVIF	Profile S**

Camera Features	In-Ceiling	Internal	Environmental/Vandal Resistant
Dimension/Weight	225mm (ring dia.) x 151.5mm (h) (71.5mm below ceiling) and 1.1Kg / 8.85in (dia.) x 5.96in (h) (2.82in below ceiling) and 2.425lb	159.5mm (dia.) x 114mm (h) and 0.85Kg / 6.28in (dia.) x 4.49in (h) and 1.873lb	171.5mm (dia.) x 114mm (h) and 1.1Kg / 6.75in (dia.) x 4.49in (h) and 2.425lb
Housing	Aluminium with polycarbonate dome	Polycarbonate/ABS with polycarbonate dome	Diecast aluminium alloy with polycarbonate dome
Protection Rating	N/A	N/A	IP66, IK10 (IEC 62262), NEMA 250 4X
Electrical	PoE (802.3af Class 0) or 24V AC/DC @ 0.4A, 9.6W max. Power supply ordered separately (Product code 110004, 110061, 110062)	PoE (802.3af Class 0) or 24V AC/DC @ 0.4A, 9.6W max. Power supply ordered separately (Product code 110004, 110061, 110062)	Camera only: PoE (802.3af Class 0) or 24V AC/DC @ 0.4A, 9.6W. Camera including heater: 24V AC/DC @ 1.33A, 32W. Power supply ordered separately (Product code 110060)
Operating Temperature	-10°C to 50°C (14°F to 122°F)	-10°C to 50°C (14°F to 122°F)	PoE powered: -10°C to 55°C (14°F to 131°F) External PSU: -40°C to 55°C (-40°F to 131°F)
Cold Start	0°C (32°F)	0°C (32°F)	-30°C (-22°F)

\* Internal and In-Ceiling Dome only. \*\* In-Ceiling Dome only. \*\*\* Environmental Vandal Resistant Dome only. \* Advanced Video Analytics require a licence. \*\* Firmware upgrade is required for ONVIF Conformance.

ULTRARANGE



IndigoVision



# Ultra 2K Fixed Dome Camera

Capture every detail with ultra-high resolution

With best in class performance, the IndigoVision Ultra 2K Fixed Dome Camera delivers rich, Full HD video and image clarity, in all lighting conditions. IndigoVision's SMART core technology gives highly optimised H.264 compression and ACF+, reducing storage costs by up to 95%.

## Key Features

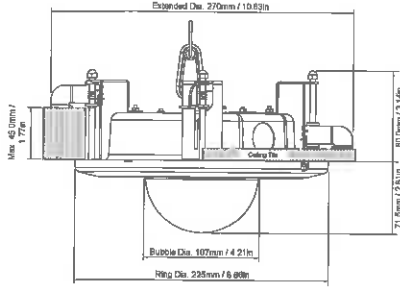
OTHER	DNA	PoE	Firewall	ONVIF	
	ACF	ACF+	Analytics	Motion Detection	
	H.264	30fps	FPGA	AAC	
	ULTRA 2K	Day/Night	Low Light	WDR	
PHYSICAL	Outdoor	IK10	Low Temp	High Temp	In-Ceiling

## Product Codes

Ultra 2K Fixed Dome Camera (NTSC)	Camera
Ultra 2K In-Ceiling Fixed Dome, 3-9mm Lens	512426
Ultra 2K In-Ceiling Fixed Dome, 10-23mm Lens	512428
Ultra 2K Internal Fixed Dome, 3-9mm Lens	512416
Ultra 2K Internal Fixed Dome, 10-23mm Lens	512418
Ultra 2K Environmental Vandal Resistant Fixed Dome, 3-9mm Lens	512446
Ultra 2K Environmental Vandal Resistant Fixed Dome, 10-23mm Lens	512448

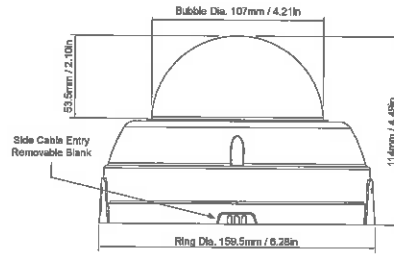
Product Code 56xxxx also available to order consisting of 51xxxx Product Code plus Enhanced Management Software License

## Dimensions: In-Ceiling



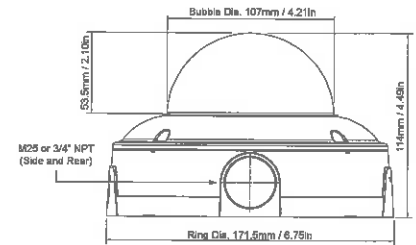
View on Side Face

## Dimensions: Internal



View on Side Face

## Dimensions: Environmental Vandal Resistant



View on Side Face

## Specification

Camera Features	
<b>Sensor</b>	1/3" Progressive CMOS
<b>Active Pixels (HxV)</b>	2MP (1920 x 1080)
<b>Horizontal Resolution</b>	> 850 TVL
<b>Minimum Sensitivity</b>	Day: 0.05 lux (color) Night: 0.005 lux (mono) 30 IRE, F1.2, 1/15s shutter. Day: 0.3 lux (color), Night: 0.03 lux (mono). 50 IRE, F1.2, 1/30s shutter
<b>Dynamic Range</b>	WDR 120dB Max
<b>Gain Control</b>	Auto setting across a 42dB range
<b>Back Light Compensation</b>	On/Off
<b>White Balance Mode</b>	Auto/Indoor/Outdoor/Manual/Auto One Push
<b>Day/Night</b>	True Day/Night with Mechanical IR Cut Filter
<b>Video Resolution</b>	HD 1080p: 1920 x 1080 pixels. 720p: 1280 x 720 pixels, SD: 960 x 540 pixels, 640 x 360 pixels, 16:9 ratio
<b>Signal/Noise Level</b>	> 39dB
<b>Lens Options</b>	Standard 3 to 9mm, Horizontal view angle 108.6° (W) 34.8° (T), F1.2, P-iris, Remote Zoom/Focus Telephoto 10-23mm Horizontal view angle 30.8° (W) 13.6° (T), F1.6, P-iris, Remote Zoom/Focus
<b>Zoom</b>	3x optical standard; 2.3x optical telephoto
<b>Iris Control</b>	Automatic P-Iris with Manual override
<b>Shutter</b>	Rolling; Auto from 1/1 to 1/50,000 sec
<b>Exposure Control</b>	Auto Iris/Auto Shutter/Slow AE
<b>Gimbal Adjustment</b>	3 axis adjustment
<b>Video Compression</b>	Full frame rate full color H.264 (ISO 14496-10), 30fps guaranteed
<b>Video Bit Rate</b>	User-configurable from 32Kbps up to 8Mbps
<b>Video Multi-Streaming</b>	Up to 32Mbps total video output. Unlimited multicast connections. Up to seven 4Mbps unicast connections, Up to sixteen 1Mbps unicast connections
<b>Video Multi-Encoder</b>	Up to two simultaneous resolutions with guaranteed frame rate including: 1080p (30fps), SD (30fps)
<b>Video Analytics</b>	Standard ACF, ACF+, Motion Detection, Hooded Advanced, Dual Tripwire, Congestion, Counterflow, Museum*
<b>Audio Compression</b>	AAC-LC (ISO 14496-3)
<b>Audio Bit Rate</b>	User-configurable bit rates from 32Kbps to 160Kbps per channel
<b>Audio Protocol</b>	RTP (RFC 3640)
<b>Audio Dual Encoder</b>	Encoder A: 1 Stream Configuration plus Encoder B: 1 Stream Configuration
<b>Audio Resolution</b>	Full Duplex 16kHz, 16 Bit Mono/Stereo Input, Mono Output
<b>Audio Input</b>	Stereo / Mono line in terminal block connector. Nominal voltage 1V p-p, Mic 30mV p-p. Mic type: dynamic or electret
<b>Audio Output</b>	Mono line out terminal block connector. 1V p-p, Minimum load impedance: 16 Ohms
<b>Binary Input/Output</b>	2 Pull up inputs for non powered contacts; 1 solid state opto-isolated relay output @500mA, LED output @20mA
<b>Data Input/Output</b>	1 Console port: RS232 up to 115.2 Kbps*
<b>Privacy Zones</b>	8 User Defined
<b>Network Interface</b>	IEEE802.3 and IETF standards: 10/100 Base-T Ethernet, TCP, UDP, RTP, ICMP, IGMP, SNMP, DHCP, NTP, DNS, HTTP, HTTPS, SSH
<b>Network Security</b>	HTTPS / Embedded Linux Firewall. Salted passwords, with MD5 encryption / IEEE 802.1x
<b>Time</b>	Embedded real-time clock, NTP client with battery backup
<b>Regulatory</b>	EN 55022 - Class A, EN 55024, EN 60068-2-29, EN 60068-2-1 & 2, EN 60068-2-30, EN 60068-2-6 & 64, CFR47 Part 15 subpart B -Class A, UL60950-1*, UL2043**, UL60950-22***, UL2802
<b>IndigoVision Software Requirements</b>	Control Center v11.0 or later
<b>ONVIF</b>	Profile S**

Camera Features	In-Ceiling	Internal	Environmental Vandal Resistant
<b>Dimension/Weight</b>	225mm (ring dia.) x 151.5mm (h) (71.5mm below ceiling) and 1.1Kg / 8.85in (dia.) x 5.96in (h) (2.82in below ceiling) and 2.425lb	159.5mm (dia.) x 114mm (h) and 0.85Kg / 6.28in (dia.) x 4.49in (h) and 1.873lb	171.5mm (dia.) x 114mm (h) and 1.1Kg / 6.75in (dia.) x 4.49in (h) and 2.425lb
<b>Housing</b>	Aluminium with polycarbonate dome	Polycarbonate/ABS with polycarbonate dome	Diecast aluminium alloy with polycarbonate dome
<b>Protection Rating</b>	N/A	N/A	IP66, IK10 (IEC 62262), NEMA 250 4X
<b>Electrical</b>	PoE (802.3af Class 0) or 24V AC/DC @ 0.4A, 9.6W max. Power supply ordered separately (Product code 110004, 110061, 110062)	PoE (802.3af Class 0) or 24V AC/DC @ 0.4A, 9.6W max. Power supply ordered separately (Product code 110004, 110061, 110062)	Camera only: PoE (802.3af Class 0) or 24V AC/DC @ 0.4A, 9.6W. Camera including heater: 24V AC/DC @ 1.33A, 32W. Power supply ordered separately (Product code: 110060)
<b>Operating Temperature</b>	-10°C to 50°C (14°F to 122°F)	-10°C to 50°C (14°F to 122°F)	PoE powered: -10°C to 55°C (14°F to 131°F) External PSU: -40°C to 55°C (-40°F to 131°F)
<b>Cold Start</b>	0°C (32°F)	0°C (32°F)	-30°C (-22°F)

\* Internal and In-Ceiling Dome only. \*\* In-Ceiling Dome only. \*\*\* Environmental Vandal Resistant Dome only. \* Advanced Video Analytics require a licence. \*\* Firmware upgrade is required for ONVIF Conformance.





IndigoVision

# Fisheye Camera Mount & Accessory Matrix

BX Range, 6MP/12MP Fisheye



Mount/Accessory	Standard
Wall Mount	130081
Vertical Pole Mount	130082
Corner Mount Adaptor	130184
Pole Mount Adaptor	130083
Junction Box	130071
Power Supply	110064, 130176

# IndigoVision Fisheye Camera Mount & Accessory Matrix Appendix - Page 1

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Wall Mount	BX Range	<p>134mm / 5.28in 187.5mm / 7.38in 94.0mm / 3.70in 17.2mm G1 1/2 4-8.00mm / 0.16in-0.3 90.0mm / 3.54in 151mm / 5.94in 131mm / 5.16in 3-M4 120° 37.0mm / 1.46in 15.0mm / 0.59in</p>	130081
Vertical Pole Mount	BX Range	<p>133.5mm / 5.26in 100mm / 3.94in 4-10.0mm / 0.16in-0.39in G1 1/2 235.5mm / 9.27in 151mm / 5.94in 131mm / 5.16in 3-M4 120° 37.0mm / 1.46in 15.0mm / 0.59in</p>	130082
Corner Mount Adaptor	BX Range	<p>243mm / 9.57in 84.0mm / 3.31in 48.0mm / 1.89in 170mm / 6.69in 119mm / 4.69in 90.0mm / 3.54in 100mm / 3.94in 35.0mm / 1.38in 70.0mm / 2.76in 56.0mm / 2.20in 84.0mm / 3.31in 4-M8 90° 8-M8 40.0mm / 1.57in 119mm / 4.69in 8-8.00mm / 0.31in-0.35in 130mm / 5.12in 80.0mm / 3.15in 138mm / 5.43in 80.0mm / 3.15in</p>	130184

# IndigoVision Fisheye Camera Mount & Accessory Matrix Appendix - Page 2

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Pole Mount Adaptor	BX Range	<p>87.0mm / 3.43in 76.0mm / 2.99in 48.0mm / 1.89in 30.0mm / 1.18in 4-M4 20.0mm / 0.79in 1.02in 90.0mm / 3.54in 117.5mm / 4.63in 15.0mm / 0.59in 42.0mm / 1.65in 4-M6-6H View on Front Face View on Side Face View on Top Face</p>	130083
Junction Box	BX Range	<p>155mm / 6.10in 119.5mm / 4.70in 130.6mm / 5.14in 3-M4 3/4" Thread (Side &amp; Rear) View on Top Face 39.0mm / 1.54in View on Side Face 48.0mm / 1.89in 86.0mm / 3.39in 4-M4 View on Bottom Face</p>	130071

## Power Supplies

Product Code	Input Voltage	Input Current (Max)	Input Connector	Output Voltage	Output Current (Max)	Output Connector	Operating Temperature Range	Dimensions (D x W x H)
110064	100-240VAC	0.8A	IEC320-C14	12V DC	2.50A	2 Pin Female Connector	0°C to 50°C / 32°F to 122°F	118mm x 52.0mm x 35.0mm / 4.65in x 2.05in x 1.38in
130176	100-240VAC	2.0A	IEC320-C14	56V DC	0.67A	RJ45 Female Connector	-20°C to 40°C / -4°F to 104°F	166mm x 80.0mm x 44.0mm / 6.54in x 3.15in x 1.73in



IndigoVision

# PTZ Camera Mount & Accessory Matrix

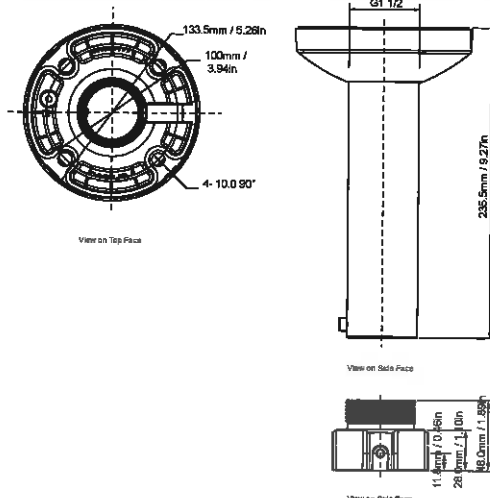
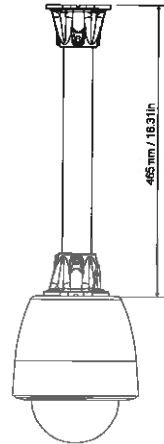
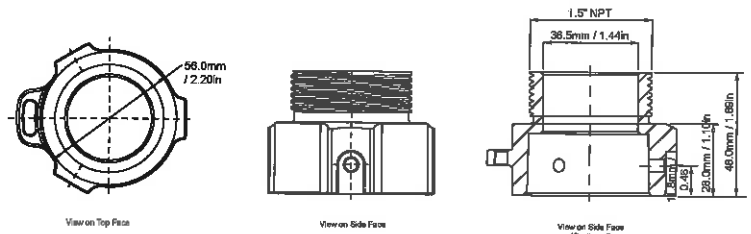
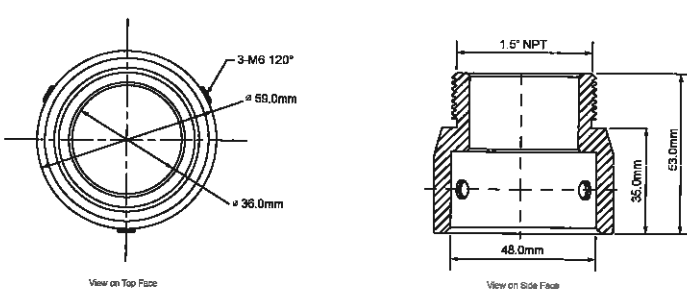
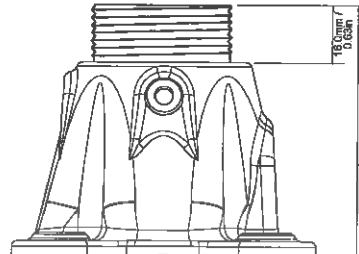
Mount/Accessory	BX Range, BX510 HD PTZ Dome		BX Range, BX520 HD Adaptive IR PTZ Dome		BX Range, BX520 4MP PTZ Dome		Ultra Range, Ultra 2K PTZ Dome	
	Internal	External	Standard	In-Ceiling	Pendant	In-Ceiling	Pendant	
In-Ceiling Mount	110245	-	-	-	-	-	-	
Wall Mount	-	110084	130181*	-	130173	-	110084	
Pendant Swan-Neck Mount	-	110085	-	-	-	-	110085	
Vertical Pole Mount	-	110086	130182	-	130174	-	110086	
1.5" NPT Adaptor (Male)	-	110087	130175	-	130185	-	110087	
1.5" NPT Adaptor (Female)	-	110088	-	-	-	-	110088	
Corner Mount Adaptor <sup>^</sup>	-	110082	130184	-	130184	-	110082	
Pole Mount Adaptor <sup>^</sup>	-	110096 (Black) <sup>^^</sup> 110196 (Grey) <sup>^^</sup>	130183	-	130183	-	110096 (Black) <sup>^^</sup> 110196 (Grey) <sup>^^</sup>	
Junction Box	-	-	130171	-	130171	-	-	
Power Junction Box	-	-	130172	-	130172	-	-	
Power Supplies	120006; 130176	120006; 130176	130176	130176	130176	110060; 130176	110060; 130176	
Cables	-	0.6m - 110172 3m - 110173 9m - 110174	-	-	-	-	0.6m - 110172 3m - 110173 9m - 110174	

