NetComm NS-01 CloudMesh Satellite User Guide

NS-01 – USER GUIDE
CloudMesh Satellite

Contents

Important notice

This device, like any wireless device, operates using radio signals which cannot guarantee the transmission and reception of data in all conditions. While the delay or loss of signal s rare, you should not rely solely on any wireless device for emergency communications or otherwise use the device in situations where the interruption of data connectivity could lead to death, personal injury, property damage, data loss, or other loss. NetComm Wireless accepts no responsibility for any loss or damage resulting from errors or delays in transmission or reception, or the failure of the CloudMesh Satellite to transmit or receive such data.

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Note – This document is subject to change without notice.

Save our environment

When this equipment has reached the end of its useful life, it must be taken to a recycling center and processed separately from domestic waste.
The cardboard box, the plastic contained in the packaging, and the parts that make up this device can be recycled in accordance with regionally established regulations. Never dispose of this electronic equipment along with the domestic waste. You may be subject to penalties or sanctions under the law. Instead, ask for disposal instructions from your municipal government.
Please be responsible and protect our environment.

Document history

This guide covers the following product:
CloudMesh Satellite (NS-01)

VER.	DOCUMENT DESCRIPTION	DATE
v1.0	Initial document release	26 May 2020
v1.1	Corrected hostname URL	15 Jul 2020

Table i. – Document revision history

Overview

Introduction

This document provides information related to the installation, operation, and use of the CloudMesh Satellite.

Prerequisites

To complete the installation of the CloudMesh Satellite, you may require the following items:

- A CloudMesh-enabled gateway with an active Internet connection.
- A computer with an Ethernet adapter or wireless 802.11a/b/g/n/ac capability and the TCP/IP Protocol installed.
- A smartphone or tablet with the Android™* or iOS # operating system.
- A current version of a web browser such as Mozilla Firefox® or Google Chrome™.

Notation

The following symbols may be used in this document:

Note – This note contains useful information.

Important – This is important information that may require your attention.

Warning – This is a warning that may require immediate action in order to avoid damage or injury.

Package contents

The CloudMesh Satellite package consists of:

- 1 x NetComm CloudMesh Satellite (NS-01)
- 1 x RJ45 Ethernet cable
- 1 x Quick Start Guide
- 1 x Warranty Card
- 1 x End User License Agreement (EULA)
- 1 x USB-C Power Adaptor (5V/3A)

If any of these items are missing or damaged, please contact NetComm Wireless Support immediately by visiting the NetComm Wireless Support website at: **https://support.netcommwireless.com/**

Product features/functionality

Perfect for

- End-users living in larger units/houses searching for a seamless whole-home network solution to improve WiFi coverage.
- ISPs looking to provide a cost-effective, fully integrated WiFi Mesh solution with full control and visibility of all access points to their new and existing customers
- ISPs who want to reduce the number of WiFi-related support calls, using self-adapting WiFi Technology on the WiFi Mesh Satellites.

Key features

- Automated WiFi issue resolution with WiFi Auto Pilot
- Seamless connection with a CloudMesh Gateway
- CloudMesh App for WiFi Analytics and Troubleshooting
- LED light bar for indicating the optimal placement of each satellite
- 2 x Gigabit Ports for versatile connectivity
- Vertical PCB and Antenna design for increased Wi-Fi coverage and cooling
- Qualcomm-based chipset for powerful WiFi
- Zero-touch setup, Cloud Orchestration, and Seamless WiFi Client Roaming for best user experience

Interfaces

Front view

Figure 1 – Front view interface

NO	INTERFACE	DESCRIPTION
1	**LED indicator**	Provides a visual representation of the status of the CloudMesh Satellite.
		Refer to the LED indicator section on page 10.

Table 1 – Front view interfaces

Rearview

Figure 2 – Rear view interfaces

NO.	INTERFACE	DESCRIPTION
1	Ethernet ports	Gigabit Ethernet LAN ports. Can be used to connect clients in bridge mode.
2	USB-C power adapter port	Connect the included power adapter here.
3	WPS button	Push this button within 2 minutes of pushing the 5GHz WPS button on the CloudMesh Gateway to connect (pair) them. During the pairing process, the LED indicator on the front side of the CloudMesh Satellite will be flashing purple, see page 9.

