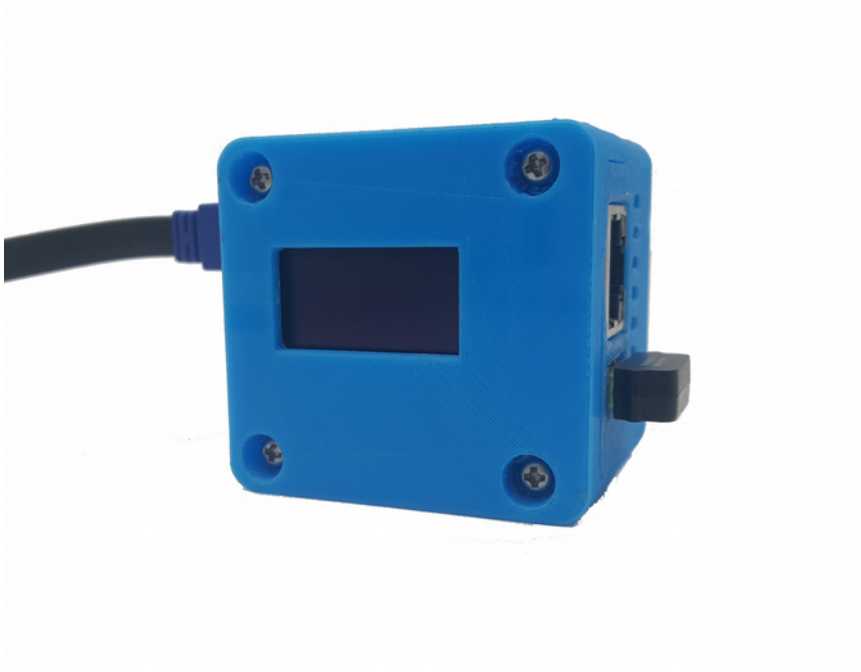
Manual of configuration MMDVM Nano hotspot PRS with Pi-Star and Windows



V0.1 September 2018 by F1JXQ for Passion-Radio.fr

Pi-Star is a software MW0MWZ https://www.pistar.uk/

PiStar.UK - Pi-Star Digital Voice Software

Information and tutorials on the DMR in France Open-DMR.fr

1 - Foreword

The nano Hotspot is a creation of the amateur HUANG BI7JTA, it is a digital multi-mode access point MMDVM type for D-Star modes, DMR, C4FM, POCSAG, P25 and NXDN.

The Nano Hotspot is available in Europe in the Passion Radio store:
https://www.passion-radio.com/digital/nano-mmdvm-624.html

It comes assembled and tested before shipment and works with BlueDV application for Windows, Linux and Android, as well as P-Star Linux.

The Nano Hotspot included: 1 card Nano mmdvm_ PCBhs_hat 433Mhz with welded ceramic antenna, one 3D printing casing, one fan, one NanoPi NEO 512M with 1 WIFI dongle, one USB cable, one OLED 2,4cm and a mini-SD card 16GB with edited image.

Warning :

Be sure to use ae food USB quality and stable 5V and 2A, improper diet will result in instability of the error rate (BER) and a overvoltage will burn the and NanoPi the map mmmdvm_hs_hat !

2 - Connecting to the Admin Interface Nano hotspot PRS

The method described below requires no knowledge of Linux, PI-Star software is already installed on the SD card Nano hotspot, and configuration can be performed directly from a Windows web browser.

The access address is the hotspot IP or via the URL Next enter in a web browser:

Via a web browser: http: // pi-star /
Via a mobile browser: http: //pi-star.local

Login: pi-star
Password: raspberry

There are 3 ways to connect the Pi-Star hotspot administration.

Method 1: Via LAN port RJ45 hotspot log in on the internet box or a router. The box or router will automatically allocate an IP address.

To connect the LAN port of the hotspot directly on the RJ45 port on a laptop, you must use a crossover cable RJ45 / reversed.

To access the administration interface, open a Firefox or Chrome on the IP hotspot.

