DIGITAL VOICE HOTSPOT

DIGITAL VOICE – VARIOUS MODES

- *MMDVM – Multi-mode Digital Voice Modem*
- Connect radio and Internet to access many of the newer digital modes
- DMR – Digital Mobile Radio
- C4FM – Yaesu System Fusion
- D-Star – Icom and Kenwood Digital Voice
- P25 – Series of Digital Radio Standards
  - Primarily used in public safety environments
  - Standards for many of the other digital voice modes
- NXDN – Icom and Kenwood digital voice open standard

DIGITAL VOICE

- Simplex – Local digital voice
- Traditional repeaters
- Repeaters with “room” or talk group access
- Repeaters with dynamic access
- Hotspots – Full access to all rooms and talk groups

HOTSPOTS

- Wireless connection allowing access to various digital networks
- Originating Radio to Hotspot
- Hotspot to Internet
- Internet to Repeater or other Hotspot
- Repeater or Hotspot to Destination Radio

SHARK OPEN SPOT

- Standalone openSpot digital radio IP gateway
- Supports D-star, C4FM and DMR
- Cross modem modes (ie., YSF to DMR)
- New product coming out ?
- Current model cost $199
- Proprietary software

NANOSPOT

- Supports – DMR, C4FM, D-Star and P25
- Additional modes with firmware upgrades
- Wi-Fi and Bluetooth connectivity
- Supports Pi-Star web based interface
- Cost $299

JUMBO SPOT

- MMDVM board with Raspberry Pi Zero
- One inch OLED screen
- Compatible with Pi-Star
- Current Model ~$110 on e-Bay
- Supports DMR, YSF, D-Star, P25
- Also supports YSF cross modes
- Can be modified to support a larger screen, such as the Nextion

MODIFIED JUMBO HOTSPOT

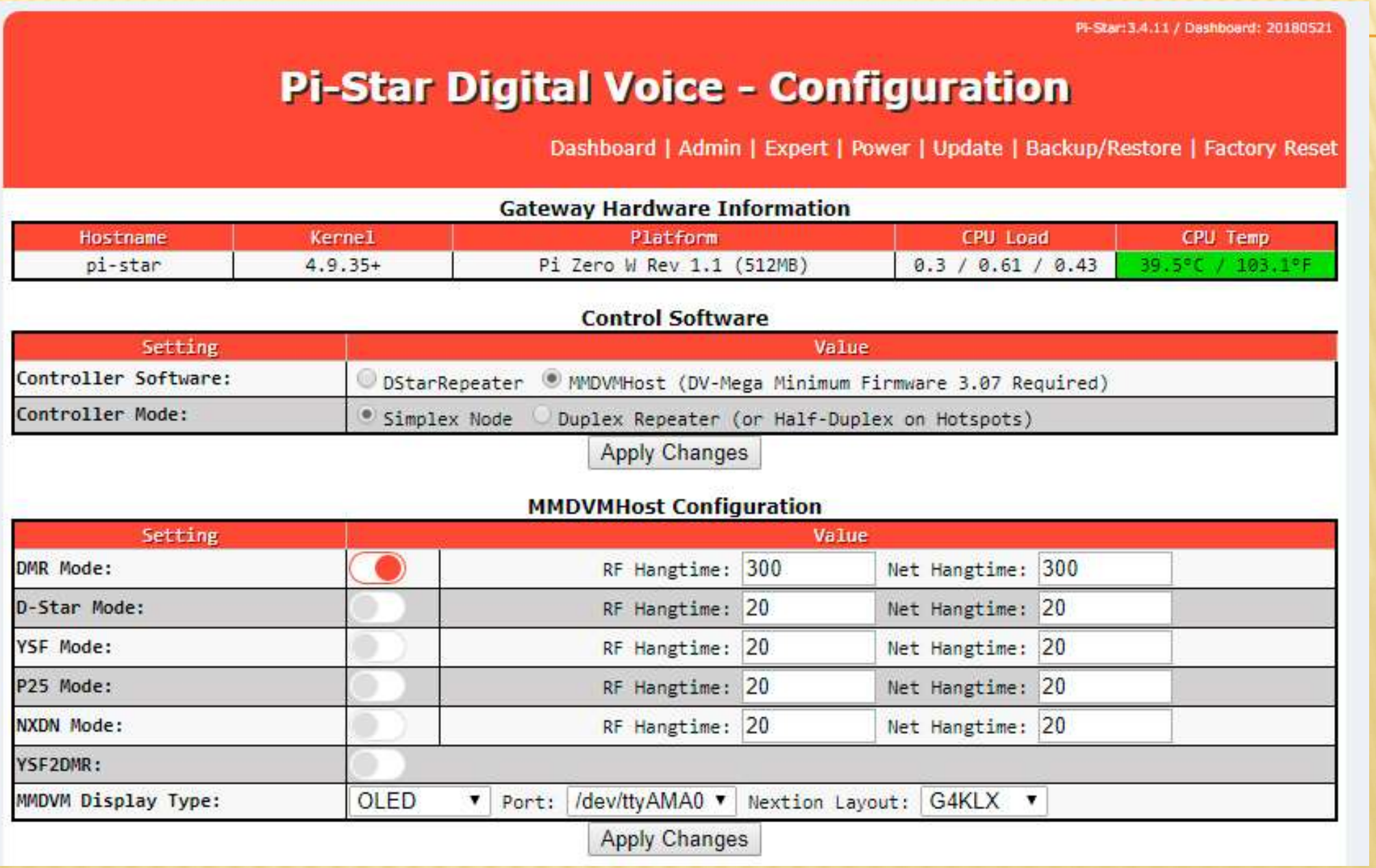
- Added 320x200 Nextion screen
- Pi-Star supports Nextion screens
- Nextion screen cost $25
- Solder 4 pins to MMDVM
- Drop down menu in Pi-Star

