

Mini 2.4 Color LCD ZUMspot

The Mini 2.4 Color LCD ZUMspot kit is a low power simplex digital mode hotspot. It supports D-Star, DMR, Fusion, NXDN, P25, M17 and POCSAG.



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ZUMspot board specifications:

- ZUMspot Board Fully Assembled And Tested
- High performance 32-bit ARM processor
- Supports DMR, P-25, D-Star, System Fusion, NXDN, M17 and POCSAG
- Onboard LEDs to show status (Tx, Rx, PTT, Mode)
- Up to 10mW RF power
- SMA antenna connector, UHF antenna included
- The firmware is pre-loaded and is easily upgraded via software

Kit includes:

- ZUMspot RPi UHF modem Board
- Raspberry Pi Zero 2 WH
- Custom case
- 3A power supply
- 2.4" LCD screen
- UHF Antenna
- Pre-Imaged MicroSD Card with WPSD Software
- 1 Year Warranty

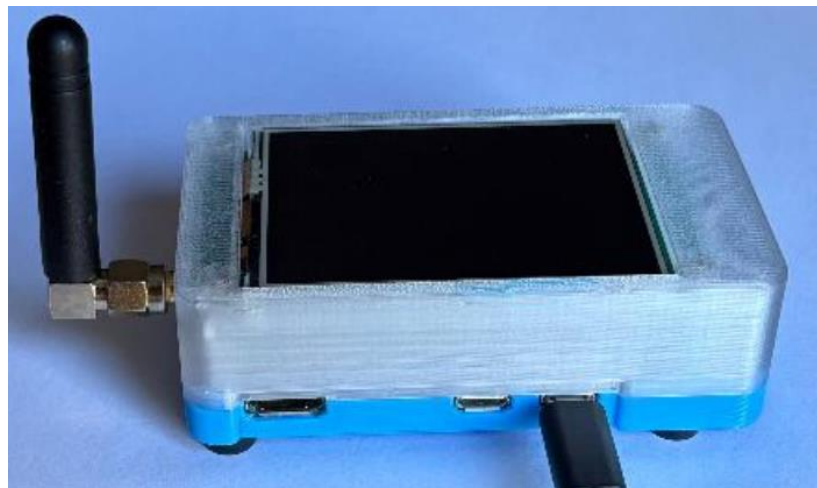
Setup:

- Make sure the SD card is installed in the Raspberry Pi Zero 2 board
- Install the antenna onto the SMA RF connector



Powering up:

- Plug in the Micro USB power cable to the Mini 2.4 Color LCD ZUMspot kit. Then plug the cable into the wall adapter and insert that into an AC outlet.
- If the Mini 2.4 Color LCD ZUMspot kit doesn't power up, then press the switch on the cable and it should power up now.



Setup WPSD:

Wi-Fi:

- Power up the Mini 2.4 Color LCD ZUMspot kit.
- After 3 minutes, scan for Wi-Fi access points from the phone or laptop. One should appear with the name “**WPSD-Setup**”
- Connect to it. When asked for the Wi-Fi password type in: raspberry
- Next, go to the web browser (Chrome, Firefox, etc.) and connect to the WPSD Dashboard page.

For WPSD versions based on Bullseye (Debian 11) use these URLs:

<http://wpsd> (for Windows, Linux and Android devices)

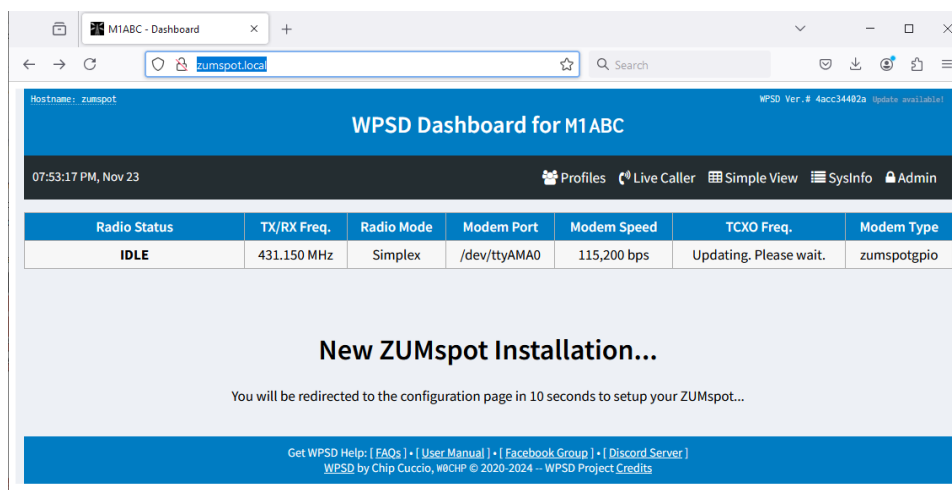
<http://wpsd.local> (for OS X and iOS devices)

For WPSD versions based on Bookworm (Debian 12) use these URLs:

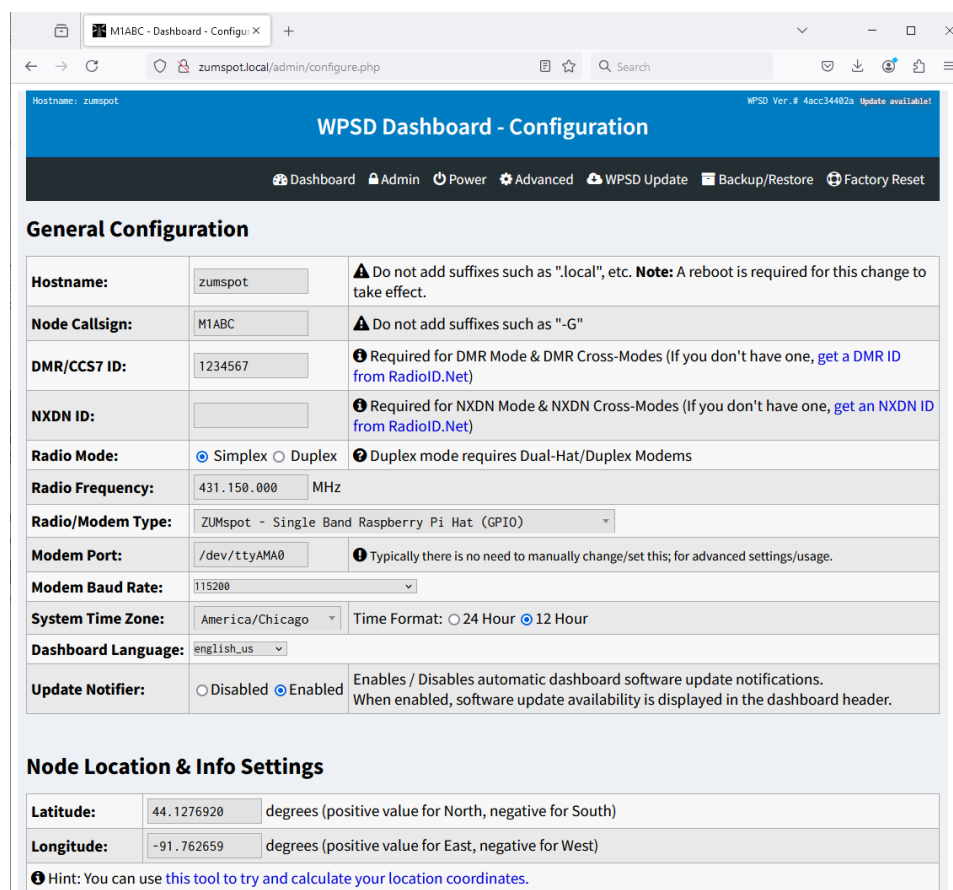
<http://zumspot> (for Windows, Linux and Android devices)

<http://zumspot.local> (for OS X and iOS devices)

- It should first go to the “New ZUMspot Installation” screen.



- It should switch automatically to the “WPSD Dashboard - Configuration” screen. If asked, enter the username which is “**pi-star**” and the password which is “**raspberry**”.



Hostname: zumspot WPSD Ver. # 4acc34402a Update available!

Dashboard Admin Power Advanced WPSD Update Backup/Restore Factory Reset

General Configuration

Hostname:	zumspot	⚠ Do not add suffixes such as ".local", etc. Note: A reboot is required for this change to take effect.
Node Callsign:	M1ABC	⚠ Do not add suffixes such as "-G"
DMR/CCS7 ID:	1234567	ℹ Required for DMR Mode & DMR Cross-Modes (If you don't have one, get a DMR ID from RadioID.Net)
NXDN ID:		ℹ Required for NXDN Mode & NXDN Cross-Modes (If you don't have one, get an NXDN ID from RadioID.Net)
Radio Mode:	☒ Simplex ☐ Duplex	⚠ Duplex mode requires Dual-Hat/Duplex Modems
Radio Frequency:	431.150.000 MHz	
Radio/Modem Type:	ZUMspot - Single Band Raspberry Pi Hat (GPIO)	
Modem Port:	/dev/ttyAMA0	ℹ Typically there is no need to manually change/set this; for advanced settings/usage.
Modem Baud Rate:	115200	
System Time Zone:	America/Chicago	Time Format: ☐ 24 Hour ☒ 12 Hour
Dashboard Language:	english_us	
Update Notifier:	☐ Disabled ☒ Enabled	Enables / Disables automatic dashboard software update notifications. When enabled, software update availability is displayed in the dashboard header.

Node Location & Info Settings

Latitude:	44.1276920	degrees (positive value for North, negative for South)
Longitude:	-91.762659	degrees (positive value for East, negative for West)

ℹ Hint: You can use [this tool to try and calculate your location coordinates](#).

- Scroll down to the section called “Wireless Configuration”.

The screenshot shows a web browser window at the URL `zumspot.local/admin/configure.php`. The page has a light blue header and a sidebar on the left. The main content area is titled "Dashboard - Configu" and contains several configuration sections. A red rectangular box highlights the "Wireless Configuration" section. Below this section, there are fields for "Auto AP SSID" (set to "zumspot") and "PSK", and a "Remote Access Password" section with "User Name" (set to "pi-star") and "Password" fields. A note at the bottom states: "NOTE: This changes the password for admin pages, this configuration page AND the 'pi - star' SSH account." The footer contains links for "Get WPSD Help", "FAQs", "User Manual", "Facebook Group", and "Discord Server", along with copyright information for WPSD by Chip Cuccio, WCHP © 2020-2024 -- WPSD Project Credits.

