



N° 2022 -BU-131

**EXTRAIT DU REGISTRE
DES DELIBERATIONS
DU BUREAU**

L'an deux mille vingt-deux, le 17 Novembre, à dix-sept heures, le Bureau communautaire de la Communauté de Communes Bazois Loire Morvan, régulièrement convoqué, s'est réuni à Cercy-la-Tour, sous la Présidence de Serge CAILLOT.

Présents :

Serge CAILLOT, Jean-Christophe SAVE, Antoine-Audoine MAGGIAR, Annick BERTRAND, Didier BOURLON, Michel MULOT, Michel MARIE, David BONGARD, Marie-Claire RANVIER, Pierre TISSIER-MARLOT

Absents excusés : Jean-Paul LAMBOURG, Serge DUCREUZOT, Yves PERRAUDIN

Étaient également présents : Maëlle GRANGEON, DGS.

Secrétaire de séance : Antoine-Audoine MAGGIAR

Nombre de membres :

- Afférents au bureau communautaire : 13
- Présents : 10
- Procurations : 0
- Qui ont pris part à la délibération : 10

Envoyé en préfecture le 19/12/2022

Reçu en préfecture le 19/12/2022

Publié le

ID : 058-200067882-20221117-2022_BU_131-DE

Numérique

Limanton – suivi du déploiement du dispositif place connectée N° 2022-BU-131

M. Antoine-Audoine MAGGIAR, conseiller communautaire délégué au numérique, explique que le camping de l'étang du Brazet à Panneçot (Limanton) est toujours en attente de pouvoir bénéficier de la technologie « Wifi Nièvre ».


La dernière proposition de Nièvre Numérique d'implantation du dispositif permettrait de couvrir l'intégralité du camping, en restant sur une installation en hotspot simple, ce qui n'engendrerait aucun surcoût pour la CCBLM [Cf. Avant-projet détaillé en annexe, pp. 6-7].

Après validation de la commande de création d'un accès Livebox Pro Fibre auprès d'Orange (abonnement de 43 € HT par mois), il est suggéré de procéder aux travaux d'installation dès cette fin d'année 2022, pour être sûr que le dispositif soit opérationnel pour la saison touristique 2023.

Une campagne communicationnelle sera effectuée en conséquence par la CCBLM pour présenter tous les espaces « Wifi Nièvre ».

.../...

Après avoir délibéré, le bureau communautaire, à l'unanimité, valide la proposition de Nièvre Numérique concernant le déploiement du dispositif place de village connectée – « Wifi Nièvre » au camping de Panneçot.



**Le Secrétaire de Séance,
Antoine-Audoine MAGGIAR.**



**Pour copie certifiée conforme,
Fait à Moulins-Engilbert,
Le 17 Novembre 2022**



**Le Président,
Serge CAILLOT.**

Envoyé en préfecture le 19/12/2022

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SLO

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SLOW



WiFi places de villages connectées
Bazois Loire Morvan

Limanton

Avant-Projet Détaillé

SUIVI DES VERSIONS			
Version	Date	Nom du rédacteur	Nature de la modification
1.0	24/06/2021	IOAN Silvio	Pré-étude
1.1	29/10/2021	IOAN Silvio	Modification 6,7.1 Création de 7.2 à 7.5, 8 plus annexes 1,2,3
1.2	04/11/2021	IOAN Silvio	Modification 2 et 4
2.0	13/07/2022	IOAN Silvio	Modification chapitre 7
3.0	29/09/2022	IOAN Silvio	Modification chapitre 7

Nièvre numérique

7 Avenue Marceau – 58000 NEVERS France

Tél : 03 86 61 82 50 – email : contact@nievrenumerique.fr



Table des matières

Introduction	2
1. Présentation du Projet.....	2
2. Principe du projet.....	2
2.1. Le but	2
2.2. L'avantage du cadre	2
3. Le processus	3
4. L'aspect technique.....	3
4.1. Le portail captif	3
4.2. Hot spot simple.....	4
5. La répartition du projet.....	4
5.1. Coté collectivité.....	4
5.2. Coté Nièvre Numérique.....	4
5.3. Schéma.....	4
6. La Commune.....	5
6.1. Localisation du Camping municipal de Panneçot.....	5
7. Site de la place de la Mairie.....	5
7.1. Site d'accueil- généralité	5
7.2. Objectif de couverture.....	6
7.3. Vue d'ensemble du site	7
7.4. Site accueil intérieur	7
8. Relevé technique.....	8
8.1. Références technique.....	8
8.2. Mesures	9
Références techniques de la mesure après construction.....	9
Nomenclature des mesures :	9
Repère sur le plan.....	10
Annexe 1	11
Annexe 2	12
Annexe 3	21



Introduction

Nièvre numérique et l'Agence de Développement Touristique de la Nièvre souhaitent promouvoir le tourisme ainsi que la connectivité Wifi gratuite pour les citoyens et les visiteurs dans les espaces publics tels que les offices de tourisme, les parcs, les places publiques, les bibliothèques, les musées et lieux touristiques via un réseau Wifi dénommé « Places de Villages Connectées ».

Nièvre numérique accompagne les collectivités dans l'aménagement des sites WiFi.

1. Présentation du Projet

La Communauté de Communes Bazois Loire Morvan souhaiterait développer des sites Wifi.

Dans le cadre « Places de Villages Connectées », Nièvre numérique a défini des critères techniques afin d'identifier différents sites sur l'ensemble du département.

Le document présente une ou des solutions d'aménagement permettant une connexion WiFi en très haut débit dans la commune avec le respect de la réglementation en vigueur.

2. Principe du projet

2.1. Le but

Facilement identifiable, la solution permettra outre une navigation illimitée sur internet, de mettre l'accent sur les aspects touristiques, ainsi que la promotion de l'actualité de la communauté de communes ou de la commune.

Cette solution sera simple d'utilisation tout en respectant la réglementation en vigueur**.

Après **une première et unique identification**, l'utilisateur pourra se connecter aux différents sites WiFi, dit « hot spot » portant le même nom « WiFi NIEVRE » sur l'ensemble du territoire nivernais. Ce maillage couvrira plusieurs lieux de vie, ainsi l'usager bénéficiera d'un réseau Wifi étendu aussi simplement qu'un réseau résidentiel. *(Comme à la maison.)*

* Hôte touristique numérique.

** Càd : qui fait quoi sur le réseau.

2.2. L'avantage du cadre

Pour l'utilisateur :

- Un seul et unique enregistrement sur le réseau via un portail captif lors de la 1^{ère} connexion.
- Tous les sites avec le même SSID. « WiFi NIEVRE » Facilement identifiable sur l'ensemble du territoire.
- Accès libre et illimité sur internet.



Pour la ComCom:

- Le nombre de connexion,
- La durée,
- La bande passante utilisée,
- Les sites visités,
- La gestion de chaque hot spot,
- La limitation d'un ou plusieurs utilisateurs,
- Le cadre légal.

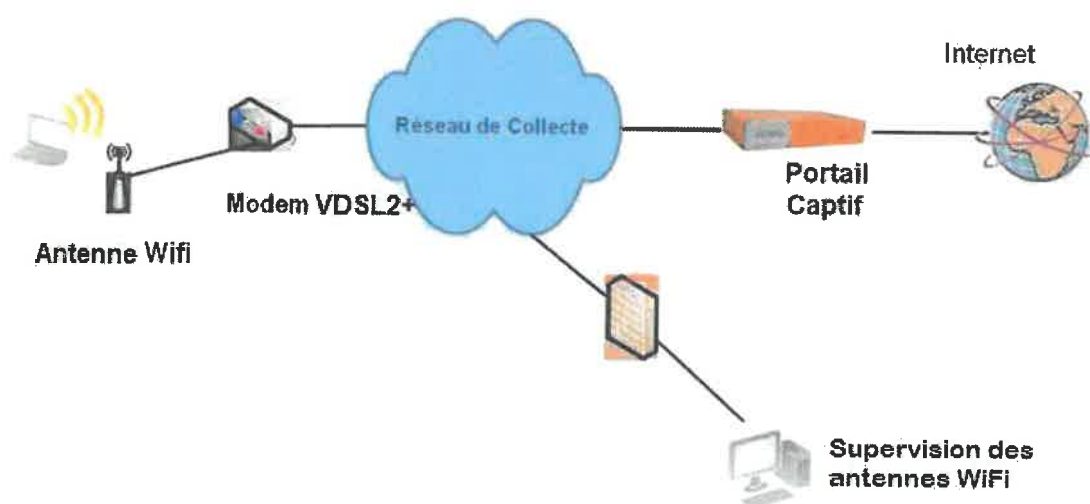
3. Le processus

- I. Convention entre la Communauté de Communes (ComCom) et Nièvre numérique (NN).
- II. La ComCom fournit une liste des différents sites pressentis à Nièvre numérique.
- III. Analyse technique et validation des prérequis. → (NN)
- IV. Création de l'Avant-Projet Simplifié (APS). → (NN)
- V. Visite technique des sites éligibles et validation d'implantation. → (Comcom & NN)
- VI. Création de l'Avant-Projet Détaillé (APD) pour chaque site → (NN)
- VII. Validation des APD → (ComCom)
- VIII. Création de l'arrivée électrique/télécom et commande de l'abonnement VDSL → (ComCom)
- IX. Commande du matériel → (NN)
- X. Installation et mise en service → (NN)

