MMDVM Hotspot for Ethernet Setup Guide

Provided by Ham World

https://hamworldinc.com



Please read before powering your device for the first time.  
  
  
  
This guide outlines the initial setup procedures used to get started with your newly purchased Jumbospot, with a DMR radio.

This guide was written for the version of software included with your radio. Newer versions may, or may not work the same.

Last Updated May 1, 2023

Released under the Public Domain, however the Jumbospot, MMDVM, and Pi-star projects are the intellectual property of the respective owners and licenses.

Table of Contents

[Introduction 1](#_Toc132495900)

[Checklist: Do these things before connecting power. 2](#_Toc132495901)

[Setup Procedure. 3](#_Toc132495902)

[Configure your Pi-Star Hotspot. 4](#_Toc132495903)

[Configure your radio 6](#_Toc132495904)

[Troubleshooting 7](#_Toc132495905)

# Introduction

Thank you for your purchase of this MMDVM hotspot! This device is a handy way to connect to amateur radio in both Alabama and worldwide, via multiple modes.

With this device, you can use an inexpensive DMR Tier II radio, to connect to services such as DMR, D-Star, NXDN, and other digital repeater systems.

### Package Contents

* **1x Assembled MMDVM Hotspot (Jumbospot), with preloaded SD Card.**
* **1x Antenna.**
* **1x USB Charging Cable (USB Power Supply Not Included).**

### Technical Information

**This device features the following technology/requirements:**

* **A SDHC MicroSD Card Slot; Minimum 8GB Capacity Required (Included)**
* **An RJ-45 Ethernet Port. Wifi is not included in this model.**   
  However, there are some users who connected via a wifi dongle with the onboard USB port. You would need a RTL8188CUS wifi dongle.
* **Internet Connection Required.**
* **Power: MicroUSB, 2A 5V Minimum.**
* Transceiver Information:   
  ADF7021 IC, featuring a frequency range of 144-146MHz, 420-475MHz, 842-950MHZ.  
  **Included antenna center frequency is 433MHz; consider a different antenna if going outside of the 70CM Band.**
* **Platform:**NanoPi NEO v1.3, A3. 256MB RAM Onboard.  
  MMDVM\_HS\_NPi

# Checklist: Do these things before connecting power.

* Ensure that you have a Windows PC available, with access to install software, and the internet.
* Ensure that you have a DMR ID for the hotspot.  
  If you don’t have an ID, register one here: <https://www.radioid.net/register>
* Pull a backup of the SD Card, in case of any issues.  
  Having a micro SD Card Reader is very helpful when troubleshooting.  
  Alternate backup: <https://www.dropbox.com/s/01mfuk9xv7ie5yh/mmdvm-nanopi-backup.zip?dl=0>   
  Source backup:
* Ensure that you have an ethernet/RJ45 cable, and a free port on your internet router/switch.  
   *For this guide, we assume you are using a standard ISP-provided ethernet router/gateway, and not using a corporate/workplace style network. Standard setups typically automatically assign an IP address configuration.  
    
  We will provide guidance, but ultimately cannot provide support for all internet service providers and router equipment.*
* Ensure that you have the SD Card inserted into the SD card slot, label side up.
* Ensure that you have the antenna connected.
* Connect one end of the ethernet cable to the hotspot, and the other end to a LAN or switch port on your router.

## Setup Procedure.

Once all steps are completed from above, you are ready to power up your device for the first time.

1. Plug in the USB power supply and cable.  
   The device will take a few moments to initialize and start up.  
   You may see the device’s ethernet lights flashing quite rapidly for a short time, and there will be an LED in the corner that will alternate between green and yellow.
2. Go to your PC, on the same network/switch, and open a web browser to:  
   <http://pi-star/>  
     
   *\*Ensure that you type it exactly as above, or your web browser may think you are trying to search the web*  
     
   Alternatively, if you prefer identifying the IP address, go to Start, type CMD, and open the Command Prompt. Then, enter PING PI-STAR.  
   The IP address will be displayed in the “Reply From.”  
   This is the address you can point your web browser to as well.
3. Once you first access Pi-Star via your web browser, it will complain “No Mode Defined.”  
   Wait a couple of moments, and it will send you to the admin/configure password box.  
     
   The default login information is:  
   Username: pi-star  
   Password: raspberry  
     
   Updating it to a strong password later is highly recommended.
4. Once you are logged in, you will see “Pi-Star Digital Voice – Configuration.  
   This is where you will set up your Pi-Star.  
     
   The next section will cover the things which should be configured.