In Windows, to find the IP address assigned to the Nano hotspot, install the software IPScan: https://www.advanced-ip-scanner.com/, then start a network scan and locate the IP address in front of the PI-STAR device.

Paste this IP address into a web browser to access the administration of PI-STAR.

Method 2: Via default WIFI access point, a wifi router, smartphone or tablet WiFi in access point mode.

You ned to create a wireless access point from a cellphone, a tablet or a wifi router with the following information :

Name of the access point (SSID) : 888888-2G
Password: 0123456789

Turn off and on the hotspot to let him connect to the default access point 888888-2G.

Method 3: Via another wireless access point, copy the configuration file to be generated from the site http://www.pistar.uk/wifi_builder.php

Then copy this configuration file in the SDCard of Nano Pi in the root directory.

3 - Setting the Nano hotspot PRS with Pi-Star

Before first use, the default language of the interface may need to be changed. If you have a Chinese interface, don't panic, follow this simple guide to put in english or other language.

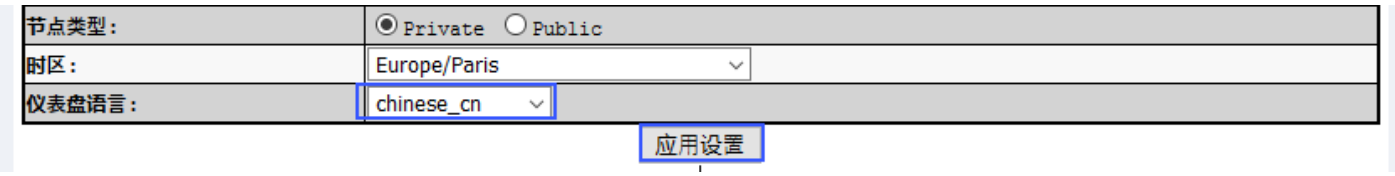
at) Changing the Interface Language

To change the language in english, visit http: //pi-star/admin/configure.php or click on the last menu upper right (framed in blue):

Then enter the following login to connect to the admin:

User: pi-star
password: raspberry

Search in the page where the drop down menu is chinese_cn, then change it to english_uk or your favorite language.



Press the button below to apply the changes and go to the Pi-Star home.

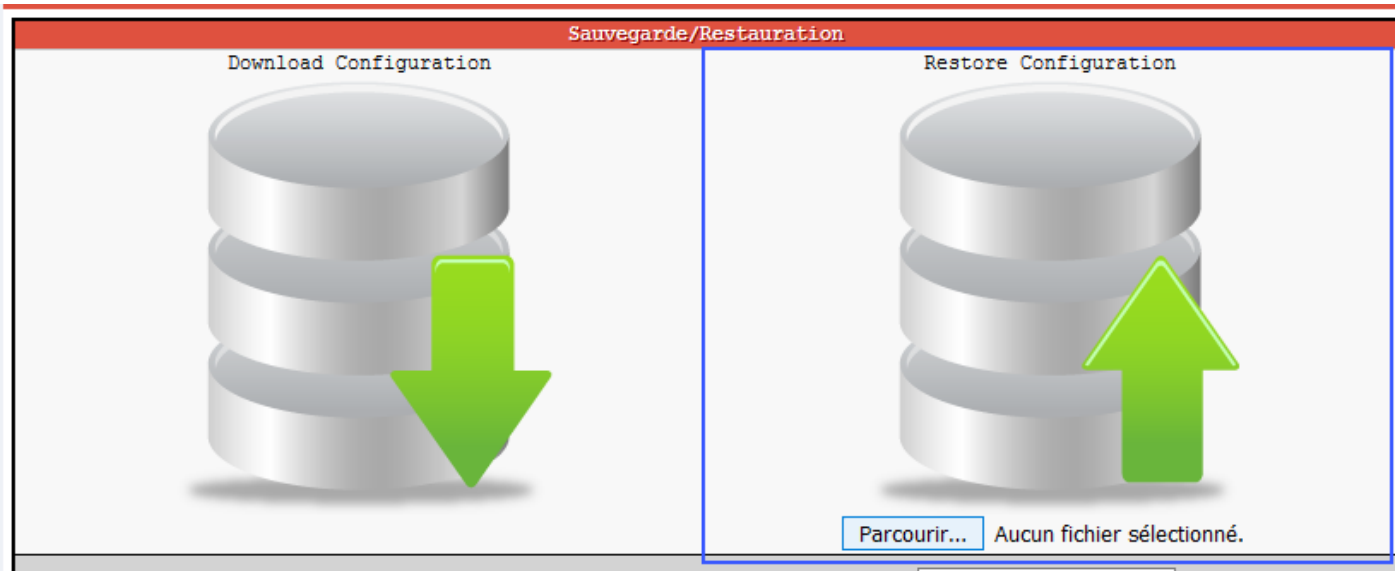
b) Installing the default configuration file