4. L'aspect technique

La supervision, l'accueil et l'identification des utilisateurs seront gérés via le portail captif.

4.1. Le portail captif



L'accès internet sera possible via un « hot spot ».

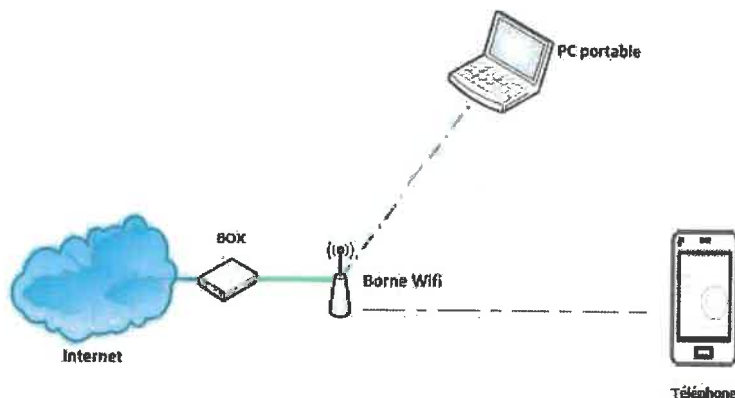
- « Hot spot simple » pour une couverture ciblée de type, place, esplanade.
- « Hot spot complexe » pour une couverture étendue de type parc, rue, bord d'étang.



4.2. Hot spot simple

Un réseau comprenant :

- Une connexion internet très haut débit (Fibre ou VDSL) dédié,
- Une prise de courant dédié,
- Une antenne Wifi omnidirectionnelle ou sectorielle.



5. La répartition du projet

5.1. Coté collectivité

La collectivité prendra en charge les éléments suivants :

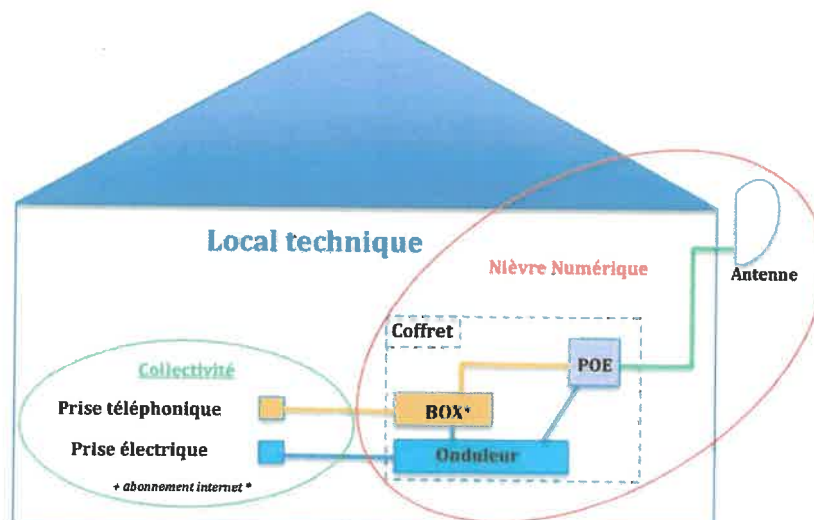
- L'installation d'une prise électrique dans le local convenu lors de la visite technique,
- L'installation de la prise téléphonique dans le local convenu lors de la visite technique,
- L'abonnement internet en technologie VDSL2+.

5.2. Coté Nièvre Numérique

Nièvre numérique prendra en charge les éléments suivants :

- Etude APS, APD, et DOE,
- L'installation de la baie qui comprendra le matériel dédié,
- L'installation et la mise en service du/des hot spot(s) WiFi,
- Le portail captif,
- La maintenance.

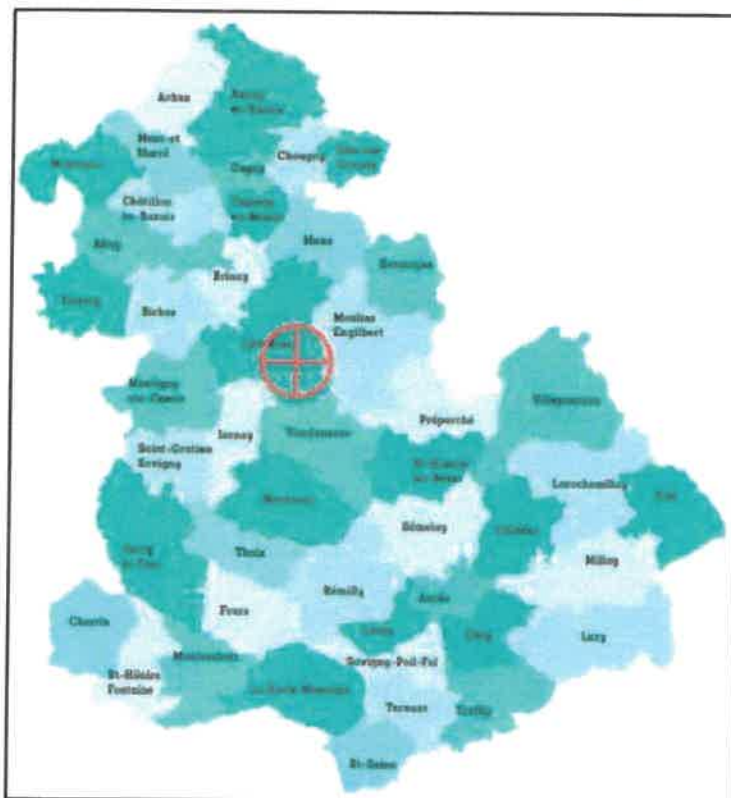
5.3. Schéma





6. La Commune

6.1. Localisation du Camping municipal de Panneçot



7. Site de la place de la Mairie

7.1. Site d'accueil- généralité

Adresse postale	Camping municipal de Panneçot Panneçot, 58290 Limanton
Propriétaire du site	Mairie
Téléphone Mairie	03.86.84.94.77
Coordonnées GPS	46°57'28,65" N 3°44'46,04"E
Responsable collectivité du site	Patrick REVENEAU Tél :06.88.97.95.96
Chef de projet	IOAN Silvio Tél: 06.81.81.68.57 s.ioan@nievrenumerique.fr
Intégrateur	Ets DAVI Tél : 01.75.84.88.23
Installateur	BACCAUD Olivier Tél: 06.98.99.22.50 olivierbaccaud@gmail.com
Equipements	Borne Wifi Ubiquiti Modem VDSL2+
Consignes de sécurité	
Raccordement au réseau	Cuivre VDSL2+ NRA MED Panneçot

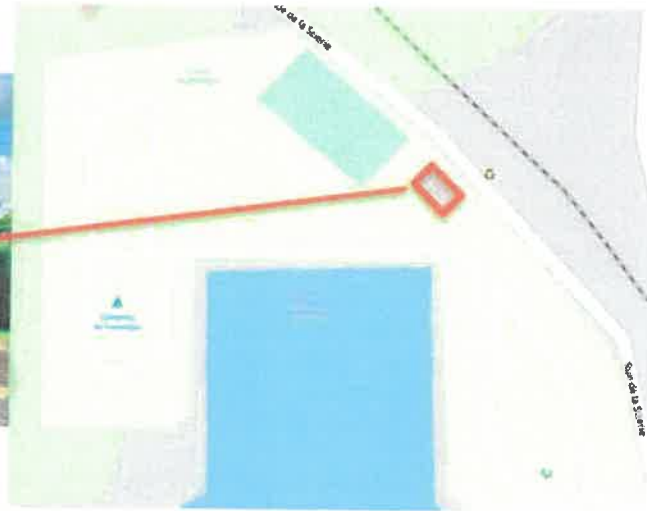


7.2. Objectif de couverture





7.3. Vue d'ensemble du site



7.4. Site accueil intérieur



Implantation dans le local technique à l'arrière du bâtiment.