Note: The following options cannot be made Public until UPnP is Enabled.

Dashboard Access:	☒ Private ☐ Public
ircDDBGateway Remote:	☒ Private ☐ Public
SSH Access:	☒ Private ☐ Public

AccessPoint Mode

Auto AP: ☒ On ☐ Off **Note:** Reboot Required if changed

Wireless Configuration

(No Connections Configured)

Add Connections

Action:

Select Country:

Auto AP SSID	PSK
zumspot	PSK: Confirm PSK: Set PSK

Remote Access Password

User Name	Password
pi-star	Password: Confirm Password: Set Password

NOTE: This changes the password for admin pages, this configuration page AND the 'pi - star' SSH account.

Get WPSD Help: [FAQs](#) | [User Manual](#) | [Facebook Group](#) | [Discord Server](#)
WPSD by Chip Cuccio, WCHP © 2020-2024 -- WPSD Project Credits

- Click on the “**Choose Action**” dropdown menu and select “**Scan and add available networks**”.

The screenshot shows the 'M1ABC - Dashboard - Config' web interface. At the top, a note states: 'Note: The following options cannot be made Public until UPnP is Enabled.' Below this are three rows for 'Dashboard Access:', 'ircDDBGateway Remote:', and 'SSH Access:', each with 'Private' (selected) and 'Public' radio buttons. The 'AccessPoint Mode' section has an 'Auto AP:' toggle set to 'On' (with 'Off' also visible) and a note: 'Note: Reboot Required if changed'. The 'Wireless Configuration' section contains a box with '(No Connections Configured)' and an 'Add Connections' button. A dropdown menu is open from the 'Add Connections' button, showing three options: 'Choose Action...', 'Scan & Add Available Networks (10 secs.)', and 'Add Connection Manually'. The 'Auto AP SSID' and 'PSK' section shows 'zumspot' for the SSID and empty fields for PSK, with a 'Set PSK' button. The 'Remote Access Password' section has a table with 'User Name' and 'Password' columns, showing 'pi-star' for the user name and empty fields for the password, with a 'Set Password' button. A note below states: 'NOTE: This changes the password for admin pages, this configuration page AND the 'pi-star' SSH account.' At the bottom, a footer contains links for 'Get WPSD Help: [FAQs] • [User Manual] • [Facebook Group] • [Discord Server]' and 'WPSD by Chip Cuccio, W8CHP © 2020-2024 - WPSD Project Credits'.

- Enter the “**Passphrase**” for the preferred Access Point (AP), and then click “**Add This Network**”.

MIABC - Dashboard - Configu- X

zumsport.local/admin/configure.php

Note: The following options cannot be made Public until UPnP is Enabled.

Dashboard Access: ☒ Private ☐ Public

ircDDBGateway Remote: ☒ Private ☐ Public

SSH Access: ☒ Private ☐ Public

AccessPoint Mode

Auto AP: ☒ On ☐ Off **Note: Reboot Required if changed**

Wireless Configuration

SSID	Signal Strength	Band	Channel	Security Type	Passphrase	Add Connection
SMA1990032704	64%	2.4 GHz	1	WPA2	Enter Passphrase	Add This Network
NETGEAR32	54%	2.4 GHz	1	WPA2	Enter Passphrase	Add This Network
SuperHouse Guest	37%	2.4 GHz	1	WPA2	Enter Passphrase	Add This Network
CG3000DV208	37%	2.4 GHz	11	WPA2	Enter Passphrase	Add This Network
SuperHouse	34%	2.4 GHz	1	WPA2	Enter Passphrase	Add This Network
Ted490	32%	2.4 GHz	6	WPA3	Enter Passphrase	Add This Network
Eero-MasterBedroom	32%	2.4 GHz	6	WPA2	Enter Passphrase	Add This Network
PencilsXIV	25%	2.4 GHz	3	WPA2	Enter Passphrase	Add This Network
MauiWaii-guest	25%	2.4 GHz	11	WPA2	Enter Passphrase	Add This Network
MauiWaii	19%	2.4 GHz	11	WPA2	Enter Passphrase	Add This Network

(No Connections Configured)

Add Connections

Action: Choose Action...

- The message “**successfully added**” should be displayed, and Interface Status should show “**Interface is active**”.

The screenshot displays the configuration page of the ZUMspot kit. At the top, there is a note: "Note: The following options cannot be made public until VPN is enabled." Below this, there are three sections for access settings: "Dashboard Access:", "ircDDBGateway Remote:", and "SSH Access:", each with "Private" and "Public" radio buttons. The "Private" option is selected for all three.

