XLX135 Information & Connection Guide

(Yaesu FT70D Edition)

I had originally set up a YSF Reflector, however this only supports Yaesu System Fusion radios natively and is limited to one Room.

I have now set up an XLX server which can support multiple different digital protocols, not only that, as it is module based so there can be multiple "Rooms". From this point forward what were previously known as "Rooms" will be referred to as "Modules".

The ID of this XLX Sever is XLX135, this is a permanent global ID and will be applicable across all of the digital modes that are supported.

The XLXd software that is running on the server can support up to 26 modules on one XLX server, this gives the ability to have multiple "Rooms" as these modules are all separate conversations can take place independently in the appropriate module.

For example the module named "NARS" has been set up for general use by the club and members and for activities such as a digital club net etc.

A second module called NARS Technical/Site has been set up as an additional module for Technical/site use, for example there may be a lot of activity between members when there is an installation or maintenance of equipment taking place at either the NARS QTH or at a members QTH or during club events. This activity could be annoying if it was in the main NARS Module, there could be an active QSO in the NARS Module or a member could be monitoring that Module.

As each module within this XLX server is separate any activity taking place is contained within each module, when you initially connect to XLX135 you will not be connected to a module. You will not be able to hear any activity on this XLX server or be able to make any contact until you connect to an appropriate module. This guide explains what modules are and how to use and connect to them.
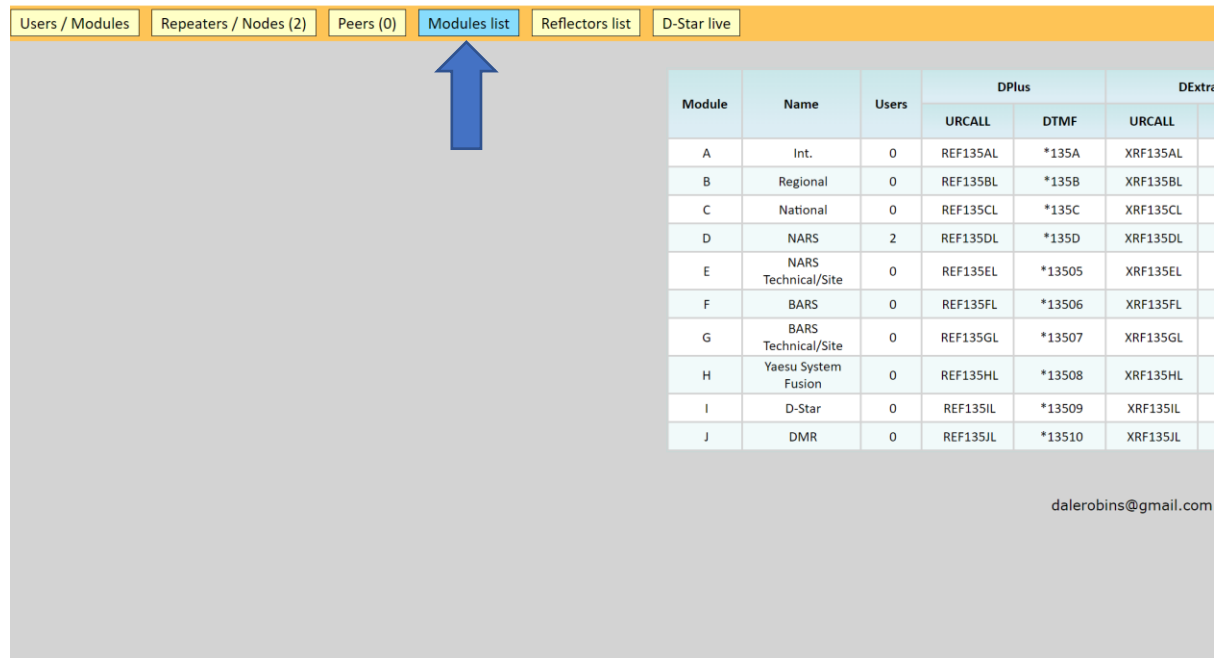
Further modules can be created by request to myself.