La prise **électrique** mise à disposition par la collectivité.

La prise **téléphone** sera installée par l'opérateur au moment de la création de la ligne.

Le **coffret** (baie de brassage) sera mis en place par l'installateur Nièvre Numérique.

Cheminement du **câble** vers l'antenne.



Cheminement du **câble** depuis local technique.



Implantation de l'antenne.

8. Relevé technique

8.1. Références technique

TRIGRAMME DE L'EQUIPEMENT	
FABRICANT	UBIQUITI
TYPE	UAP AC M
ADRESSE MAC INITIALE	
IDENTIFIANT DANS LE CONTROLEUR	
IMPLANTATION DANS LE CONTROLEUR (Affiché sur le portail captif aperçu en Annexe 1)	
COORDONNEES GPS	
OPERATEUR WIFI :	CIGALE
FOURNISSEUR D'ACCES INTERNET	
TYPE DE CONTRAT	VDSL PRO
MAC ADRESS DE LA BOX INITIALE	
DEBIT UP (Kb /s)	
DEBIT DOWN (Kb /s)	

8.2. Mesures

Références techniques de la mesure après construction

APPAREIL DE TEST	MODELE	SYSTEME D'EXPLOITATION
	TABLETTE ASUS ZENPAD 10	ANDROID 7
LOGICIEL DE TEST	NOM	VERSION
	WIFI ANALYSER (open source)	1.9.3-41SL (7.0-24)
POINT DE DESSERTE CONNECTE		
	COORDONNEES GPS	FREQUENCE
Mac :		CHxx-xxxxMhz

Nomenclature des mesures :

REP	COORDONNEES GPS	VISIBILITE DU POINT	PUISSANCE (DBM)	DEBIT MESURE (Kbp/s)	POINT D'ACCES



Repère sur le plan





Annexe 1

17:20 Ven. 14 févr.

68 %

portail.wifinièvre.fr
WifiNièvre

Se connecter

Annuler



Bienvenue sur le réseau de hotspots
Wifi Nièvre.

Cet accès Wifi vous est offert par
Mairie de St Honoré les Bains

REJOINDRE

Vous êtes déjà utilisateur de Wifi Nièvre ?

Connectez votre nouvel appareil

nièvre
numérique

RÉGION
BOURGOGNE
FRANCHE
COMTE



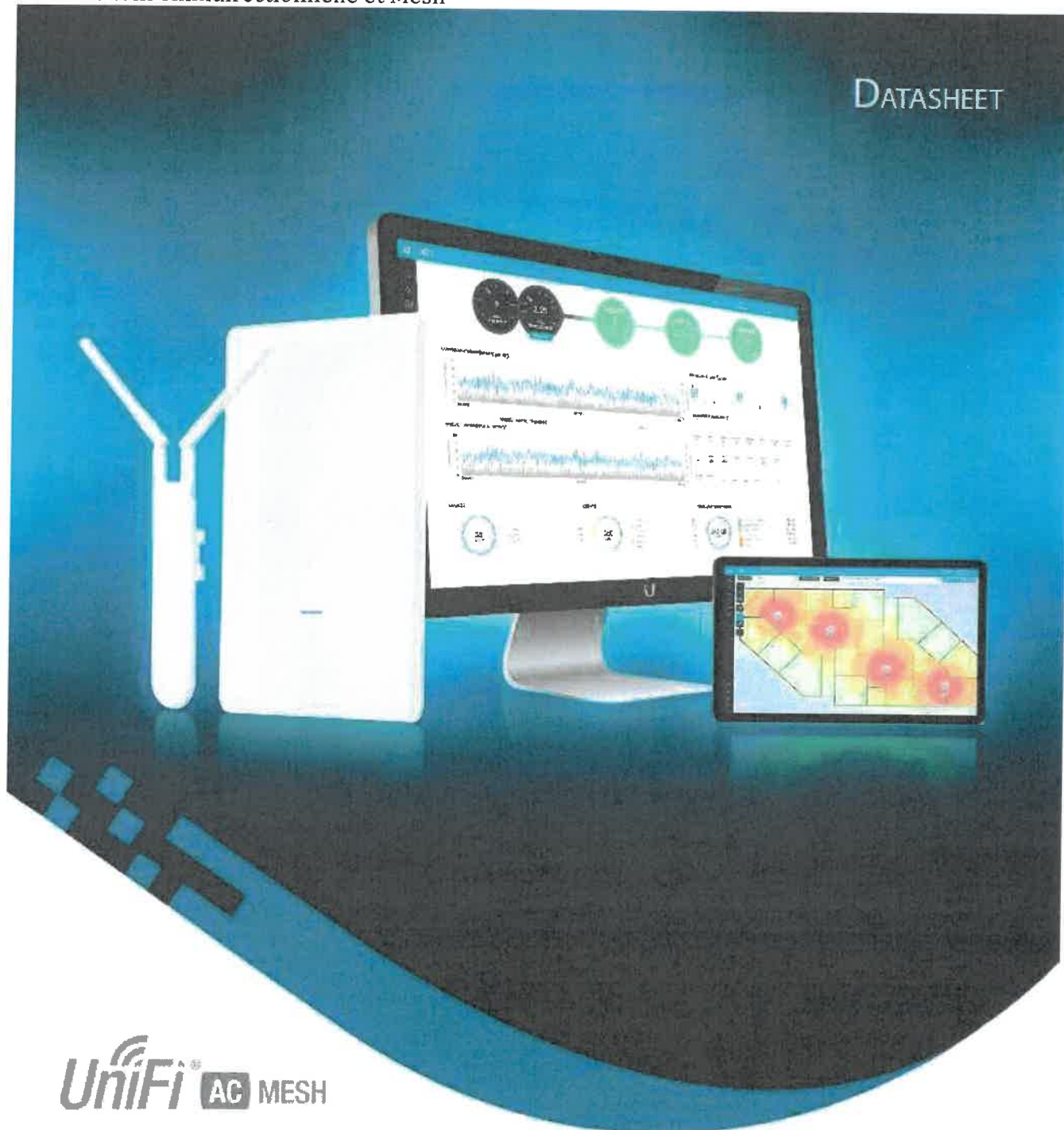
❓ Wifi Nièvre, c'est quoi ?

📍 Où trouver des points Wifi Nièvre ?