Table 2 – Rearview interfaces

Bottom view

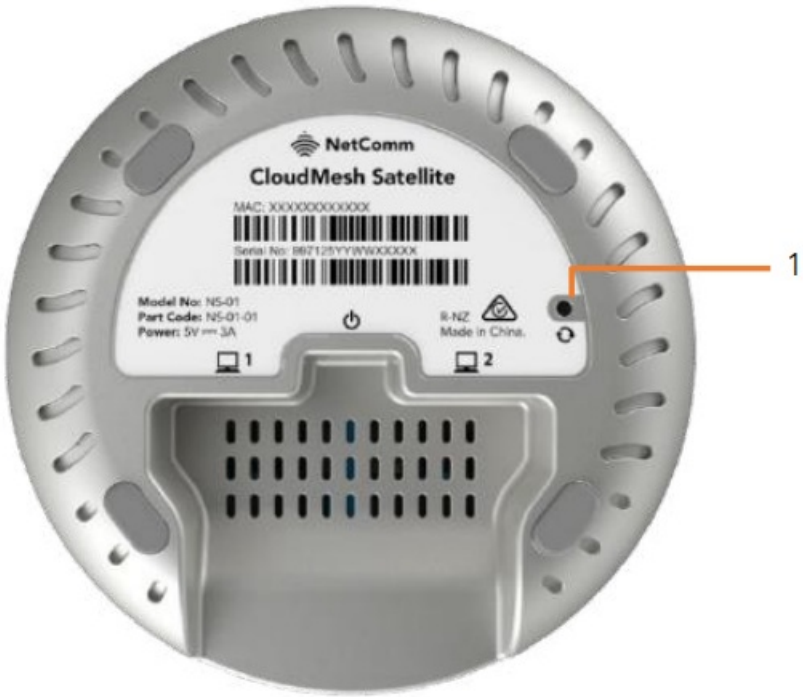

Figure 3 – Front view interfaces

NO	INTERFACE	DESCRIPTION
1	Reset button	To reset the CloudMesh Satellite, insert a straightened paper clip or similarly shaped object into the small hole marked with the reset icon and hold for ten (10) seconds.

Table 3 – Bottom view interface

Physical dimensions and weight

The table below lists the physical dimensions and weight of the CloudMesh Satellite.

DIMENSIONS	
Width	113 mm
Height	145 mm
Depth	110 mm
Weight	320 grams

Table 4 – Physical dimensions and weight

CloudMesh Satellite location

Figure 4 - WiFi coverage diagram

Your CloudMesh Satellite works best when it is placed in a central location to the area you want to cover. Ideally, it should be located no more than two rooms away from the CloudMesh Gateway. To increase the size of your mesh network, you can add multiple CloudMesh Satellites.

Signal strength

The wireless connection between your CloudMesh Satellite and your various WiFi client devices will be strong when they are in close proximity and have direct line of sight. As your client device moves further away from the CloudMesh Satellite / CloudMesh Gateway or solid objects block direct line of sight to the gateway or satellite, your wireless performance may degrade. This may not be directly noticeable and is greatly affected by the individual installation environment.

If you have concerns about your network's performance that might be related to the range or obstruction factors, try moving the device to a position between three to five meters from the CloudMesh Satellite or CloudMesh Gateway to see if the distance is the problem.

Note – While some of the items listed below can affect network performance, they will not prohibit your wireless network from functioning; if you are concerned that your network is not operating at its maximum effectiveness, this checklist may help

If you experience difficulties connecting wirelessly between your WiFi Devices and your CloudMesh network,

please try the following:

- In multi-story homes, place the CloudMesh Satellite on a floor that is as close to the center of the home as possible. This may mean placing the CloudMesh Satellite on an upper floor.
- Try not to place the CloudMesh Satellite near a cordless telephone that operates at the same radio frequency as the CloudMesh Satellite (2.4GHz/5GHz).

Avoiding obstacles and interference

Avoid placing your CloudMesh Satellite near devices that may emit radio “noise,” such as microwave ovens.
If your wireless signal seems weak in some spots, make sure that objects such as those listed below are not blocking the signal’s path between your devices and the CloudMesh Satellite.
Dense objects that can inhibit wireless communication include:

- Refrigerators
- Washers and/or dryers
- Metal cabinets
- Large aquariums
- Metallic-based, UV-tinted windows

Pair the CloudMesh Satellite with your CloudMesh Gateway

Preconfigured – already paired

If the CloudMesh Satellite and the CloudMesh Gateway have been preconfigured by your internet service provider, the devices will already have been paired together and you can turn on both devices and begin using them.

Normal operation of paired devices

The startup sequence of paired a CloudMesh Satellite that is paired with a CloudMesh Gateway is as follows:

1. Turn on your CloudMesh Gateway (refer to the CloudMesh Gateway User Guide).
2. Connect to the Internet.
3. Position the CloudMesh Satellite within a distance of the CloudMesh Gateway (refer to CloudMesh Satellite location section of this guide, above).
4. Connect the power adapter to the CloudMesh Satellite, the LED will flash red.
5. The CloudMesh Satellite will start initializing, the LED will be solid purple.
6. Wait 10 minutes as the CloudMesh Satellite attempts to pair with the CloudMesh Gateway, the LED will flash blue.
7. When the satellite has been paired with the gateway the LED will be solid white or blue, depending on the signal strength.
   If the LED is solid red, this means the signal is poor.
   