There are currently 10 modules enabled on this XLX server, each of these modules are visible by going to the XLX dashboard that has been setup: http://xlx.hopto.org then click on the **Modules** button

XLX Multiprotocol Gateway Reflector

XLX135 v2.5.3 - Dashboard v2.4.2 2W0ODS - XLX Server / Service uptime: 12 days 15:54:05

| Users / Modules | Repeaters / Nodes (2) | Peers (0) | Modules list | Reflectors list | D-Star live |

Module	Name	Users	DPlus		DExtra
			URCALL	DTMF	URCALL
A	Int.	0	REF135AL	*135A	XRF135AL
B	Regional	0	REF135BL	*135B	XRF135BL
C	National	0	REF135CL	*135C	XRF135CL
D	NARS	2	REF135DL	*135D	XRF135DL
E	NARS Technical/Site	0	REF135EL	*13505	XRF135EL
F	BARS	0	REF135FL	*13506	XRF135FL
G	BARS Technical/Site	0	REF135GL	*13507	XRF135GL
H	Yaesu System Fusion	0	REF135HL	*13508	XRF135HL
I	D-Star	0	REF135IL	*13509	XRF135IL
J	DMR	0	REF135JL	*13510	XRF135JL

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Module	Name	Users	DPlus		DExtra		DCS		DMR	YSF DG-ID
			URCALL	DTMF	URCALL	DTMF	URCALL	DTMF		
A	Int.	0	REF135AL	*135A	XRF135AL	B135A	DCS135AL	D135A	4001	10
B	Regional	0	REF135BL	*135B	XRF135BL	B135B	DCS135BL	D135B	4002	11
C	National	0	REF135CL	*135C	XRF135CL	B135C	DCS135CL	D135C	4003	12
D	NARS	2	REF135DL	*135D	XRF135DL	B135D	DCS135DL	D135D	4004	13
E	NARS Technical/Site	0	REF135EL	*13505	XRF135EL	B13505	DCS135EL	D13505	4005	14
F	BARS	0	REF135FL	*13506	XRF135FL	B13506	DCS135FL	D13506	4006	15
G	BARS Technical/Site	0	REF135GL	*13507	XRF135GL	B13507	DCS135GL	D13507	4007	16
H	Yaesu System Fusion	0	REF135HL	*13508	XRF135HL	B13508	DCS135HL	D13508	4008	17
I	D-Star	0	REF135IL	*13509	XRF135IL	B13509	DCS135IL	D13509	4009	18
J	DMR	0	REF135JL	*13510	XRF135JL	B13510	DCS135JL	D13510	4010	19

Looking at the Module List above, in the column titled **Module** there are a series of letters, each one of these letters is allocated to a Module, in the **Name** column there is a description of each Module that has been allocated. It is important to familiarise yourself with the designated letter as this is used globally across this XLX system.

Looking at the module list there are 2 entries for NARS, **Module D** which corresponds to NARS and **Module E** which corresponds to NARS Technical/Site.

If you would like to see what user is connected to what module click on to the **User / Modules** button.

Looking at the **User / Modules** section you will see that there are 2 tables, the first table will show the Callsign of any user that is currently connected to XLX135, when they were last heard and the last module they transmitted in to. The first column **#** will show if a user is currently transmitting.

Under the DPRS column clicking on will show their location on the aprs.fi website, however this location information is either provided by the location information that has been entered in to a users pi-star hotspot or from their radios GPS (If GPS capable/Configured)

On the next table you will see **NARS D,** this table will show all users that are currently connected to that module, a table for each module will appear under this section on the dashboard whenever there is a user connected to it.

In addition to the above if you click on the **Repeaters / Nodes** button you will get some additional information, this will display what digital protocol they are using and unlike the **Users / Modules** section shown previously where it displays the module where the user was last active, under **Module** it shows the module that they are currently connected to.

Callsign	Apply	Protocol	Apply	Module	Apply

#	Flag	DV Station	Band	Last Heard	Linked for	Protocol	Module	IP
1	🏴	MW1DCF-B	70cm	31.01.2023 19:49	2 days 04:02:02 s	YSF	D	*.*.*.191
2	🏴	MW0LGE-B	70cm	31.01.2023 15:17	1 days 22:20:55 s	YSF	D	*.*.*.62
3	🏴	2W0ODS-B	70cm	02.02.2023 12:49	0 days 00:34:21 s	YSF	D	*.*.*.21

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As mentioned at the beginning of this document this is XLX server supports multiple different digital protocols.

In it's current configuration anyone using a Yaesu System Fusion radio or a DMR radio can communicate with each other with no additional configuration or have to use crossover modes on their hotspot. Dstar users can connect and use this XLX server, but due to Dstar having a proprietary licenced codec they are currently only able to communicate with other Dstar users.

However, I am currently in the process of purchasing either 1 or 2 DVMEGA DVstick33 USB sticks which are based on an AMBE3003 Chipsets. These have to be imported from Holland and I am currently in discussion with DVMEGA regarding a purchase. With one or more of these USB Sticks Dstar users will be able to communicate through this XLX server with both Yaesu System Fusion and DMR users in any of the modules, as the XLX server will use the DVMEGA DVstick33 to transcode the Dstar codec bi-directionally to other digital protocols, which is completely transparent to all users.