LOADING PI-STAR ONTO HOTSPOT

- May need to re-image Pi-Star
- Use “Etcher” to write image to micro-SD card
- Latest version available from:
- www.pistar.uk
- Documentation available at:
- amateurradionotes.com/pi-star.htm

CONFIGURING JUMBO FOR YOUR WI-FI

- Goto www.pistar.uk
- Use Wi-Fi builder under Pi-Star Tools
- Enter in SSID and Password
- It will create config file for your Jumbo Spot
- Place this file on blank micro-SD card
- Insert in Raspberry Pi and boot
- Wi-Fi connection should start
  - If not, you may have to open a port in your router


Pi-Star:3.4.11 / Dashboard: 20180521
Pi-Star Digital Voice - Configuration
Dashboard | Admin | Expert | Power | Update | Backup/Restore | Factory Reset
Gateway Hardware Information
Hostname
Kernel
Platform
CPU Load
CPU Temp
pi-star
4.9.35+
Pi Zero W Rev 1.1 (512MB)
0.3 / 0.61 / 0.43
39.5°C / 103.1°F
Control Software
Setting
Value
Controller Software:
DStarRepeater
MMDVMHost (DV-Mega Minimum Firmware 3.07 Required)
Controller Mode:
Simplex Node
Duplex Repeater (or Half-Duplex on Hotspots)
Apply Changes
MMDVMHost Configuration
Setting
Value
DMR Mode:
RF Hangtime: 300
Net Hangtime: 300
D-Star Mode:
RF Hangtime: 20
Net Hangtime: 20
YSF Mode:
RF Hangtime: 20
Net Hangtime: 20
P25 Mode:
RF Hangtime: 20
Net Hangtime: 20
NXDN Mode:
RF Hangtime: 20
Net Hangtime: 20
YSF2DMR:
MMDVM Display Type:
OLED
Port: /dev/ttyAMA0
Nextion Layout: G4KLX
Apply Changes

General Configuration

Setting	Value
Hostname:	pi-star — Do not add suffixes such as .local
Node Callsign:	N8IDA
CCS7/DMR ID:	1139021
Radio Frequency:	431.075.000 MHz
Latitude:	39.086739 degrees (positive value for North, negative for South)
Longitude:	-084.3591 degrees (positive value for East, negative for West)
Town:	Anderson Twp EM79tc
Country:	USA
URL:	http://www.qrz.com/db/N8IDA — (•) Auto ( ) Manual
Radio/Modem Type:	STM32-DVM / MMDVM_HS - Raspberry Pi Hat (GPIO)
Node Type:	( ) Private (•) Public
System Time Zone:	America/New_York
Dashboard Language:	english_us