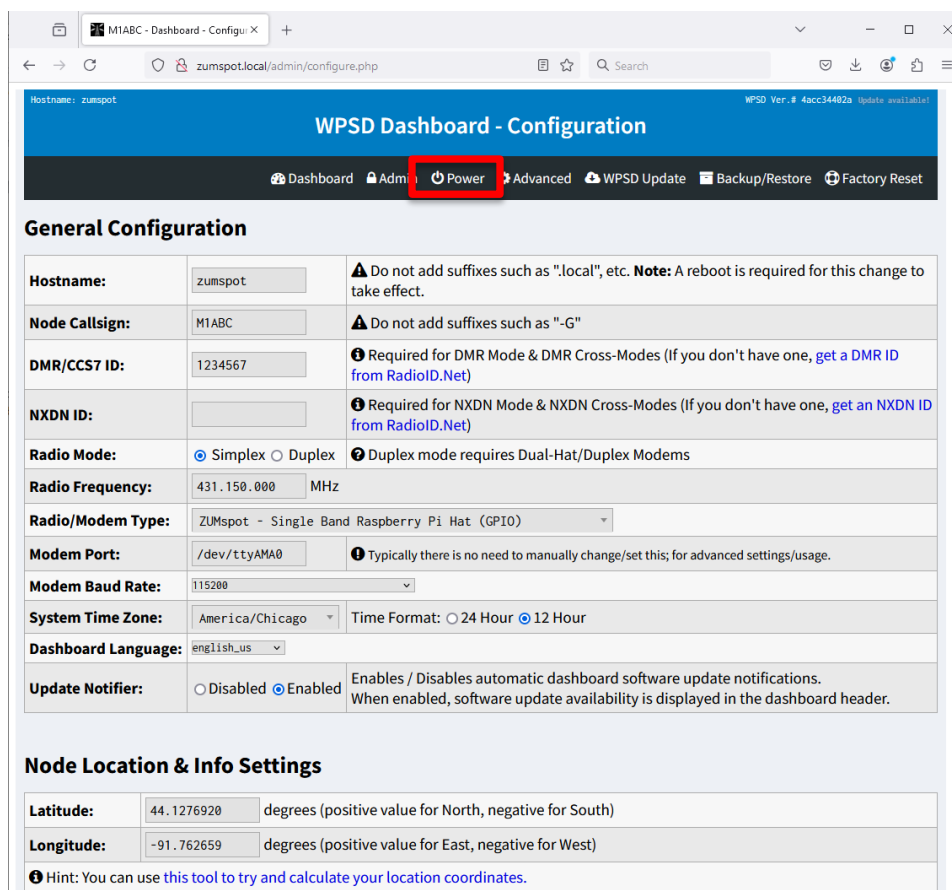
Under the "AccessPoint Mode" section, the "Auto AP:" is set to "On". A note states: "Note: Reboot Required if changed".

The "Wireless Configuration" section shows a message: "Connection 'NETGEAR32' (44433680-0bd6-473e-b9f6-fe9a1bb9b832) successfully added." Below this, a table titled "Configured Connections" lists the connection "NETGEAR32" with a "Delete Connection" button.

The "Wireless Information and Statistics" section is divided into two columns. The left column, "Interface Information", shows: "Interface Name: wlan0", "Interface Status: **Interface is active**", "IP Address: 192.168.1.1", "Subnet Mask: 255.255.255.0", and "Mac Address: d8:3a:dd:64:2f:ca". The right column, "Wireless Information", shows: "Connected To: NETGEAR32", "AP Mac Address: 78:d2:94:73:f0:c6", "Bitrate: 65.0 MBit/s", "Signal Level: -59 dBm", "Transmit Power: 31 dBm", "Link Quality: 73 %", "Channel Info: 2.4GHz Ch1 (2.412 GHz)", and "WiFi Country: US".

At the bottom, there is an "Add Connections" section.

- Scroll back to the top of the page and click on the “Power” button.



Hostname: zumspot WPSD Ver: 4acc34402a Update available!