   Important – Reposition the Satellite closer to the Gateway.
   Refer to the **CloudMesh Satellite location** section of this guide, above.
8. The CloudMesh Satellite is now ready to use.

Paired via WPS

If the CloudMesh Satellite and the CloudMesh Gateway have not been set up by your internet service provider, you will need to pair these devices together.
The CloudMesh Satellite can pair with a CloudMesh Gateway using the WPS (Wi-Fi Protected Setup™) functionality of each device.

1. Place the CloudMesh Satellite next to your CloudMesh Gateway.
2. Connect to power, switch on and wait for both devices to power on.
3. If the CloudMesh Satellite LED light is still flashing blue after ten minutes, this confirms that you will need to pair it with the CloudMesh Gateway.
4. Ensure that the CloudMesh Gateway is connected to the Internet.
5. Press and release the WPS button on the rear of the CloudMesh Satellite.
6. The LED on the CloudMesh Satellite will flash purple to indicate that the WPS pairing window has started and will last for two minutes.
7. Press and release the 5G WPS button on the CloudMesh Gateway while CloudMesh Satellite LED is still flashing purple.
8. The pairing process can take up to five minutes. It is normal for the CloudMesh Satellite LED to transition to flash blue to indicate that pairing is in progress.
9. When the pairing process is complete, CloudMesh Satellite's LED light will indicate signal strength, see the LED indicators section below.
10. Position the CloudMesh Satellite in a satisfactory location on your premises and begin using your new mesh.

Pair via Ethernet cable

An alternative pairing method to using WPS (see page 9) is to use the yellow RJ45 Ethernet cable (supplied with the satellite) connected to the Ethernet port of each device to pair the CloudMesh Satellite with a CloudMesh Gateway.

1. Place the CloudMesh Satellite next to your CloudMesh Gateway.
2. Connect to power, switch both on, and wait for both devices to power on.
3. If the CloudMesh Satellite LED light is still flashing blue after ten minutes, this confirms that you will need to pair it with the CloudMesh Gateway.
4. Ensure that the CloudMesh Gateway is connected to the Internet.
5. Plug the yellow RJ45 Ethernet cable (supplied with the satellite) into any of the Ethernet ports on the back of each device.
6. Allow 2 minutes for the CloudMesh Satellite to download information from CloudMesh Gateway, the LED will turn solid white.
7. When the satellite has been paired with the gateway the LED will be solid white or blue, depending on the signal strength.
8. Unplug the ethernet cable from between the two devices and wait 10 minutes as CloudMesh Satellite attempts to pair with the CloudMesh Gateway, the LED will flash blue.
9. Position the CloudMesh Satellite in a satisfactory location on your premises.
10. Power on the CloudMesh Satellite and begin using your new mesh.

LED indicators

The following table explains the meaning of the different colored LED indicator lights and actions.

LED	LED ACTIVITY	MEANING
	Briefly flashes red	Powering on
	Flashing blue	Pairing in progress
	Flashing purple	WPS pairing window
	Solid white	Pairing successful: Good signal
	Solid blue	Pairing successful: Medium signal
	Solid red	Pairing successful: Poor signal
	Flashing red	Firmware upgrade in progress

Table 5 – LED indicator meanings

Connect client devices

You can connect any number of WiFi-enabled client devices to the internet via the NS-01 CloudMesh Satellite

using the WPS (WiFi Protected Setup™) functionality of each device.
In addition, you can connect two peripheral client devices using the ethernet points on the back of the NS-01 CloudMesh Satellite.

Connect a client via WPS

The NS-01 provides two methods to establish a connection with client devices:

- WPS (WiFi Protected Setup™) functionality
- Connection via Ethernet

Connect a device using the WPS button (default setting)

1. Bring a WPS-enabled device within WiFi range and press the WPS button on the back of the CloudMesh Satellite.
2. The LED on the front of the CloudMesh Satellite will flash purple for up to two minutes.

   Note – You can also connect a client device using the WPS button on the CloudMesh Gateway (or another CloudMesh Satellite on your wireless mesh).

   Once it is connected using one device, it will be connected to all the gateways and satellites on your CloudMesh network.
3. Once the device is connected, the WPS LED will remain illuminated.

Connect a client via Ethernet cable

Alternatively, you can directly connect a device, for example, a printer, to the CloudMesh Satellite using an ethernet cable.

1. Connect the yellow Ethernet cable provided to one of the yellow ports marked ‘Ethernet’ at the back of the NS-01.
2. Connect the other end of the yellow Ethernet cable to your client device.

Turn off the LED light

Figure 5 – Turn off LED display

In some locations, for example, a bedroom, the LED light may become an unwanted distraction.
To control the display of the CloudMesh Satellite’s LED light, press and hold the WPS button for 7 seconds to

switch the light's display between ON and OFF.