Each DVstick33 has the capability to transcode 3 streams, so one DVstick33 would support 1 conversation as 2 streams are required to transcode one conversation (1 to receive and decode, 1 to encode and send), with 2 DVstick33's there are a total of 6 streams, so 3 simultaneous conversations can take place.

The XLX server is currently running on a Raspberry Pi, this is perfectly ample for it's current configuration, but it is a different matter regarding transcoding.

I will move the XLX server across to a dedicated Linux based computer in order to give the best performance and USB throughput for the DVstick33 or Multiple DVstick33's.

In addition to the above, I have just taken out a new broadband contract for a Fibre to the premises line that has 1000Mbps Down/1000Mbps Up and I have purchased a Static IP address for this XLX Server.

Pi-Star XLX135 Connection Guide (Yaesu FT70D)

This guide assumes that you have a MMDVM Compatible hotspot with a working Pi-Star installation and that it is configured for use with Yaesu System Fusion. Your FT70D will also need to be configured with the hotspot frequency either saved as memory or entered via the keypad. In order to use WiresX/System Fusion your FT70D must have your call sign saved. If this hasn't been done this can be done by pressing and holding **F** on the keypad, rotating the dial on top of the radio to Menu **63 MYCALL**, press **F**, then use the dial on top of the radio to change characters and enter your call sign. Use the **Band** key to move to the next character input. To save your call sign press **PTT.** The UHF frequencies allocated for Low Power Personal Hotspot use in the UK are the following: 434.000 and 438.800.

Please only use the lowest RF power that's required for reliable operation from your radio.

Firstly update Pi-Star to ensure that the latest host files are installed, if the host files are out of date Pi-Star will be unaware of this XLX135 server and you will be unable to connect. This can be easily done by going to the webpage of your Pi-Star hotspot, clicking on either **Admin** or **Configuration**, then click on **Update.** If at any point you are asked for a username and password and you have not changed it the default username/password for Pi-Star is: pi-star/raspberry.

If the update has been successful you will see **Finished** as per the screenshot below:
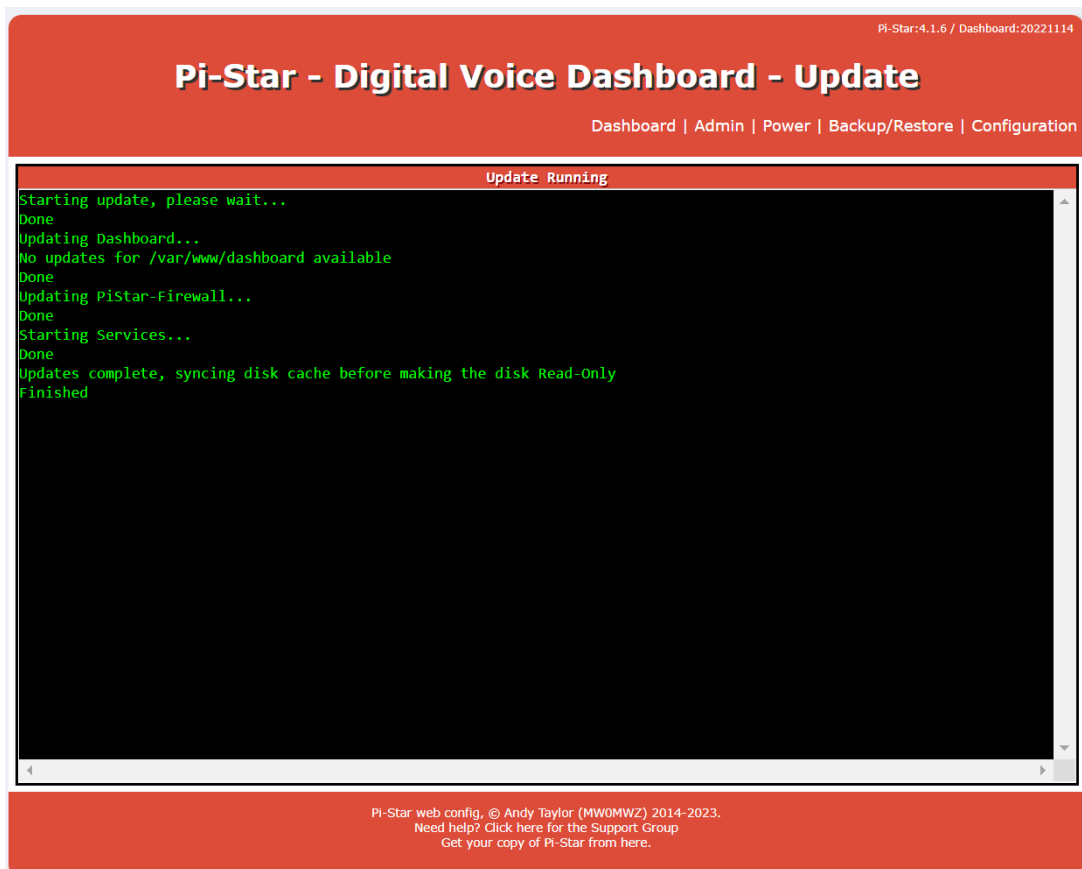
Once it has finished updating, In order to use WiresX on your FT70D to connect to this XLX135 server please check/change the following, click on **Configuration** at the top, scroll down to **MMDVMHost Configuration** and check that **YSF Mode:** is enabled, if not please enable it and then **Apply Changes.**