\* Included with camera purchase. <sup>^</sup> Adaptors are compatible with the Wall Mount. <sup>^^</sup> The Pole Mount Adaptor can take a 0.5in strap

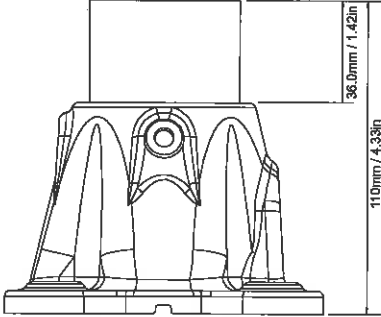
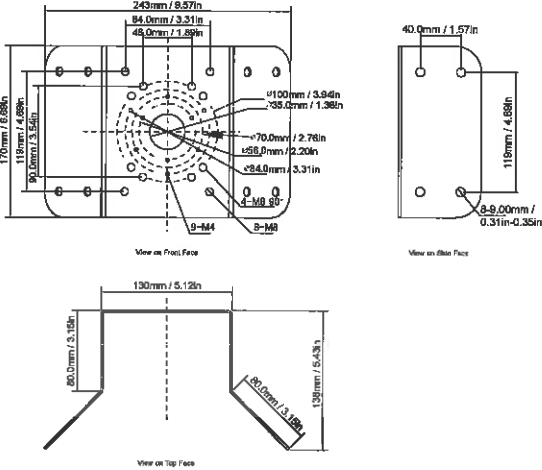
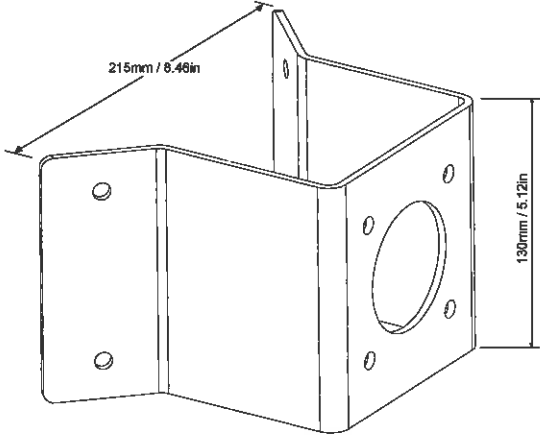
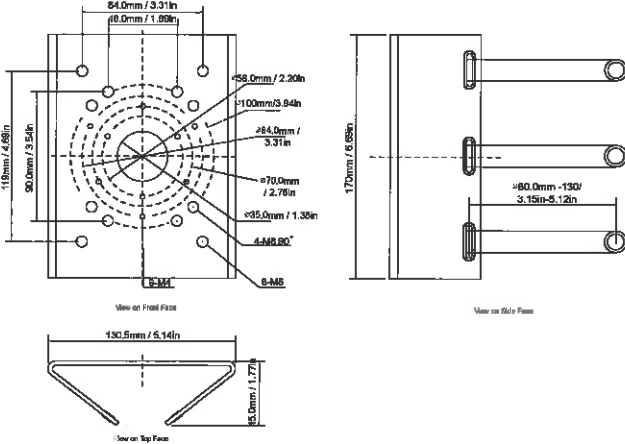
# IndigoVision PTZ Camera Mount & Accessory Matrix Appendix - Page 1

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Wall Mount	BX Range		<p>BX Range BX520 Std - 130181</p>
Wall Mount	BX Range		<p>BX Range BX520 Pen - 130173</p>
Pendant Wall Mount	Ultra Range BX Range		<p>Ultra Range Pen - 110084</p> <p>BX Range BX510 Ext - 11084</p>
Pendant Swan-Neck Mount	Ultra Range BX Range		<p>Ultra Range Pen - 110085</p> <p>BX Range BX510 Ext - 110085</p>

# IndigoVision PTZ Camera Mount & Accessory Matrix Appendix - Page 2

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Pendant Vertical Pole Mount	BX Range		BX Range BX520 Std - 130182 Pen - 130174
Pendant Vertical Pole Mount	Ultra Range BX Range		Ultra Range Pen - 110086  BX Range BX510 Ext - 110086
1.5" NPT Adaptor (Male)	BX Range		BX Range BX520 Std - 130175
1.5" NPT Adaptor (Male)	BX Range		BX Range BX520 Pen - 130185
1.5" NPT Adaptor (Male)	Ultra Range BX Range		Ultra Range Pen - 110087  BX Range BX510 Ext - 110087

# IndigoVision PTZ Camera Mount & Accessory Matrix Appendix - Page 3

Mount Name	Camera Range	Dimensional Drawing	Product Codes
1.5" NPT Adaptor (Female)	Ultra Range BX Range		<p>Ultra Range Pen - 110088</p> <p>BX Range BX510 Ext - 110088</p>
Corner Mount Adaptor	BX Range		<p>BX Range BX520 Std - 130184 Pen - 130184</p>
Corner Mount Adaptor	Ultra Range BX Range		<p>Ultra Range Pen - 110082</p> <p>BX Range BX510 Ext - 110082</p>
Pole Mount Adaptor	BX Range		<p>BX Range BX520 Std - 130183 Pen - 130183</p>

# IndigoVision PTZ Camera Mount & Accessory Matrix Appendix - Page 4

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Pole Mount Adaptor	Ultra Range BX Range		<p>Ultra Range Pen - 110096 (Black) Pen - 110196 (Grey)</p> <p>BX Range BX510 Ext - 110096 (Black) Ext - 110196 (Grey)</p>
Junction Box	BX Range		<p>BX Range BX520 Std - 130171 Pen - 130171</p>
Power Junction Box	BX Range		<p>BX Range BX520 Std - 130172 Pen - 130172</p>



**Power Supplies**

Product Code	Input Voltage	Input Current (Max)	Input Connector	Output Voltage	Output Current (Max)	Output Connector	Operating Temperature Range	Dimensions (D x W x H)
110060	100-240VAC	1.9A	IEC320-C14	24V DC	3.33A	Bare Wires	32°F to 122°F	168mm x 78.0mm x 45.0mm / 6.61in x 3.07in x 1.77in
130176	100-240VAC	2.0A	IEC320-C14	56V DC	0.67A	RJ45 Female Connector	-4°F to 104°F	166mm x 80.0mm x 44.0mm / 6.54in x 3.15in x 1.73in
120006	100-240VAC	2.0A	IEC320-C14	30V DC	4.0A	Bare Wires	32°F to 104°F	148mm x 59mm x 32mm

**Cables**

Camera Range	Product Code	Description
Ultra Range + BX510	110172	Cable assembly and gland (0.6m)
	110173	Cable assembly and gland (3m)
	110174	Cable assembly and gland (9m)



IndigoVision

# Dome Camera Mount & Accessory Matrix

GX Range, GX420 HD Minidome	GX Range, GX420 HD Pan/Tilt Minidome	BX Range, BX420 Minidome Cameras	Ultra Range, Ultra 2K Fixed Dome

Mount/Accessory	Vandal Resistant	Vandal Resistant	Vandal Resistant	Environmental Vandal Resistant	Internal	Vandal Resistant
In-Ceiling	130013	130013	130180, 130074	-	-	-
Exit Collar	130011	130011	130072	-	-	-
Wall Mount	130012	130018	-	-	-	-
Bracket Wall Mount	-	-	-	-	-	110160
Pendant Wall Mount*	-	-	-	-	-	110020
Pendant Swan-Neck Mount*	-	-	-	-	-	110022
Pendant Vertical Pole Mount*	-	-	130073	-	-	110024
1.5" NPT Pendant Mount (Male)**	-	-	130075	-	-	110027
1.5" NPT Pendant Mount (Female)**	-	-	-	-	-	110028
Corner Mount Adaptor**	130184	130184	130184	-	-	110082
Pole Mount Adaptor**	130083, 130183	130083, 130183	130083, 130183	-	-	110096 (Black) <sup>A</sup> 110196 (Grey) <sup>A</sup>
Power Supply	110064; 130176	110064, 130176	110064, 130176	110004; 110062; 130176	-	110060
Cable	-	-	-	-	-	6m - 110171

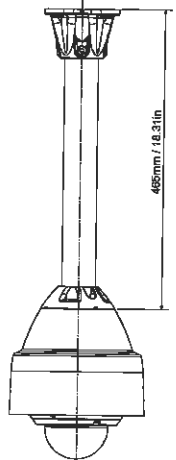
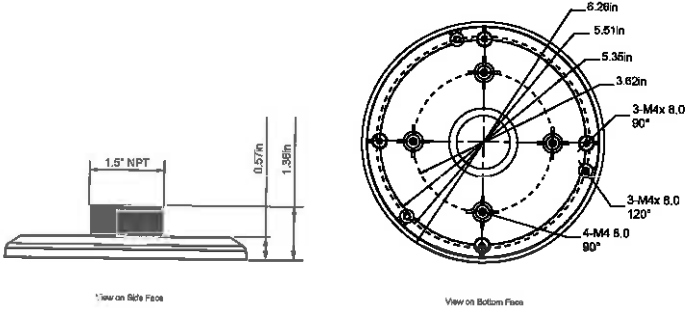
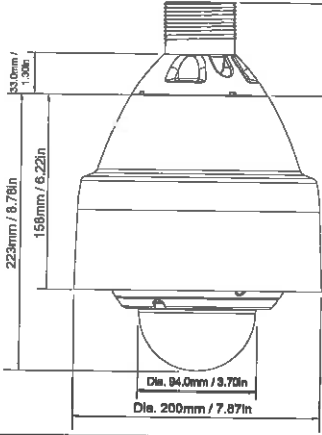
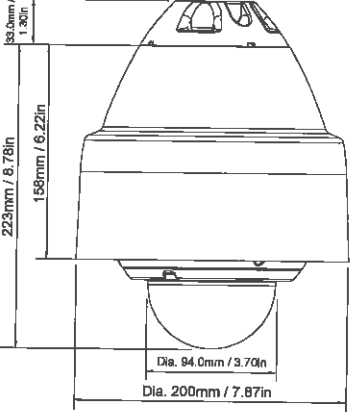
\* Adaptors are compatible with the Pendant Wall Mount + All Dome Pendant Mounts include a Pendant Sun Shroud as standard <sup>A</sup> The Pole Mount Adaptor can take a 0.5in strap  
 \*\* Multiple poles can be connected to create lengths in multiples of 250mm

Mount Name	Camera Range	Dimensional Drawing	Product Codes
In-Ceiling Mount	GX Range	<p>Bottom Face</p> <p>Top Face</p> <p>Side Face</p>	GX Range GX420 V.R - 130013
In-Ceiling Mount	BX Range	<p>View on Bottom Face</p> <p>View on Top Face</p> <p>View on Side Face</p>	BX Range BX420 V.R - 130180 E.V.R - 130074
Exit Collar	GX Range	<p>TOP</p> <p>BOTTOM</p> <p>Side View</p>	GX Range GX420 V.R - 130011
Exit Collar	BX Range	<p>Top View</p> <p>Side View</p>	BX Range BX420 V.R - 130072 E.V.R - 130072

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Wall Mount	GX Range		GX Range GX420 Minidome V.R - 130012
Wall Mount	GX Range		GX Range GX420 Pan/Tilt Minidome V.R - 130018
Wall Mount	BX Range		BX Range BX420 V.R - 130072 E.V.R - 130072
Bracket Wall Mount	Ultra Range		Ultra Range (Ultra 2K) V.R - 110160

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Pendant Wall Mount	Ultra Range		Ultra Range (Ultra 2K) V.R - 110020
Pendant Swan-Neck Mount	Ultra Range		Ultra Range (Ultra 2K) V.R - 110022
Pendant Vertical Pole Mount	BX Range		BX Range BX420 V.R - 130073 E.V.R - 130073

# IndigoVision Dome Camera Mount & Accessory Matrix Appendix - Page 4

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Pendant Vertical Pole Mount	Ultra Range		Ultra Range (Ultra 2K) V.R - 110024
1.5" NPT Pendant Mount (Male)	BX Range		BX Range BX420 V.R - 130075 E.V.R - 130075
1.5" NPT Pendant Mount (Male)	Ultra Range		Ultra Range (Ultra 2K) V.R - 110027
1.5" NPT Pendant Mount (Female)	Ultra Range		Ultra Range (Ultra 2K) V.R - 110028

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Corner Mount Adaptor	GX Range, BX Range		<p>GX Range GX420 V.R - 130184</p> <p>BX Range BX420 V.R - 130184 E.V.R - 130184</p>
Corner Mount Adaptor	Ultra Range		<p>Ultra Range (Ultra 2K) V.R - 110082</p>
Pole Mount Adaptor	GX Range, BX Range		<p>GX Range GX420 V.R - 130083</p> <p>BX Range BX420 V.R - 130083 E.V.R - 130083</p>

Mount Name	Camera Range	Dimensional Drawing	Product Codes
Pole Mount Adaptor	GX Range		GX Range GX420 V.R - 130183
Pole Mount Adaptor	Ultra Range		Ultra Range (Ultra 2K) E.V.R - 110096 (Black) E.V.R - 110196 (Grey)

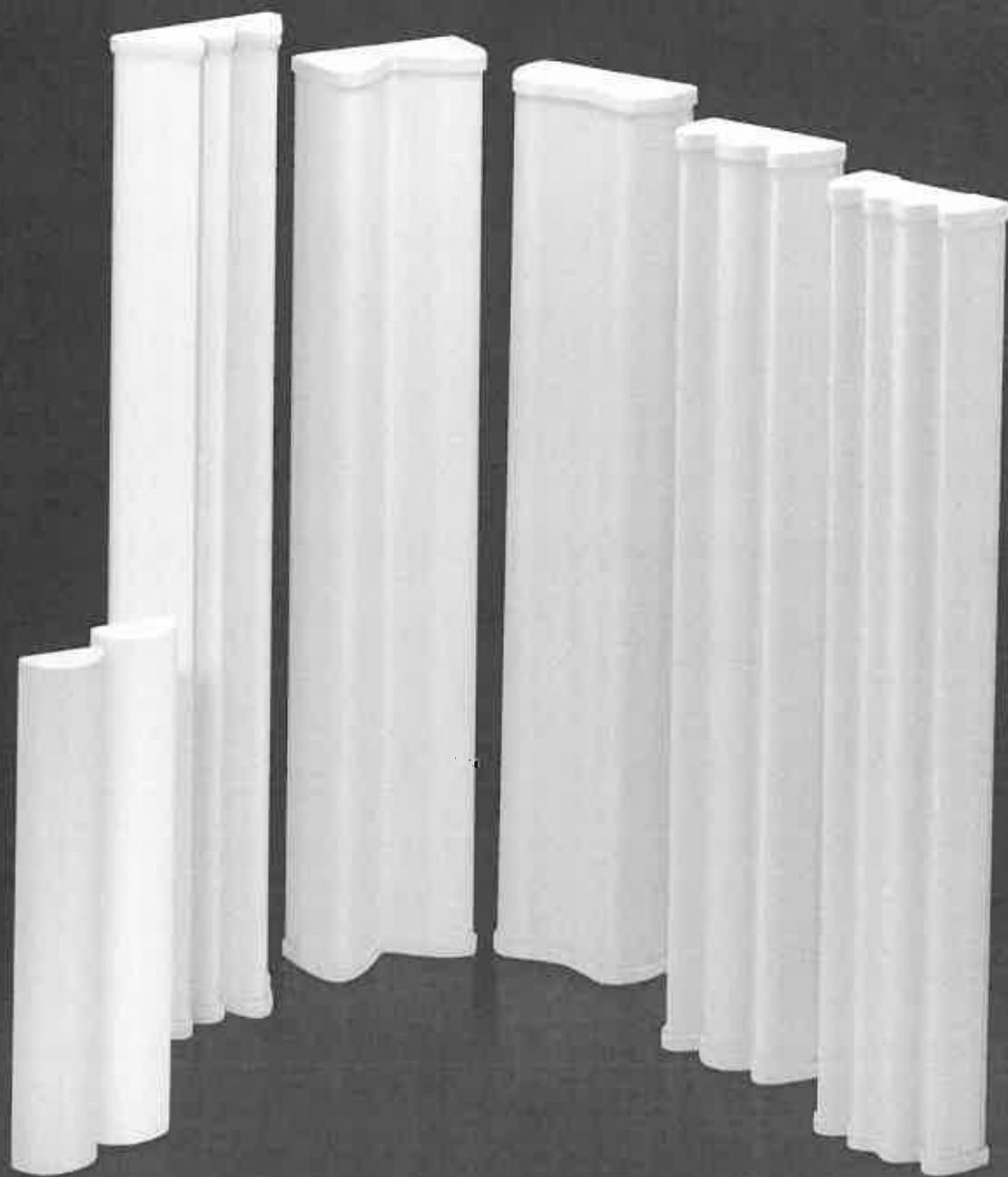
## Power Supplies

Product Code	Input Voltage	Input Current (Max)	Input Connector	Output Voltage	Output Current (Max)	Output Connector	Operating Temperature Range	Dimensions (D x W x H)
110004	100-240VAC	0.5A	IEC320-C14	24V DC	0.625A	Bare Wires	0°C to 50°C	100mm x 59.0mm x 33.0mm
110060	100-240VAC	1.9A	IEC320-C14	24V DC	3.33A	Bare Wires	0°C to 50°C	168mm x 78.0mm x 45.0mm
110062	100-240VAC	0.4A	IEC320-C14	24V DC	0.62A	Bare Wires	-30°C to 65°C	91.0mm x 38.0mm x 36.0mm
110064	100-240VAC	0.8A	IEC320-C14	12V DC	2.50A	2 Pin Female Connector	0°C to 50°C	118mm x 52.0mm x 35.0mm
130176	100-240VAC	2.0A	IEC320-C14	56V DC	0.67A	RJ45 Female Connector	-20°C to 40°C	166mm x 80.0mm x 44.0mm