Apply Changes

DMR Configuration

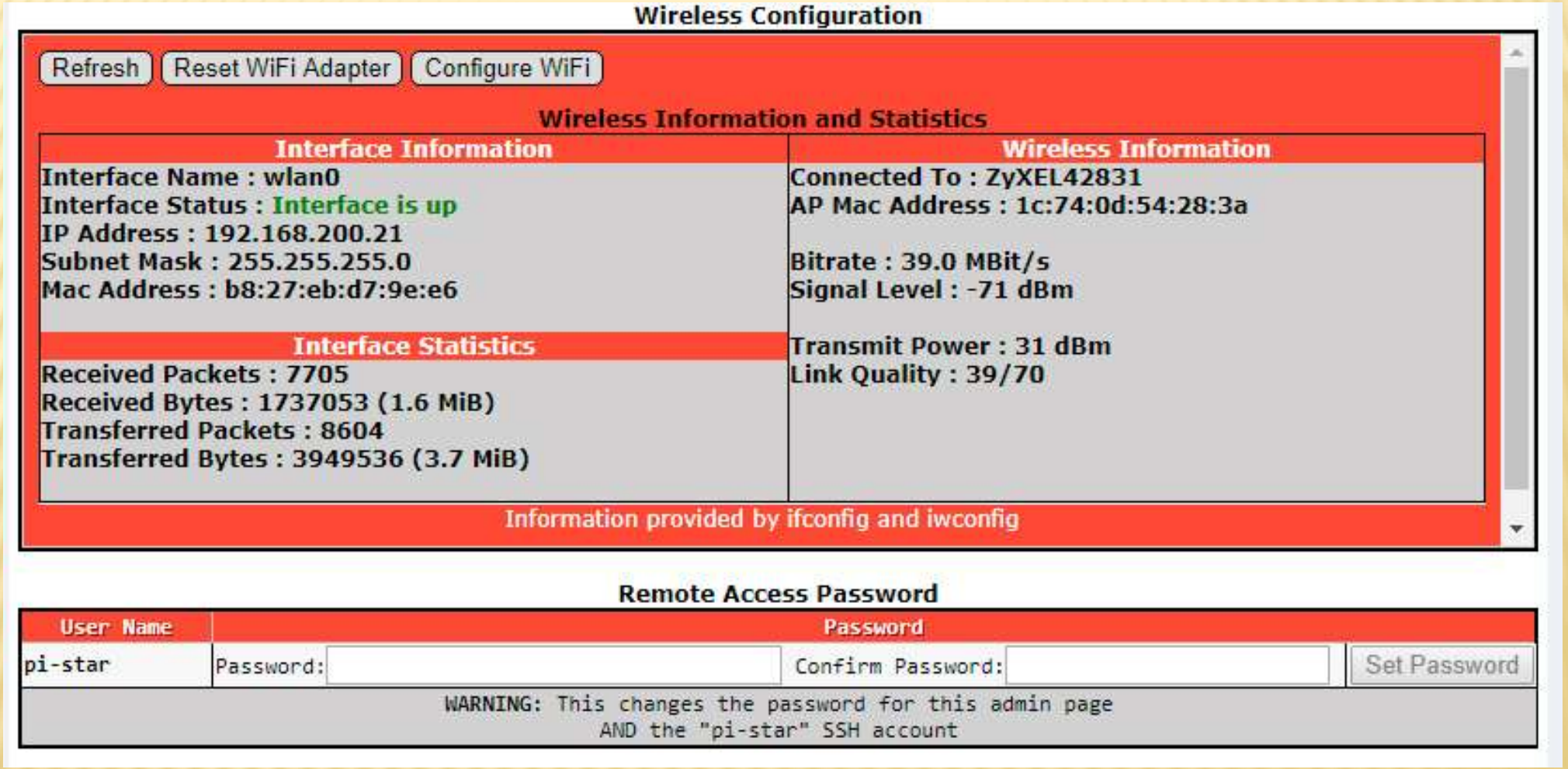
Setting	Value
DMR Master:	DMRGateway
BrandMeister Master:	BM_United_States_3101
BrandMeister Network:	Repeater Information | Edit Repeater (BrandMeister Selfcare)
DMR+ Master:	DMR+_USA-MINNESOTA
DMR+ Network:	Options=
XLX Master:	XLX_950
XLX Master Enable:	
DMR Color Code:	1
DMR EmbeddedLCOnly:	
DMR DumpTAData:	

Apply Changes

Firewall Configuration

Setting	Value	
Dashboard Access:	Private Public	
ircDDGBateway Remote:	Private Public	
SSH Access:	Private Public	
Auto AP:	On Off	Note: Reboot Required if changed
uPNP:	On Off	

Apply Changes


Wireless Configuration
Refresh
Reset WiFi Adapter
Configure WiFi
Wireless Information and Statistics
Interface Information
Interface Name : wlan0
Interface Status : Interface is up
IP Address : 192.168.200.21
Subnet Mask : 255.255.255.0
Mac Address : b8:27:eb:d7:9e:e6
Interface Statistics
Received Packets : 7705
Received Bytes : 1737053 (1.6 MiB)
Transferred Packets : 8604
Transferred Bytes : 3949536 (3.7 MiB)
Wireless Information
Connected To : ZyXEL42831
AP Mac Address : 1c:74:0d:54:28:3a
Bitrate : 39.0 MBit/s
Signal Level : -71 dBm
Transmit Power : 31 dBm
Link Quality : 39/70
Information provided by ifconfig and iwconfig
Remote Access Password
User Name
Password
pi-star
Password:
Confirm Password:
Set Password
WARNING: This changes the password for this admin page
AND the "pi-star" SSH account