Annexe 2

Antenne Wifi omnidirectionnelle et Mesh



UniFi **AC** MESH

802.11AC AP with Plug & Play Mesh

Models: UAP-AC-M, UAP-AC-M-PRO

High-Performance Wide-Area Wi-Fi with UniFi Mesh Technology

Breakthrough Speeds up to 1300 Mbps in the 5 GHz Band

802.3af PoE Compatibility





Scalable Enterprise Wi-Fi Management

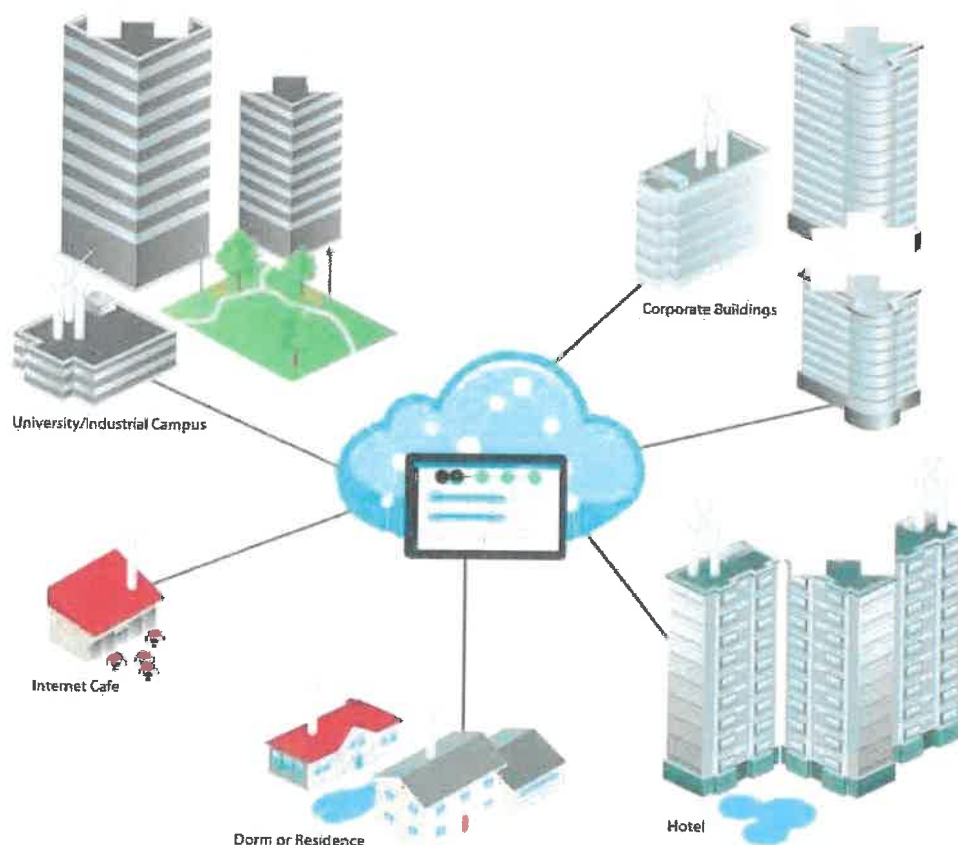
UniFi® is the revolutionary Wi-Fi system that combines enterprise performance, unlimited scalability, and a central management controller. The UniFi AC Mesh APs have a refined industrial design and can be easily installed using the included mounting hardware.

Easily accessible through any standard web browser and the UniFi mobile app (iOS or Android), the UniFi Controller software is a powerful software engine ideal for high-density client deployments requiring low latency and high uptime performance.

Use the UniFi Controller software to quickly configure and administer an enterprise Wi-Fi network – no special training required. RF map and performance features, real-time status, automatic UAP device detection, and advanced security options are all seamlessly integrated.

Extend Your Coverage

With the UniFi Controller software running in a NOC or in the cloud, administrators can manage multiple sites: multiple distributed deployments and multi-tenancy for managed service providers. Below are some deployment examples.



UniFi Controller

Packed with Features

Use the UniFi Controller to provision thousands of UniFi APs, map out networks, quickly manage system traffic, and provision additional UniFi APs.

Breakthrough RF Map

Use the RF map to monitor and analyze radio frequencies for optimal AP placement, configuration, and troubleshooting.

Powerful RF Performance Features

Advanced RF performance and configuration features include spectral analysis, airtime fairness, and band steering.

Detailed Analytics

Use the configurable reporting and analytics to manage large user populations and expedite troubleshooting.

Wireless Uplink

Wireless Uplink functionality enables wireless connectivity between APs for extended range. One wired UniFi AP uplink supports up to four wireless downlinks on a single operating band, allowing wireless adoption of devices in their default state and real-time changes to network topology.

For devices that support Plug & Play Mesh, this functionality is extended to allow multi-hop wireless uplink – so wirelessly uplinked APs can support uplink to other wirelessly uplinked APs.

Guest Portal/Hotspot Support

Easy customization options for Guest Portals include authentication, Hotspot setup, and the ability to use your own external portal server. Use UniFi's rate limiting for your Guest Portal/Hotspot package offerings. Apply different bandwidth rates (download/upload), limit total data usage, and limit duration of use.

All UniFi APs include Hotspot functionality:

- Built-in support for billing integration using major credit cards.
- Built-in support for voucher-based authentication.
- Built-in Hotspot Manager for voucher creation, guest management, and payment refunds.
- Full customization and branding of Hotspot portal pages.

Multi-Site Management

A single cloud-based UniFi Controller can manage multiple sites: multiple, distributed deployments and multi-tenancy for managed service providers. Each site is logically separated and has its own configuration, maps, statistics, guest portal, and admin read/write and read-only accounts.

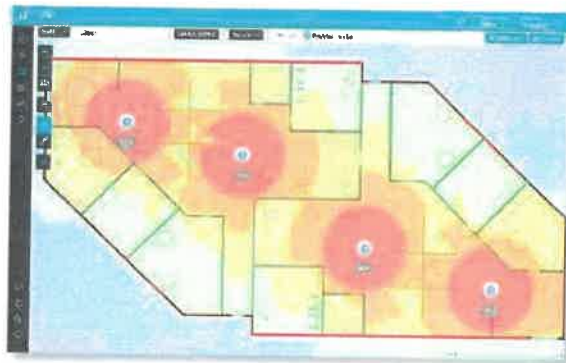
WLAN Groups

Manage flexible configurations of large deployments. Create multiple WLAN groups and assign them to an AP's radio.



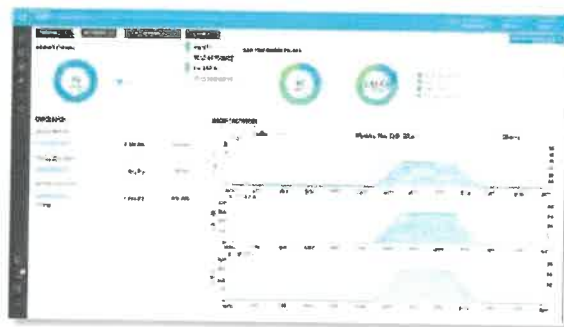
Dashboard

UniFi provides a visual representation of your network's status and delivers basic information about each network segment.



RF Map

Monitor UniFi APs and analyze the surrounding RF environment.



Statistics

UniFi visualizes network traffic in clear and easy-to-read graphs.




UniFi Mobile App

Manage your UniFi devices from your smartphone or tablet.



Model Comparison



	UAP-AC-M	UAP-AC-M-PRO
Environment	Indoor/Outdoor	Outdoor
Simultaneous Dual-Band	✓	✓
2.4 GHz Radio Rate	300 Mbps	450 Mbps
2.4 GHz MIMO	2x2	3x3
5 GHz Radio Rate	867 Mbps	1300 Mbps
5 GHz MIMO	2x2	3x3
Secondary Ethernet Port		✓
PoE Mode	24V Passive PoE 802.3af PoE accommodates	802.3af PoE
Wall Mount	✓	✓
Pole Mount	✓	✓
Fast Mount	✓	

Use Cases

Mesh Multi-Hop A large outdoor area, such as a park with minimal infrastructure, can take advantage of a mesh network comprised of the UniFi AC Mesh models.

Omnidirectional Coverage, Indoors or Outdoors The UAP-AC-M includes adjustable dual-band omni antennas.

You have the option to use a 5 GHz omni antenna¹ for spot-beam coverage in high-density locations with numerous APs and clients, like a conference hall or event center.

Directional Coverage, Outdoors The UAP-AC-M is versatile.