## Cables

Camera Range	Product Code	Description
Ultra Range (Ultra 2K)	110171	Cable assembly and gland (6m)





# airMAX™

## 2x2 MIMO BaseStation Sector Antenna

Models: AM-9M13, AM-2G15-120, AM-2G16-90, AM-3G18-120,  
AM-5G16-120, AM-5G17-90, AM-5G19-120, AM-5G20-90

High Performance, Long Range

Seamlessly Integrates with RocketM

Excellent Cross-Polarization Isolation



# Overview

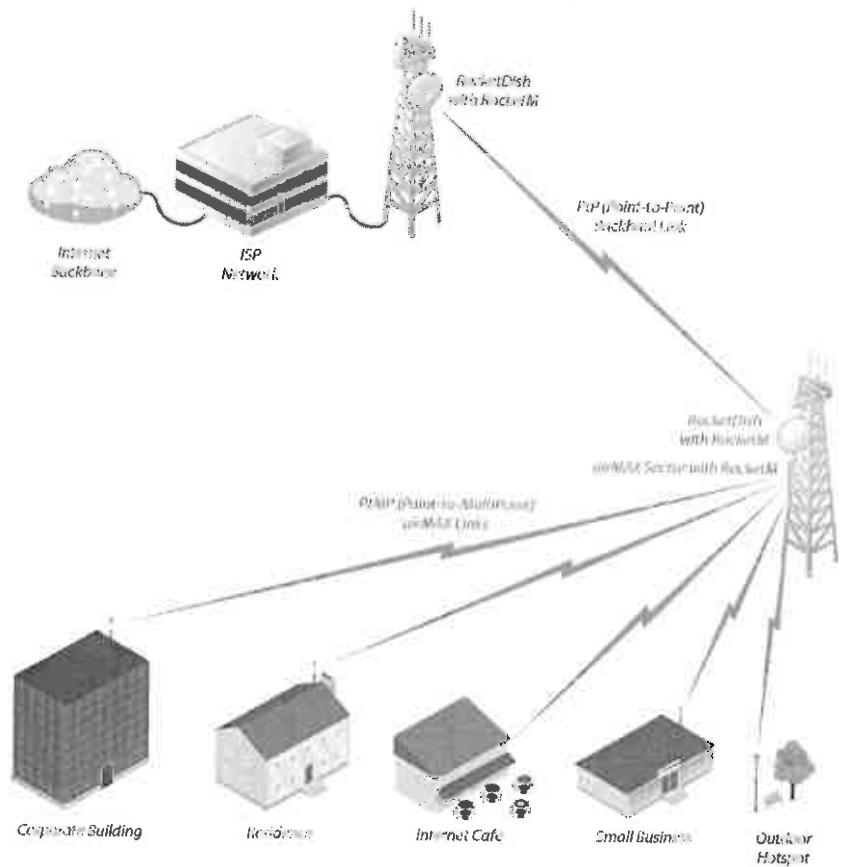
## Sector Coverage

The airMAX Sector Antenna is a Carrier Class 2x2 Dual Polarity MIMO Sector Antenna that was designed to seamlessly integrate with RocketM radios (RocketM sold separately).

Pair the RocketM's radio with the airMAX Sector Antenna's reach to create a powerful basestation. This versatile combination gives network architects unparalleled flexibility and convenience.

On the right is one example of how the airMAX Sector Antenna can be deployed:

PtMP (Point to Multi-Point) Link Example



airMAX Sector Antennas provide sector-wide coverage and utilize airMAX technology to produce carrier-class performance and power.

## Utilize airMAX Technology\*

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX protocol allows each client to send and receive data using pre-designated time slots scheduled by an intelligent AP controller.

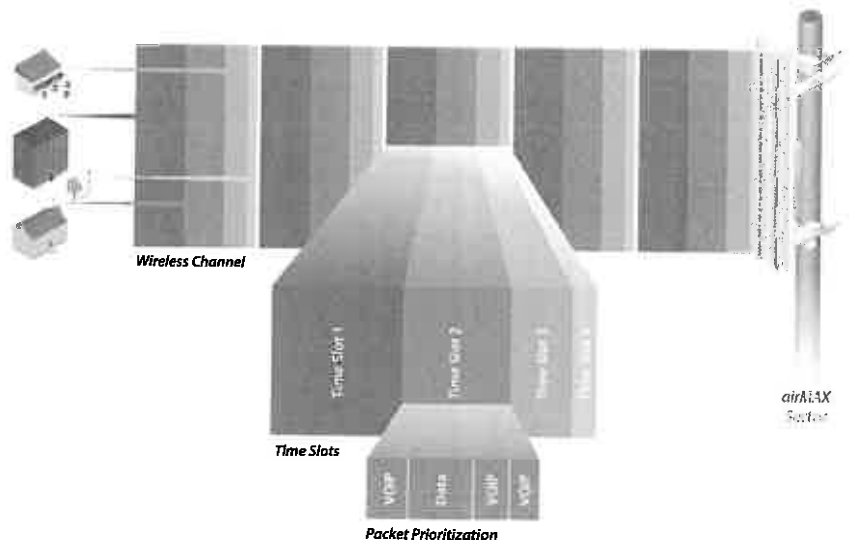
This "time slot" method eliminates hidden node collisions and maximizes airtime efficiency. It provides many magnitudes of performance improvements in latency, throughput, and scalability compared to all other outdoor systems in its class.

**Intelligent QoS** Priority is given to voice/video for seamless streaming.

**Scalability** High capacity and scalability.

**Long Distance** Capable of high-speed, carrier-class links.

\* When airMAX Sector is paired with RocketM



Up to 100 airMAX clients can be connected to an airMAX Sector; four airMAX clients are shown to illustrate the general concept.

# Models



*AM-9M13*  
(900 MHz, 13 dBi)



*AM-2G15-120*  
(2.4 GHz, 15 dBi)



*AM-2G16-90*  
(2.4 GHz, 16 dBi)



*AM-3G18-120*  
(3 GHz, 18 dBi)



*AM-5G16-120*  
(5 GHz, 16 dBi)



*AM-5G17-90*  
(5 GHz, 17 dBi)



*AM-5G19-120*  
(5 GHz, 19 dBi)



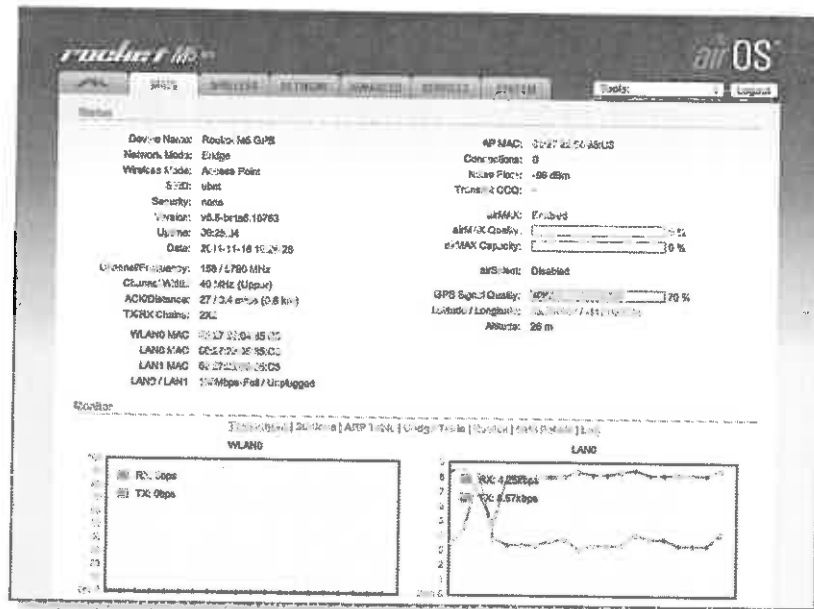
*AM-5G20-90*  
(5 GHz, 20 dBi)

# Software

## airOS™

airOS is an intuitive, versatile, highly developed Ubiquiti firmware technology. It is exceptionally intuitive and was designed to require no training to operate. Behind the user interface is a powerful firmware architecture, which enables high-performance, outdoor multipoint networking.

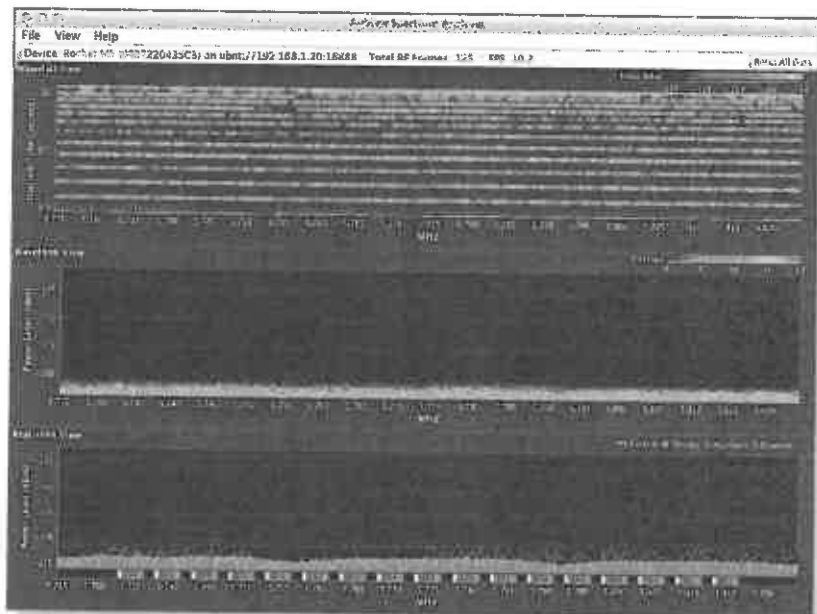
- Protocol Support
- Ubiquiti Channelization
- Spectral Width Adjustment
- ACK Auto-Timing
- AAP Technology
- Multi-Language Support



## airView™

Integrated on all Ubiquiti M products, airView provides Advanced Spectrum Analyzer Functionality: Waterfall, waveform, and real-time spectral views allow operators to identify noise signatures and plan their networks to minimize noise interference.

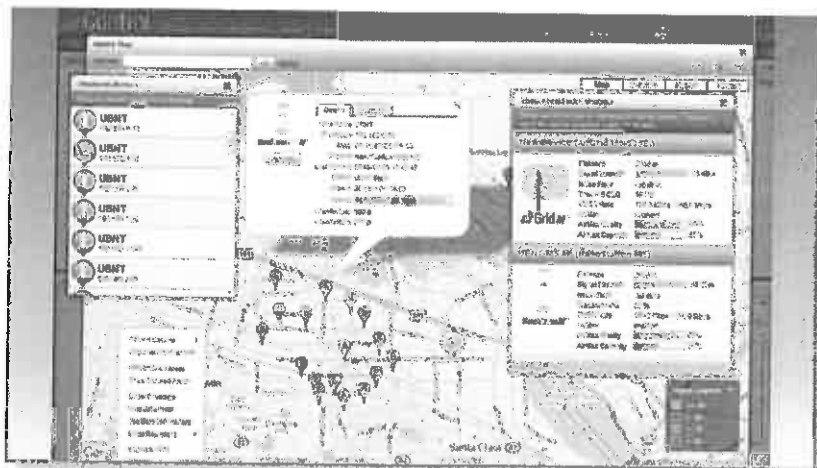
- **Waterfall** Aggregate energy over time for each frequency.
- **Waveform** Aggregate energy collected.
- **Real-time** Energy is shown in real time as a function of frequency.
- **Recording** Automate airView to record and report results.



## airControl™

airControl is a powerful and intuitive, web-based server network management application, which allows operators to centrally manage entire networks of Ubiquiti devices.

- Network Map
- Monitor Device Status
- Mass Firmware Upgrade
- Web UI Access
- Manage Groups of Devices
- Task Scheduling



# Specifications

	Antenna Characteristics			
Model	AM-9M13	AM-2G15-120	AM-2G16-90	AM-3G18-120
Dimensions* (mm)	1290 x 290 x 134	700 x 145 x 93	700 x 145 x 79	735 x 144 x 78
Weight**	12.5 kg	4.0 kg	3.9 kg	5.9 kg
Frequency Range	902 - 928 MHz	2.3 - 2.7 GHz	2.3 - 2.7 GHz	3.3 - 3.8 GHz
Gain	13.2 - 13.8 dBi	15.0 - 16.0 dBi	16.0 - 17.0 dBi	17.3 - 18.2 dBi
HPOL Beamwidth	109° (6 dB)	123° (6 dB)	91° (6 dB)	118° (6 dB)
VPOL Beamwidth	120° (6 dB)	118° (6 dB)	90° (6 dB)	121° (6 dB)
Electrical Beamwidth	15°	9°	9°	6°
Electrical Downtilt	N/A	4°	4°	3°
Max. VSWR	1.5:1	1.5:1	1.5:1	1.5:1
Wind Survivability	125 mph	125 mph	125 mph	125 mph
Wind Loading	95 lbf @ 100 mph	24 lbf @ 100 mph	19 lbf @ 100 mph	21 lbf @ 100 mph
Polarization	Dual-Linear	Dual-Linear	Dual-Linear	Dual-Linear
Cross-pol Isolation	30 dB Min.	28 dB Min.	28 dB Min.	28 dB Min.
ETSI Specification	N/A	EN 302 326 DN2	EN 302 326 DN2	EN 302 326 DN2
Mounting	Universal Pole Mount, RocketM Bracket, and Weatherproof RF Jumpers included			

\* Dimensions exclude pole mount and RocketM (RocketM sold separately)

\*\* Weight includes pole mount and excludes RocketM (RocketM sold separately)

	Antenna Characteristics			
Model	AM-5G16-120	AM-5G17-90	AM-5G19-120	AM-5G20-90
Dimensions* (mm)	367 x 63 x 41	367 x 63 x 41	700 x 135 x 73	700 x 135 x 70
Weight**	1.1 kg	1.1 kg	5.9 kg	5.9 kg
Frequency Range	5.10 - 5.85 GHz	4.90 - 5.85 GHz	5.15 - 5.85 GHz	5.15 - 5.85 GHz
Gain	15.0 - 16.0 dBi	16.1 - 17.1 dBi	18.6 - 19.1 dBi	19.4 - 20.3 dBi
HPOL Beamwidth	137° (6 dB)	72° (6 dB)	123° (6 dB)	91° (6 dB)
VPOL Beamwidth	118° (6 dB)	93° (6 dB)	123° (6 dB)	85° (6 dB)
Electrical Beamwidth	8°	8°	4°	4°
Electrical Downtilt	4°	4°	2°	2°
Max. VSWR	1.5:1	1.5:1	1.5:1	1.5:1
Wind Survivability	125 mph	125 mph	125 mph	125 mph
Wind Loading	6 lbf @ 100 mph	6 lbf @ 100 mph	20 lbf @ 100 mph	26 lbf @ 100 mph
Polarization	Dual-Linear	Dual-Linear	Dual-Linear	Dual-Linear
Cross-pol Isolation	22 dB Min.	22 dB Min.	28 dB Min.	28 dB Min.
ETSI Specification	EN 302 326 DN2	EN 302 326 DN2	EN 302 326 DN2	EN 302 326 DN2
Mounting	Universal Pole Mount, RocketM Bracket, and Weatherproof RF Jumpers included			

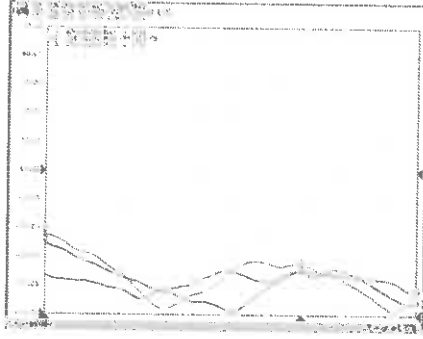
\* Dimensions exclude pole mount and RocketM (RocketM sold separately)