The image file that is mounted on the Nano Pi is pre-configured with the PI-Star software to run on the DMR Brandmeister network and the master server Brandmeister 2042 (NL).

The default configuration file to download to:

To install the default configuration file, visit http: //pi-star/admin/config_backup.php or go to "Settings" then "Backup / Restore".

In the right column, click the "Browse" button to get the configuration file on the computer, then click the green arrow to send the file:

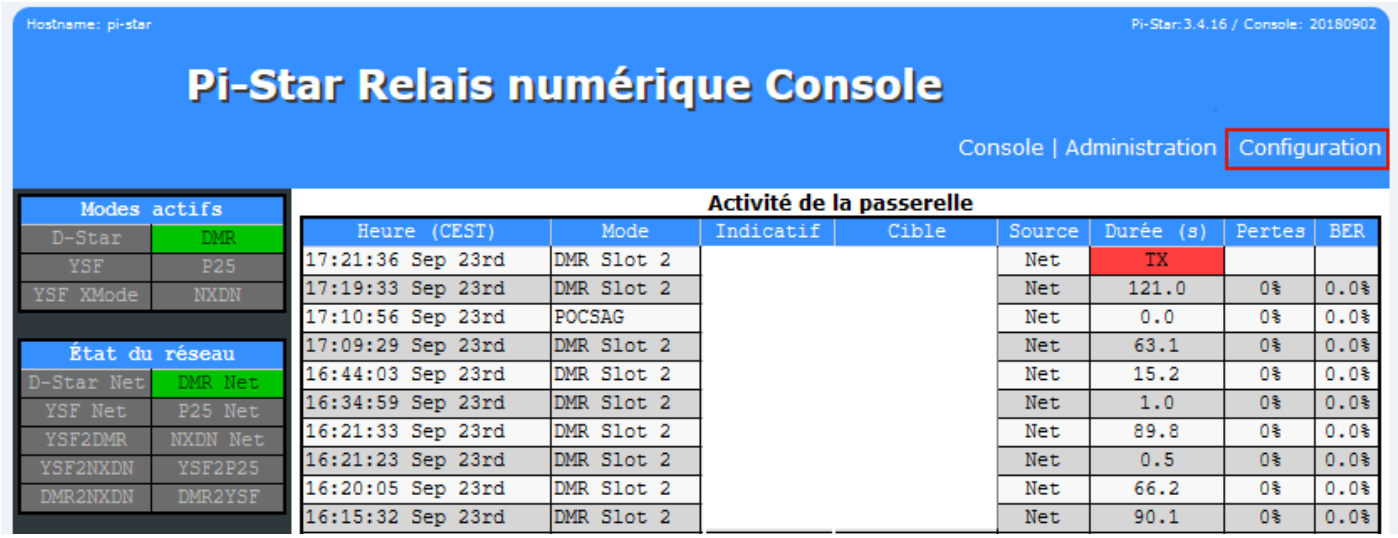


c) Setting the Nano Hotspot with PI-STAR

Il remains to configure the information about callsign, radio frequency hotspot, QTH, locator, etc., as shown below.