Hostname: pi-star

Pi-Star:3.4.11 / Dashboard: 20180521

Pi-Star Digital Voice Dashboard for N8IDA

Dashboard | Admin | Configuration

Modes Enabled	
D-Star	DMR
YSF	P25
YSF XMode	NXDN

Network Status	
D-Star Net	DMR Net
YSF Net	P25 Net
YSF2DMR	NXDN Net
YSF2NXDN	YSF2P25

Radio Info	
Trx	Listening DMR
Tx	431.075000 MHz
Rx	431.075000 MHz
FW	HS_Hat:v1.3.3

DMR Repeater	
DMR ID	1139021
DMR CC	1
TS1	disabled
TS2	enabled
TG 3139/not linked	
DMR Master	
BM United States 3101	
DMR+ USA-MINNESOTA	

Gateway Activity

Time (EDT)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER
15:53:38 Jun 5th	DMR Slot 2	KC8HI	TG 3139	Net	0.8	0%	0.0%
15:47:35 Jun 5th	DMR Slot 2	N8IDA	TG 3102	RF	4.3	0%	0.6%
15:42:17 Jun 5th	DMR Slot 2	W8KWH	TG 3139	Net	4.4	0%	0.0%
15:39:12 Jun 5th	DMR Slot 2	KF8G	TG 3139	Net	0.5	0%	0.0%
15:37:26 Jun 5th	DMR Slot 2	N8WGP	TG 3139	Net	0.2	0%	0.0%

Local RF Activity

Time (EDT)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI
15:47:35 Jun 5th	DMR Slot 2	N8IDA	TG 3102	RF	4.3	0.6%	S9+46dB

Modem	
Port	/dev/ttyAMA0
TXInvert	1
RXInvert	0
PTTInvert	0
TXDelay	100
RXOffset	-475
TXOffset	0
DMRDelay	0
RXLevel	50
TXLevel	50
RXDCOffset	0
TXDCOffset	0
CWIdTXLevel	50
D-StarTXLevel	50
DMRTXLevel	50
YSFTXLevel	50
P25TXLevel	50
RSSIMappingFile	/usr/local/etc/RSSI.dat
Trace	0
Debug	0
RFLevel	100
NXDNTXLevel	50

Apply Changes

Receive offset – on instruction sheet

May have to fine tune this number

Pi-Star:3.4.11 / Dashboard:20180521

Pi-Star Digital Voice - Expert Editors

Dashboard | Admin | Update | Backup/Restore | Configuration

Quick Editors: DStarRepeater | ircDDBGateway | TimeServer | MMDVMHost | DMRGateway | YSFGateway | P25Gateway
Full Editors: DMRGateway | PiStar-Remote | WiFi Config | BM API Key | System Cron | RSSI Dat **Tools:** SSH Access

Expert Editors

****WARNING****

Pi-Star Expert editors have been created to make editing some of the extra settings in the config files more simple, allowing you to update some areas of the config files without the need to login to your Pi over SSH.

Please keep in mind when making your edits here, that these config files can be updated by the dashboard, and that your edits can be over-written. It is assumed that you already know what you are doing editing the files by hand, and that you understand what parts of the files are maintained by the dashboard.