Dashboard Admin **Power** Advanced WPSD Update Backup/Restore Factory Reset

General Configuration

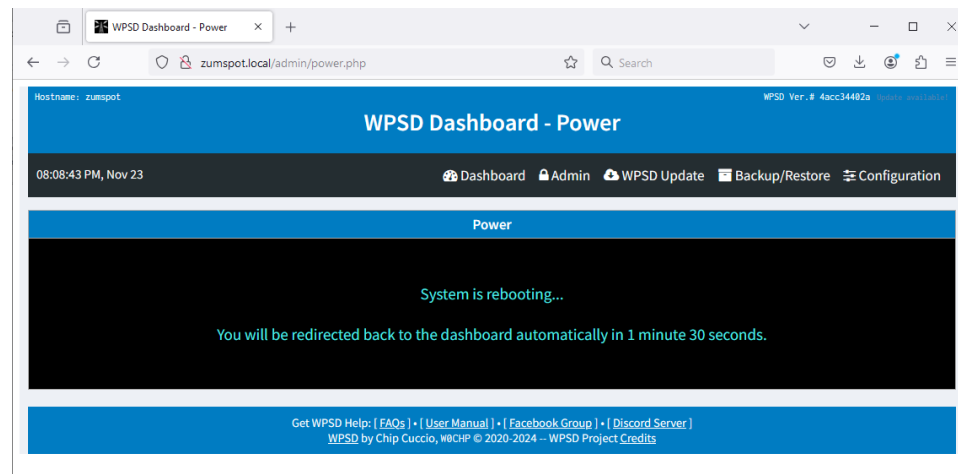
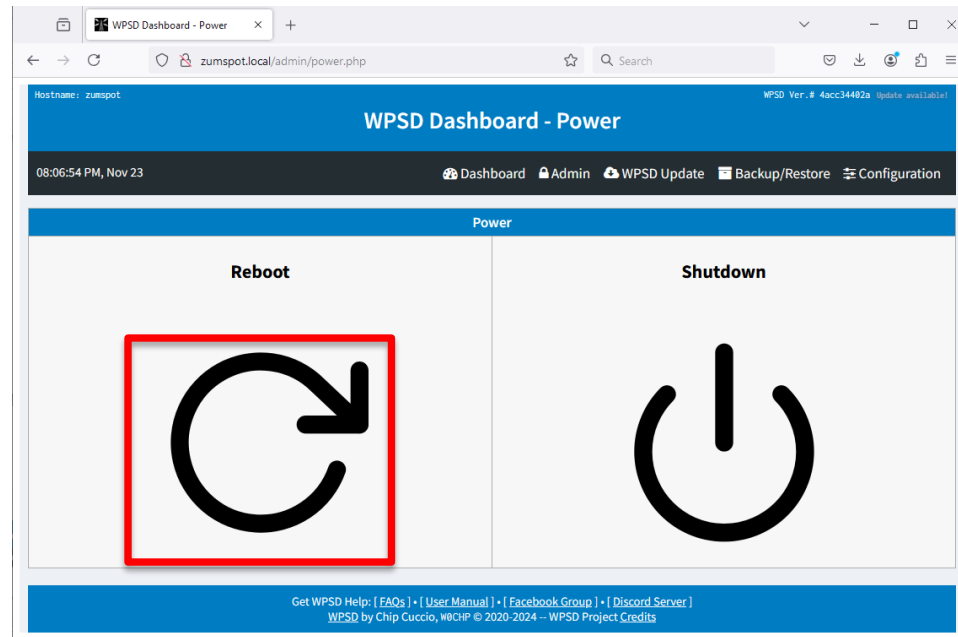
Hostname:	zumspot	⚠ Do not add suffixes such as ".local", etc. Note: A reboot is required for this change to take effect.
Node Callsign:	M1ABC	⚠ Do not add suffixes such as "-G"
DMR/CCS7 ID:	1234567	ℹ Required for DMR Mode & DMR Cross-Modes (If you don't have one, get a DMR ID from RadioID.Net)
NXDN ID:		ℹ Required for NXDN Mode & NXDN Cross-Modes (If you don't have one, get an NXDN ID from RadioID.Net)
Radio Mode:	☒ Simplex ☐ Duplex	ℹ Duplex mode requires Dual-Hat/Duplex Modems
Radio Frequency:	431.150.000 MHz	
Radio/Modem Type:	ZUMspot - Single Band Raspberry Pi Hat (GPIO)	
Modem Port:	/dev/ttyAMA0	ℹ Typically there is no need to manually change/set this; for advanced settings/usage.
Modem Baud Rate:	115200	
System Time Zone:	America/Chicago	Time Format: ☐ 24 Hour ☒ 12 Hour
Dashboard Language:	english_us	
Update Notifier:	☐ Disabled ☒ Enabled	Enables / Disables automatic dashboard software update notifications. When enabled, software update availability is displayed in the dashboard header.

Node Location & Info Settings

Latitude:	44.1276920	degrees (positive value for North, negative for South)
Longitude:	-91.762659	degrees (positive value for East, negative for West)

ℹ Hint: You can use [this tool](#) to try and calculate your location coordinates.

- Click on the “**Reboot**” button and wait for the ZUMspot finish restarting.



- After 3 minutes, connect back to the local Access Point, and then connect to the WPSD configuration page.

For WPSD versions based on Bullseye (Debian 11) use these URLs:

<http://wpsd> (for Windows, Linux and Android devices)

<http://wpsd.local> (for OS X and iOS devices)

For WPSD versions based on Bookworm (Debian 12) use these URLs:

<http://zumspot> (for Windows, Linux and Android devices)