## Configure your Pi-Star Hotspot.

1. Control Software
   1. Controller Software: MMDVMHost (Do not change this)
   2. Controller Mode: Simplex Node (Do not change this)
2. General Configuration
   1. Hostname: pi-star (Recommend keep this the same)
   2. Node Callsign: [Enter the callsign used for DMR-ID registration]
   3. Radio Frequency: 438.8 MHz (Change this. Consult local band plans, listen to make sure that you aren’t causing harmful interference.)  
      *438.8 MHz is great for 5-20mW from the hotspot, but your 1W handheld can cause interference with satellite stations. Generally, avoid 435-438MHz.*
   4. Latitude, Longitude: [Enter the latitude/longitude of where this unit will be used most]  
      *Note: To find Lat/Lon coordinates, you can use* [*https://maps.google.com*](https://maps.google.com)*, enter an address. The result will show, but the URL will also show an @ symbol just before the Latitude/Longitude*.
   5. Town: [Enter your town, and locator]
   6. Country: [Enter your country]
   7. Node Type: Private (normally).  
      Some users have created full repeater systems. Use Public with caution.
   8. APRS Host Enable: [Enable if desired]
   9. APRS Host: [Choose your APRS Host, if applicable]  
      US Users will typically use noam.aprs2.net
   10. System Time Zone: [Choose your time zone]  
       Note: US Users should use the time zones prefixed with America/.
   11. Dashboard Language [Select your preferred language]
   12. **Click Save. You will see a warning. Click ok.  
       Select the Radio/Modem Type  
       STM32-DVM / MMDVM\_HS – Raspberry Pi Hat (GPIO)  
       Click Apply Changes.**
3. The page will refresh and uncover more configuration options.
4. Mobile GPS Configuration: Normally not applicable.
5. Firewall Configuration  
   The device has its own firewall.
   1. Dashboard Access: Private
   2. ircDDBGateway Remote: Private
   3. SSH Access: Private
   4. Auto AP: On  
      This facilitates wifi devices to be configured over wifi if no connection is found.
   5. uPNP: On  
      This attempts to autoconfigure consumer-grade router firewalls.  
      \*uPNP is sometimes considered as a security risk, and may not be required.
6. Remote Access Password:   
   Change this to something that you can remember, but a strong password.
7. MMDVMHost Configuration (scroll back up)  
   This depends on how you plan on using this hotspot.  
   Examples below:
   1. MMDVM Display Type: OLED Type 6 on port /dev/ttyama0
   2. Set the modems that you expect to use to ON.
   3. DMR Mode: On  
      Click Apply Changes.
   4. Now, go back to General Configuration.
8. General Configuration:
   1. CCS7/DMR ID: [Enter your registered DMR ID]
9. DMR Configuration
   1. DMR Master: [Select the appropriate master server, such as Brandmeister BM\_ for your region]
   2. Brandmeister Master: [Same. Can actually be same as DMR Master]  
      You will want to register at <https://brandmeister.network/>
   3. BM Hotspot Security: [If you have one, enter it here]  
      This is set in BrandMeister, under SelfCare, for your hotspot’s DMR ID.
   4. Brandmeister Network ESSID: [Select the ESSID – Allows you to have more than one item under your call]
   5. Similar settings for DMR+, and XLX (D-Star)
   6. DMR Color Code: [IMPORTANT – Remember what you set this to]
10. D-Star Configuration (If enabled)  
    Set as desired.
11. Yaesu System Fusion (If enabled)  
    Set as desired. You may prefer WiresX passthrough.
12. Once you save your settings, go to Backup that configuration.  
    It can be reused later if troubleshooting, or if you have a second hotspot.

## Configure your radio

Once you have configured your Pi-Star hotspot to your liking, it’s time to add channels to your DMR radio. As there are many DMR radios at the time of this writing, we can only provide general information.

* Transmit and Receive Frequency: [The earlier frequency you defined in Configuration]
* Color Code: [The earlier color code you defined, default is 1]
* Time Slot: 2 [You can check in the Dashboard tab]
* Set up your talk groups just like you would for any other DMR repeater.
* Recommend lowest transmit power possible.

### Yaesu Fusion: Using Wires-X commands

* YSF Startup Host: None
* Uppercase Hostfiles: Off (FT-70 is the only radio requiring this)
* WiresX Passthrough: On.
* Note: Sometimes, a mobile/base radio may transmit a bit too hot for the receive side.

## Troubleshooting

* Sometimes, if you upgrade/update, things break.  
  There is no shame in starting over again, and trying again.  
  If you need to rewrite/start from scratch, use the backup you saved earlier, or:  
  <https://www.dropbox.com/s/01mfuk9xv7ie5yh/mmdvm-nanopi-backup.zip?dl=0>  
    
  To write this to an SD Card, you can use Win32DiskImager:  
  <https://win32diskimager.org/>   
    
  Be careful to ensure that you select the correct drive letter. Overwriting the wrong drive, like C: could render your PC inoperable.
* If you get any Brandmeister Access Denials, check to make sure that TOTP is disabled.  
  Sometimes, too much security, can be bad.
* Community Based Support Options:
  + The Source: <https://www.pistar.uk/>
  + Forum: <https://forum.pistar.uk/>
  + Facebook Group: https://www.facebook.com/groups/pistarusergroup/
* Network related:  
  We have found that having a router behind a router can cause issues. This condition is called “Double-NAT.” Try placing the device on the first router nearest to the internet.
* D-Star Net Status Red:  
  This is something of a known issue in Pi-Star 4.1.5, but that is the newest version of Pi-Star.  
    
  To fix this, you will need to.
  + Click Expert at the top of the screen (Be careful, dragons ahead!)
  + Click on ircDDBGateway
  + Press Ctrl+F together, which will open a place where you can type.  
    This is a Web Page Search tool in most web browsers.
  + Enter M1ABC, and kit enter.
  + Change all references to M1ABC to your callsign. There may only be one.
  + Click Apply Changes.
  + Return to the Dashboard for a quick check. You should see D-Star Net in green now. You might also see your hotspot display light up with a D-Star logo.