To access the configuration page, visit: http: //pi-star/admin/configure.php

Or from the "Configuration" menu at the top right:



Step 1 : fill your callsign, ID CCS7, frequency of the hotspot, lattitude, longitude, city, country, URL (address of your website), time zone and language of the console:

Configuration générale

Paramètres	Valeur
Hostname:	pi-star Do not add suffixes such as .local
Indicatif du Node:	
Id CCS7/DMR:	
Fréquence radio:	433.450.000 MHz
Latitude:	degrees (positive value for North, negative for South)
Longitude:	degrees (positive value for East, negative for West)
Ville:	
Pays:	
URL:	Auto Manual
Modèle Radio/Modem:	STM32-DVM / MMDVM_HS - Raspberry Pi Hat (GPIO)
Type de Node:	Private Public
Fuseau horaire:	Europe/Paris
Langage de la console:	french_fr

Appliquer les modifications

2nd step : Choice DMR server

By default the server DMR Brandmeister BM 2042:

Configuration DMR

Paramètres	Valeur
Master DMR:	BM_France_2082
Réseau BrandMeister:	Repeater Information | Edit Repeater (BrandMeister Selfcare)
Code Couleur DMR:	1
DMR LC intégré uniquement:	
DMR DumpTAData:	

Appliquer les modifications

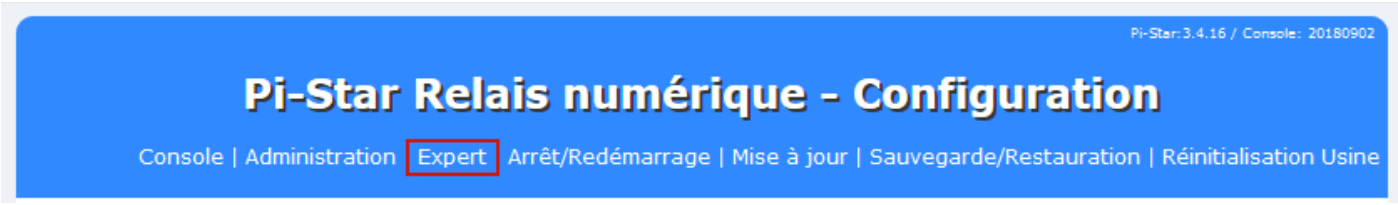
EStep 3: Offset setting

Setting the offest is essential for the hotspot to function properly and must be adjusted according to the walkie-talkie and there is no "universal" settings.