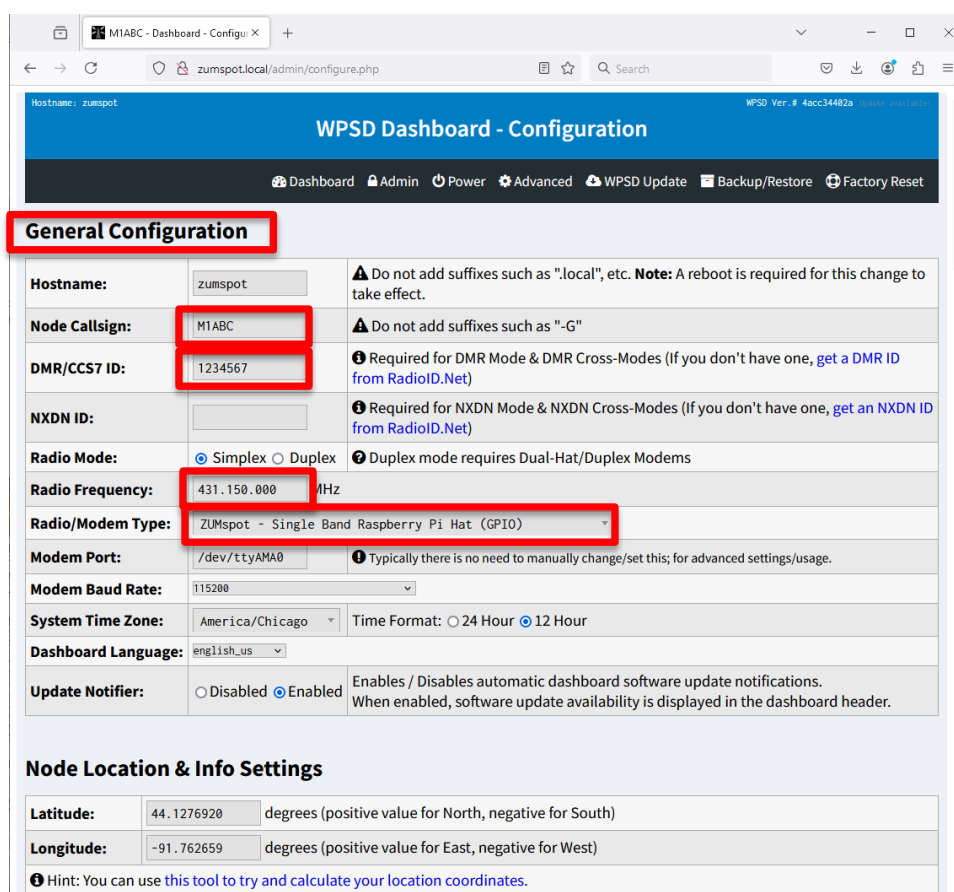
<http://zumspot.local> (for OS X and iOS devices)

Ethernet:

- The Mini 2.4 Color LCD ZUMspot supports using Ethernet when a Micro-USB to Ethernet adapter (purchased separately) is plugged into the empty USB connector on the unit. When the unit boots the first time, the IP address acquired via DHCP from the network over Ethernet will be displayed on the LCD screen.

WPSD configuration:

- Start by entering the information into the “**General Configuration**” section. At a minimum, enter the “**Node Callsign**”, and “**Radio Frequency**”. Use the local frequency coordinator rules to select a frequency that won’t interfere with local activity. Optionally enter the “**DMR/CCS7 ID**” and “**NXDN ID**”. Also make sure the “**Radio/Modem Type**” is set to “**ZUMspot – Single Band Raspberry Pi HAT (GPIO)**”.



WPSD Dashboard - Configuration

Hostname: zumspot WPSD Ver: # 4acc34482a

Dashboard Admin Power Advanced WPSD Update Backup/Restore Factory Reset

General Configuration

Hostname: zumspot
Node Callsign: M1ABC
DMR/CCS7 ID: 1234567
NXDN ID:
Radio Mode: ☒ Simplex ☐ Duplex
Radio Frequency: 431.150.000 MHz
Radio/Modem Type: ZUMspot - Single Band Raspberry Pi Hat (GPIO)
Modem Port: /dev/ttyAMA0
Modem Baud Rate: 115200
System Time Zone: America/Chicago **Time Format:** ☐ 24 Hour ☒ 12 Hour
Dashboard Language: english_us
Update Notifier: ☐ Disabled ☒ Enabled

