

# New Packet Radio Setup

NPR-H from DO5DSH

Date: 2021-01-20

Version: 1.0

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## 1. Connections

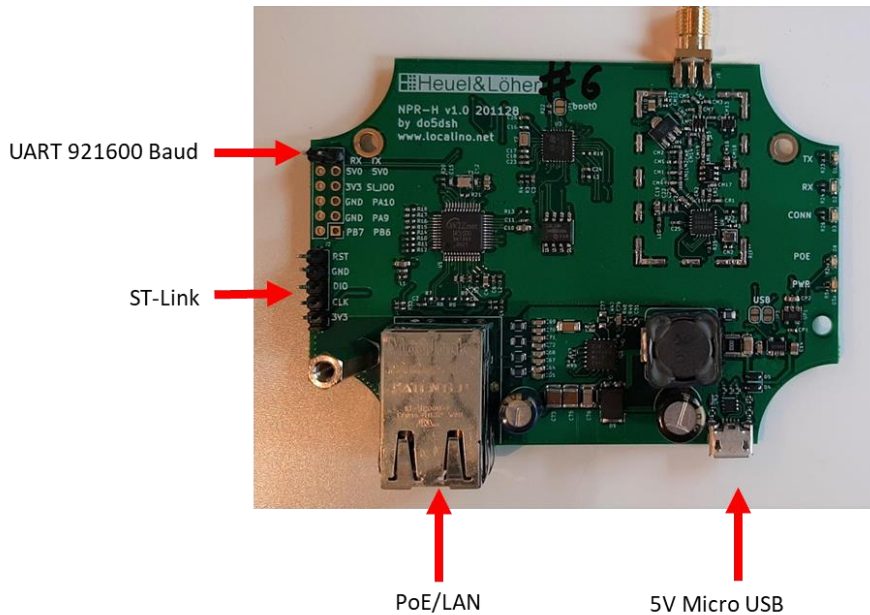


Figure 1: NPR-H Top

The following GPIO pins are routed to the board edge connector.

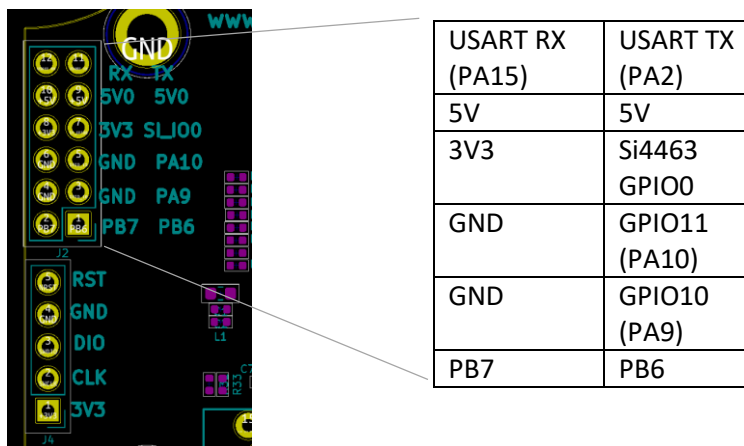


Figure 2: GPIO Connector

GPIO10 (PA9) is switched by the MCU once TX is on and can be used to drive the switch of an external power amplifier (PA) for example.

The UART pins use 921600 baud setting.

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## 2. Power Supply

Either use a 5V Micro USB connector and standard LAN cable without PoE supply

or

LAN connection with PoE supply. The PoE interface is compatible to IEEE standard 802.3af.

## 3. Connection to a PC

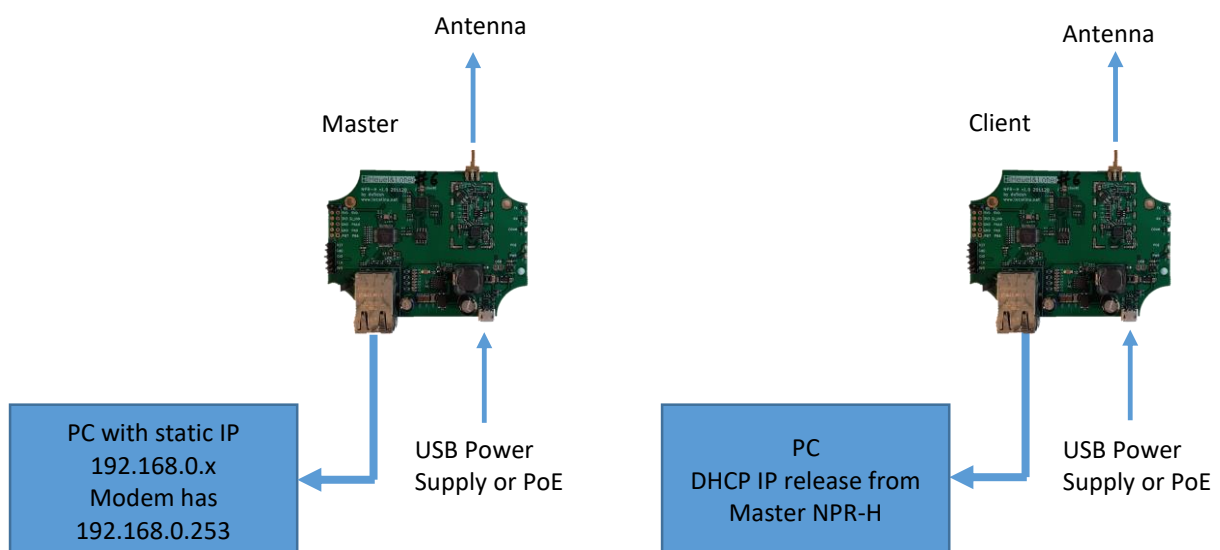


Figure 3: Typical setup of a direct connection between master and client

Wire the 5V Micro USB Power supply and LAN cable to your PC. You can also use the USB port from your PC to connect power to the NPR-H. The NPR-H draws ~250 mA.