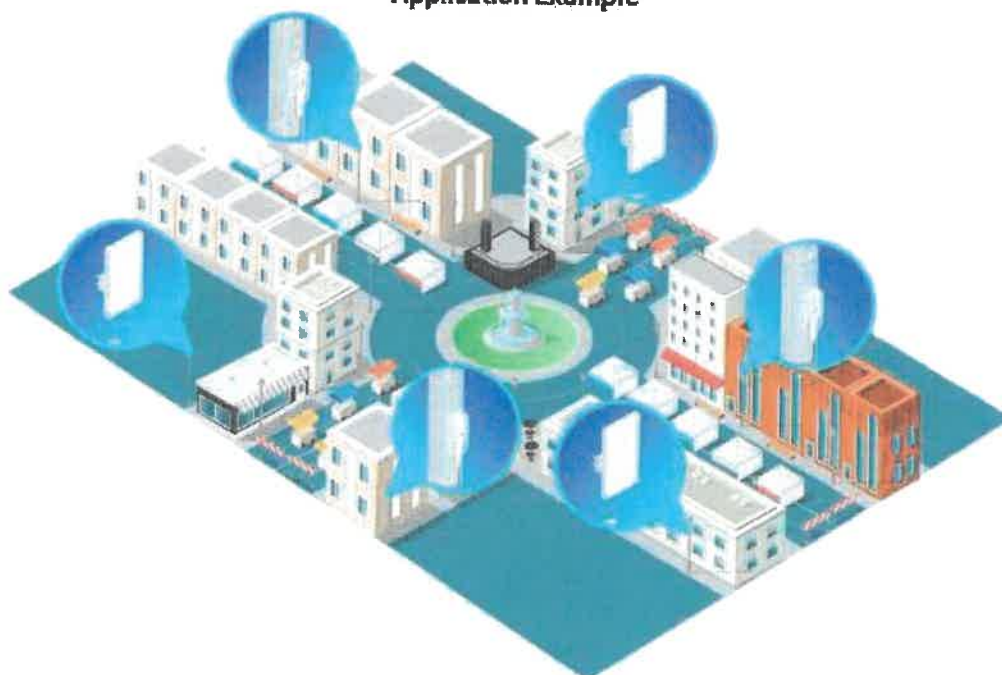
You have the option to use a 5 GHz sector antenna² (wide beam in the azimuth plane and narrow in the elevation plane) for broad outdoor coverage.

Maximum Coverage, Outdoors The UAP-AC-M-PRO is ideal for applications requiring 3x3 MIMO data rates for close-in omni coverage.

Temporary Installations Deploy the UniFi AC Mesh models for outdoor installations requiring quick setup and takedown, such as a street fair, music festival, or concert venue.

¹ Different antenna gains are allowed for each regulatory domain or country. It is the installer's responsibility to check local regulations.

Application Example



Both UniFi AC Mesh models provide wireless coverage for a street fair in a city plaza.



Hardware Overview

Model: UAP-AC-M

The UAP-AC-M provides simultaneous, dual-band, 2x2 MIMO technology and is available in single- and five-packs¹.

Compact Form Factor The UAP-AC-M discreetly integrates into any environment.

Weather-Resistant Enclosure The UAP-AC-M can be used indoors or outdoors.

Versatile Mounting The UAP-AC-M can be mounted on a wall, pole, or fast-mount of an optional Ubiquiti® high-gain antenna². (All accessories are included.)

Multiple Power Options The UAP-AC-M is compatible with 802.3af PoE Alternative A and 24V passive PoE. You can power it with the included Gigabit PoE adapter¹ or an 802.3af Alternative A compatible switch, such as the UniFi PoE Switch or EdgePoint™ EP-R6.

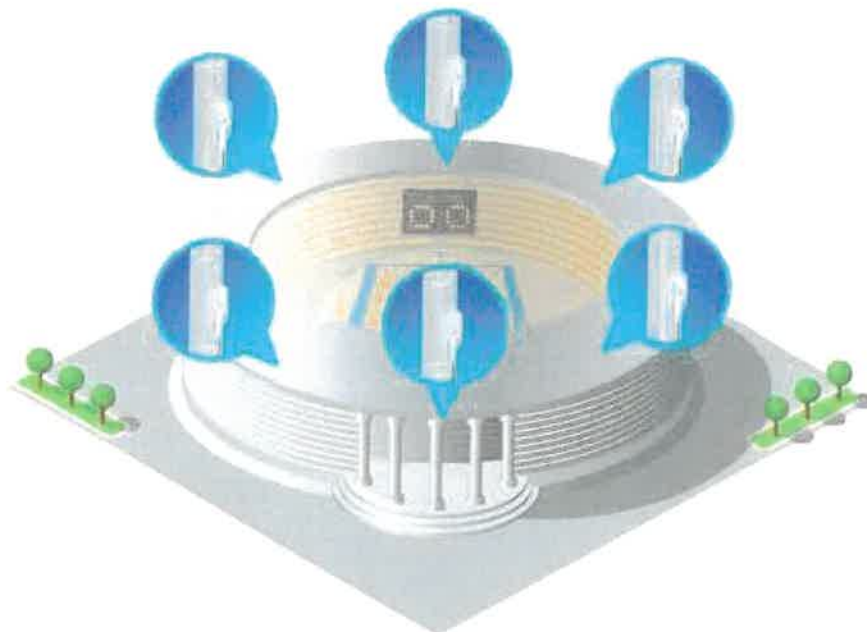
Antenna Options Use the included omni antennas, or use the included fast-mount adapter to install the AP on an optional connectorized antenna² for expanded range coverage and customized pattern shaping.

¹ Five-packs do not ship with PoE adapters; we recommend powering the UniFi APs with the UniFi PoE Switch instead.

² Different antenna gains are allowed for each regulatory domain or country. It is the installer's responsibility to check local regulations.



Application Example



The UAP-AC-M utilizes the same antenna connector technology as airMAX® antennas.²



Hardware Overview

Model: UAP-AC-M-PRO

The UAP-AC-M-PRO provides simultaneous, dual-band, 3x3 MIMO technology and is available in single- and five-packs*.

Weather-Resistant Form Factor The enclosure of the UAP-AC-M-PRO is designed to withstand the elements, making it ideal for outdoor deployment.

Powerful Coverage Built-in dual-band omnidirectional antennas deliver expanded range coverage outdoors.

Mounting Flexibility The UAP-AC-M-PRO can be mounted on a wall or pole. (All accessories are included.)

Dual Gigabit Ethernet Ports The primary port is for data and PoE; the secondary port is for bridging.

Multiple Power Options You can power the UAP-AC-M-PRO with an 802.3af compatible switch, UniFi PoE Switch, or the included Gigabit PoE adapter*.

* Five-packs do not ship with PoE adapters; we recommend powering the UniFi APs with the UniFi PoE Switch instead.



Application Example



The UniFi AC M Pro APs cover the quad and park on a university campus.



UAP-AC-M Specifications

UAP-AC-M	
Dimensions	353 x 46 x 34.4 mm (13.9 x 1.81 x 1.35")
Weight	152 g (5.36 oz) with Antennas
Networking Interface	(1) 10/100/1000 Ethernet Port
Buttons	Reset
Power Method	24V Passive PoE (Pairs 4, 5+; 7, 8 Return); 802.3af Alternative A (Pairs 1, 2+; 3, 6 Return) (Supported Voltage Range: 44 to 57VDC)
Power Supply	24V, 0.5A Gigabit PoE Adapter*
Power Save	Supported
Maximum Power Consumption	8.5W
Maximum TX Power	
2.4 GHz	20 dBm
5 GHz	20 dBm
Antennas	(2) External Dual-Band Omni Antennas
2.4 GHz	3 dBi
5 GHz	4 dBi
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	Wall/Pole/Fast-Mount (Kits Included)
Operating Temperature	-30 to 70° C (-22 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

* Only the single-pack of the UAP-AC-M includes a PoE adapter.

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 867 Mbps (MCS0 - MCS9 NSS1/2, VHT 20/40/80)
802.11n	6.5 Mbps to 300 Mbps (MCS0 - MCS15, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps



UAP-AC-M-PRO Specifications

UAP-AC-M-PRO	
Dimensions	343.2 x 181.2 x 60.2 mm (13.51 x 7.13 x 2.37")
Weight	633 g (1.40 lb)
Networking Interface	(2) 10/100/1000 Ethernet Ports
Buttons	Reset
Power Method	802.3af PoE (Supported Voltage Range: 44 to 57VDC)
Power Supply	48V, 0.5A PoE Gigabit Adapter*
Power Save	Supported
Maximum Power Consumption	9W
Maximum TX Power	
2.4 GHz	22 dBm
5 GHz	22 dBm
Antennas	(3) Internal Dual-Band Antennas 8 dBi
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	Wall/Pole (Pole Kit Included)
Operating Temperature	-40 to 70° C (-40 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

* Only the angled port of the UAP-AC-M-PRO includes a PoE connector

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 1300 Mbps (MCS0 - MCS9 NSS1/2/3, VHT 20/40/80)
802.11n	6.5 Mbps to 450 Mbps (MCS0 - MCS23, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps



UniFi Switch Compatibility

The UniFi switches are compatible with UniFi Access Points and UniFi G3 Video Cameras, as detailed below.