NS-01 Web User Interface

This section contains information on accessing the NS-01's web user interface and how to perform firmware upgrade and access the logging feature.

NS-01 firmware upgrade

Periodically both the gateway and its satellites will have firmware updates released to improve their performance. We recommend always applying the latest upgrade when it becomes available, and at the same time, you should check that the other components of the mesh also have their most recent version of firmware installed.
There are two ways of accessing the NS-01 Web User Interface. The method to use depends on whether or not the CloudMesh Satellite is paired with its Gateway or not.
If the CloudMesh Satellite is currently paired to a CloudMesh Gateway you can access the NS01's Web User Interface by typing its unique hostname into the URL test entry box.
The unique hostname for each CloudMesh Satellite is based on the following formula:

- **http://ns-01-.local**
- Where XXXX is the last 4 digits of that Satellite's unique serial number.

  The CloudMesh Satellite's serial number can be found on the label affixed to its bottom:

Figure 6 – Serial number on label on bottom of NS-01

If the device is not paired, please first follow Appendix B – Set NS-01 IP connectivity to access Web UI to set up a static IP for the Satellite and then continue from step 4.b of this section, below.
To access the NS-01 Web User Interface:

1. Connect the supplied power adapter into the USB connection on the bottom of your CloudMesh Satellite (NS-01) and plug the power adaptor into a PowerPoint.

   If necessary, switch the PowerPoint switch on at the wall.
2. Allow 60 – 90 seconds for the NS-01 to power up.
3. Connect the supplied RJ45 Ethernet cable from one of the two yellow ETHERNET ports on the bottom of the NS-01 CloudMesh Satellite to an Ethernet port on your computer.

Figure 7 – RJ45 Ethernet cable connecting PC with NC-01

4. Open a web browser (e.g. Internet Explorer, Firefox, Safari, etc) and type in the IP address appropriate for your Satellite:

   a If your CloudMesh Satellite is currently paired to a CloudMesh Gateway, type the unique hostname that you based on the formula described earlier in this section.

   b If your CloudMesh Satellite is not paired to a CloudMesh Gateway, type the static IP address that you defined using the instructions in Appendix B – Set NS- 01 IP connectivity to access Web UI.

5. At the Authorization Required screen:

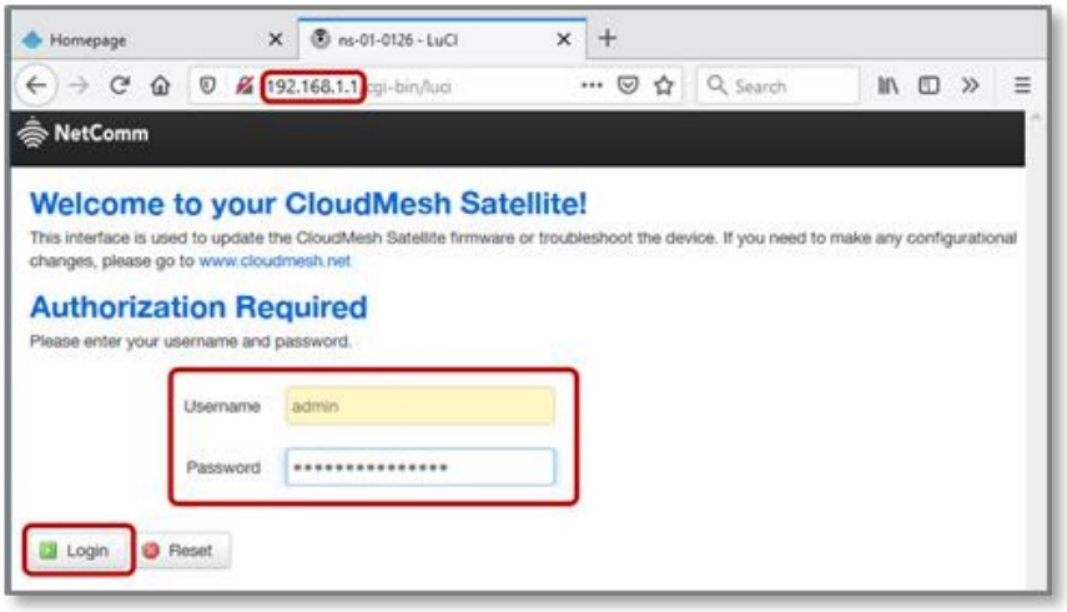

Figure 8 – Log in to NS-01 user interface

   a Type admin into the Username field,

   b Enter the serial number (Serial No) printed on the label on the label on the bottom of the NS-01 into the Password field, and

   c Click the Login button.