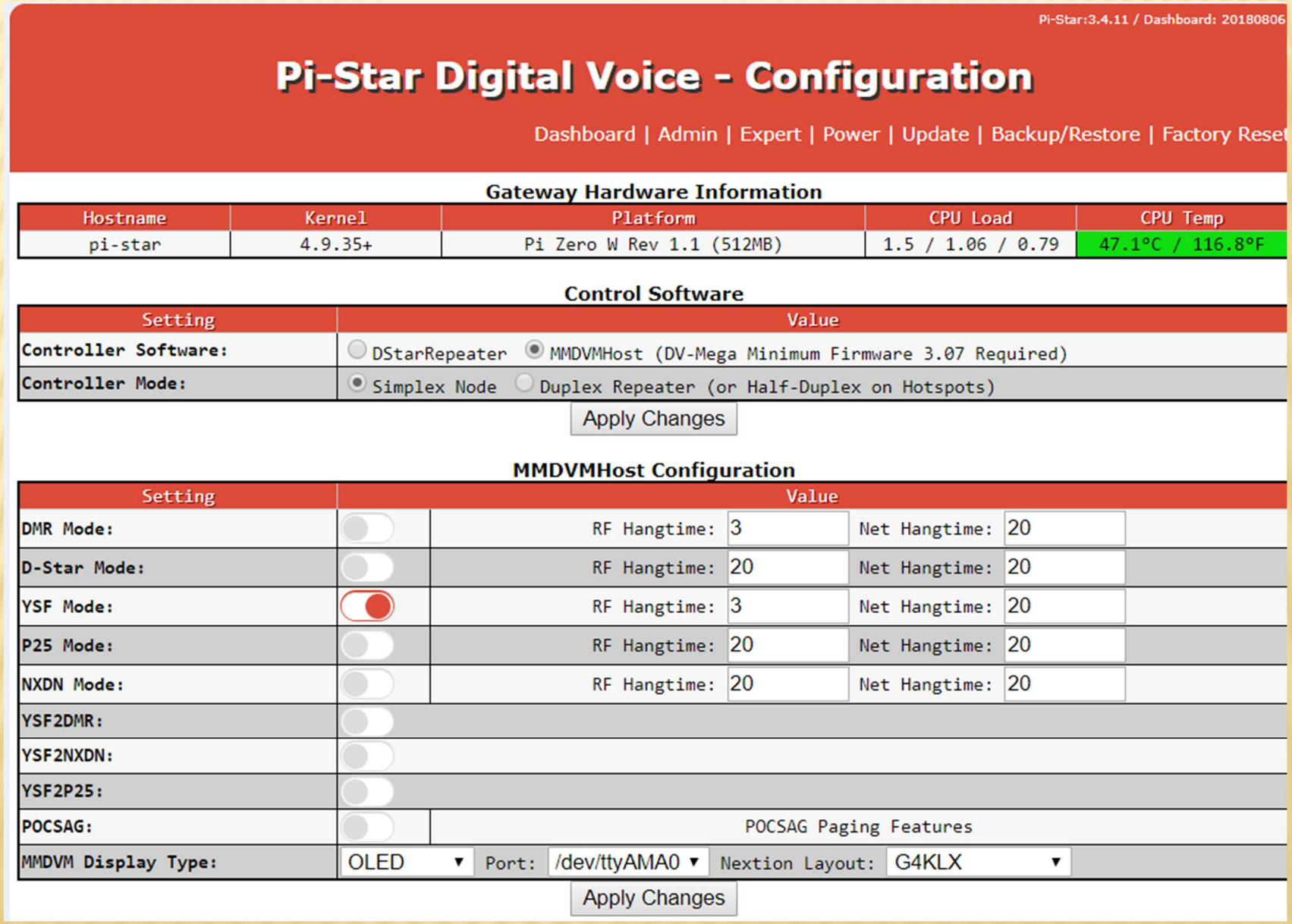
With that warning in mind, you are free to make any changes you like, for help come to the Facebook group (link at the bottom of the page) and ask for help if / when you need it.
73 and enjoy your Pi-Star experiance.
Pi-Star UK Team.

Yaesu Fusion Radio

FT-1D

DIGITAL VOICE HOTSPOT

CONFIGURE PI-STAR FOR YSF



Pi-Star:3.4.11 / Dashboard: 20180806

Pi-Star Digital Voice - Configuration

Dashboard | Admin | Expert | Power | Update | Backup/Restore | Factory Reset

Gateway Hardware Information

Hostname	Kernel	Platform	CPU Load	CPU Temp
pi-star	4.9.35+	Pi Zero W Rev 1.1 (512MB)	1.5 / 1.06 / 0.79	47.1°C / 116.8°F

Control Software

Setting	Value
Controller Software:	○ DStarRepeater ◉ MMDVMHost (DV-Mega Minimum Firmware 3.07 Required)
Controller Mode:	◉ Simplex Node ○ Duplex Repeater (or Half-Duplex on Hotspots)

Apply Changes

MMDVMHost Configuration

Setting	Value			
DMR Mode:	○	RF Hangtime: 3	Net Hangtime: 20	
D-Star Mode:	○	RF Hangtime: 20	Net Hangtime: 20	
YSF Mode:	●	RF Hangtime: 3	Net Hangtime: 20	
P25 Mode:	○	RF Hangtime: 20	Net Hangtime: 20	
NXDN Mode:	○	RF Hangtime: 20	Net Hangtime: 20	
YSF2DMR:	○			
YSF2NXDN:	○			
YSF2P25:	○			
POCSAG:	○	POCSAG Paging Features		
MMDVM Display Type:	OLED ▾	Port: /dev/ttyAMA0 ▾	Nextion Layout: G4KLX ▾	

Apply Changes

SELECT START-UP HOST

General Configuration

Setting	Value
Hostname:	pi-star Do not add suffixes such as .local
Node Callsign:	WB0NPN
CCS7/DMR ID:	1139880
Radio Frequency:	432.205.000 MHz
Latitude:	39.52 degrees (positive value for North, negative for South)
Longitude:	-84.37666 degrees (positive value for East, negative for West)
Town:	Liberty Township
Country:	USA
URL:	http://www.qrz.com/db/wb0npn ○ Auto ◉ Manual
Radio/Modem Type:	STM32-DVM / MMDVM_HS - Raspberry Pi Hat (GPIO) ▼
Node Type:	◉ Private ○ Public
System Time Zone:	America/Detroit ▼
Dashboard Language:	english_us ▼