\*\* Weight includes pole mount and excludes RocketM (RocketM sold separately)

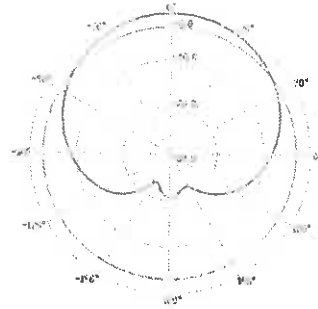


### AM-9M13 Antenna Information

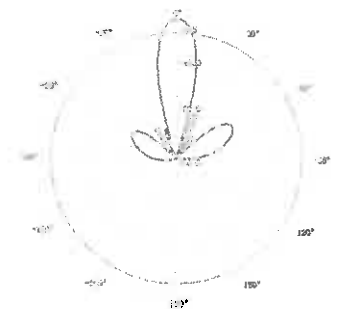
Return Loss



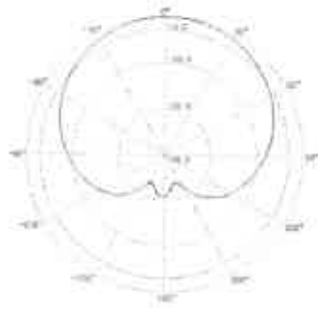
Vertical Azimuth



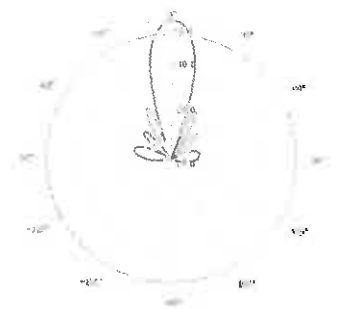
Vertical Elevation



Horizontal Azimuth

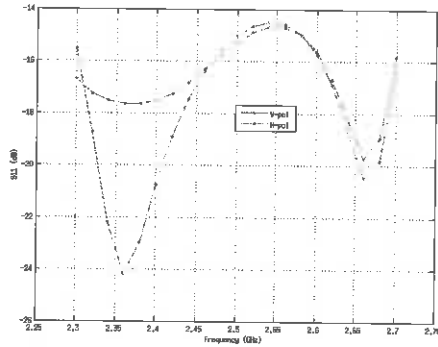


Horizontal Elevation

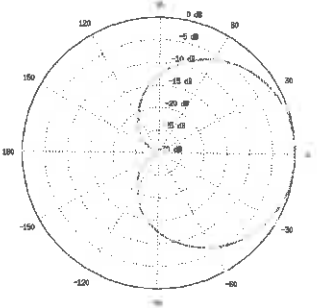


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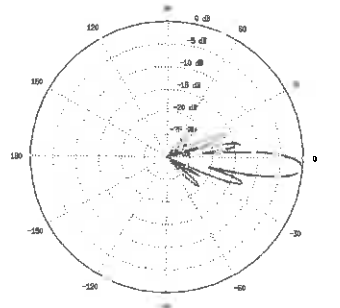
Return Loss



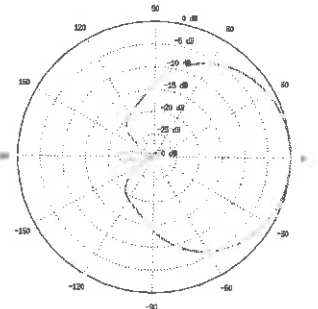
Vertical Azimuth



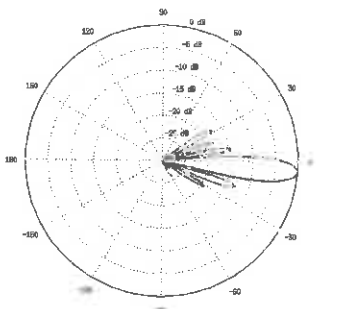
Vertical Elevation



Horizontal Azimuth

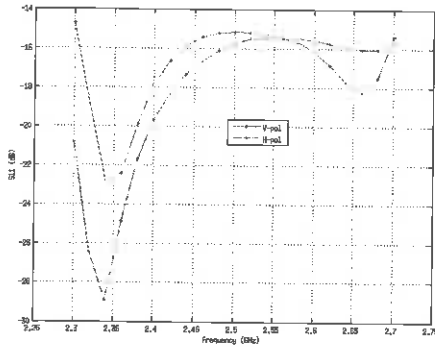


Horizontal Elevation

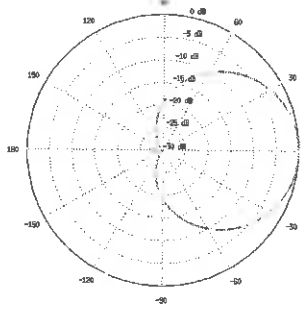


# AM-2G16-90 Antenna Information

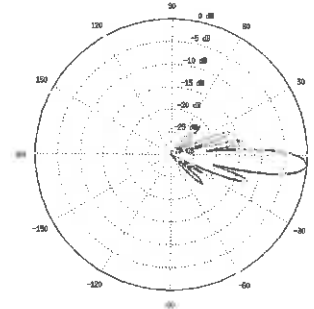
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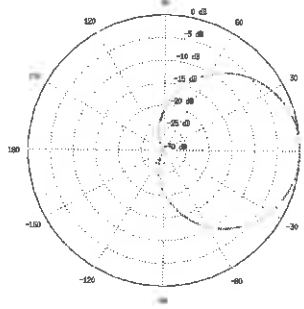
Vertical Azimuth



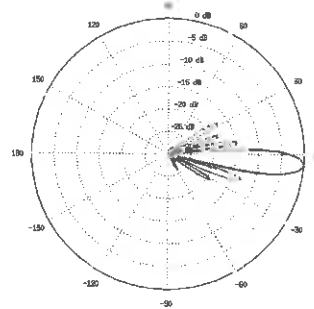
Vertical Elevation



Horizontal Azimuth

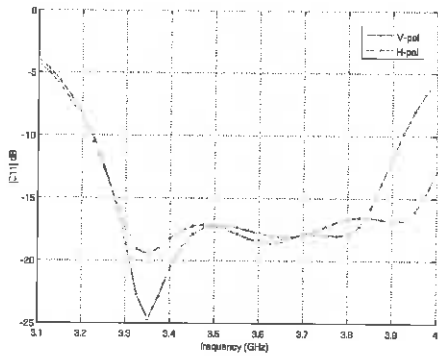


Horizontal Elevation

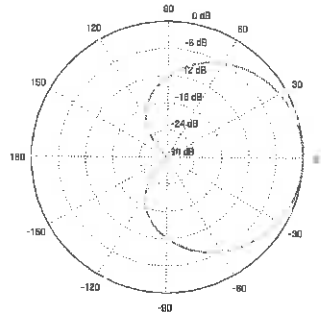


# AM-3G18-120 Antenna Information

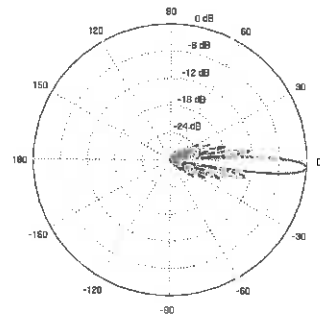
Return Loss



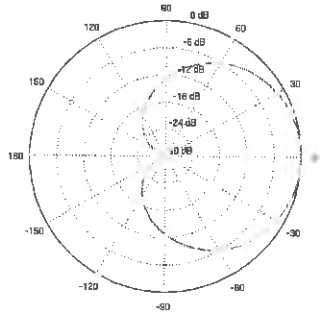
Vertical Azimuth



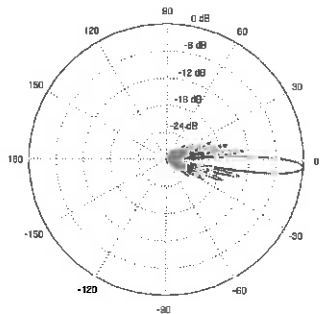
Vertical Elevation



Horizontal Azimuth

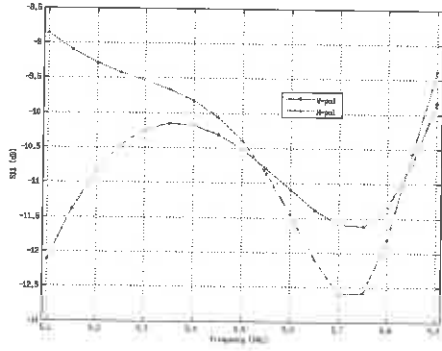


Horizontal Elevation

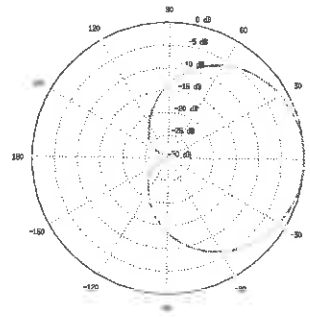


## AM-5G16-120 Antenna Information

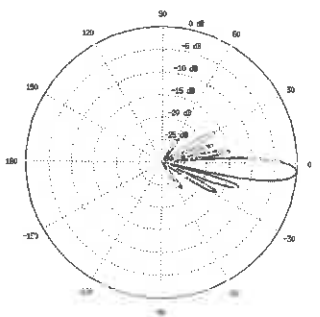
Return Loss



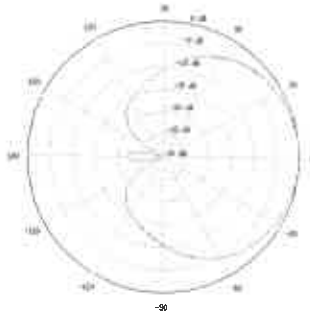
Vertical Azimuth



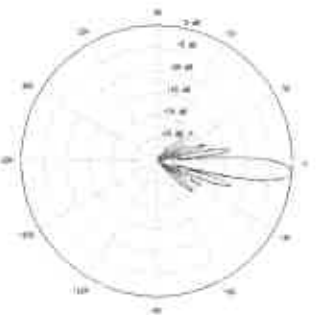
Vertical Elevation



Horizontal Azimuth

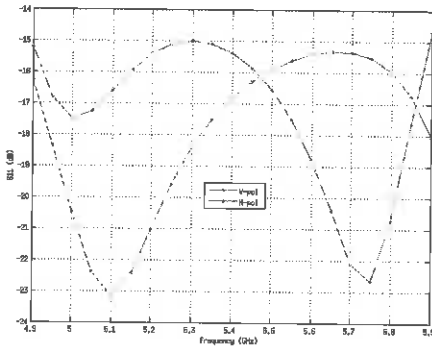


Horizontal Elevation

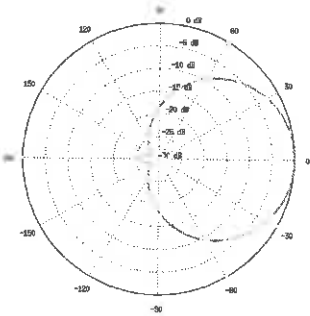


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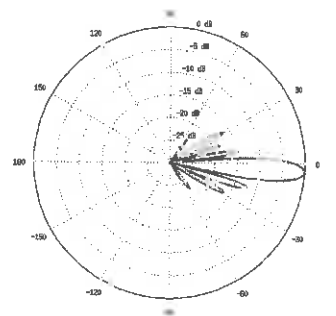
Return Loss



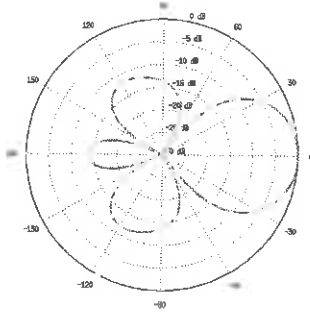
Vertical Azimuth



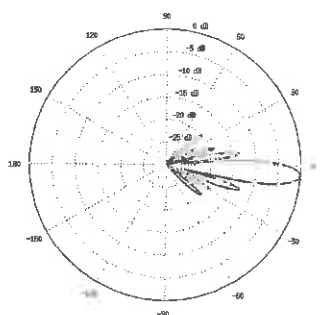
Vertical Elevation



Horizontal Azimuth



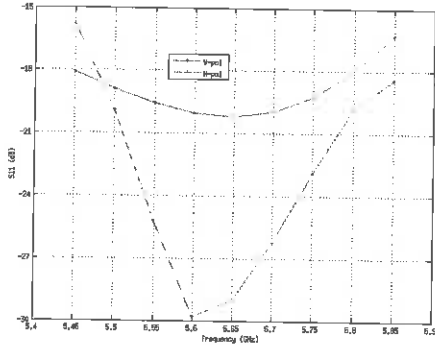
Horizontal Elevation



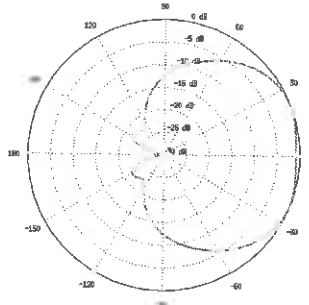


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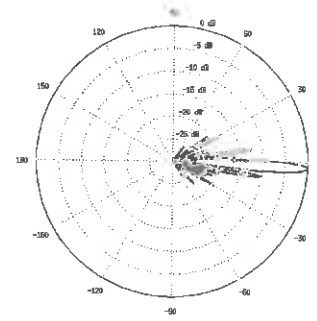
Return Loss



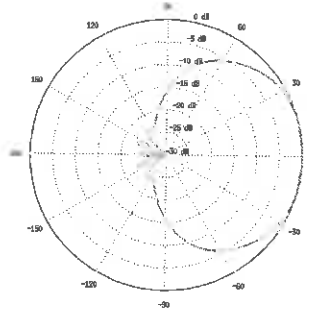
Vertical Azimuth



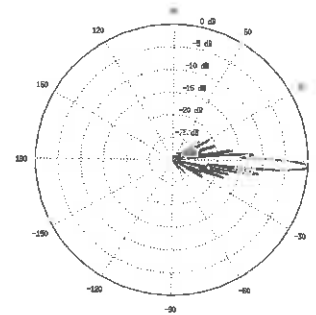
Vertical Elevation



Horizontal Azimuth

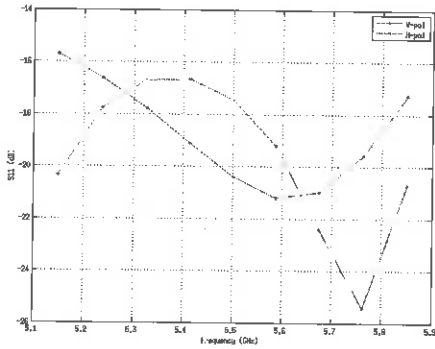


Horizontal Elevation

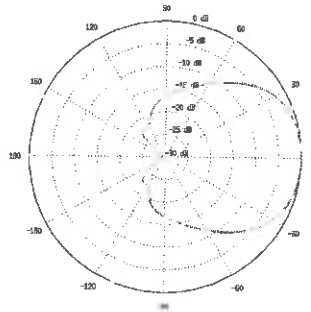


# AM-5G20-90 Antenna Information

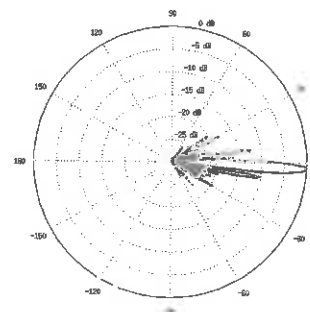
Return Loss



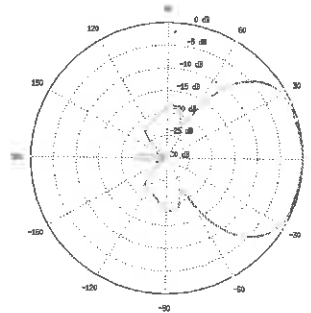
Vertical Azimuth



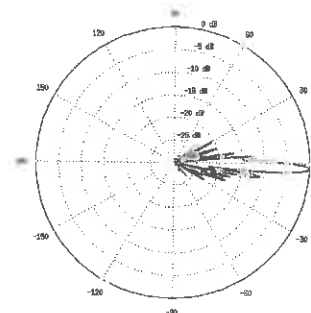
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



# TOUGH Cable™

## OUTDOOR CARRIER CLASS SHIELDED

Protect your networks from the most brutal environments with Ubiquiti Networks' industrial-grade, shielded Ethernet cable, TOUGH Cable.

### Increase Performance

Dramatically improve your Ethernet link states, speeds, and overall performance with Ubiquiti TOUGH Cables.

### Extreme Weatherproof

Designed for outdoor use, TOUGH Cables have been built to perform even in the harshest weather and environments.

### ESD Damage Protection

Protect your networks from devastating electrostatic discharge (ESD) attacks.

### Extended Cable Support

TOUGH Cables have been developed to increase power handling performance for extended cable run lengths.

## Bulletproof your networks

TOUGH Cable is currently available in two versions: PRO Shielding Protection and CARRIER Shielding Protection.