6. Upon successful login, the Status page will display.
7. Select System > Backup/Flash Firmware from the menu in the toolbar of the screen:

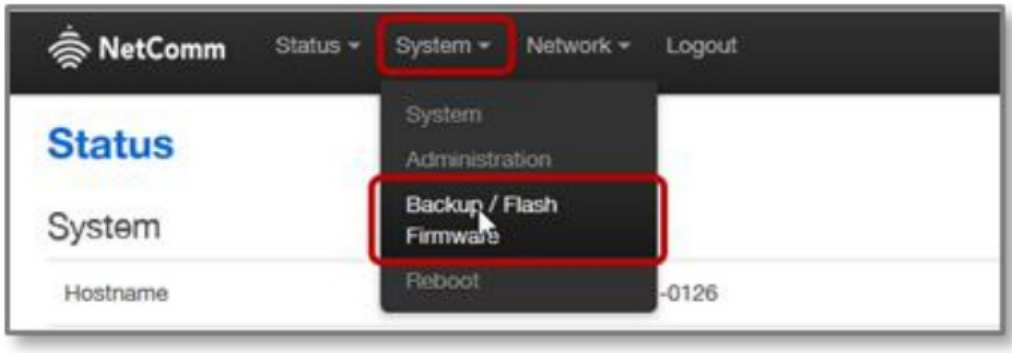

Figure 9 – Check current firmware version

8. From the Flash Operations screen select the Actions tab and in the Flash new firmware image section make the following settings:

   a Deselect the Keep settings option

   b Click the Browse button to locate and upload the NS-01 firmware upgrade file.

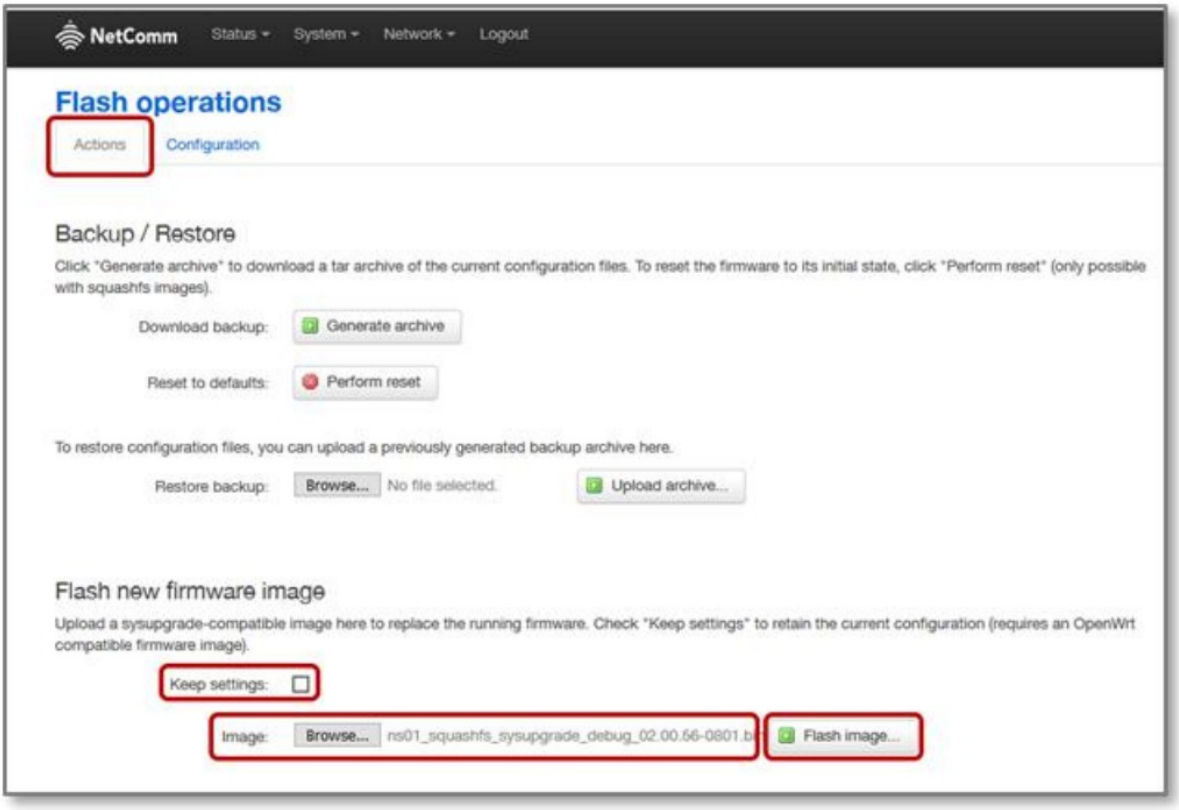

Figure 10 – Update firmware interface

   c When the file has been uploaded, its filename will appear immediately to the right of the Browse button.

   d Click the Flash image button to proceed.