Apply Changes

Yaesu System Fusion Configuration

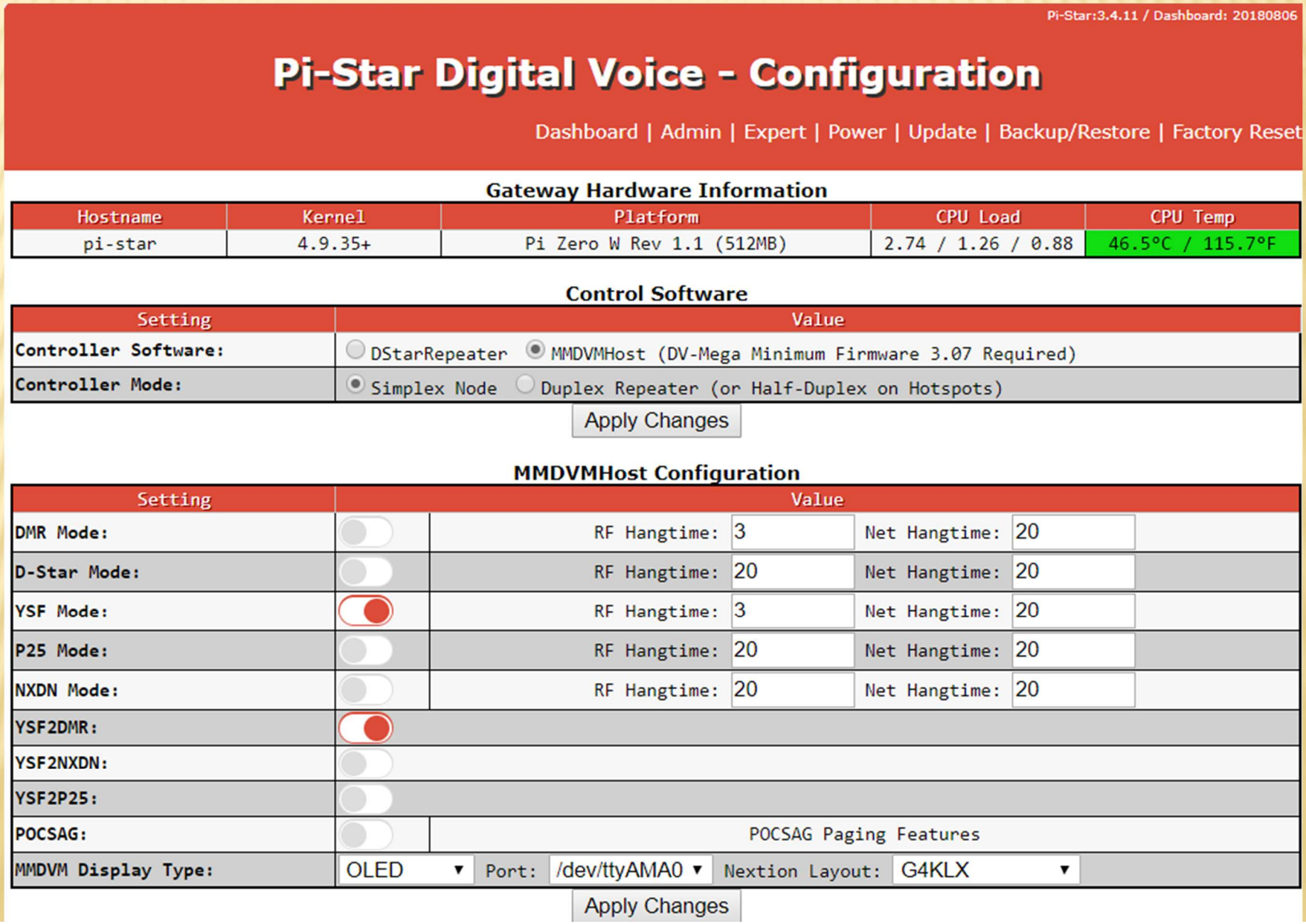
Setting	Value
YSF Startup Host:	YSF02034 - Alabama-Link - Alabama-Link ▼
APRS Host:	iad.aprs2.net ▼

Apply Changes

CONNECTING TO YSF NODE

- Details for all connection procedures is best described in the Wires-X operating manual.
- Briefly, hold the DX button for about 5 seconds.
- Node selected in configuration will connect.
- Depress ENT key for about 5 seconds, and succeeding options for connection will be displayed.