USB Data lines of the NPR-H are open jumpers. They are not connected and USB data transfer is not functional without soldering the jumper pads.

### 3.1. Master settings

1. Wire the master to your PC Ethernet.
2. Setup a static IP, e.g. 192.168.0.10
3. The master NPR-H has the IP 192.168.0.253 by default

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4. Test the connection via ping or putty. Use the Telnet port and open a connection to 192.168.0.254 on port 23 to the NPR-H



Figure 4: Open Putty connection

Any command from F4HDKs command list can be issued via Telnet. For example with “status” you can retrieve the up and downlink status. With “display config” you can visualize the configuration of the modem.

It is important to notice the DHCP range, which is 192.168.0.65 to 192.168.0.96 in this setting.

Any client connecting to the master will get a DHCP address from the master client. The PC where the client modem is connected to will get this DHCP address assigned!

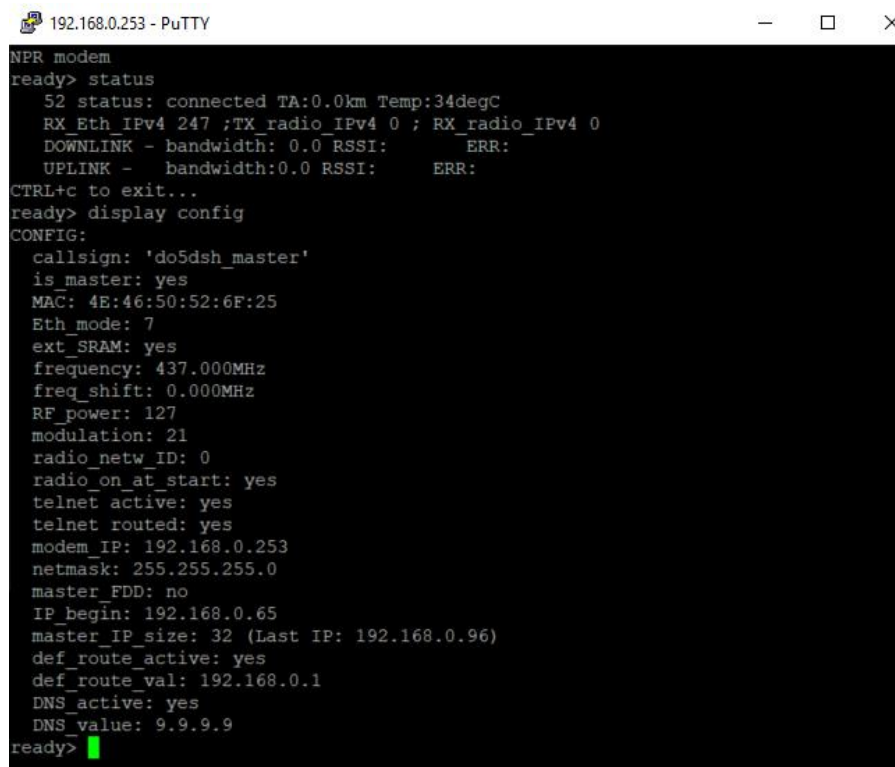


Figure 5: Telnet output

### 3.2. Client settings

1. Wire the client to your PC Ethernet.
2. Setup DHCP IP
3. The master assigns the DHCP via 70cm band. In this setup the first IP is 192.168.0.65.

## 4. Configuration

The NPR-H can be configured via UART with 921600 baud setting. Connect for example a USB-UART adapter to the marked pins TX, RX and GND.

Alternatively the NPR-H can be configured via Telnet, 192.168.0.253:23



Figure 6: Connection with exemplary USB-UART interface

## 5. Good to know

The TX LED blinks on TX. The RX LED blinks once a packet is received. CONN will blink in master settings, if the master is operational. CONN will be on from a client if its connected to a master.

The master boots and will blink TX several times if “radio\_on\_at\_boot” is configured to yes. After some time, the master will be quiet.

The client boots and sends packets to the master in a regular interval (several seconds). Once the master responds they will exchange packets and a connection will be established.

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Please also take a look at the documentation from F4HDK which is available here:

[NPR advanced guide](#)

[NPR specification](#)

[NPR introduction](#)

[NPR Firmware 2020 06 29 band 70 cm](#)

[NPR source code 2020 06 29](#)

## 6. Technical Specification

Output Power	+25 dBm
LNA Gain	13 dB
RF Connector	SMA
Frequency Range	360 - 535 MHz, optimized for 70 cm ham radio band
Noise Figure	< 1.5 dB
<b>Power</b>	
Power consumption	230mA @ 5V
Power supply	Micro USB 5V DC or Power over Ethernet (PoE)
<b>Dimensions</b>	
PCB	66,3 x 90,6 x 18 mm
incl. RJ45 jack sticking out from the PCB edge	70 x 90,6 x 18 mm

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