**TOUGH Cable PRO** is a Category 5e, outdoor, carrier-class shielded cable with an integrated ESD drain wire.

**TOUGH Cable CARRIER** is a Category 5e, outdoor, carrier-class shielded cable that features an integrated ESD drain wire, anti-crosstalk divider, and secondary shielding. It is rated to provide optimal performance on Gigabit Ethernet networks.

### Additional Information:

- 24 AWG copper conductor pairs
- 26 AWG integrated ESD drain wire to prevent ESD attacks and damage
- PE outdoor-rated, weatherproof jacket
- Multi-layered shielding
- Available in lengths of 1000 ft (304.8 m)

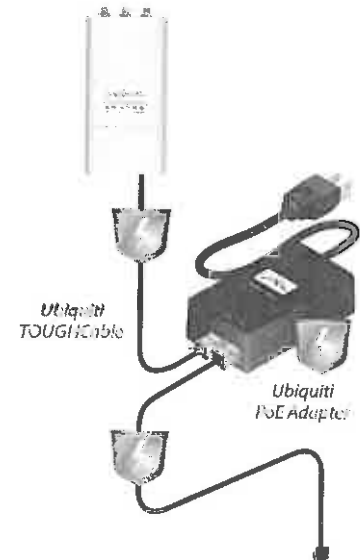
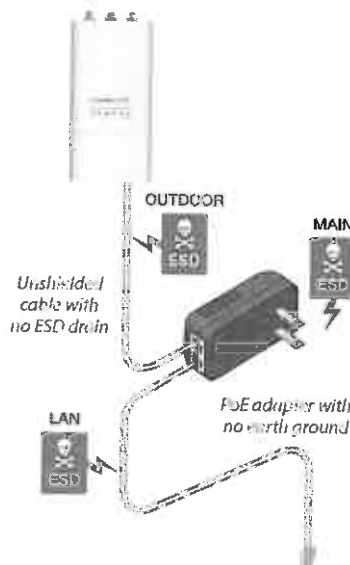


## TOUGH Cable Connectors

Specifically designed for use with Ubiquiti TOUGH Cables, TOUGH Cable Connectors protect against ESD attacks and Ethernet hardware damage, while allowing rapid field deployment without soldering. The standard TOUGH Cable Connectors are available in 100-pc. bags, while the TC-GND versions include ground wires and are available in 20-pc. bags.

ESD attacks are the leading cause for device failures. The diagram below illustrates the areas vulnerable to ESD attacks in a network.

By using a grounded Ubiquiti Power over Ethernet (PoE) Adapter along with Ubiquiti TOUGH Cable and TOUGH Cable Connectors, you can effectively protect against ESD attacks.



All specifications in this document are subject to change without notice.

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JL051613



*rocket 5AC*  
**PRISM**

airMAX® ac BaseStation  
with airPrism® Technology

Model: R5AC-PRISM

Worldwide, Full-Band 5 GHz Coverage

airMAX ac Technology for up to 500+ Mbps Throughput

Revolutionary airPrism Active RF Filtering Technology

## Advanced RF Analytics

airMAX ac devices feature a multi-radio architecture to power a revolutionary RF analytics engine.

An independent processor on the PCBA powers a second, dedicated radio, which persistently analyzes the full 5 GHz spectrum and every received symbol to provide you with the most advanced RF analytics in the industry.

Data from the spectrum analysis and RF performance monitoring is displayed on the *Main* tab and airView Spectrum Analyzer.

## Real-Time Reporting

The *Main* tab displays the following RF information:

- Persistent RF Error Vector Magnitude (EVM) constellation diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms
- Signal-to-Noise Ratio (SNR) time series plots

## Spectral Analysis

airView allows you to identify noise signatures and plan your networks to minimize noise interference. airView performs the following functions:

- Constantly monitors environmental noise
- Collects energy data points in real-time spectral views
- Helps optimize channel selection, network design, and wireless performance

airView runs in the background without disabling the wireless link, so there is no disruption to the network.

In airView, there are three spectral views, each of which represents different data.

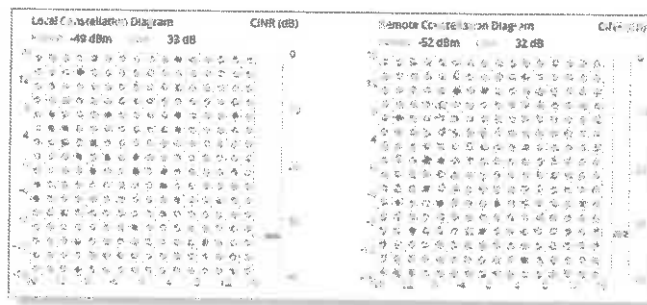
- **Waterfall** Aggregate energy collected for each frequency
- **Waveform** Aggregate energy collected
- **Ambient Noise Level** Background noise energy shown as a function of frequency

airView provides powerful spectrum analyzer functionality, eliminating the need to rent or purchase additional equipment for conducting site surveys.

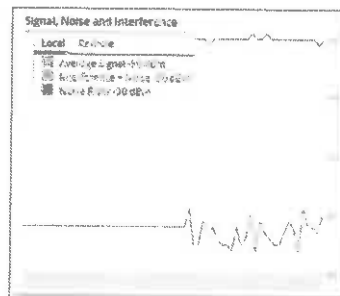
## Multi-Radio Architecture



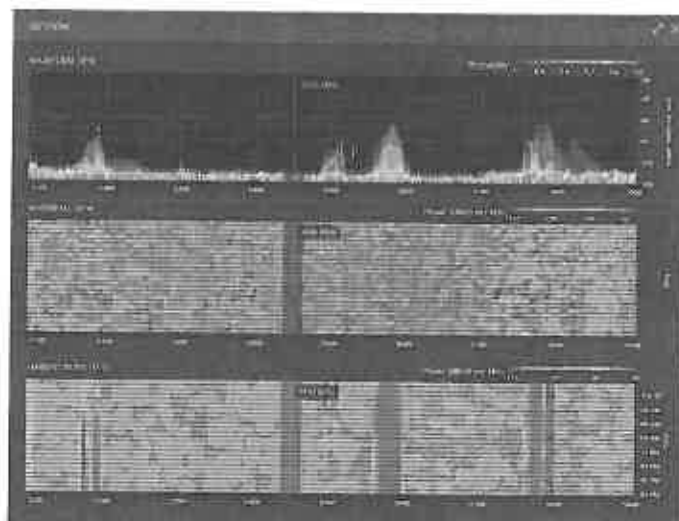
## Constellation Diagrams and CINR Histograms



## SNR Time Series Plots



## Dedicated Spectral Analysis



# Technology

## airMAX<sup>®</sup> ac

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX ac protocol allows each client to send and receive data using pre-designated time slots scheduled by an intelligent AP controller.

This time slot method eliminates hidden node collisions and maximizes airtime efficiency, so airMAX ac technology provides performance improvements in latency, noise immunity, scalability, and throughput compared to other outdoor systems in its class.

**Intelligent QoS** Priority assigned to voice/video for seamless streaming.

**Scalability** High capacity and scalability.

**Long Distance** Capable of high-speed, carrier-class links.

### Superior Performance

The next-generation airMAX ac technology boosts the advantages of our proprietary TDMA protocol.

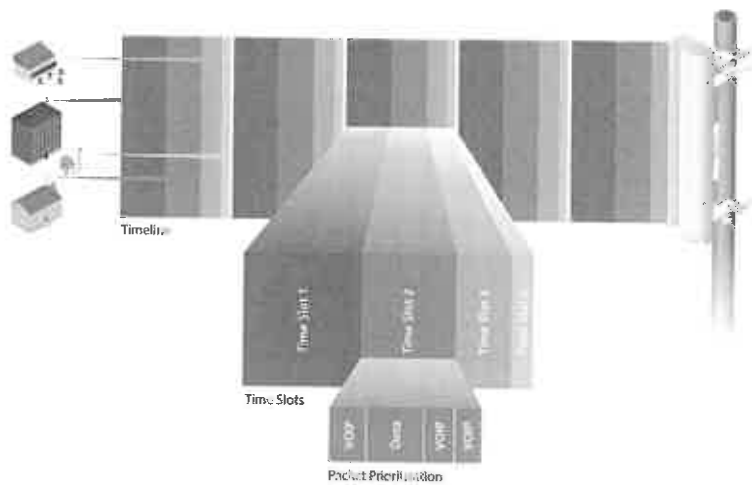
Ubiquiti's airMAX engine with custom IC dramatically improves TDMA latency and network scalability. The custom silicon provides hardware acceleration capabilities to the airMAX scheduler, to support the high data rates and dense modulation used in airMAX ac technology.

### Throughput Breakthrough

airMAX ac supports high data rates, which require dense modulation: 256QAM – a significant increase from 64QAM, which is used in airMAX.

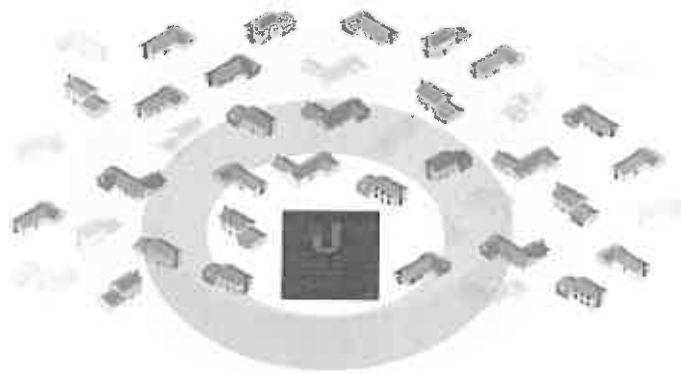
With their use of proprietary airMAX ac technology, airMAX ac products supports up to 500+ Mbps\* (maximum 80 MHz channel width) real TCP/IP throughput – up to triple the throughput of standard airMAX products.

## airMAX ac TDMA Technology



Up to 100 airMAX ac stations can be connected to an airMAX ac Sector; four airMAX ac stations are shown to illustrate the general concept.

## airMAX ac Network Scalability



## Superior Throughput Performance



\* Up to 500+ Mbps (maximum 40 MHz channel width) for P2MP links.

# Technology

## airPRISM

To enhance airMAX ac performance, Ubiquiti Networks introduces our patented airPrism technology, which is featured on the Rocket5ac Prism, model R5AC-PRISM.

### Improves SNR

High data rates require a high Signal-to-Noise Ratio (SNR), which is challenging to achieve, especially in noisy, high-density areas.

Integrated into Ubiquiti's custom silicon, airPrism technology creates a high SNR by isolating signals within the operating channel and rejecting interference using specialized circuitry, the High-Selectivity Receiver (HSR).

### Removes Interference

Depending on the product model and operating mode, available channel widths may include 10, 20, 30, 40, 50, 60, and/or 80 MHz.

Theoretically APs operate on different channels; however, because of the wider channel bandwidths, there can be overlap in spectrum usage.

airPrism technology removes up to an additional 30+ dB of adjacent channel interference through the active filtering design, so an airMAX ac AP with airPrism technology can provide significantly greater performance than a typical AP.

### Facilitates AP Co-Location

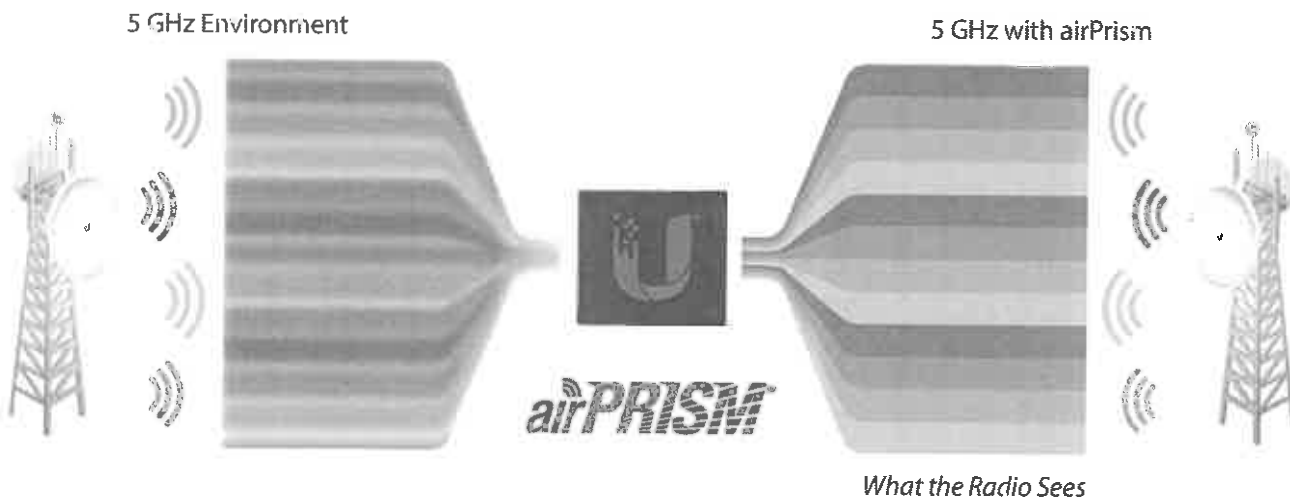
Co-location is vital in many scenarios. For example, a WISP may have limited tower space, so it must co-locate all APs within that allotted footprint. Shielding and other means can lessen interference but may be impractical.

By deploying airMAX ac APs with airPrism technology, you can co-locate APs and enhance the overall performance of your wireless network.

Number of APs	Channel Width
4	80 MHz*
8	40 MHz
16	20 MHz

\* PtP only

### Active Radio Frequency Filtering



### Improved Latency and Noise Immunity



# rocket<sup>5AC</sup> PRISM

The Rocket5ac Prism is designed to deliver maximum spectral efficiency and throughput.

## Features

**5 GHz Frequency Band** With plenty of available spectrum, this unlicensed band works well for long-distance links. The Rocket5ac Prism features full-band 5 GHz coverage and maximizes output power for the US market, meeting strict OOB requirements.

**airView** Use the real-time spectrum analyzer so you can identify noise signatures and design your wireless links to minimize noise interference.

**High Performance** To take full advantage of its design and capabilities, deploy the Rocket5ac Prism for PtP or PtMP links in high RF noise environments.

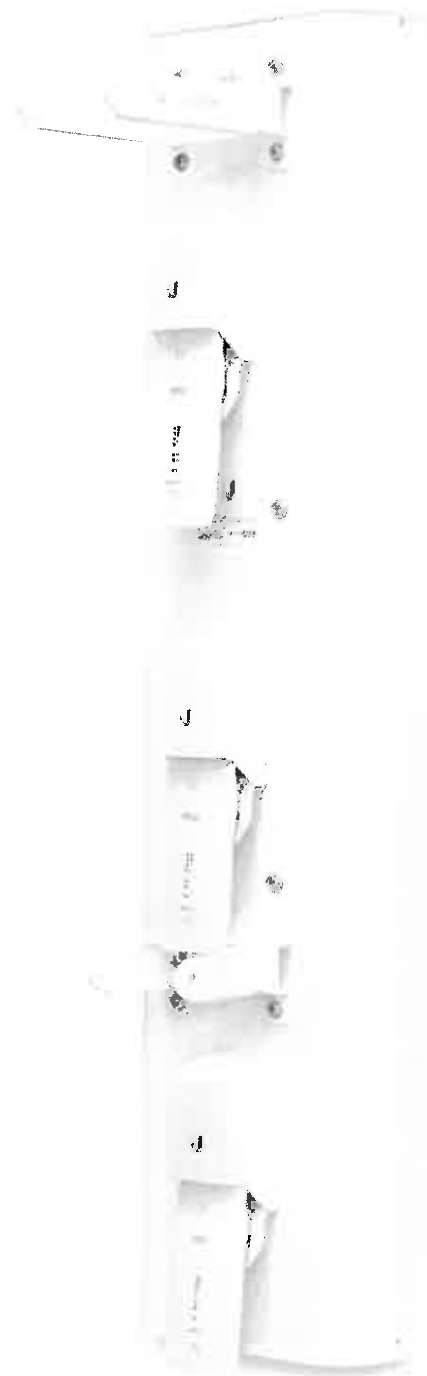
**airPrism Sector Antenna** You can mount three Rocket5ac Prism radios on the airPrism 5 GHz 3x30° HD Sector Antenna, model AP-5AC-90-HD, for PtMP links. Each Rocket radio corresponds with a specific 30° beamwidth and independently transmits and receives.

**EMI-Shielded Metal Housing** Helps protect the Rocket5ac Prism against electromagnetic interference.

**Gigabit Ethernet** Delivers high throughput over its wired connection.

**Passive Power over Ethernet (PoE)** 24V Passive PoE functionality is included. Both power and data are carried over a single Ethernet cable to the Rocket ac. Use the included PoE Adapter or an optional PoE switch.

**Plug and Play Integration** Every airMAX antenna has a built-in Rocket mount, so no tools are needed to install the Rocket5ac Prism. (airMAX ac antennas are recommended for optimal performance.)