CONFIGURE PI-STAR FOR YSF TO DMR



Pi-Star:3.4.11 / Dashboard: 20180806

Pi-Star Digital Voice - Configuration

Dashboard | Admin | Expert | Power | Update | Backup/Restore | Factory Reset

Gateway Hardware Information

Hostname	Kernel	Platform	CPU Load	CPU Temp
pi-star	4.9.35+	Pi Zero W Rev 1.1 (512MB)	2.74 / 1.26 / 0.88	46.5°C / 115.7°F

Control Software

Setting	Value
Controller Software:	○ DStarRepeater ◉ MMDVMHost (DV-Mega Minimum Firmware 3.07 Required)
Controller Mode:	◉ Simplex Node ○ Duplex Repeater (or Half-Duplex on Hotspots)

Apply Changes

MMDVMHost Configuration

Setting	Value			
DMR Mode:		RF Hangtime: 3	Net Hangtime: 20	
D-Star Mode:		RF Hangtime: 20	Net Hangtime: 20	
YSF Mode:		RF Hangtime: 3	Net Hangtime: 20	
P25 Mode:		RF Hangtime: 20	Net Hangtime: 20	
NXDN Mode:		RF Hangtime: 20	Net Hangtime: 20	
YSF2DMR:				
YSF2NXDN:				
YSF2P25:				
POCSAG:		POCSAG Paging Features		
MMDVM Display Type:	OLED	Port: /dev/ttyAMA0	Nextion Layout: G4KLX	

Apply Changes

SELECT YSF TO DMR BRIDGE

General Configuration

Setting	Value
Hostname:	pi-star Do not add suffixes such as .local
Node Callsign:	WB0NPN
CCS7/DMR ID:	1139880
Radio Frequency:	432.205.000 MHz
Latitude:	39.52 degrees (positive value for North, negative for South)
Longitude:	-84.37666 degrees (positive value for East, negative for West)
Town:	Liberty Township
Country:	USA
URL:	http://www.qrz.com/db/wb0npn ○ Auto ◉ Manual
Radio/Modem Type:	STM32-DVM / MMDVM_HS - Raspberry Pi Hat (GPIO)
Node Type:	◉ Private ○ Public
System Time Zone:	America/Detroit
Dashboard Language:	english_us

Apply Changes

Yaesu System Fusion Configuration

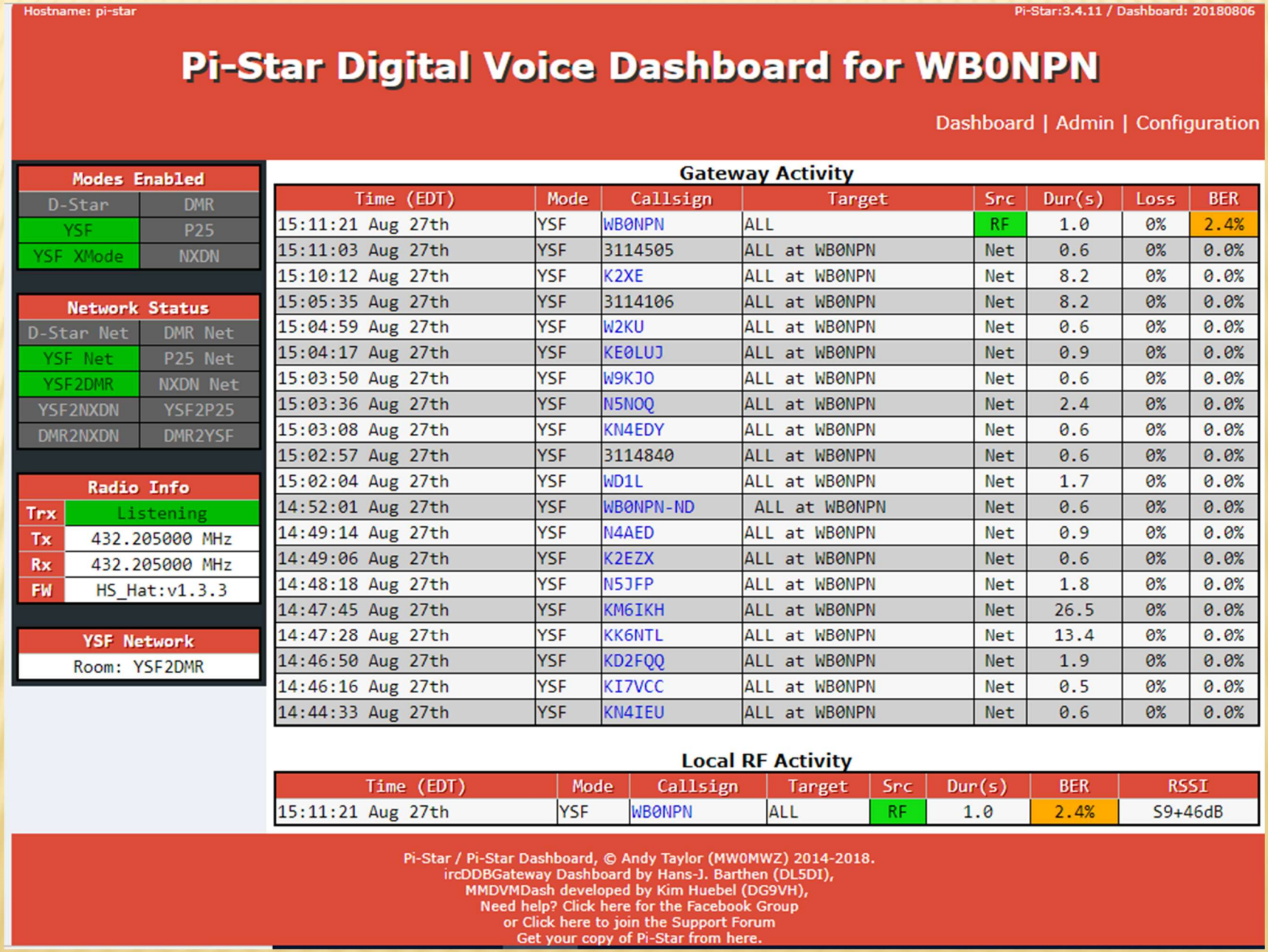
Setting	Value
YSF Startup Host:	YSF00002 - YSF2DMR - YSF2DMR Bridge
APRS Host:	iad.aprs2.net
(YSF2DMR)CCS7/DMR ID:	1139880
DMR Master:	BM_United_States_3102
DMR TG:	310