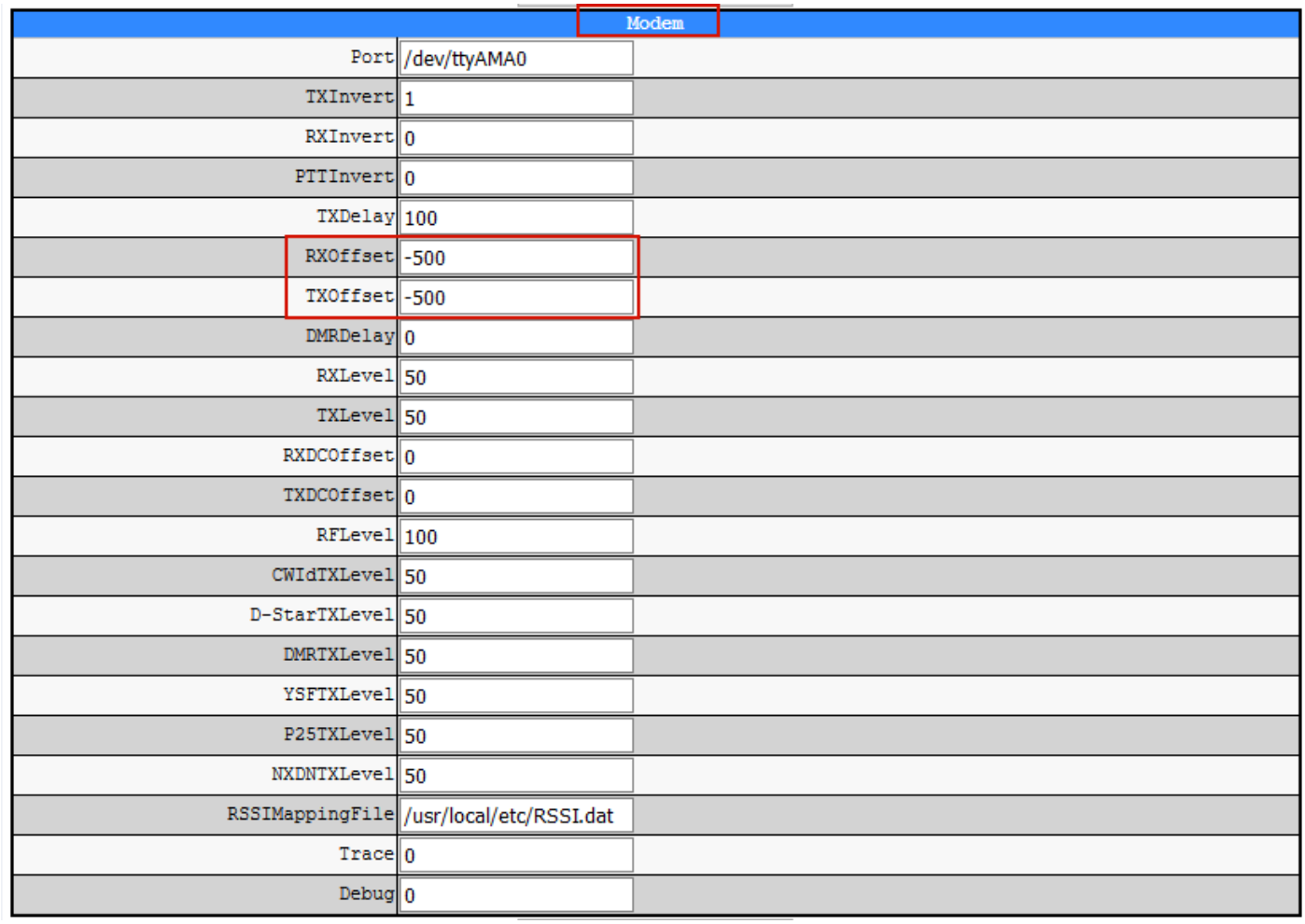
The offset is used to adjust the reception frequency and transmission so that the signal match exaclty the set frequency.

Default offset RX and TX is set to -500 in the Pi-Star version for the Nano Hotspot PRS.

To set and adjust the offset, go to the menu " **Expert** "Or via the address: http: //pi-star/admin/expert/edit_mmdvmhost.php



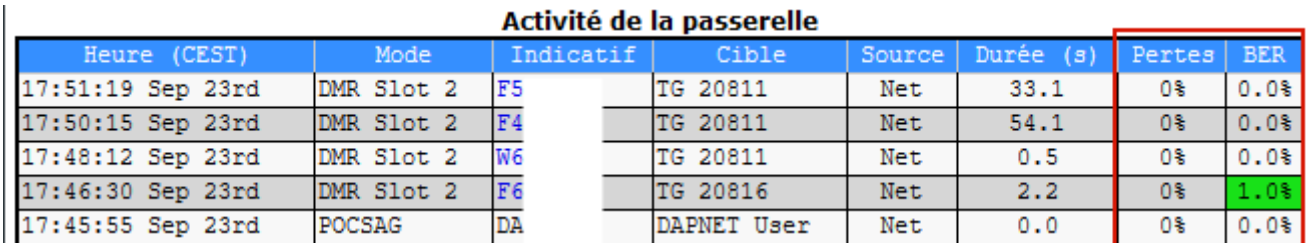
To change the offset values RX and TX, go in the " **Modem** "Then the fields **RXOffset** and **TXOffset** :



Modem	
Port	/dev/ttyAMA0
TXInvert	1
RXInvert	0
PTTInvert	0
TXDelay	100
RXOffset	-500
TXOffset	-500
DMRDelay	0
RXLevel	50
TXLevel	50
RXDCOffset	0
TXDCOffset	0
RFLevel	100
CWIdTXLevel	50
D-StarTXLevel	50
DMRTXLevel	50
YSFTXLevel	50
P25TXLevel	50
NXDNTXLevel	50
RSSIMappingFile	/usr/local/etc/RSSI.dat
Trace	0
Debug	0

Tip: To fine tune the RX & TXOffset, use a SDR receiver with TCXO to adjust the frequency correction.