# Specifications

## R5AC-PRISM

Dimensions	88 x 40 x 230 mm (3.47 x 1.58 x 9.06")				
Weight	400 g (14.11 oz)				
Power Supply	24V, 0.5A Gigabit PoE				
Max. Power Consumption	8.5W				
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)				
Supported Voltage Range	18-26VDC				
Operating Frequency	Worldwide	USA: U-NII-1	USA: U-NII-2A	USA: U-NII-2C	USA: U-NII-3
	5150 - 5875 MHz	5150 - 5250 MHz <sup>2</sup>	5250 - 5350 MHz*	5470 - 5725 MHz <sup>3</sup>	5725 - 5850 MHz <sup>3</sup>
Networking Interface	(1) 10/100/1000 Ethernet Port				
RF Connectors	(2) RP-SMA (Waterproof), (1) GPS (Waterproof)				
Processor Specs	Atheros MIPS 74Kc, 720 MHz				
Memory	128 MB DDR2 SDRAM, 16 MB NOR Flash				
LEDs	Power, LAN, GPS, (4) Signal Strength				
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels				
Channel Sizes	PtP Mode		PtMP Mode		
	10/20/30/40/50/60/80 MHz		10/20/30/40 MHz		
Enclosure Characteristics	Die-Cast Aluminum with White Powder Coating				
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV				
Operating Temperature	-40 to 80° C (-40 to 176° F)				
Operating Humidity	5 to 95% Noncondensing				
Wireless Approvals	FCC, IC, CE				
RoHS Compliance	Yes				
Shock and Vibration	ETSI300-019-1.4				
Modes	Access Point, Station				
Services	Web Server, SNMP, SSH Server, Telnet, Ping Watchdog, DHCP, NAT, Bridging, Routing				
Utilities	Antenna Alignment Tool, Discovery Utility, Site Survey, Ping, Traceroute, Speed Test				
Distance Adjustment	Dynamic Ack and Ackless Mode				
Power Adjustment	Software Adjustable UI or CLI				
Security	WPA2 AES Only				
QoS	Supports Packet Level Classification WMM and User Customer Level: High/Medium/Low				
Statistical Reporting	Up Time, Packet Errors, Data Rates, Wireless Distance, Ethernet Link Rate				
Other	Remote Reset Support, Software Enabled/Disabled, VLAN Support, 256QAM, GPS, TX Filter				
Ubiquiti Specific Features	30/50/60 MHz Channels, airMAX ac Mode, Traffic Shaping with Burst Support, Discovery Protocol, Frequency Band Offset, Ackless Mode				

## R5AC-PRISM Output Power: 27 dBm

TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	27 dBm	± 2 dB	airMAX ac	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	27 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	27 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	27 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	27 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (¾)	27 dBm	± 2 dB		6x 64QAM (¾)	-83 dBm	± 2 dB
	6x 64QAM (¾)	26 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (¾)	25 dBm	± 2 dB		6x 64QAM (¾)	-74 dBm	± 2 dB
	8x 256QAM (¾)	23 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (¾)	22 dBm	± 2 dB		8x 256QAM (¾)	-65 dBm	± 2 dB

\* Some frequencies may require activation; visit: <https://www.ubnt.com/fclabelrequest>



# Plug and Play Integration

Rocket radios and airMAX antennas have been designed to seamlessly work together. Every airMAX antenna has a built-in Rocket mount, so installation requires no special tools.

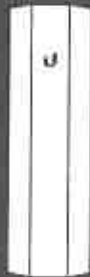
## Antenna Compatibility



Rocket5ac Prism

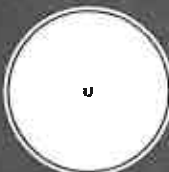
— Frequency Band —

5 GHz



Sector

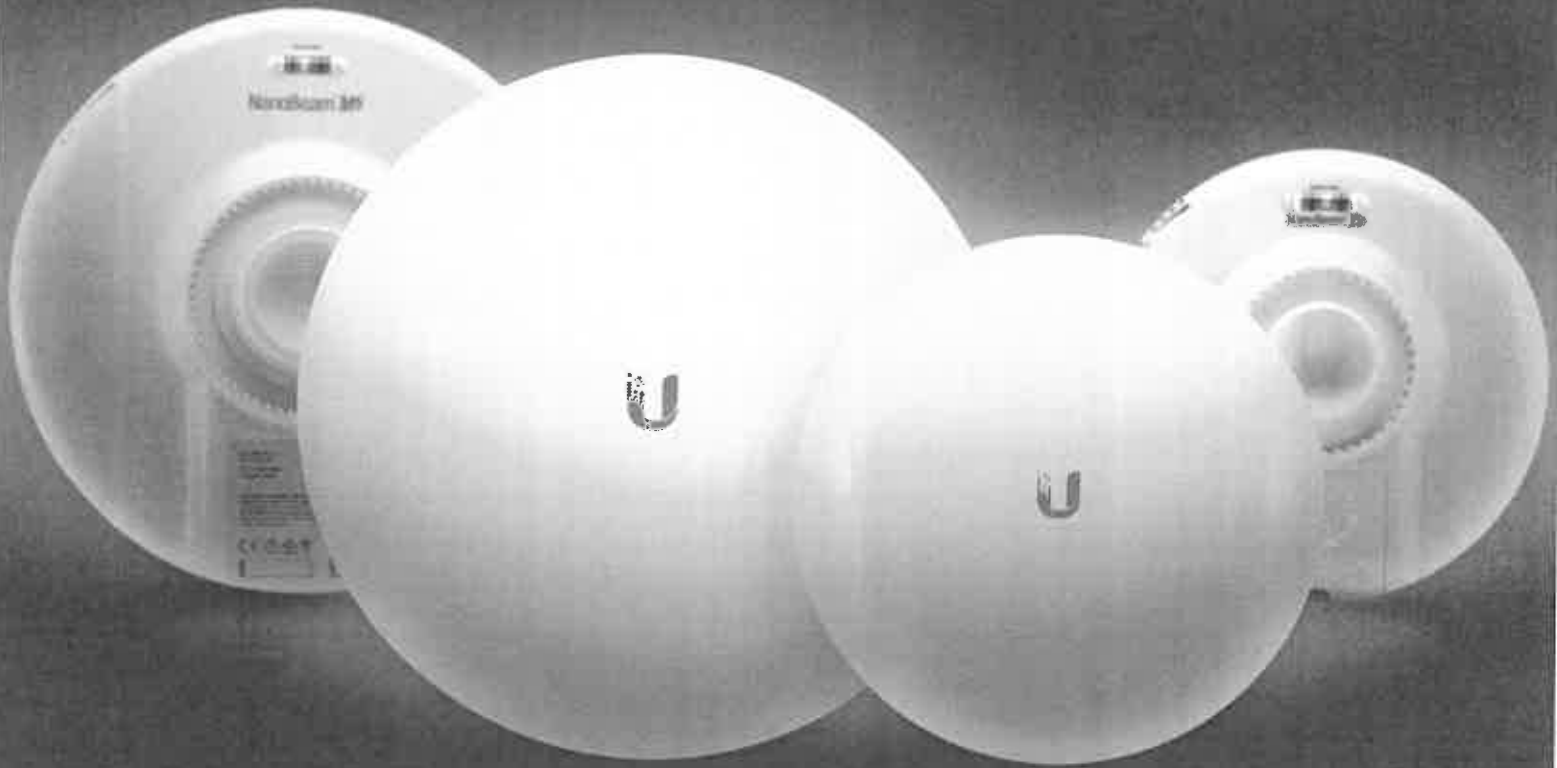
- AM-5AC21-60
- AM-5AC22-45
- AM-V5G-TI
- AM-M-V5G-TI
- AM-5G16-120
- AM-5G17-90
- AM-5G19-120
- AM-5G20-90
- AP-5AC-90-HD



Rocket Dish

- RD-5G31-AC
- RD-5G30-LW
- RD-5G30
- RD-5G34





# NanoBeam<sup>M</sup>

High-Performance airMAX<sup>®</sup> Bridge

Models: NBE-M2-13, NBE-M5-16, NBE-M5-19

Uniform Beamwidth Maximizes Noise Immunity

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Innovative Mechanical Design

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High-Speed Processor for Superior Performance



# Overview

Starting with the first-generation NanoBridge®, Ubiquiti Networks pioneered the all-in-one design for an airMAX® product functioning as a CPE (Customer Premises Equipment). Now Ubiquiti Networks launches the latest generation of CPE, the NanoBeam®.

## Improved Noise Immunity

Available for the 2.4 and 5 GHz frequency bands, the NanoBeam directs RF energy in a tighter beamwidth. With the focus in one direction, the NanoBeam blocks or spatially filters out noise, so noise immunity is improved. This feature is especially important in an area crowded with other RF signals of the same or similar frequency.

## Integrated Design

The Ubiquiti® Research and Development team combined the radio and antenna to create a more efficient and compact CPE. The NanoBeam gets maximum gain out of the smallest footprint.

Providing increased performance from its faster processor and innovative mechanical design at a low cost, the NanoBeam is extremely versatile and cost-effective to deploy.

## airMAX Technology Included

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX protocol allows each client to send and receive data using pre-designated time slots scheduled by an intelligent AP controller.

This time slot method eliminates hidden node collisions and maximizes airtime efficiency. It provides significant performance improvements in latency, throughput, and scalability compared to all other outdoor systems in its class.

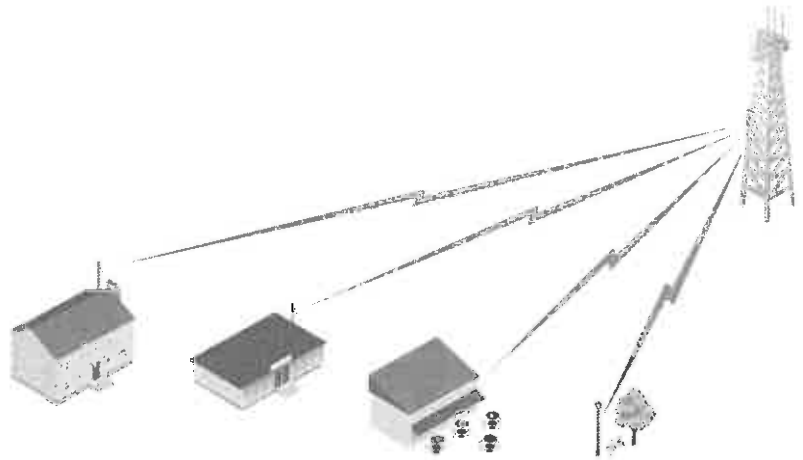
**Intelligent QoS** Priority is given to voice/video for seamless streaming.

**Scalability** High capacity and scalability.

**Long Distance** Capable of high-speed, carrier-class links.

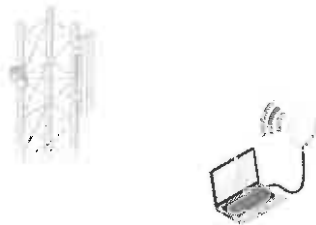
## Application Examples

### PtMP Client Links



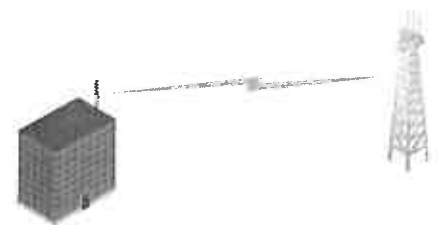
The NanoBeam used as a CPE device for each client in an airMAX PtMP network.

### Wireless Client



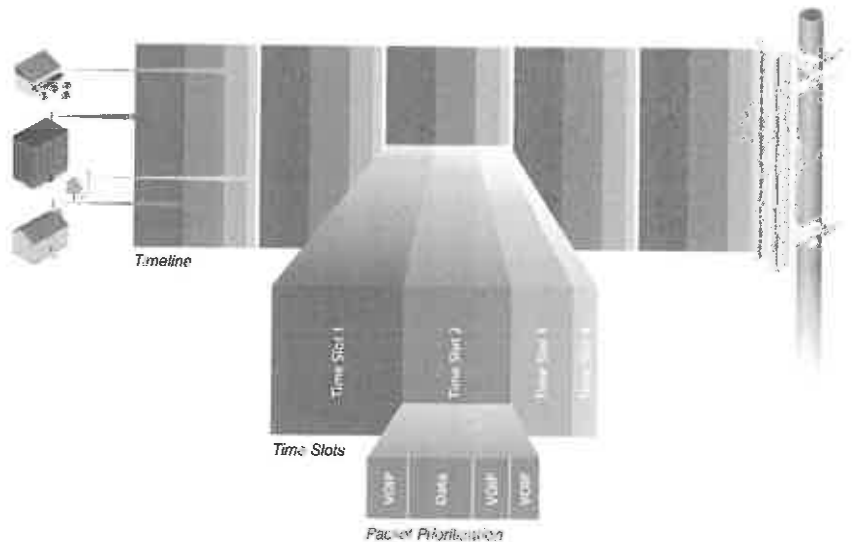
The NanoBeam as a powerful wireless client.

### PtP Link



Use a NanoBeam on each side of a PtP link.

## airMAX TDMA Technology



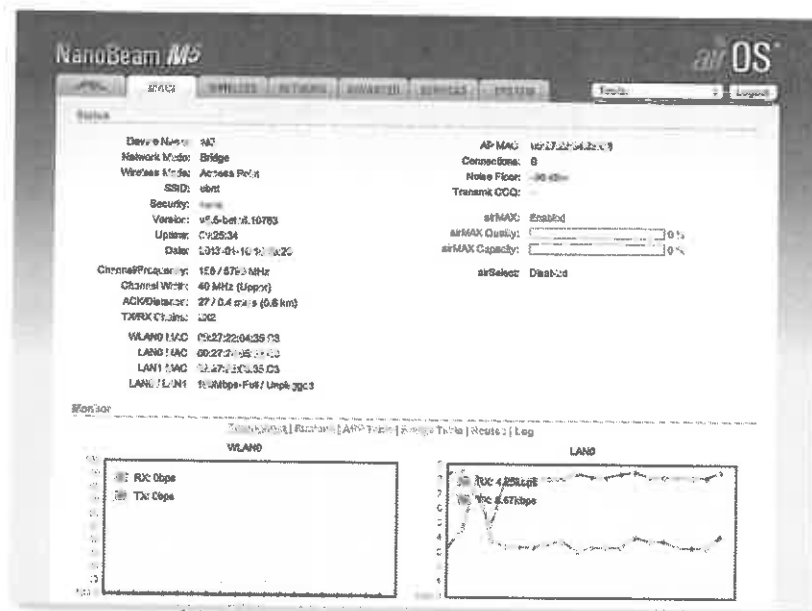
Up to 100 airMAX stations can be connected to an airMAX Sector; four airMAX stations are shown to illustrate the general concept.

# Software

## airOS®

airOS® is an intuitive, versatile, highly developed Ubiquiti firmware technology. It is exceptionally intuitive and was designed to require no training to operate. Behind the user interface is a powerful firmware architecture, which enables high-performance, outdoor multi-point networking.

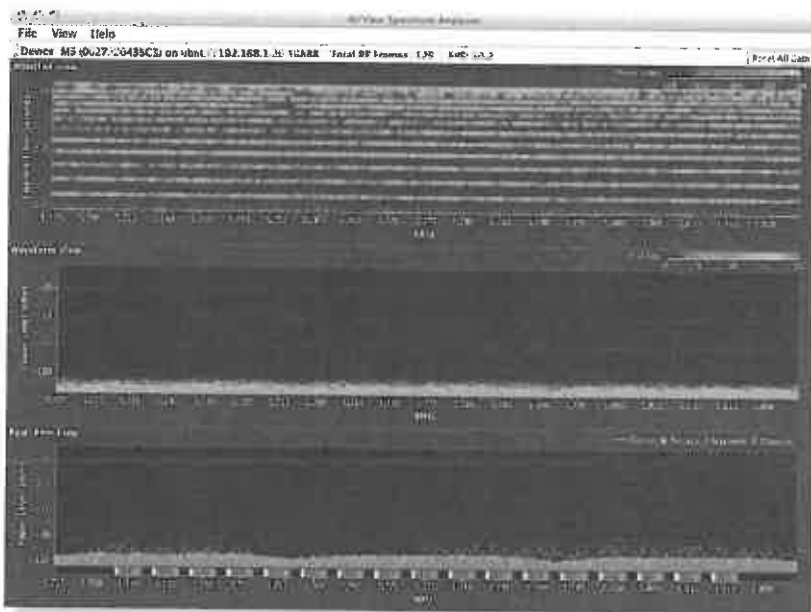
- Protocol Support
- Ubiquiti Channelization
- Spectral Width Adjustment
- ACK Auto-Timing
- AAP Technology
- Multi-Language Support



## airView®

Integrated on all Ubiquiti M products, airView® provides advanced spectrum analyzer functionality: waterfall, waveform, and real-time spectral views allow operators to identify noise signatures and plan their networks to minimize noise interference.

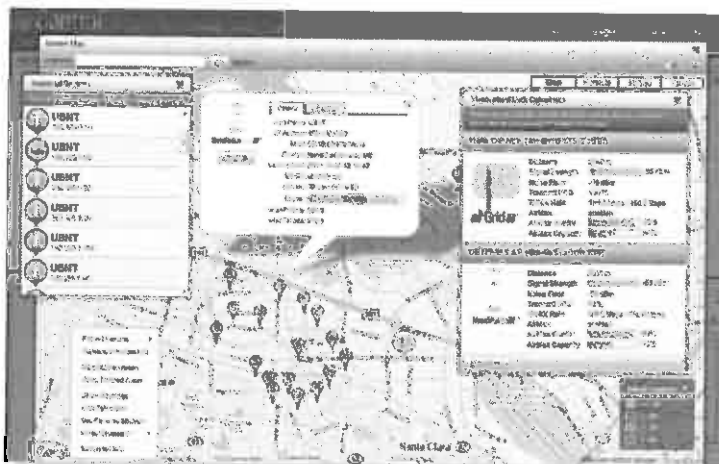
- **Waterfall** Aggregate energy over time for each frequency.
- **Waveform** Aggregate energy collected.
- **Real-time** Energy is shown in real time as a function of frequency.
- **Recording** Automate airView to record and report results.