Once the changes have applied then scroll down to **Yaesu System Fusion Configuration,** make sure both **UPPERCASE Hostfiles:** and **WiresX Passthrough:** are both enabled. If they are not then please enable both and **Apply Changes.** If you want the hotspot to always start up connected to XLX135 you can select it here as a **YSF Startup Host:**, however that is completely optional.

MMDVMHost Configuration

Setting	Value				
DMR Mode:	⚪	RF Hangtime:	20	Net Hangtime:	20
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:	⚪				
YSF2NXDN:	⚪				
YSF2P25:	⚪				
DMR2YSF:	⚪	Uses 7 prefix on DMRGateway			
DMR2NXDN:	⚪	Uses 7 prefix on DMRGateway			
POCSAG:	⚪	POCSAG Paging Features			
MMDVM Display Type:	OLED Type 3 ∨ Port: /dev/ttyAMA0 ∨ Nextion Layout: G4KLX ∨				

Apply Changes

Once the changes have applied then scroll down to **Yaesu System Fusion Configuration,** make sure both **UPPERCASE Hostfiles:** and **WiresX Passthrough:** are both enabled. If they are not then please enable both and **Apply Changes.** If you want the hotspot to always start up connected to XLX135 you can select it here as a **YSF Startup Host:**, however that is completely optional.

Yaesu System Fusion Configuration

Setting	Value
YSF Startup Host:	None ∨
UPPERCASE Hostfiles:	🔴 Note: Update Required if changed
WiresX Passthrough:	🔴

Apply Changes

You can click now click on the **Admin** on the Pi-Star webpage if you want to monitor activity or check that your radio is working correctly with your Pi-Star hotspot.

If everything is set up correctly on your Pi-Star hotspot, under **Modes Enabled** YSF should be green and under **Network Status** YSF Network should also be green. If either of those are red please check that your Pi-Star hotspot has internet access.

OPTIONAL If you want to test your radio at this stage you can connect to the YSF Parrot by clicking on the **Reflector** drop down list on the **YSF Link Manager**, select **YSF00001 – Parrot**, make sure **Link** is selected then click on **Request Change**. Now transmit on your FT70D with and talk in to it with a short sentence, if everything is working correctly the **Parrot** will replay your audio back to your FT70D, once you have finished testing with the **Parrot** select **UnLink** and then click **Request Change**.

Next we will connect to the XLX135 server using WiresX on the FT70D, firstly make sure your FT70D is on either the correct memory preset for your Pi-Star Hotspot, or manually enter the frequency of your Hotspot on the Keypad. (Due to the frequency allocation of the low power hotspot frequencies, you may notice that your radio is not transmitting on the correct frequency. This is due to a setting on the FT70D called Automatic Repeater Shift, you will see a small box on the top of the LCD with a "**–**" symbol, please make sure that you have disabled any repeater split frequencies by pressing **F** then **0** and rotate the dial till it says **SIMP**, then save that memory preset as per the user guide, if you do not wish to save the hotspot as a memory preset you will need to follow these steps every time you type in the hotspot frequency or alternatively disable Automatic Repeater Shift)

Press **F** then **AMS** to open a WiresX connection to the hotspot, if the connection is successful you will hear a short tune from the FT70D.

If you do not hear the beeps and **WIRES** is flashing on the radio try pressing the **MODE** button to re-send the WiresX initialisation again (This may take a couple of presses) this can sometimes be needed if the Pi-Star is configured for multiple different digital protocols and it is scanning through those modes when idle. If this does not work and you get a beep, beep, beep opposed to a short tune something is not configured correctly on either your Hotspot or FT70D.