The percentage of error correction (BER) must be as low as possible (Below 1%) and can be check from the dashboard: http: // pi-star / or https://brandmeister.network/?page=lh



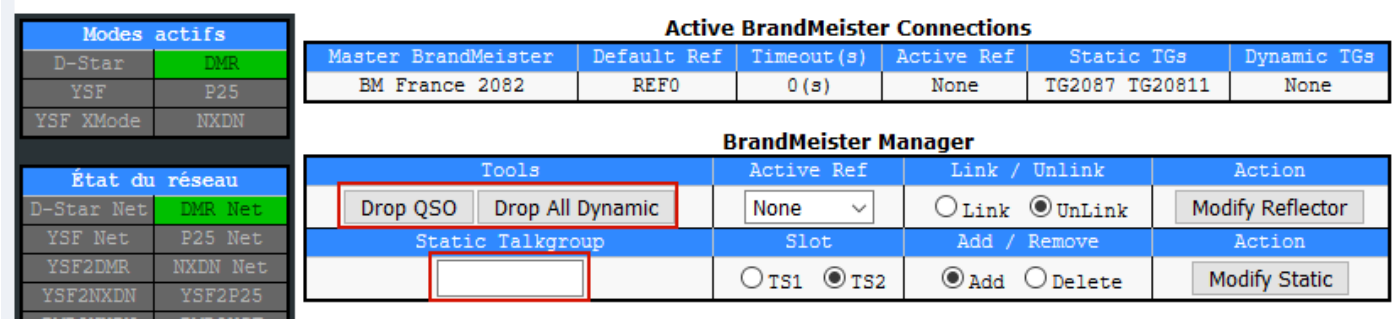
Activité de la passerelle

Heure (CEST)	Mode	Indicatif	Cible	Source	Durée (s)	Pertes	BER
17:51:19 Sep 23rd	DMR Slot 2	F5	TG 20811	Net	33.1	0%	0.0%
17:50:15 Sep 23rd	DMR Slot 2	F4	TG 20811	Net	54.1	0%	0.0%
17:48:12 Sep 23rd	DMR Slot 2	W6	TG 20811	Net	0.5	0%	0.0%
17:46:30 Sep 23rd	DMR Slot 2	F6	TG 20816	Net	2.2	0%	1.0%
17:45:55 Sep 23rd	POCSAG	DA	DAPNET User	Net	0.0	0%	0.0%

Step 5: Configuring TG and reflector from Pi-Star

From the "Administration" menu or from this address: http: // pi-star / admin /

It is possible to configure the reflectors and talkgroup request directly through the PI-Star web interface:



to use this function, you need to get an API key requested from Brandmeister website and the selfcare :

Then, copy the API key in the "BM API" menu from the "Expert" menu or via the address: http: //pi-star/admin/expert/fulledit_bmapikey.php