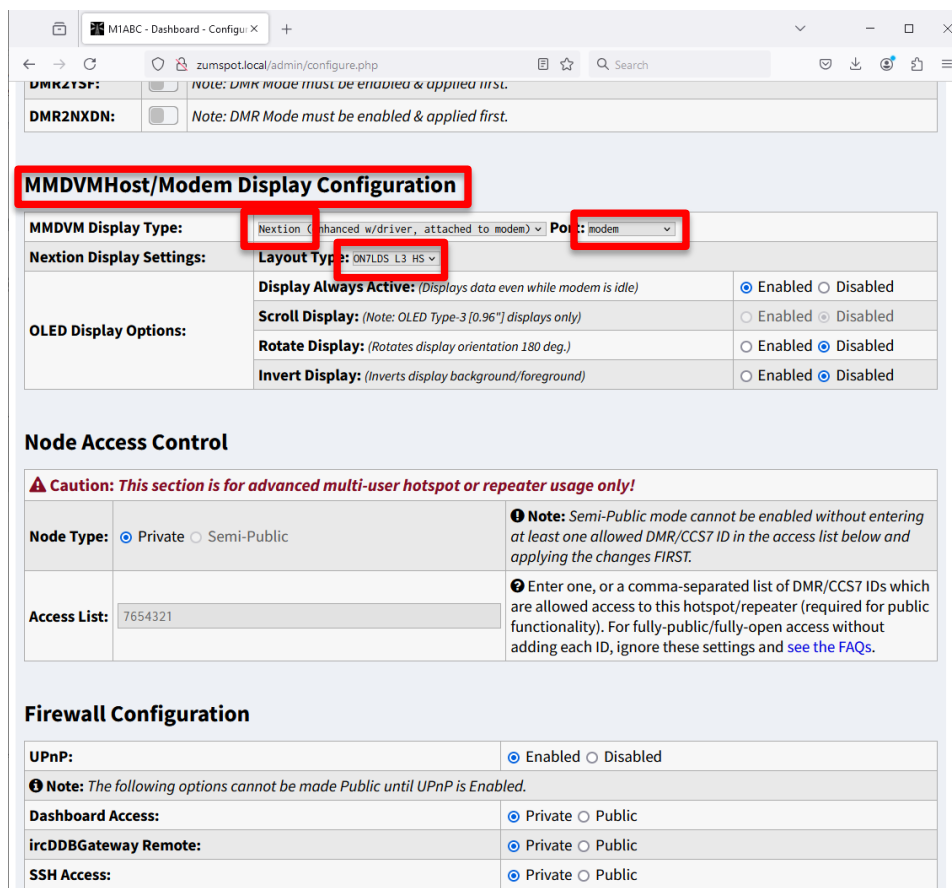
⚠ Do not add suffixes such as ".local", etc. **Note:** A reboot is required for this change to take effect.
 ⚠ Do not add suffixes such as "-G"
 ⓘ Required for DMR Mode & DMR Cross-Modes (If you don't have one, [get a DMR ID from RadioID.Net](#))
 ⓘ Required for NXDN Mode & NXDN Cross-Modes (If you don't have one, [get an NXDN ID from RadioID.Net](#))
 ⓘ Duplex mode requires Dual-Hat/Duplex Modems
 ⓘ Typically there is no need to manually change/set this; for advanced settings/usage.

Node Location & Info Settings

Latitude: 44.1276920 degrees (positive value for North, negative for South)
Longitude: -91.762659 degrees (positive value for East, negative for West)

ⓘ Hint: You can use [this tool](#) to try and calculate your location coordinates.

- Next, scroll down to the “MMDVMHost/Modem Display Configuration” section. Next, make sure “MMDVM display Type” is set to “Nextion”, “Port” is set to “Modem” and “Nextion Layout” is set to “ON7LDS L3”.



MMDVMHost/Modem Display Configuration

MMDVM Display Type: Nextion (enhanced w/driver, attached to modem) **Port:** modem

Nextion Display Settings: Layout Type: ON7LDS L3 HS

OLED Display Options:

Display Always Active: (Displays data even while modem is idle)	☒ Enabled ☐ Disabled
Scroll Display: (Note: OLED Type-3 [0.96"] displays only)	☐ Enabled ☒ Disabled
Rotate Display: (Rotates display orientation 180 deg.)	☐ Enabled ☒ Disabled
Invert Display: (Inverts display background/foreground)	☐ Enabled ☒ Disabled

Node Access Control

Caution: This section is for advanced multi-user hotspot or repeater usage only!

Node Type: ☒ Private ☐ Semi-Public

Access List: 7654321

Firewall Configuration

UPnP: ☒ Enabled ☐ Disabled

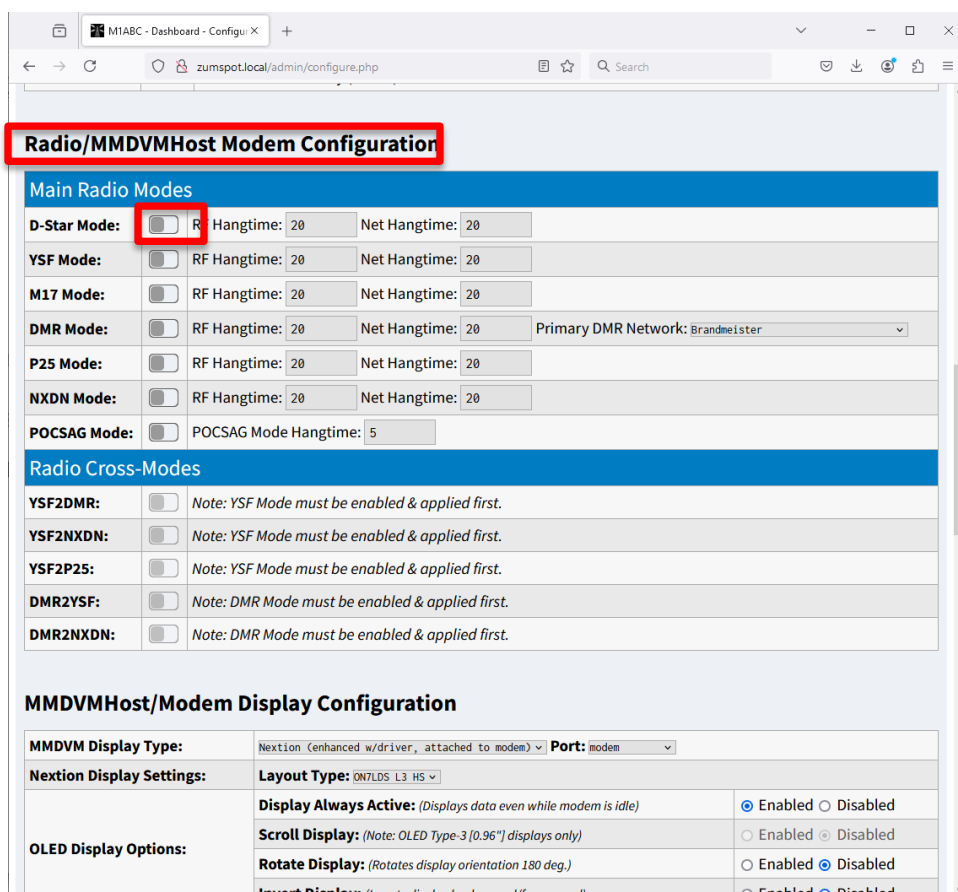
Note: The following options cannot be made Public until UPnP is Enabled.