9. The system will read the file and ask you to Verify its details:

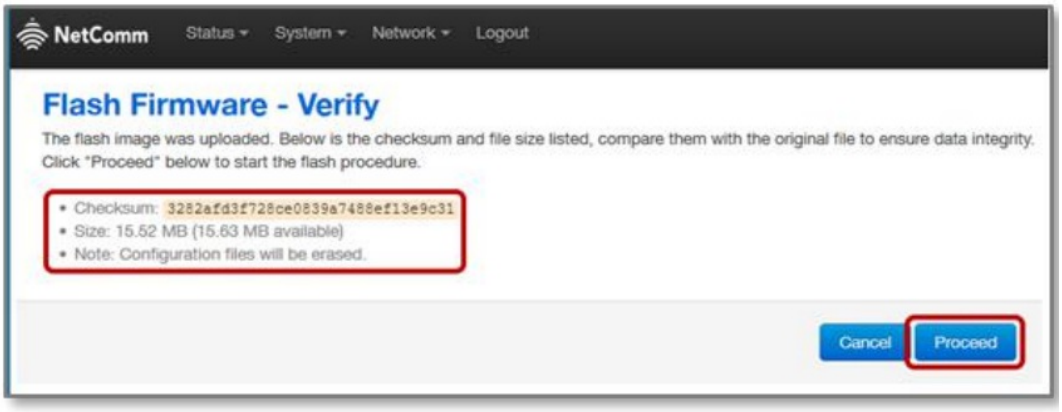

Figure 11 – Uploading in progress message

10. Click the Proceed button to finalize the upgrade process.
11. A progress message page appears:

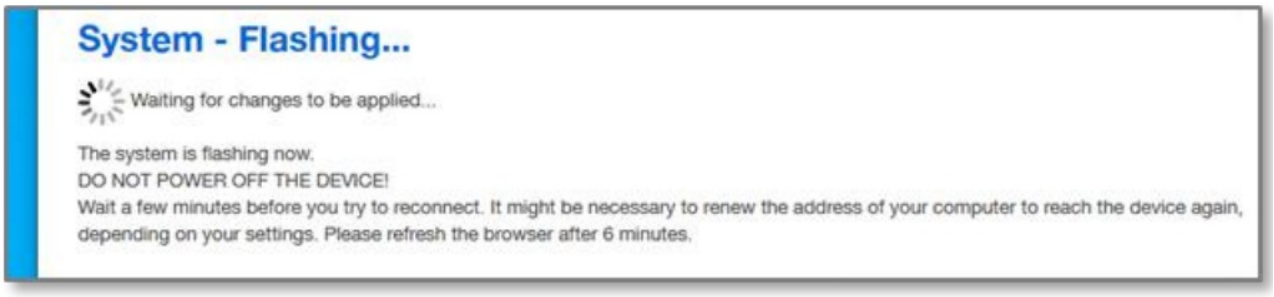

Figure 12 – Uploading in progress message

12. Wait four to six minutes and then refresh the browser, you will be returned to the Authorization Required screen.
13. Log in as you did in step 5, above.
    Upon successful login, the Status page will display.

View the NS-01 log

The NS-01 compiles a chronological log of all recent events.
In the NS-01's web user interface, click Status in the main menu and select System Log from its drop-down menu.

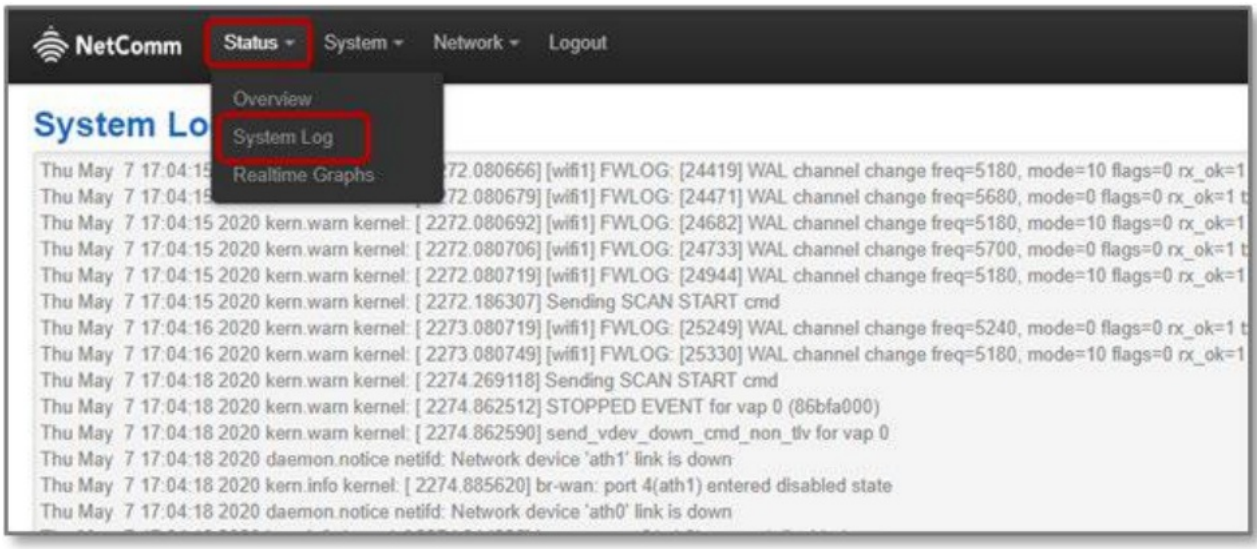

Figure 13 – System Log

Each log entry has a date and timestamp and a short description of the event.