Now that we have connected to the Hotspot with WiresX you will see either see your Call Sign on the display of the FT70D (Or the Call Sign of user of the Hotspot you are connecting to) or the name of the YSF Server that you are currently connected to on Pi-Star.

Moved to Step 2 if XLX135 was set as a startup host or has manually been selected in the reflector drop down list

Step 1:

This step is to tell Pi-Star that we want to connect to XLX135, to do this rotate the dial on top of the FT70D until you see **En*_ _ _ _ _** This is the WiresX direct entry screen, using the keypad on the FT70D enter **13500** the display will show **En*13500**, do not worry if you have mistyped this number, you can correct it by typing it again. Next press the **AMS** Key and you will hear a short tune, the FT70D will then display **Cn XLX 135**. If you do not get the short tune press **AMS** to try again. Now the Pi-Star is connected to **XLX135,** we now need to select a module within **XLX135** that we want to use. As Pi-Star has been configured for "WiresX Passthrough" we now need to close the current WiresX connection in order to give it further instructions to select a module, to do this press and hold the **MODE** key, the FT70D will leave WiresX and then either display the name of your Hotspot memory preset or the VFO with your Hotspot frequency (Whichever you used to connect to the hotspot).

It's important to note at this stage we have closed the WiresX connection, we have not disconnected from **XLX135**.

Step 2:

We now need to tell Pi-Star that we want to enter a module, we do this by opening a WiresX connection. Press **F**, then **AMS** as before, then rotate the dial on the FT70D to the direct entry screen, **En*_ _ _ _** will be displayed again, here we need to enter the number that corresponds with the module that we want to connect to. The FT70D does not allow a connection through the letter assigned to that module, however we can connect using direct entry with numbers, for example **Module A = 1**, **Module B = 2**, so if we want to connect to **NARS** which is **Module D** it is the 4th entry in the list of Modules so it is number 4, we need to pad that number out as the direct entry mode requires 5 digits. So using the numbers on the keypad on the FT70D type 00004 the display will show **En*00004**, then press the **AMS** key. If everything is successful you will hear a short tune from the FT70D and the module name will scroll across the display, in this example **MODULE D**.

If you wish to change modules within **XLX135** then simply rotate the dial on top of the FT70D till it displays the direct entry screen **En*_ _ _ _** and type in the module number, for example **NARS Technical/Site Module D** which would be **00005** and press the **AMS** key. Once you are connected in WiresX passthrough mode you can move between modules.

Now that you are connected to the Module you wish to use, you can communicate with your radio as normal within these Modules, listen to see if there is a QSO taking place, if not press PTT and call as if you were using Simplex or a traditional Repeater.

You can look on your Pi-Star dashboard to check whether you are connected to **XLX135** and also go to the **XLX135** web page http://xlx.hopto.org for more information, for example to see who is connected to what module, if anyone is currently active in a QSO, look at the list of modules there and to check what module you are currently connected to.

There is no timeout on the **XLX** server or within modules, once you are connected you will stay in the last module you selected. It can be left for hours or days if you want to monitor a module.

To disconnect from **XLX135**, if you are in WiresX mode press and hold the **BAND** key on the FT70D, this will disconnect Pi-Star from **XLX135**. You can check this by going to your Pi-Star hotspot webpage, under **YSF Network** it will display **Not Linked.** Then press and hold the **MODE** key to leave WiresX mode.

Congratulations, you are now set up for **XLX135**, hopefully this guide explains the process clearly, if you require any further assistance, troubleshooting or advice please contact me either by email: dale.robins@gmail.com, Telephone: 0737734286 Or at the club!

As I mentioned there are 10 Modules on this **XLX135** Server, most **XLX** servers follow a standard and have the first 3 Modules allocated to **Int.** , **Regional** and **National**. If any modules are going to be linked or crossed over to any other networks please use those modules and as this XLX server appears on lists on not only Pi-Star but other XLX references

those 3 rooms will be available for anyone to use, keep an eye on activity as there may be opportunity to speak to people worldwide if they visit this server.

There are no restrictions to any modules on here, any person with a valid amateur radio licence can use any of these modules and anyone can be invited to use this XLX server by yourselves, however it is good etiquette to use the first 3 general modules for that opposed to the club specific modules.

If there are any questions or any further suggestions to anything related to this XLX server, modules and associated documentation please contact me.

Further documentation will follow for different radios and digital protocols.

Thank you for reading,

Dale

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