AP/Camera Model	US-8	US-8-60W	US-8-150W	US-16-150W	US-24-250W	US-24-500W	US-48-500W	US-48-750W
UVC-G3	✓	✓	✓	✓	✓	✓	✓	✓
UVC-G3-AF	✓	✓	✓	✓	✓	✓	✓	✓
UVC-G3-DOME	✓	✓	✓	✓	✓	✓	✓	✓
UAP	✓	✓	✓	✓	✓	✓	✓	✓
UAP-LR	✓	✓	✓	✓	✓	✓	✓	✓
UAP-PRO	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-LITE	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-LR	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-PRO	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-M	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-M-PRO	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-IW*	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-IW-PRO*	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-HD	—	—	✓	✓	✓	✓	✓	✓

✓ Compatible with the UniFi switch

✗ Requires an Instant 802.3af Gigabit PoE Converter: INS-3AF-I-G or INS-3AF-O-G

Note:

* For the UAP-AC-IW and UAP-AC-IW-PRO, PoE passthrough is supported by all of the switches listed above except for models US-8 and US-8-60W.

Related Product Datasheets



UniFi Switch 8, UniFi Switch 8-60W:

dl.ubnt.com/datasheets/unifi/UniFi_Switch_8_DS.pdf



UniFi PoE Switches:

dl.ubnt.com/datasheets/unifi/UniFi_PoE_Switch.pdf

Specifications are subject to change. Ubiquiti products are sold with a limited warranty described at: www.ubnt.com/support/warranty. The limited warranty requires the use of arbitration to resolve disputes on an individual basis, and, where applicable, specify arbitration instead of jury trials or class actions.
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9 AUGUST 2019

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Annexe 3

Antenne Wifi sectorielle

Datasheet

NanoStation™M NanoStation™locoM



NanoStation™M
NanoStation™locoM

Indoor/Outdoor airMAX™ CPE
Models: NSM2, NSM3, NSM365, NSM5, locoM2, locoM5, locoM9

Cost-Effective, High-Performance

Compact and Versatile Design

Powerful Integrated Antenna

UBIQUITI™
NETWORKS



Overview

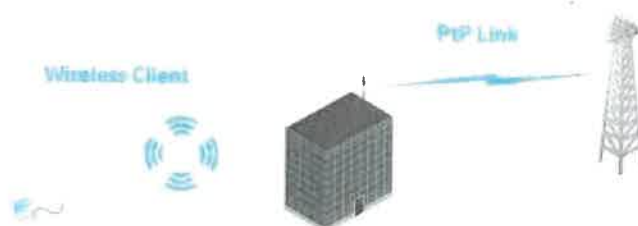
Leading-Edge Industrial Design

Ubiquiti Networks™ set the bar for the world's first low-cost and efficient broadband Customer Premises Equipment (CPE) with the original NanoStation™. The NanoStationM and NanoStationlocoM take the same concept to the future with sleek and elegant form factors, along with integrated airMAX™ (MIMO TDMA protocol) Technology.

The low cost, high performance, and small form factor of NanoStationM and NanoStationlocoM make them extremely versatile and economical to deploy.



NanoStationM as powerful clients in an airMAX PtMP (Point-to-Multi-Point) network setup.



NanoStationM as a powerful wireless client.

Use two NanoStationM to create a PtP link.

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.

Latency Multiple features dramatically reduce noise.

• Only NanoStationM models

• Remote reset is an option that is sold separately as the PDE-24. The NanoStationM includes a 24V PoE adapter without remote reset.

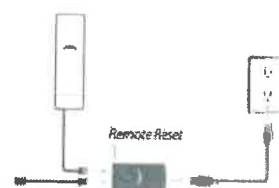
Dual Ethernet Connectivity'

The NanoStationM provides a secondary Ethernet port with software-enabled PoE output for seamless IP video integration.



Intelligent PoE²

Remote hardware reset circuitry of the NanoStationM allows the device to be remotely reset from the power supply location.



The NanoStationM may also be powered by the Ubiquiti Networks TOUGHSwitch PoE. In addition, any NanoStationM can easily become 48V, 802.3af compliant through use of the Ubiquiti Instant 802.3af Adapter (sold separately).



Models



NanoStation M

Model	Frequency	Gain
NSM2	2.4 GHz	11 dBi
NSM3	3 GHz	13 dBi
NSM365	3.65 GHz	13 dBi
NSM5	5 GHz	16 dBi



NanoStation loco M

Model	Frequency	Gain
locoM2	2.4 GHz	8 dBi
locoM5	5 GHz	13 dBi



NanoStation loco M

Model	Frequency	Gain
locoM9	900 MHz	8 dBi

Datasheet

NanoStation M NanoStation loco M

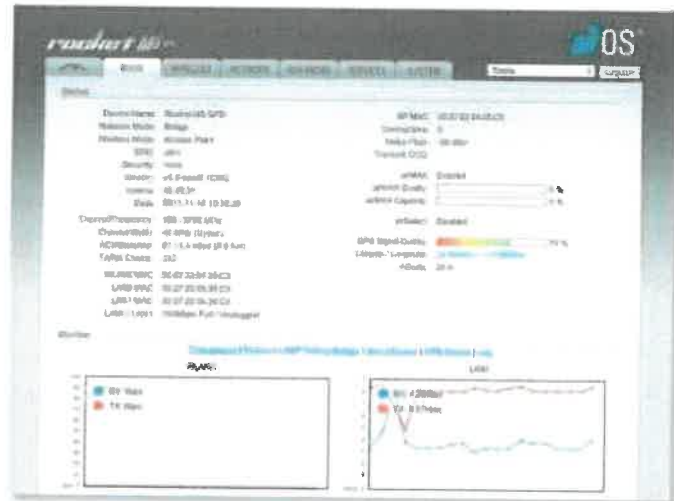


Software

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.

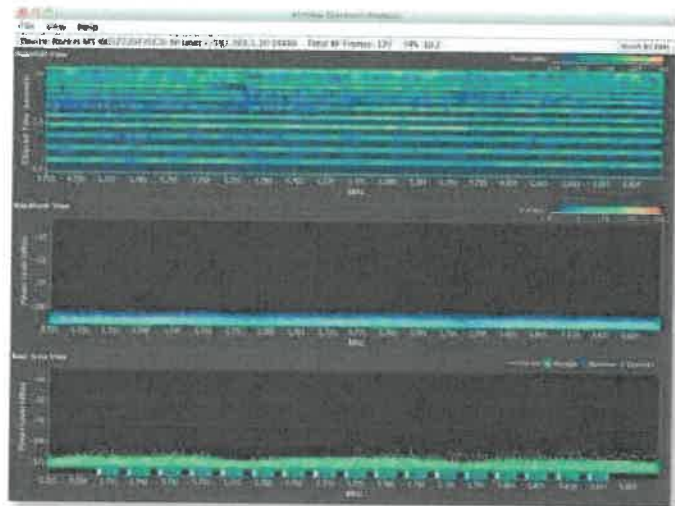
- Protocol Support
- Ubiquiti Channelization
- Spectral Width Adjustment
- ACK Auto-Timing
- AAP Technology
- Multi-Language Support



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** Automize 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

System Information			
Model	NanoStationM	locoM5/M2	locoM9
Processor Specs	Atheros MIPS 24KC, 400 MHz	Atheros MIPS 24KC, 400 MHz	Atheros MIPS 24KC, 400 MHz
Memory	32 MB SDRAM, 8 MB Flash	32 MB SDRAM, 8 MB Flash	64 MB SDRAM, 8 MB Flash
Networking Interface	(2) 10/100 Ethernet Ports	(1) 10/100 Ethernet Port	(1) 10/100 Ethernet Port

Regulatory/Compliance Information				
Model	NSM5/NSM2/locoM5/locoM2	NSM3	NSM365	locoM9
Wireless Approvals	FCC Part 15.247, IC RS210, CE	-	FCC Part 90Z	FCC Part 15.247, IC RS210
RoHS Compliance	Yes	Yes	Yes	Yes