## airControl®

airControl® is a powerful and intuitive, web-based server network management application, which allows operators to centrally manage entire networks of Ubiquiti devices.

- Network Map
- Monitor Device Status
- Mass Firmware Upgrade
- Web UI Access
- Manage Groups of Devices
- Task Scheduling



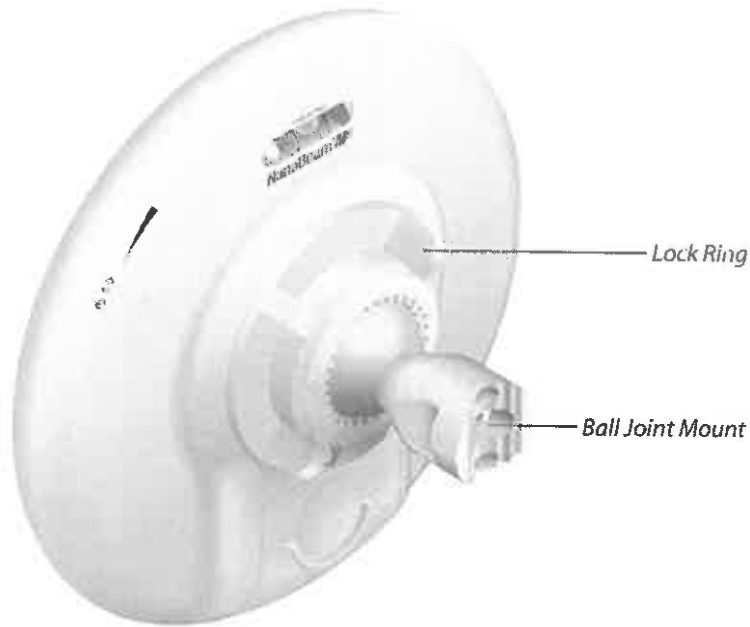
# Hardware Overview

## Innovative Mechanical Design

- **All-in-one design** The NanoBeam provides both the radio and antenna in the smallest possible footprint.
- **Quick and easy installation** No fasteners are required for pole-mounting, and a single wall fastener (not included) is required for wall-mounting.
- **Convenient alignment** The NanoBeam pivots on its ball joint for easy aiming.

## Compact Form Factor

- **Efficient footprint** The radio and antenna are combined into a single body that takes up minimal space.
- **Versatile mounting** The NanoBeam can be mounted in almost any position needed for line of sight.
- **Aesthetics** The NanoBeam is small enough to blend discreetly into the background at a customer's location.



NBE-M5-19 with Mounting Hardware

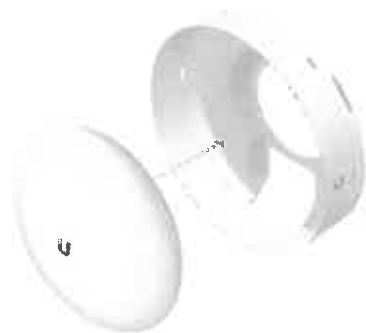
## Optional Isolator Shield Accessory



### IsoBeam™

Model	NBE-M2-13	NBE-M5-16	NBE-M5-19
ISO-BEAM-16		✓	
ISO-BEAM-19	✓		✓

An RF isolator shield is available as an optional accessory to enhance signal isolation.



Installation Using the IsoBeam™

# Optional Mounting Accessories

## NanoBeam<sup>®</sup> Wall Mount Kit



Model	NBE-M2-13	NBE-M5-16	NBE-M5-19
NBE-WMK	✓	✓	✓

A wall mount kit is available as an optional accessory to enhance stability for wall-mounting.



*Installation Using the NanoBeam Wall Mount Kit*

## NanoBeam<sup>®</sup> Window Mount



Model	NBE-M2-13	NBE-M5-16	NBE-M5-19
NBE-16-WM		✓	
NBE-19-WM	✓		✓

A suction cup mount is available as an optional accessory to mount the NanoBeam on a window.



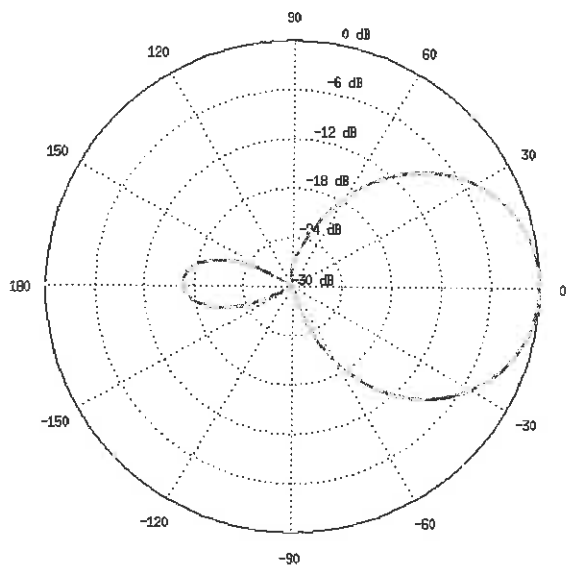
*Installation Using the NanoBeam Window Mount*

# Specifications

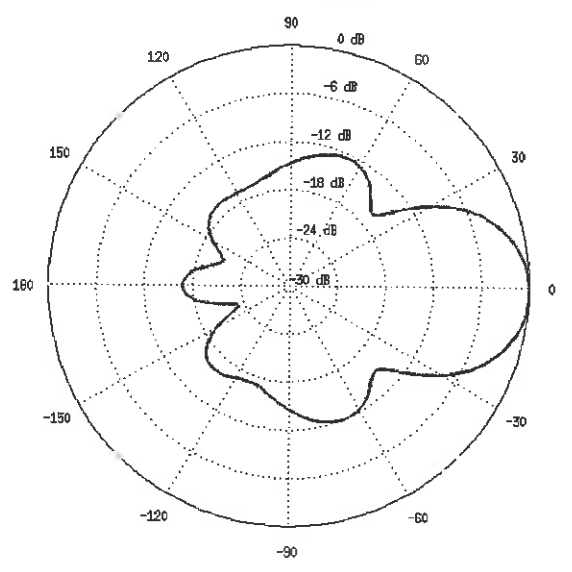
NBE-M2-13	
Dimensions	189 x 189 x 125 mm (7.44 x 7.44 x 4.92")
Weight	0.530 kg (1.17 lb)
Power Supply	24V, 0.5A PoE
Max. Power Consumption	6W
Operating Frequency	2405 - 2475 MHz
Gain	13 dBi
Networking Interface	(1) 10/100 Ethernet Port
Processor Specs	Atheros MIPS 74Kc, 560 MHz
Memory	64 MB DDR2, 8 MB Flash
LEDs	(1) Power, (1) LAN, (4) WLAN
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels
Channel Sizes	5/8/10/20/30/40 MHz
Polarization	Dual Linear
Enclosure	Outdoor UV Stabilized Plastic
Mounting	Pole-Mount (Kit Included), Wall-Mount
Wind Loading	45.4 N @ 200 km/h (10.2 lbf @ 125 mph)
Wind Survivability	200 km/h (125 mph)
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV
Operating Temperature	-40 to 80° C (-40 to 176° F)
Operating Humidity	5 to 95% Noncondensing
Wireless Approvals	FCC, IC, CE
RoHS Compliance	Yes
Salt Fog Test	IEC 68-2-11 (ASTM B117), Equivalent: MIL-STD-810 G Method 509.5
Vibration Test	IEC 68-2-6
Temperature Shock Test	IEC 68-2-14
UV Test	IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4
Wind-Driven Rain Test	ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5

NBE-M2-13 Output Power: 28 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
<b>802.11g</b>	1 - 24 Mbps	28 dBm	± 2 dB	<b>802.11g</b>	1 - 24 Mbps	-94 dBm Min.	± 2 dB
	36 Mbps	26 dBm	± 2 dBQ		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	25 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	24 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
<b>802.11n/airMAX</b>	MCS0	28 dBm	± 2 dB	<b>802.11n/airMAX</b>	MCS0	-96 dBm	± 2 dB
	MCS1	28 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	27 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	26 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	25 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	24 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	22 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	28 dBm	± 2 dB		MCS8	-96 dBm	± 2 dB
	MCS9	28 dBm	± 2 dB		MCS9	-95 dBm	± 2 dB
	MCS10	27 dBm	± 2 dB		MCS10	-92 dBm	± 2 dB
	MCS11	26 dBm	± 2 dB		MCS11	-90 dBm	± 2 dB
	MCS12	25 dBm	± 2 dB		MCS12	-86 dBm	± 2 dB
	MCS13	24 dBm	± 2 dB		MCS13	-83 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-77 dBm	± 2 dB
MCS15	22 dBm	± 2 dB	MCS15	-74 dBm	± 2 dB		

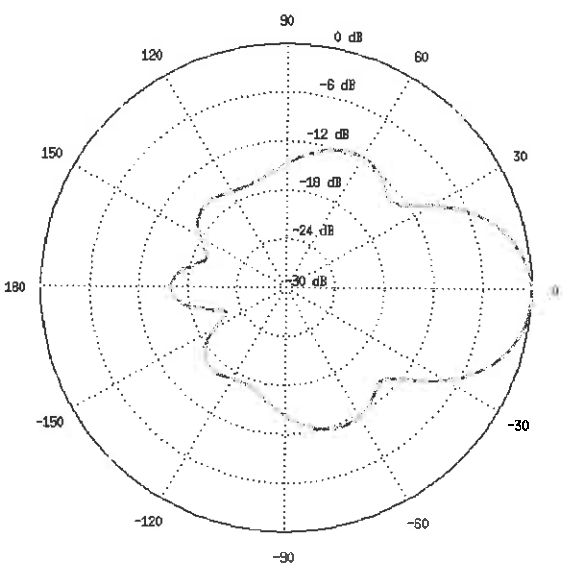
Vertical Azimuth



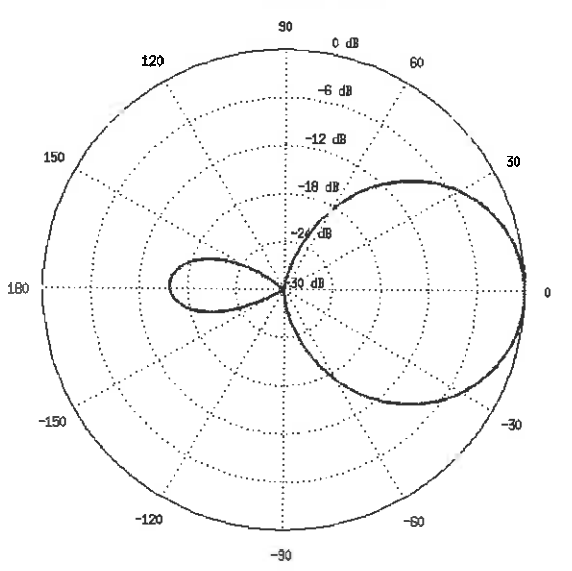
Vertical Elevation



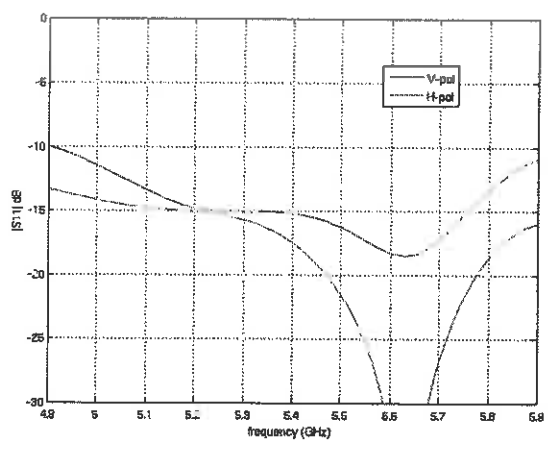
Horizontal Azimuth



Horizontal Elevation



Return Loss





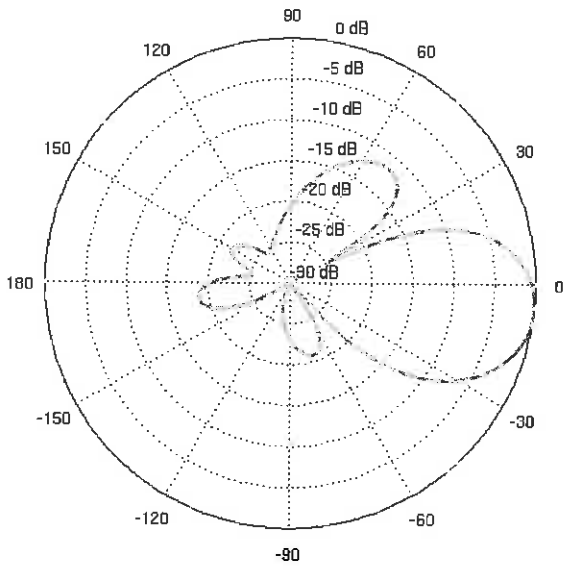
# Specifications

NBE-M5-16					
Dimensions	140 x 140 x 54 mm (5.51 x 5.51 x 2.13")				
Weight	0.320 kg (0.71 lb)				
Power Supply	24V, 0.5A PoE				
Max. Power Consumption	6W				
Operating Frequency	Worldwide	USA: U-NII-1	USA: U-NII-2A	USA: U-NII-2C	USA: U-NII-3
	5150 - 5875 MHz	5150 - 5250 MHz*	5250 - 5350 MHz*	5470 - 5725 MHz*	5725 - 5850 MHz*
Gain	16 dBi				
Networking Interface	(1) 10/100 Ethernet Port				
Processor Specs	Atheros MIPS 74Kc, 560 MHz				
Memory	64 MB DDR2, 8 MB Flash				
LEDs	(1) Power, (1) LAN, (4) WLAN				
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels				
Max. VSWR	1.5:1				
Channel Sizes	5/8/10/20/30/40 MHz				
Polarization	Dual Linear				
Enclosure	Outdoor UV Stabilized Plastic				
Mounting	Pole-Mount (Kit Included), Wall-Mount				
Wind Loading	21.4 N @ 200 km/h (4.8 lbf @ 125 mph)				
Wind Survivability	200 km/h (125 mph)				
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV				
Operating Temperature	-40 to 70° C (-40 to 158° F)				
Operating Humidity	5 to 95% Noncondensing				
Wireless Approvals	FCC, IC, CE				
RoHS Compliance	Yes				
Salt Fog Test	IEC 68-2-11 (ASTM B117), Equivalent: MIL-STD-810 G Method 509.5				
Vibration Test	IEC 68-2-6				
Temperature Shock Test	IEC 68-2-14				
UV Test	IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4				
Wind-Driven Rain Test	ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5				

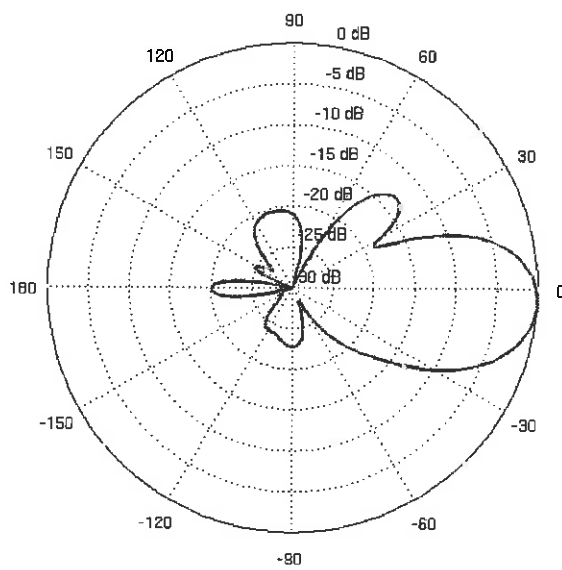
NBE-M5-16 Output Power: 26 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
<b>802.11a</b>	6 - 24 Mbps	26 dBm	± 2 dB	<b>802.11a</b>	6 - 24 Mbps	-94 dBm Min.	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
<b>802.11n/airMAX</b>	MCS0	26 dBm	± 2 dB	<b>802.11n/airMAX</b>	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
MCS15	23 dBm	± 2 dB	MCS15	-75 dBm	± 2 dB		

\* Some frequencies may require activation; visit: <https://www.ubnt.com/fcclabelrequest>