CloudMesh Satellite reset

To reset the CloudMesh Satellite, insert a straightened paper clip or similarly shaped object into the small hole on the bottom of the satellite market with the reset icon.

Figure 14 – Location of reset button on bottom

Press and hold the reset button for ten (10) seconds to return the satellite to its factory default settings.

Note – The gateway and its satellite(s) will still be paired once connected to the internet. You will not have to repeat the pairing process, just start both up, connect the gateway to the internet and they will automatically pair (this pairing process may take a few minutes).

Appendix A – Safety Information

Please read before use:

LOCATION

This device is designed for indoor use only.
Place the device in a central location for the best WiFi performance.

AIRFLOW

Do not restrict airflow around the device.
The device is air-cooled and may overheat where airflow has been restricted.
Always allow a minimum clearance of 5cm around all sides and the top of the device.
Do not cover, do not put in an enclosed space, do not put under or behind large items of furniture.
Your device may become warm during normal use

ENVIRONMENT

Do not place this device in direct sunlight or any hot areas.
The safe operating temperature of this device is between 0° and 40°C Do not allow this device to come in contact with any liquid or moisture. Do not place this device in any wet or humid areas such as the kitchen, bathroom, or laundry rooms.

POWER SUPPLY

Always use only the power supply unit that came with the device. You should immediately stop using the power supply unit if the cable or power supply unit is damaged.

SERVICE

There are no user-serviceable components in the device.
Do not attempt to disassemble, repair, or modify the device.

SMALL CHILDREN

Do not leave your device and its accessories within the reach of small children or allow them to play with it. Your device contains small parts with sharp edges that may cause an injury or which could become detached and create a choking hazard.

RF EXPOSURE

The device contains a transmitter and a receiver. When it is on, it receives and transmits RF energy. The device conforms with the radio frequency (RF) exposure limits adopted by the Australian Communications and Media Authority Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2014 when used at a distance of not less than 20 cm from the body.

PRODUCT HANDLING

Always treat your device and its accessories with care and keep it in a clean and dust-free place.
Do not expose your device or its accessories to open flames.
Do not drop, throw or try to bend your device or its accessories.
Do not use harsh chemicals, cleaning solvents, or aerosols to clean the device or its accessories.
Do not paint your device or its accessories.
Please check local regulations for the disposal of electronic products.
Arrange power and Ethernet cables in a manner such that they are not likely to be stepped on or have items placed on them.

Appendix B – Set NS-01 IP connectivity to access Web UI

If your CloudMesh Satellite NS-01 is currently not paired to a CloudMesh Gateway you will have to access the Satellite directly using a separate IP address that you create for it.
As the CloudMesh Satellite does not have its own DHCP server, you must manually set the IP address of your PC to be the 192.168.1.x subnet.
The static IP address cannot be 192.168.1.1 and must be any number in the range: 192.168.1.2 to 192.168.1.254
To set a static IP address:

Figure 15 – Windows Start button

1. On the computer that you will use to connect to the NS-01 Satellite, click the Windows Start button in the lower-left:

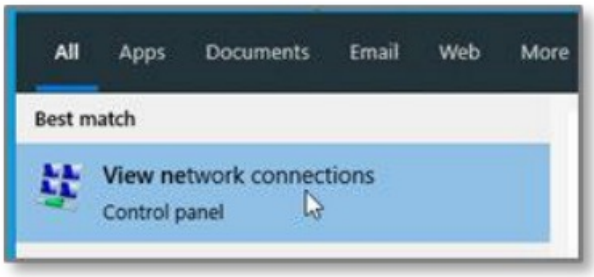

Figure 16 – Select View network connections

2. Type View Network Connections.
3. Select View Network Connections when it appears in the search results box:

Figure 17 – List of Network Connections

4. From the Network connections page, right-click on the connection that you had used to connect to the Gateway:

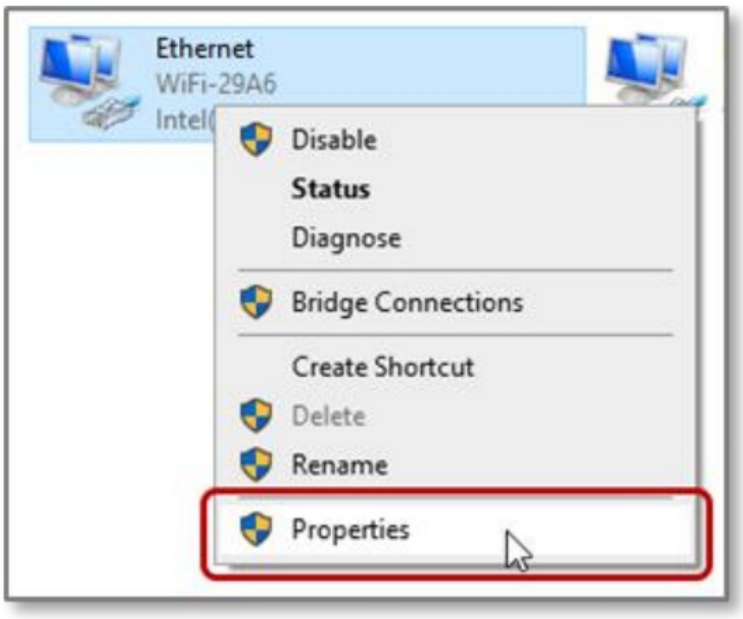

Figure 18 – Select Properties for current connection

5. Select Properties from the popup menu:

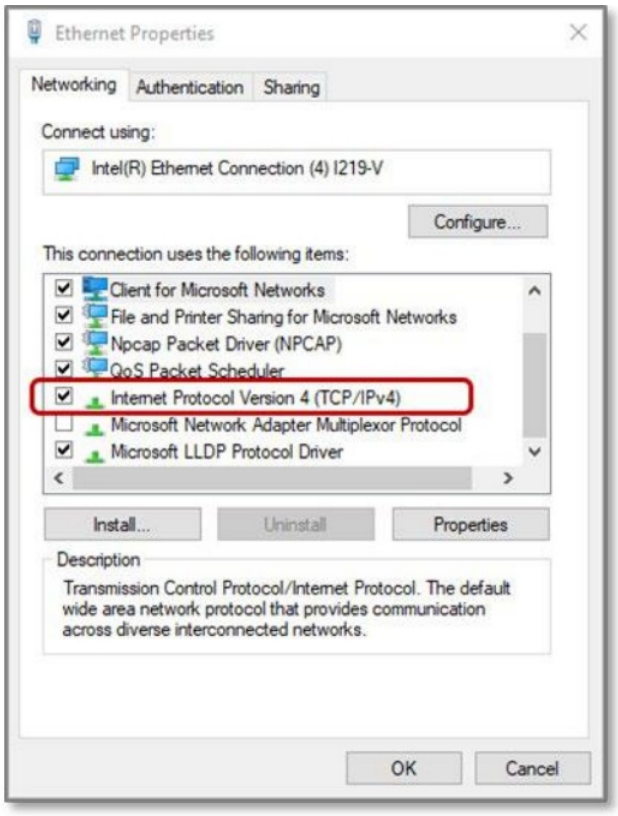

Figure 19 – Select ☑ Internet Protocol Version (TCP/IPv4)

6. In the Networking tab of the Ethernet Properties dialog box, go to the list of This connection uses the following items:

   Internet Protocol Version (TCP/IPv4)
7. Double click on Internet Protocol Version (TCP/IPv4), see blue highlight above.
8. The Internet Protocol Version (TCP/IPv4) Properties page appears:

Figure 20 – Set the static IP address

9. Select Use the following IP address to enter the details of the new static IP address for the NS-01 CloudMesh Satellite:
   an In the IP address text box enter any IP address in the range: 192.168.1.2 to 192.168.1.254
   b In the Subnet mask text box enter: 255.255.255.0
   c In the Default gateway text box enter the IP address of the CloudMesh Satellite: 192.168.1.1
10. Click the OK button to close the Internet in the Ethernet Properties dialog box.
11. Click the ⊗ close button to close the Network connections page.

Appendix C – Technical specifications

WIRELESS NETWORK

- IEEE 802.11 ac/n/g/a

WIRED NETWORK

- 2 x Auto-sensing Gigabit LAN ports

DIMENSIONS

- 113 (w) x 145 (h) x 110 (d) mm

WEIGHT

- 320g

POWER INPUT

- 100 V to 240 V/AC, 50/60 Hz

TEMPERATURE
Operating Temperature Range:

- 0 to 40 °C

Storage Temperature Range:

- -20 to 70 °C (-4 to 158 °F)

HUMIDITY
Operating Humidity Range:

- 10% to 90% non-condensing

Storage Humidity Range:

- 5% to 90% non-condensing

PART NUMBER

- NS-01-01

NetComm Wireless Limited was acquired by Casa Systems, Inc
Casa Systems, the future of NetComm

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Documents / Resources

	NetComm NS-01 CloudMesh Satellite [pdf] User Guide NS-01, CloudMesh Satellite, NS-01 CloudMesh Satellite