Physical/Electrical/Environmental						
Model	NSM5	NSM3/365	NSM2	locoM5	locoM2	locoM9
Dimensions (mm)	294 x 31 x 80	294 x 31 x 80	294 x 31 x 80	163 x 31 x 80	163 x 31 x 80	164 x 72 x 199
Weight	0.4 kg	0.5 kg	0.4 kg	0.18 kg	0.18 kg	0.9 kg
Power Supply (PoE)	24V, 0.5A	24V, 0.5A	24V, 0.5A	24V, 0.5A	24V, 0.5A	24V, 0.5A
Max. Power Consumption	8 W	8 W	8 W	5.5 W	5.5 W	6.5 W
Gain	16 dBi	13.7 dBi	11 dBi	13 dBi	8 dBi	8 dBi
RF Connector	-	-	-	-	-	External RP-SMA
Polarization	Dual Linear					
Enclosure Characteristics	Outdoor UV Stabilized Plastic					
Mounting	Pole Mounting Kit Included					
Power Method	Passive Power over Ethernet (pairs 4, 5+; 7, 8 return)					
Operating Temperature	-30 to 75° C					
Operating Humidity	5 to 95% Condensing					
Shock & Vibration	ETSI300-019-1.4					

Operating Frequency Summary (MHz)					
Model	NSM5/locoM5	NSM365	NSM3	NSM2/locoM2	locoM9
Worldwide	5170 - 5875	3650-3675	3400-3700	2412-2462	902-928
USA	5725 - 5850	-	-	-	-
USA DFS	5250 - 5850	-	-	-	-



Datasheet

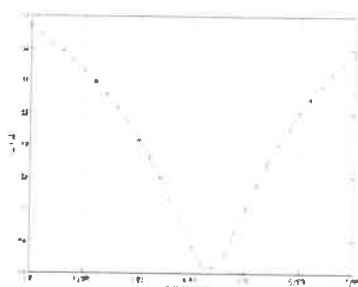
NanoStation M NanoStation loco M

NanoStation locoM9 Specifications

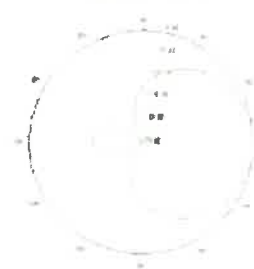
Output Power: 28 dBm						
500 MHz TX POWER SPECIFICATIONS			900 MHz RX POWER SPECIFICATIONS			
MCS Index	Avg. Tx	Tolerance	airMAX	MCS Index	Sensitivity	Tolerance
MCS0	28 dBm	± 2 dB		MCS0	-96 dBm	± 2 dB
MCS1	28 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
MCS2	28 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
MCS3	28 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
MCS4	28 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
MCS5	24 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
MCS6	22 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
MCS7	21 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
MCS8	28 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
MCS9	28 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
MCS10	28 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
MCS11	28 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
MCS12	28 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
MCS13	24 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
MCS14	22 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
MCS15	21 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

Antenna Information	
Gain	7.5 dBi
Cross-pol Isolation	28 dB Minimum
Max. VSWR	1.3:1
Beamwidth	60° (H-pol) / 60° (V-pol) / 50° (Elevation)

Return Loss



Vertical Azimuth



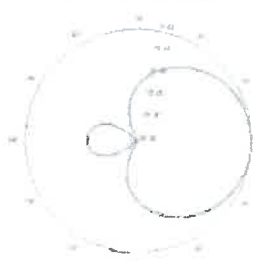
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation

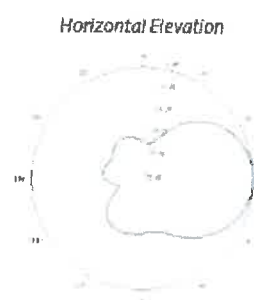
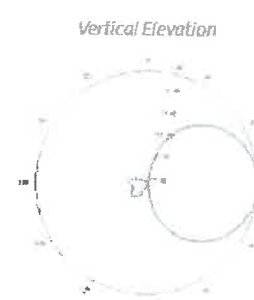
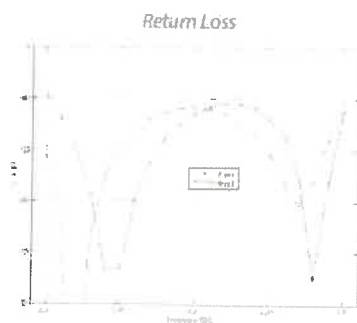




NanoStation locoM2 Specifications

2.4 GHz TX POWER SPECIFICATIONS				2.4 GHz RX POWER SPECIFICATIONS			
	Data Rate/MCS	Avg. TX	Foldback		Data Rate/MCS	Sensitivity	Tolerance
11b/g	1-24 Mbps	23 dBm	± 2 dB	11b/g	1-24 Mbps	-83 dBm	± 2 dB
	36 Mbps	21 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	19 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	18 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
airMAX	MCS0	23 dBm	± 2 dB	airMAX	MCS0	-96 dBm	± 2 dB
	MCS1	23 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	23 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	23 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	22 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	20 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	18 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	17 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	23 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	23 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	23 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	23 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	22 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	20 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	18 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	17 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

Antenna Information	
Gain	8.5 dBi
Cross-pol Isolation	20 dB Minimum
Max. VSWR	1.4:1
Beamwidth	60° (H-pol) / 60° (V-pol) / 60° (Elevation)



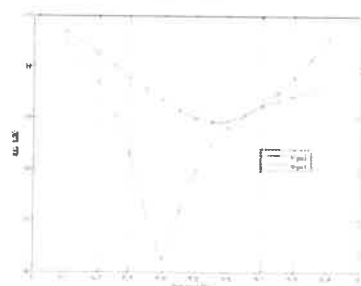


NanoStationlocoM5 Specifications

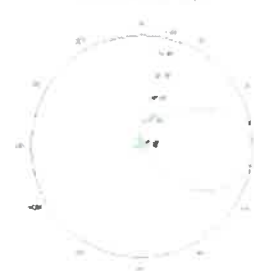
Output Power: 23 dBm							
5 GHz TX POWER SPECIFICATIONS				5 GHz RX POWER SPECIFICATIONS			
	Data Rate/MCS	Avg. TX	Tolerance		Data Rate/MCS	Sensitivity	Tolerance
11b/g	6-24 Mbps	23 dBm	± 2 dB	11b/g	6-24 Mbps	-83 dBm	± 2 dB
	36 Mbps	21 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	19 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	18 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
airMAX	MCS0	23 dBm	± 2 dB	airMAX	MCS0	-96 dBm	± 2 dB
	MCS1	23 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	23 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	23 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	22 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	20 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	18 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	17 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	23 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	23 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	23 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	23 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	22 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	20 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	18 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	17 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

Antenna Information	
Gain	13 dBi
Cross-pol Isolation	20 dB Minimum
Max. VSWR	1.4:1
Beamwidth	45° (H-pol) / 45° (V-pol) / 45° (Elevation)

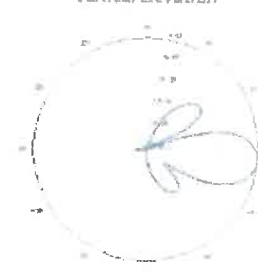
Return Loss



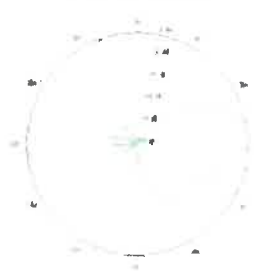
Vertical Azimuth



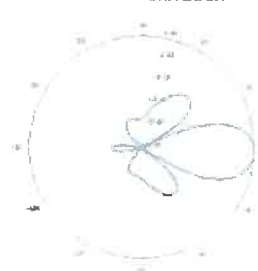
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation

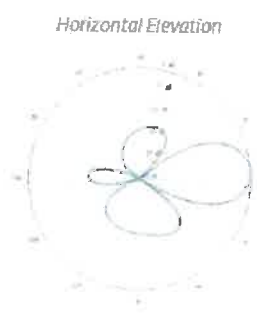
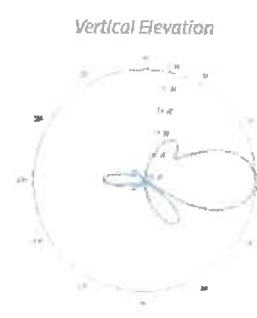
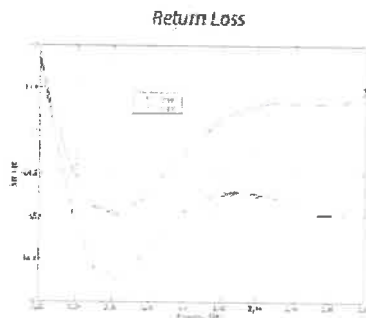




NanoStationM2 Specifications

Output Power: 28 dBm							
2.4 GHz TX POWER SPECIFICATIONS				2.4 GHz RX POWER SPECIFICATIONS			
	Data Rate/MCS	Avg TX	Tolerance		Data Rate/MCS	Sensitivity	Tolerance
11b/g	1-24 Mbps	28 dBm	± 2 dB	11b/g	1-24 Mbps	-83 dBm	± 2 dB
	36 Mbps	35 dBm	± 2 dB		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
40MAX	MCS0	28 dBm	± 2 dB	40MAX	MCS0	-96 dBm	± 2 dB
	MCS1	28 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	28 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	28 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	27 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	25 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	-95 dBm	± 2 dB
	MCS9	28 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	28 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	28 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	27 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	25 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	22 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

Antenna Information	
Gain	10.4-11.2 dBi
Cross-pol Isolation	23 dB Minimum
Max. VSWR	1.6:1
Beamwidth	55° (H-pol) / 53° (V-pol) / 27° (Elevation)



www.ubnt.com/airmax

Datasheet

NanoStationM NanoStation locoM

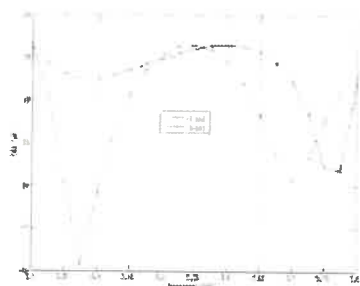


NanoStationM3/M365 Specifications

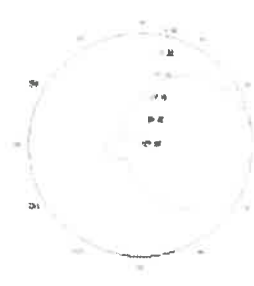
Output Power: 25 dBm						
TX POWER SPECIFICATIONS			RX POWER SPECIFICATIONS			
MCS Index	Avg. TA	Tolerance	MCS Index	Sensitivity	Tolerance	
MCS0	25 dBm	± 2 dB	MCS0	-94 dBm	± 2 dB	
MCS1	25 dBm	± 2 dB	MCS1	-93 dBm	± 2 dB	
MCS2	25 dBm	± 2 dB	MCS2	-90 dBm	± 2 dB	
MCS3	25 dBm	± 2 dB	MCS3	-89 dBm	± 2 dB	
MCS4	24 dBm	± 2 dB	MCS4	-86 dBm	± 2 dB	
MCS5	23 dBm	± 2 dB	MCS5	-83 dBm	± 2 dB	
MCS6	22 dBm	± 2 dB	MCS6	-77 dBm	± 2 dB	
MCS7	20 dBm	± 2 dB	MCS7	-74 dBm	± 2 dB	
MCS8	25 dBm	± 2 dB	MCS8	-93 dBm	± 2 dB	
MCS9	25 dBm	± 2 dB	MCS9	-91 dBm	± 2 dB	
MCS10	25 dBm	± 2 dB	MCS10	-85 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	22 dBm	± 2 dB	MCS14	-78 dBm	± 2 dB	
MCS15	20 dBm	± 2 dB	MCS15	-75 dBm	± 2 dB	

Antenna Information	
Gain	12.2 - 13.7 dBi
Cross-pol Isolation	28 dB Minimum
Max. VSWR	1.4:1
Beamwidth	60° (H-pol) / 60° (V-pol) / 20° (Elevation)

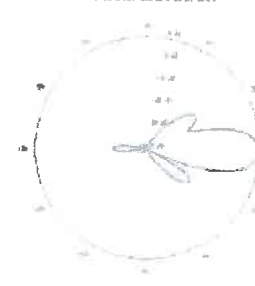
Return Loss



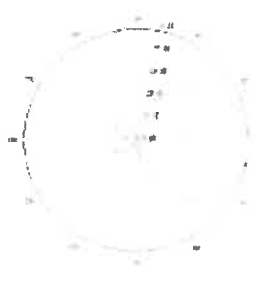
Vertical Azimuth



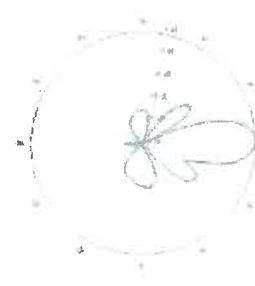
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation

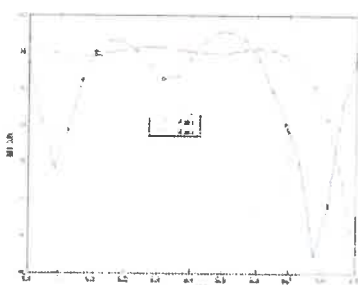




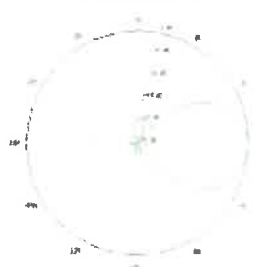
NanoStationM5 Specifications

Output Power: 27 dBm						
5 GHz TX POWER SPECIFICATIONS				5 GHz RX POWER SPECIFICATIONS		
	Data Rate/MCS	Avg. TX	Tolerance		Data Rate/MCS	Sensitivity
11a	6-24 Mbps	27 dBm	± 2 dB	11a	6-24 Mbps	-94 dBm
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm
	48 Mbps	23 dBm	± 2 dB		48 Mbps	-77 dBm
	54 Mbps	22 dBm	± 2 dB		54 Mbps	-75 dBm
11n/airMAX	MCS0	27 dBm	± 2 dB	11n/airMAX	MCS0	-96 dBm
	MCS1	27 dBm	± 2 dB		MCS1	-95 dBm
	MCS2	27 dBm	± 2 dB		MCS2	-92 dBm
	MCS3	27 dBm	± 2 dB		MCS3	-90 dBm
	MCS4	26 dBm	± 2 dB		MCS4	-86 dBm
	MCS5	24 dBm	± 2 dB		MCS5	-83 dBm
	MCS6	22 dBm	± 2 dB		MCS6	-77 dBm
	MCS7	21 dBm	± 2 dB		MCS7	-74 dBm
	MCS8	27 dBm	± 2 dB		MCS8	-95 dBm
	MCS9	27 dBm	± 2 dB		MCS9	-93 dBm
	MCS10	27 dBm	± 2 dB		MCS10	-90 dBm
	MCS11	27 dBm	± 2 dB		MCS11	-87 dBm
	MCS12	26 dBm	± 2 dB		MCS12	-84 dBm
	MCS13	24 dBm	± 2 dB		MCS13	-79 dBm
	MCS14	22 dBm	± 2 dB		MCS14	-78 dBm
	MCS15	21 dBm	± 2 dB		MCS15	-75 dBm
Antenna Information						
Gain			14.6 - 16.1 dBi			
Cross-pol Isolation			22 dB Minimum			
Max. VSWR			1.5:1			
Beamwidth			43° (H-pol) / 41° (V-pol) / 15° (Elevation)			

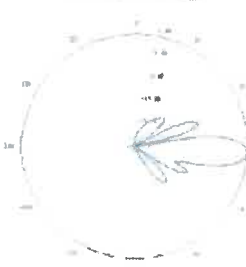
Return Loss



Vertical Azimuth



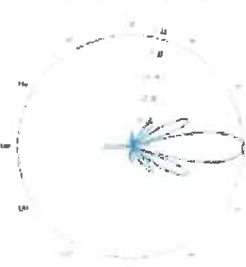
Vertical Elevation



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 and available in 100-pc. bags, TOUGH Cable Connectors protect against ESD attacks and Ethernet hardware damage, while allowing rapid field deployment without soldering.

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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