Apply Changes

CONNECTING TO YSF NODE

- Details for all connection procedures is best described in the Wires-X operating manual.
- Briefly, hold the DX button for about 5 seconds.
- Connection to the YSF to DMR bridge will be indicated on the display.

DASHBOARD RECORD



Hostname: pi-star

Pi-Star:3.4.11 / Dashboard: 20180806

Pi-Star Digital Voice Dashboard for WB0NPN

Dashboard | Admin | Configuration

Modes Enabled	
D-Star	DMR
YSF	P25
YSF XMode	NXDN

Network Status	
D-Star Net	DMR Net
YSF Net	P25 Net
YSF2DMR	NXDN Net
YSF2NXDN	YSF2P25
DMR2NXDN	DMR2YSF

Radio Info	
Trx	Listening
Tx	432.205000 MHz
Rx	432.205000 MHz
FW	HS_Hat:v1.3.3

YSF Network
Room: YSF2DMR

Gateway Activity

Time (EDT)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER
15:11:21 Aug 27th	YSF	WB0NPN	ALL	RF	1.0	0%	2.4%
15:11:03 Aug 27th	YSF	3114505	ALL at WB0NPN	Net	0.6	0%	0.0%
15:10:12 Aug 27th	YSF	K2XE	ALL at WB0NPN	Net	8.2	0%	0.0%
15:05:35 Aug 27th	YSF	3114106	ALL at WB0NPN	Net	8.2	0%	0.0%
15:04:59 Aug 27th	YSF	W2KU	ALL at WB0NPN	Net	0.6	0%	0.0%
15:04:17 Aug 27th	YSF	KE0LUJ	ALL at WB0NPN	Net	0.9	0%	0.0%
15:03:50 Aug 27th	YSF	W9KJO	ALL at WB0NPN	Net	0.6	0%	0.0%
15:03:36 Aug 27th	YSF	N5NOQ	ALL at WB0NPN	Net	2.4	0%	0.0%
15:03:08 Aug 27th	YSF	KN4EDY	ALL at WB0NPN	Net	0.6	0%	0.0%
15:02:57 Aug 27th	YSF	3114840	ALL at WB0NPN	Net	0.6	0%	0.0%
15:02:04 Aug 27th	YSF	WD1L	ALL at WB0NPN	Net	1.7	0%	0.0%
14:52:01 Aug 27th	YSF	WB0NPN-ND	ALL at WB0NPN	Net	0.6	0%	0.0%
14:49:14 Aug 27th	YSF	N4AED	ALL at WB0NPN	Net	0.9	0%	0.0%
14:49:06 Aug 27th	YSF	K2EZX	ALL at WB0NPN	Net	0.6	0%	0.0%
14:48:18 Aug 27th	YSF	N5JFP	ALL at WB0NPN	Net	1.8	0%	0.0%
14:47:45 Aug 27th	YSF	KM6IKH	ALL at WB0NPN	Net	26.5	0%	0.0%
14:47:28 Aug 27th	YSF	KK6NTL	ALL at WB0NPN	Net	13.4	0%	0.0%
14:46:50 Aug 27th	YSF	KD2FQQ	ALL at WB0NPN	Net	1.9	0%	0.0%
14:46:16 Aug 27th	YSF	KI7VCC	ALL at WB0NPN	Net	0.5	0%	0.0%
14:44:33 Aug 27th	YSF	KN4IEU	ALL at WB0NPN	Net	0.6	0%	0.0%

Local RF Activity

Time (EDT)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI
15:11:21 Aug 27th	YSF	WB0NPN	ALL	RF	1.0	2.4%	S9+46dB