Dashboard Access: ☒ Private ☐ Public

ircDDBGateway Remote: ☒ Private ☐ Public

SSH Access: ☒ Private ☐ Public

- Next, scroll down to the “Radio/Modem Configuration” section. Click on the mode to be enabled.



The screenshot shows a web browser window with the URL `zumspot.local/admin/configure.php`. The page title is "M1ABC - Dashboard - Config: X". The main section is titled "Radio/MMDVMHost Modem Configuration" and is highlighted with a red box. Below this title, there are two main sections: "Main Radio Modes" and "Radio Cross-Modes".

Main Radio Modes

Mode	Enabled	RF Hangtime	Net Hangtime	Additional Settings
D-Star Mode:	☒	20	20	
YSF Mode:	☐	20	20	
M17 Mode:	☐	20	20	
DMR Mode:	☐	20	20	Primary DMR Network: Brandmeister
P25 Mode:	☐	20	20	
NXDN Mode:	☐	20	20	
POCSAG Mode:	☐	POCSAG Mode Hangtime: 5		

Radio Cross-Modes

Mode	Enabled	Note
YSF2DMR:	☐	Note: YSF Mode must be enabled & applied first.
YSF2NXDN:	☐	Note: YSF Mode must be enabled & applied first.
YSF2P25:	☐	Note: YSF Mode must be enabled & applied first.
DMR2YSF:	☐	Note: DMR Mode must be enabled & applied first.
DMR2NXDN:	☐	Note: DMR Mode must be enabled & applied first.

MMDVMHost/Modem Display Configuration

MMDVM Display Type:	Nextion (enhanced w/driver, attached to modem) Port: modem	
Nextion Display Settings:	Layout Type: ON7LDS L3 HS	
OLED Display Options:	Display Always Active: (Displays data even while modem is idle)	☒ Enabled ☐ Disabled
	Scroll Display: (Note: OLED Type-3 [0.96"] displays only)	☐ Enabled ☒ Disabled
	Rotate Display: (Rotates display orientation 180 deg.)	☐ Enabled ☒ Disabled
	Invert Display: (Inverts display background/foreground)	☐ Enabled ☒ Disabled

- Click “Apply Changes” when done

have enabled GPSd (below), it will use the GPS device location information.

Changes pending: Click “Apply Changes” to save and activate after making all necessary changes.

[Apply Changes](#) [Revert Changes](#)

Radio/MMDVMHost Modem Configuration

Main Radio Modes

D-Star Mode:	☒	RF Hangtime: 20	Net Hangtime: 20	
YSF Mode:	☐	RF Hangtime: 20	Net Hangtime: 20	
M17 Mode:	☐	RF Hangtime: 20	Net Hangtime: 20	
DMR Mode:	☐	RF Hangtime: 20	Net Hangtime: 20	Primary DMR Network: Brandmeister
P25 Mode:	☐	RF Hangtime: 20	Net Hangtime: 20	
NXDN Mode:	☐	RF Hangtime: 20	Net Hangtime: 20	
POCSAG Mode:	☐	POCSAG Mode Hangtime: 5		

Radio Cross-Modes

YSF2DMR:	☐	Note: YSF Mode must be enabled & applied first.
YSF2NXDN:	☐	Note: YSF Mode must be enabled & applied first.
YSF2P25:	☐	Note: YSF Mode must be enabled & applied first.
DMR2YSF:	☐	Note: DMR Mode must be enabled & applied first.
DMR2NXDN:	☐	Note: DMR Mode must be enabled & applied first.

MMDVMHost/Modem Display Configuration

MMDVM Display Type:	Nextion (enhanced w/driver, attached to modem) Port: modem
Nextion Display Settings:	Layout Type: ON7LDS L3 HS
Display Always Active: (Displays data even while modem is idle) ☒ Enabled ☐ Disabled	

Finished:

After completing the WPSD configuration the Mini 2.4 Color LCD ZUMspot kit is ready to connect to DSTAR, DMR and other networks.



Support:

MMDVM groups.io group:

<https://groups.io/g/OpenDV>

WPSD website:

<https://w0chp.radio/wpsd/>

WPSD User Manual:

<https://manual.wpsd.radio/>

ZUM Radio Facebook group:

<https://www.facebook.com/groups/249802742395450/>

There is more information on configuring and using MMDVM in this document:

https://amateurradionotes.com/images/1-Playing_with_Pi-Star.pdf