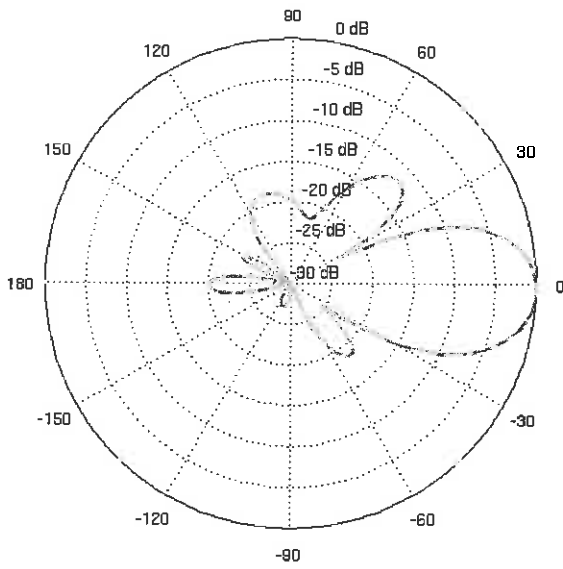
Vertical Azimuth



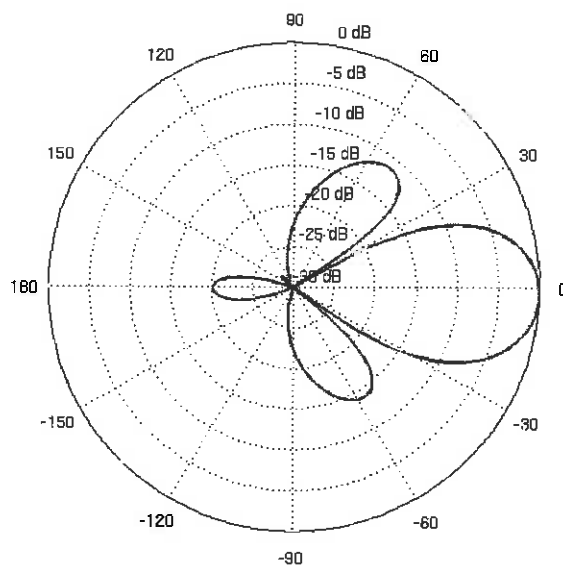
Vertical Elevation



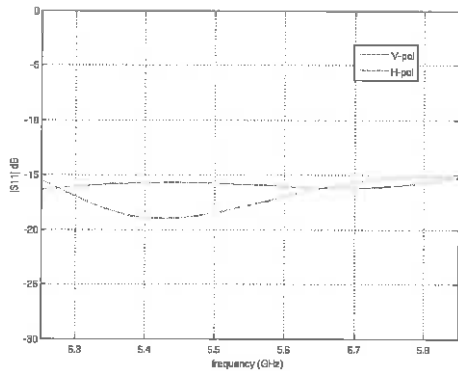
Horizontal Azimuth



Horizontal Elevation



Return Loss



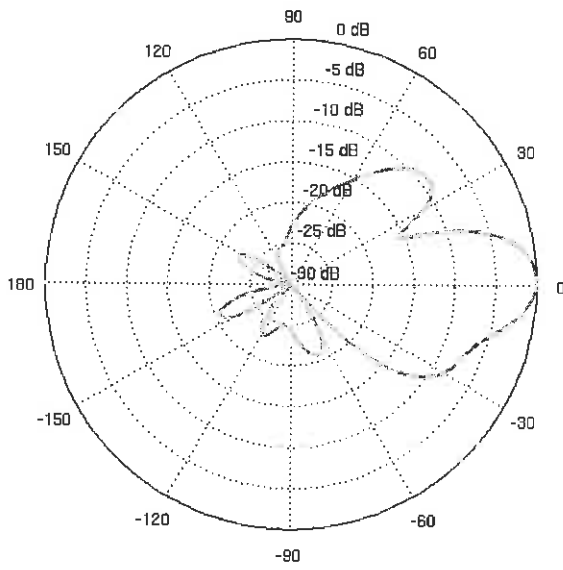
# Specifications

NBE-MS-19					
Dimensions	189 x 189 x 125 mm (7.44 x 7.44 x 4.92")				
Weight	0.530 kg (1.17 lb)				
Power Supply	24V, 0.5A PoE				
Max. Power Consumption	8W				
Operating Frequency	Worldwide	USA: U-NII-1	USA: U-NII-2A	USA: U-NII-2C	USA: U-NII-3
	5150 - 5875 MHz	5150 - 5250 MHz*	5250 - 5350 MHz*	5470 - 5725 MHz*	5725 - 5850 MHz*
Gain	19 dBi				
Networking Interface	(1) 10/100 Ethernet Port				
Processor Specs	Atheros MIPS 74Kc, 560 MHz				
Memory	64 MB DDR2, 8 MB Flash				
LEDs	(1) Power, (1) LAN, (4) WLAN				
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels				
Max. VSWR	1.5:1				
Channel Sizes	5/8/10/20/30/40 MHz				
Polarization	Dual Linear				
Enclosure	Outdoor UV Stabilized Plastic				
Mounting	Pole-Mount (Kit Included), Wall-Mount				
Wind Loading	45.4 N @ 200 km/h (10.2 lbf @ 125 mph)				
Wind Survivability	200 km/h (125 mph)				
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV				
Operating Temperature	-40 to 70° C (-40 to 158° F)				
Operating Humidity	5 to 95% Noncondensing				
Wireless Approvals	FCC, IC, CE				
RoHS Compliance	Yes				
Salt Fog Test	IEC 68-2-11 (ASTM B117), Equivalent: MIL-STD-810 G Method 509.5				
Vibration Test	IEC 68-2-6				
Temperature Shock Test	IEC 68-2-14				
UV Test	IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4				
Wind-Driven Rain Test	ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5				

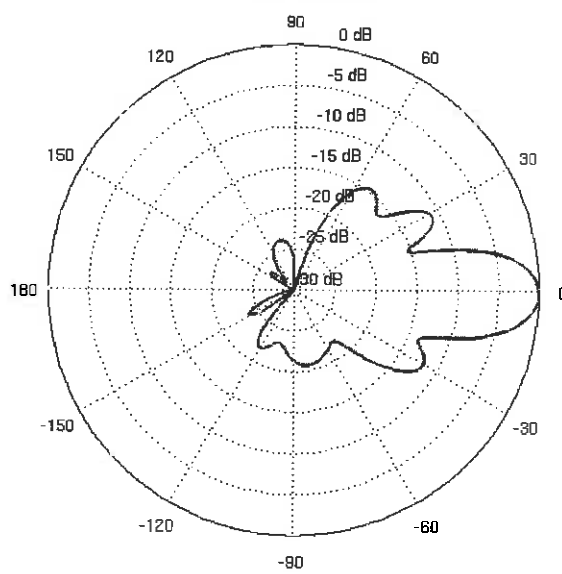
NBE-MS-19 Output Power: 26 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
<b>802.11a</b>	6 - 24 Mbps	26 dBm	± 2 dB	<b>802.11a</b>	6 - 24 Mbps	-94 dBm Min.	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
<b>802.11n/airMAX</b>	MCS0	26 dBm	± 2 dB	<b>802.11n/airMAX</b>	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
MCS15	23 dBm	± 2 dB	MCS15	-75 dBm	± 2 dB		

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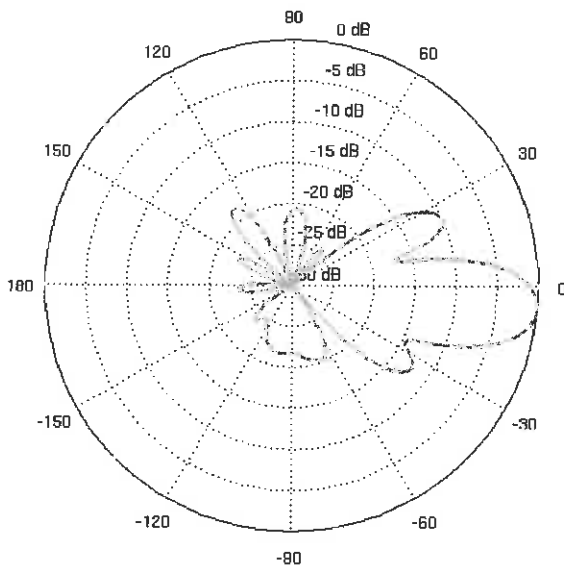
Vertical Azimuth



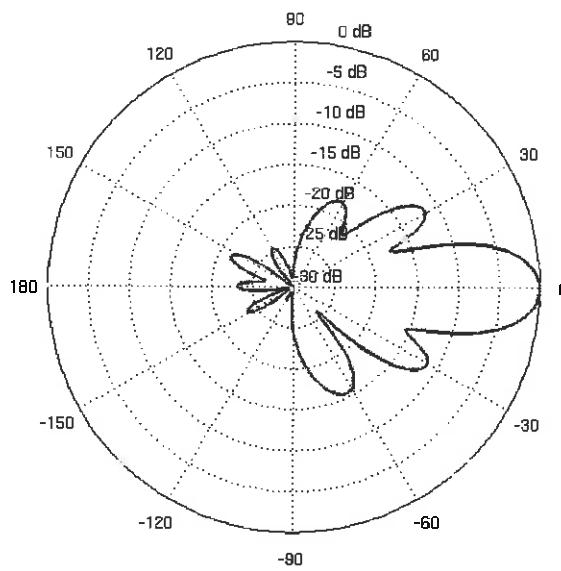
Vertical Elevation



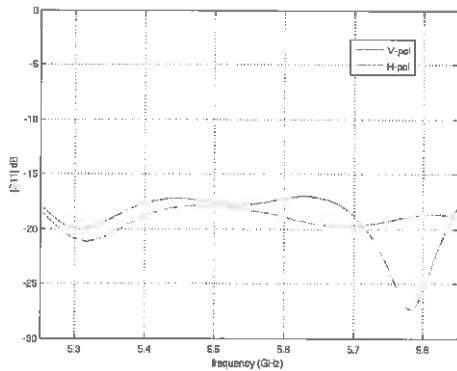
Horizontal Azimuth



Horizontal Elevation

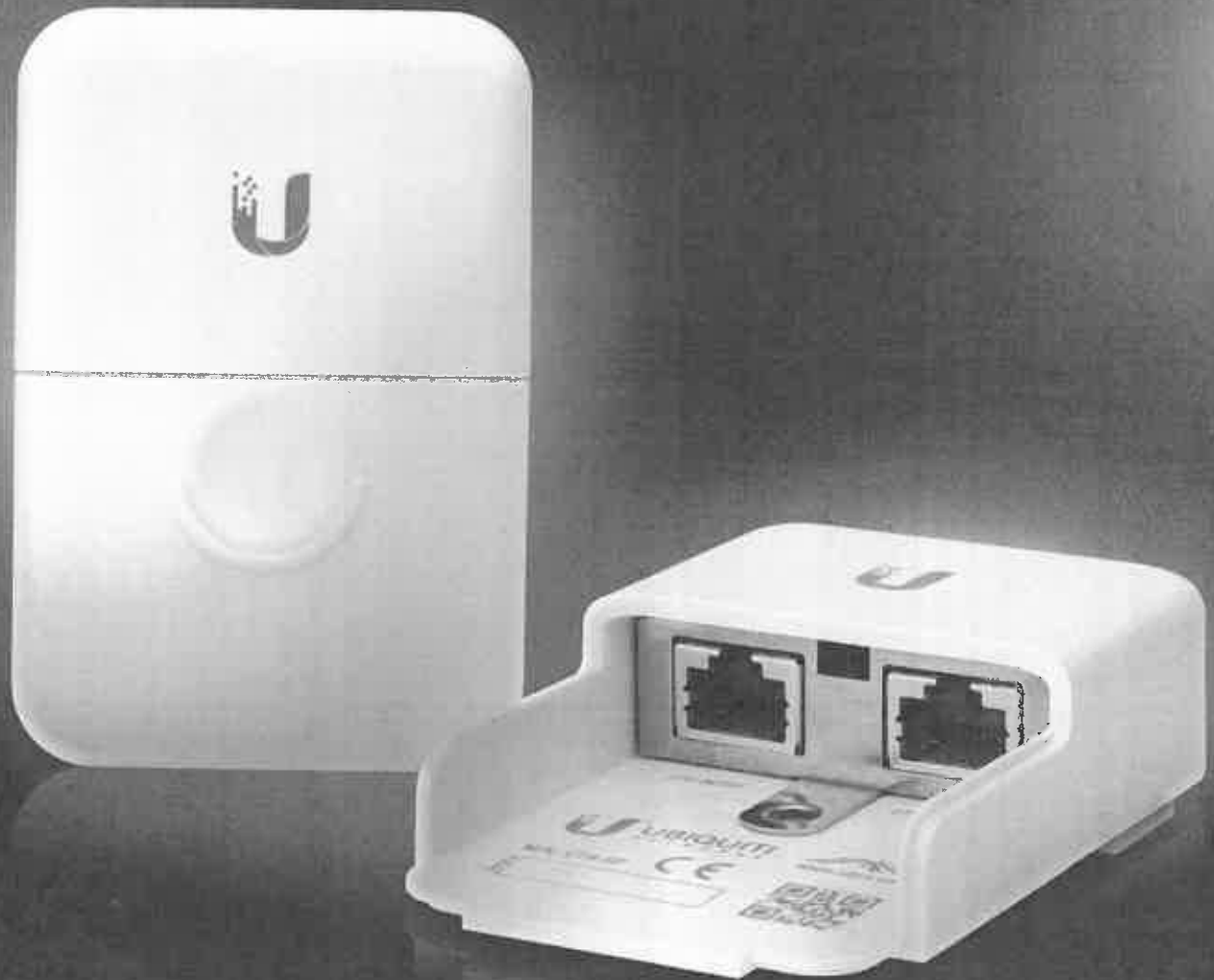


Return Loss



www.ubnt.com

Specifications are subject to change. Ubiquiti products are sold with a limited warranty described at [www.ubnt.com/support/warranty](http://www.ubnt.com/support/warranty)  
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## Ethernet Surge Protector

Model: ETH-SP

Low-Cost Protection and Fast Installation

Protects Outdoor Ethernet Devices

Compatible with 10/100/1000 Mbps Networks



# Ethernet Surge Protector

## ESD Protection for Outdoor High-Speed Networks

Introducing the Ethernet Surge Protector, model ETH-SP, from Ubiquiti Networks. The ETH-SP is a cost-effective solution for protecting outdoor Ethernet devices from damaging electrostatic discharge and surges. Since all Ubiquiti® airMAX® devices already have robust ESD protection built in, adding the ETH-SP to the installation provides an additional layer of protection to the network.

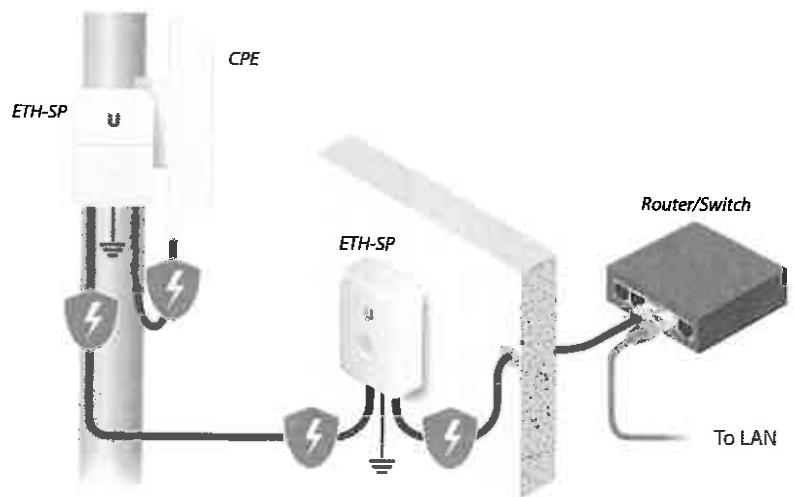
The ETH-SP is engineered to protect Power-over-Ethernet (PoE) or non-PoE devices with connection speeds of up to 1 Gbps. Two passive, surge-protected RJ45 connections provide maximum equipment compatibility.



## Ideal for WISP Networks

All Ubiquiti airMAX devices are equipped with ESD protection. However, to protect outdoor devices, and to meet certain local code requirements, installing the ETH-SP is essential.

For example, to guard against costly service calls, and to help your subscriber installations meet code requirements, install two ETH-SPs: one near the CPE, and the other at the entry point to the building. Damaging ESD attacks and surges will be absorbed by the ETH-SPs and safely discharged into the ground.



## Fast Installation

The ETH-SP was designed for easy, plug and play installation:



1. Attach the ETH-SP to a grounded pole.



2. Drill a pilot hole into the pole.



3. Fasten the ground screw.



4. Connect the Ethernet cables.

# Specifications

Ethernet Surge Protector	
Dimensions	91 x 61 x 32.5 mm (3.58 x 2.4 x 1.28")
Weight	80 g (2.82 oz)
Interface Connections	(2) RJ45 Female Connectors
ESD/EMP Protection	Absorbing Transient Current with Response to Surge Voltage from 100V/s to 1kV/μs
DC Spark-Over Voltage	90V @ 100V/s
Maximum Impulse Spark-over Voltage	700V @ 1kV/μs
Discharge Current	5kA (Maximum) 0.5kA (Normal)
Maximum Insulation Resistance	1G ohm @ 50V
Maximum Capacitance	1.0 pF @ 1 MHz
Data Line Protection	RJ45 10/100/1000 Ethernet
IEEE 802.3af PoE Support	Yes
Shock and Vibration Certification	ETSI300-019-1.4 Standard
Operating Temperature	-30 to 65° C (-22 to 149° F)
Operating Humidity	10 to 90% Noncondensing



Specifications are subject to change. Ubiquiti products are sold with a limited warranty described at: [www.ubnt.com/support/warranty](http://www.ubnt.com/support/warranty)  
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