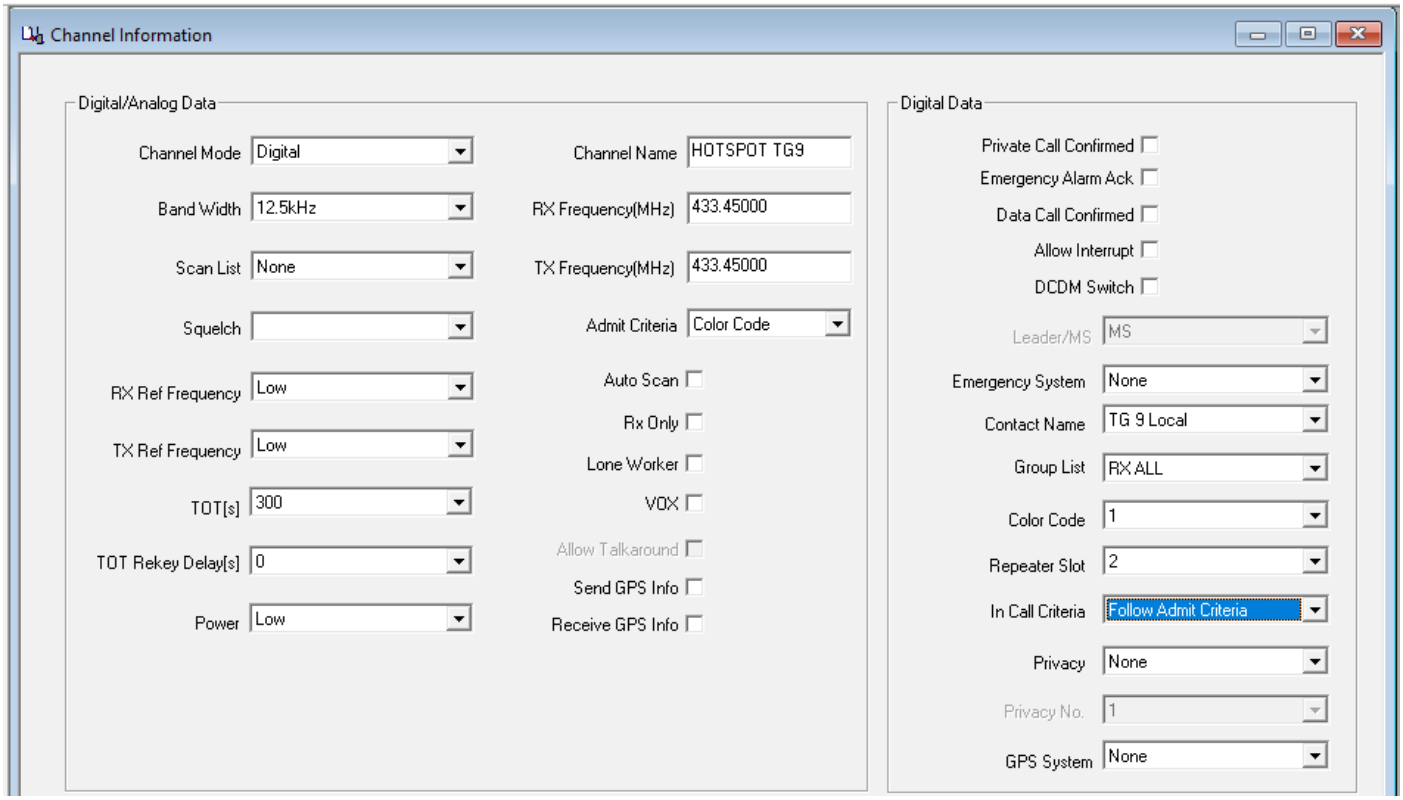
As with all other changes to, click "Apply Changes" for the change are taken into account.

4 - Configuration walkie-talkie with nano hotspot PRS

For DMR equipment and according to the kind of material/brand, configuration are nearly the same.

Channel name: HOTSPOT TG9
Timeslot: 2
Color code: 1
RX Frequency: 433.45000 (or your customized frequency)
Frequency TX: 433.45000 (or your customized frequency)
Talkgroup (contact): TG9

Example channel configuration hotspot for TYT MD-380/390/2017:



With the principle of talkgroups and reflectors " **on demand** " it is not necessary to configure a channel by TG.

From the walkie-talkie, you can dial the talkgroup or reflector, then press the PTT to activate the connection to the TG or reflector.

It is also possible to change talkgroup from a web browser or via the administrative console Pi-Star: [http: // pi-star / admin /](http://pi-star/admin/) either via the Selfcare Brandmeister: https://brandmeister.network/index.php?page=selfcare and the hotspot left menu: