

A Polite Warning

This document assumes the user is familiar with D-Net, our remote control application, and with networking terminology and configurations. It is possible to set a device to a static IP address that will no longer be accessible to D-Net making it impossible to reset without complex reconfiguration of the controlling device, which can be a lengthy process.

We strongly recommend using DHCP IP addressing for NST Audio products unless strictly necessary within your network infrastructure to do otherwise, and do not undertake swapping to static IP addressing during a critical performance!

DHCP and Static IP Addressing Modes

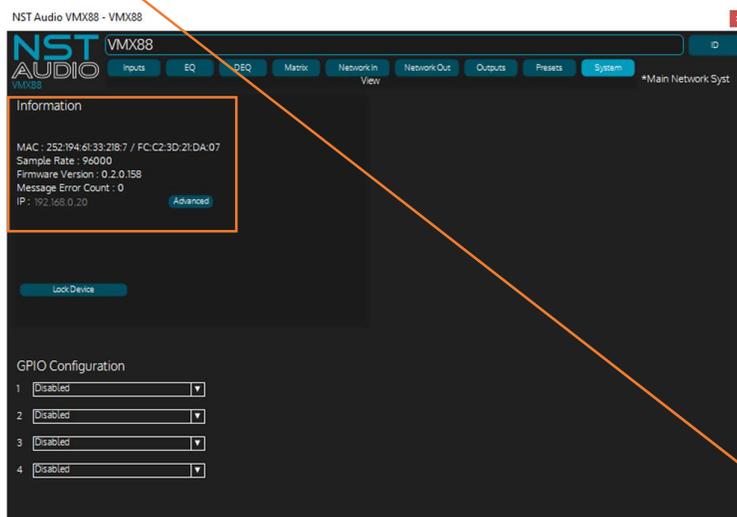
By default, all products leaves the factory in DHCP mode. This means the control network interface will be to get an IP address from a DHCP server. Should a DHCP server not be available it will resort to link local autoconfiguration /automatic private IP addressing mode and auto assign one in the 169.254.*.* range.

For communications between a computer and a device both must have IP addresses in the same range. For example if auto assigned, both must be in the 169.254.*.* range or if obtaining addresses from a DHCP server both in the 192.168.*.* range Note : 192.168.*.* is just common default range used by many DHCP servers.

Checking a device's IP address in D-Net

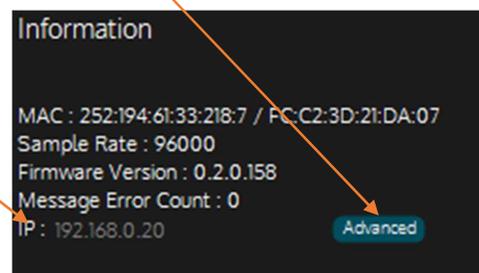
VMxxx Devices

After the device has been discovered by D-Net, opening it for editing (double click on device in the left hand rack view) and then selecting the "System" tab on VMxxx devices will access device operational information, including the device's IP address:



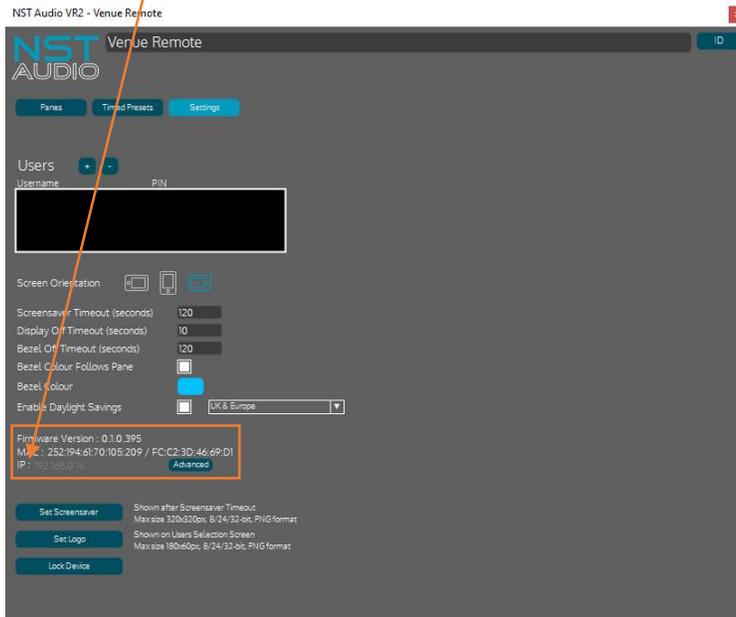
In this instance the device's IP address is set to 192.168.0.20.

The fact that this address is in the 192.169.*.* range means it is probably set to DHCP addressing and not a static IP address. This can be verified by pressing the "Advanced" button.



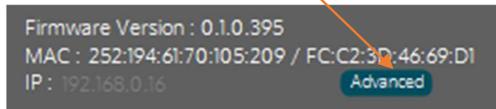
VR2 and VR1 Devices

After the device has been discovered by D-Net, opening it for editing (double click on device in the left hand rack view) and then selecting the “Settings” tab on VR2 devices will access device operational information, including the device’s IP address:

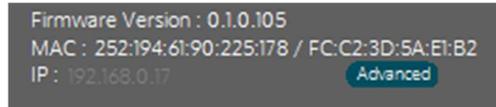
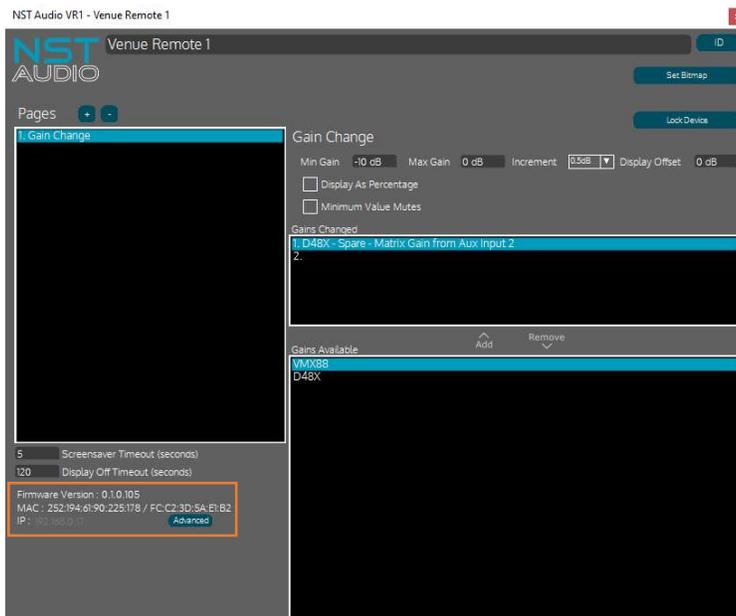


In this instance the device’s IP address is set to 192.168.0.20.

The fact that this address is in the 192.169.*.* range means it is probably set to DHCP addressing and not a static IP address. This can be verified by pressing the “Advanced” button.



For VR1 devices the system information is shown on the initial pane bottom left:



The “Advanced” button then reveals the DHCP status of the device and shows the current subnet mask.

The subnet mask number format is shown in the CIDR format, where the shorthand mask value is appended onto the end of the IP address. This is normally shown in the form 192.168.0.20/**/16** with the **/16** being the subnet mask. It is separated it out in D-Net allowing it to be hidden unless required.

Information

MAC : 252:194:61:33:218:7 / FC:C2:3D:21:DA:07
 Sample Rate : 96000
 Firmware Version : 0.2.0.158
 Message Error Count : 0
 IP : 192.168.0.20
 DHCP
 Subnet Mask 16

Advanced

Apply

In our example, set to **/16**, this equates to an actual subnet mask of 255.255.0.0. Swapping from one format to the other is straightforward - the value in CIDR format is the number of bits shifted in from the MSB of the top octet in the mask.

So, a value of **/3** for the subnet mask equates to

11100000.00000000.00000000.00000000 or 224.0.0.0 in decimal.

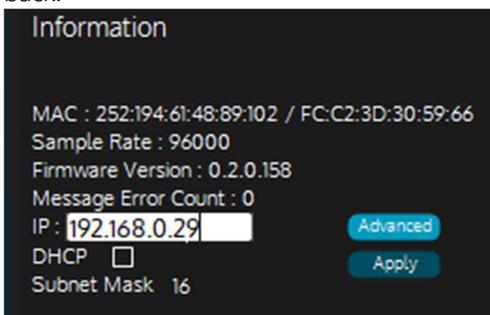
CIDR	SUBNET MASK
/24	255.255.255.0
/23	255.255.254.0
/22	255.255.252.0
/21	255.255.248.0
/20	255.255.240.0
/19	255.255.224.0
/18	255.255.192.0
/17	255.255.128.0
/16	255.255.0.0
/15	255.254.0.0
/14	255.252.0.0
/13	255.248.0.0
/12	255.240.0.0
/11	255.224.0.0
/10	255.192.0.0
/9	255.128.0.0
/8	255.0.0.0
/7	254.0.0.0
/6	252.0.0.0
/5	248.0.0.0
/4	240.0.0.0
/3	224.0.0.0
/2	192.0.0.0
/1	128.0.0.0
/0	0.0.0.0

Another Polite Warning!

We strongly recommend using DHCP IP addressing for NST Audio products unless strictly necessary within your network infrastructure to do otherwise, and do not undertake swapping to static IP addressing during a critical performance!

Changing a device's IP address in D-Net

Having pressed the "Advanced" button, it is now possible to type in a new IP address for the device and to adjust the value of the subnet mask. Be aware that setting the IP address to something outside of the address space that the computer is using will immediately render it unreachable by D-Net and you will not be able to switch it back.



Set the required IP address and press ENTER. Make sure you then press "Apply" to reconfigure the IP address. The device will go offline for a brief period while the network interface resets to use this new address. This will only be for about 1-2 seconds.

Any longer than this, and the IP address chosen is out of the range of the computer. This is a not immediately recoverable state and restarting D-Net, your computer or the device will NOT fix this!

If The Worst Has Happened...

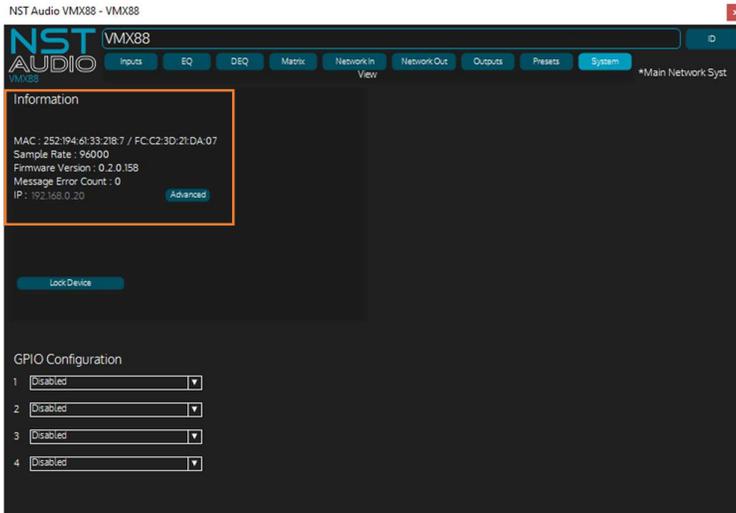
A device with an out of range IP address may still be discoverable by your computer and D-Net as the type of messages used for discovery use a different method not tied to the device's IP address. This allows D-Net to find all devices without having to know their individual IP addresses beforehand, and some limited information is returned following a broadcast exchange, including its name, its model and type and its IP address/subnet mask.

D-Net may show a device that is flashing green (connected normally) but primarily red (on a 1-2second cycle). This most likely a device that is out of range. If the device has appeared in D-Net but it will not respond to a Global Mute command while all other devices will, this confirms an out of range IP configuration.

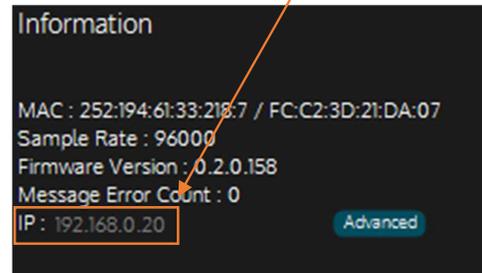
The quickest method to recover the device and reset to a working address space is a direct connection to a PC. Please see page 5 for details of how to do this.

IP Address Settings Recovery via Direct Connection

We need to know the IP address and subnet mask on the device that is not responding correctly. If you have been able to discover it in D-Net, double click on device in the left hand rack view and select the "System" tab.

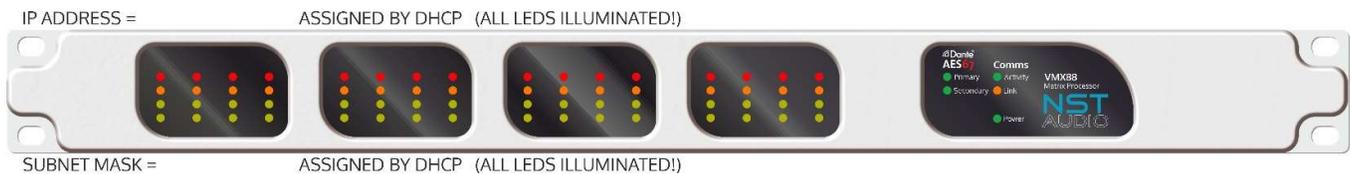


In this instance the device's IP address is set to 192.168.0.20.



If the device cannot be discovered using D-Net, it can be decoded via the front panel LEDs during the power-up sequence. The level meters are used to display the IP address and subnet mask. Note this ins only displayed for about 2 seconds so we recommend taking a photo with a phone when they illuminate and decoding the patterns afterwards!

By default a device will be set to DHCP and on power-up , all the meter LEDs will briefly illuminate.

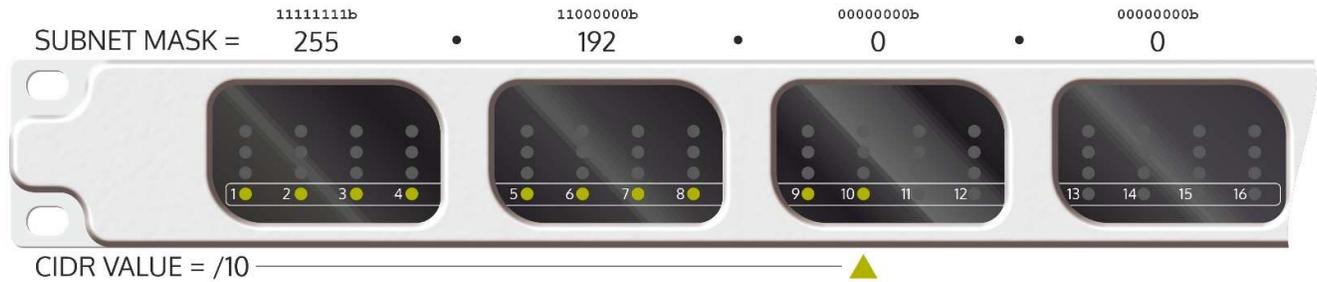


If a static IP has been set, the meter LEDs will show the IP address using the top two rows of LEDs (red/yellow).



Each window displays that octet's value in binary using the LEDs encoded as outlined above. For example, in the left-most window, the "128" and "64" LEDs are illuminated, so we add these together and that gives 192. In this way, the entire IP address can be decoded.

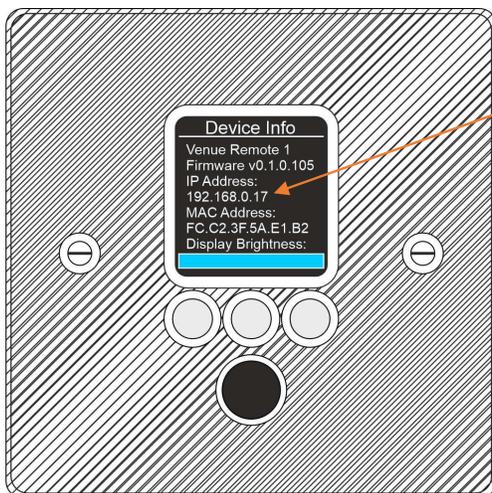
The subnet mask display uses a different technique in keeping with the CIDR notation used to show it in D-Net.



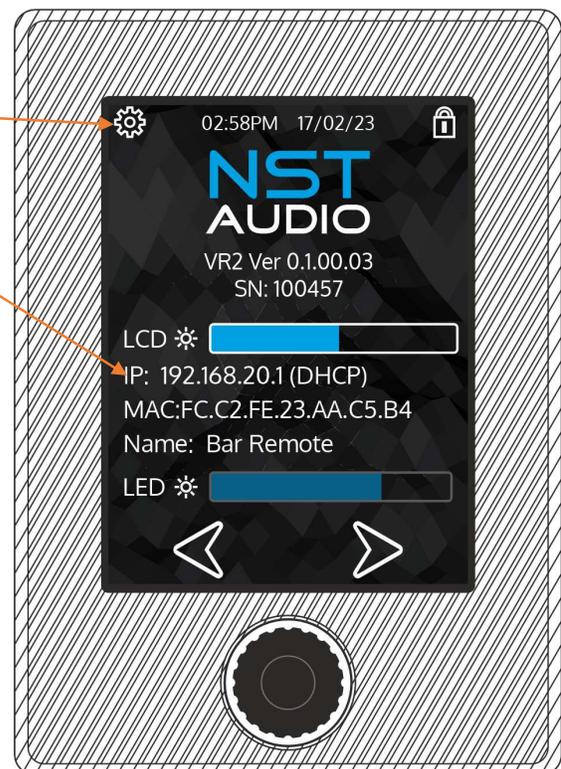
The bottom row of meter LEDs (green) show an increasing number from left to right, directly representing the subnet CIDR format value. In this example, 1-10 are illuminated so the subnet mask is set to 10 which equates to 255.192.0.0 if we refer back to the table on page 3.

The VR1 and VR2 can also show their IP addresses directly on their own screens by accessing the system info pages.

For a VR1, press the two outside buttons together and the IP address is listed here:



For a VR2, press the cog icon, and the IP address is listed here:



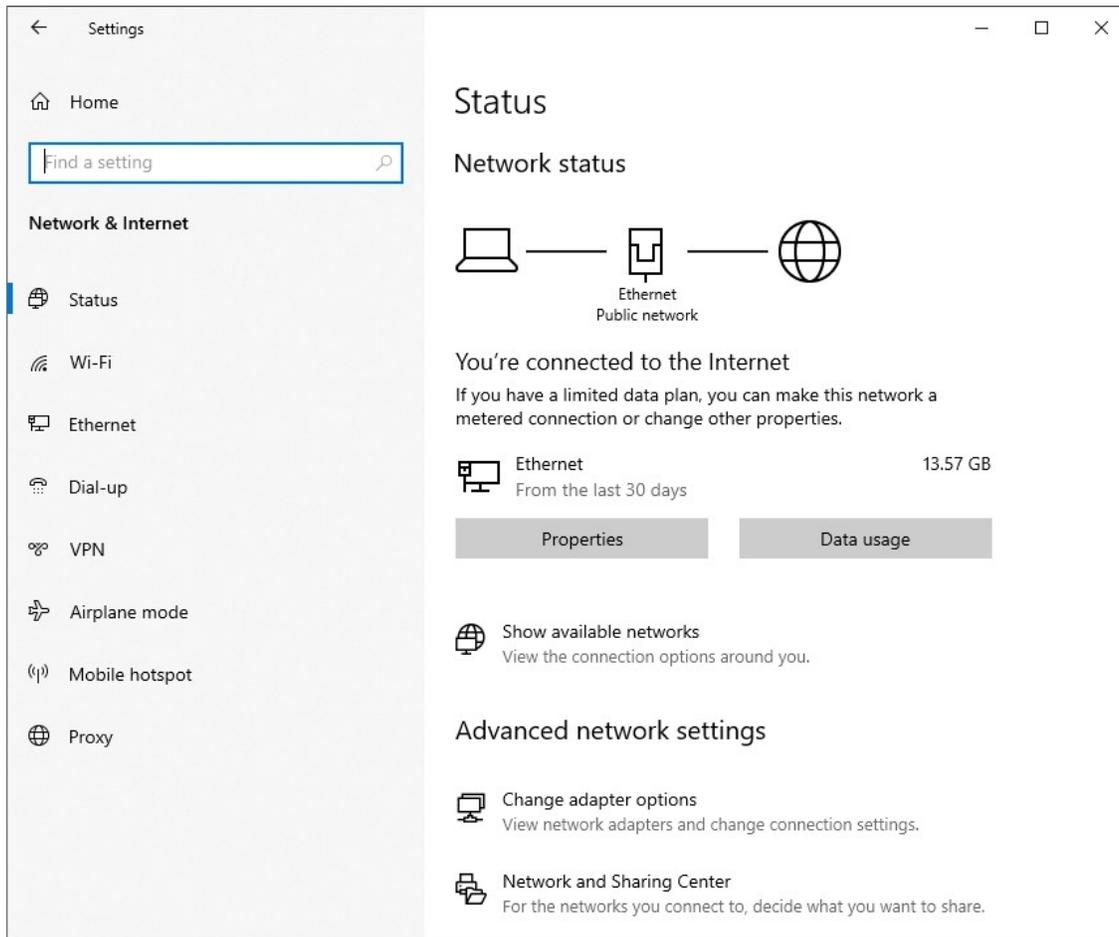
Whichever method is used to obtain the IP address and subnet mask information, the next step is the same. Configuration for a Windows PC starts on page 7 and for Mac OS starts on page 14.

Direct Connection to a Computer (Windows)

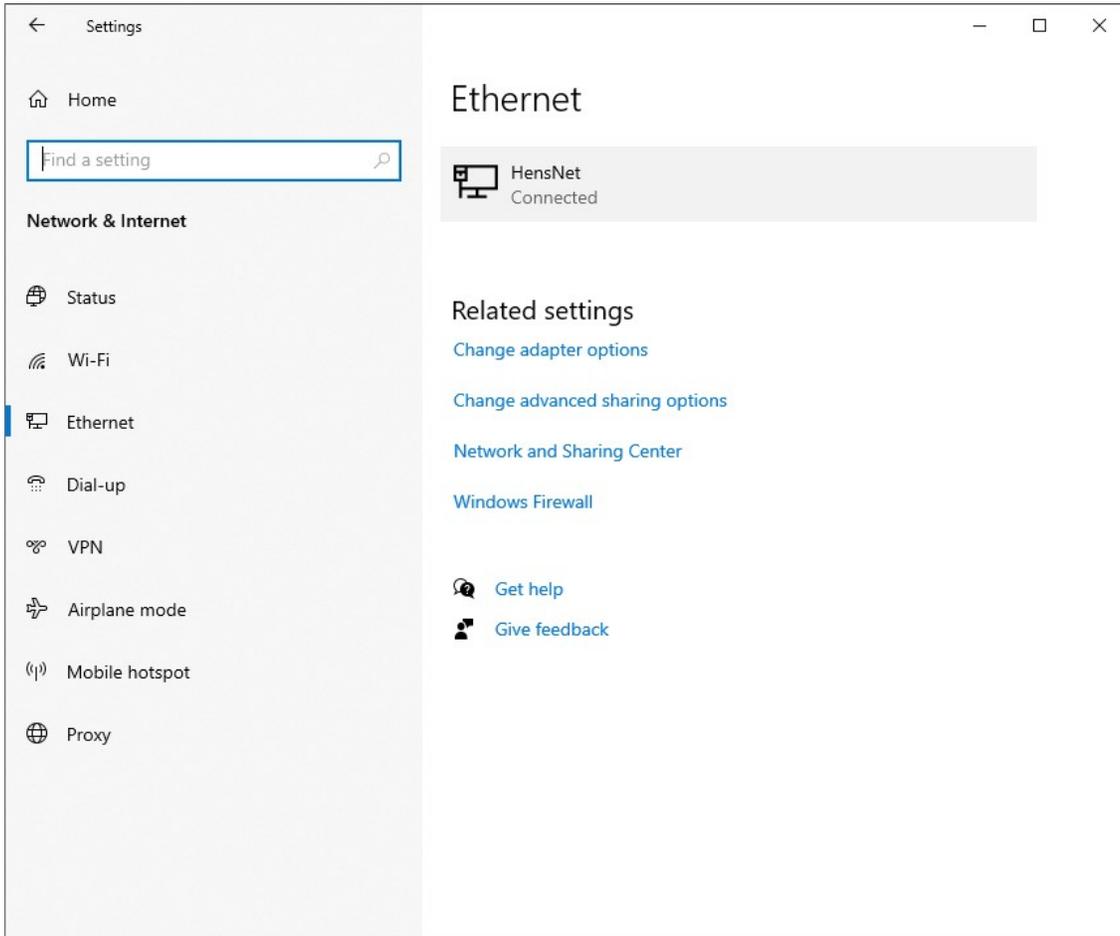
The next step is to set the computer's wired network IP address to be in a suitable range to allow visibility of the static IP erroneously assigned to the device. This method is largely the same on Windows 10 & 11, and our example shows Windows 10.

Plug an ethernet cable directly into the Comms socket on the rear of the device and into the Ethernet port on the computer. We also recommend temporarily turning off WiFi if in use on the computer.

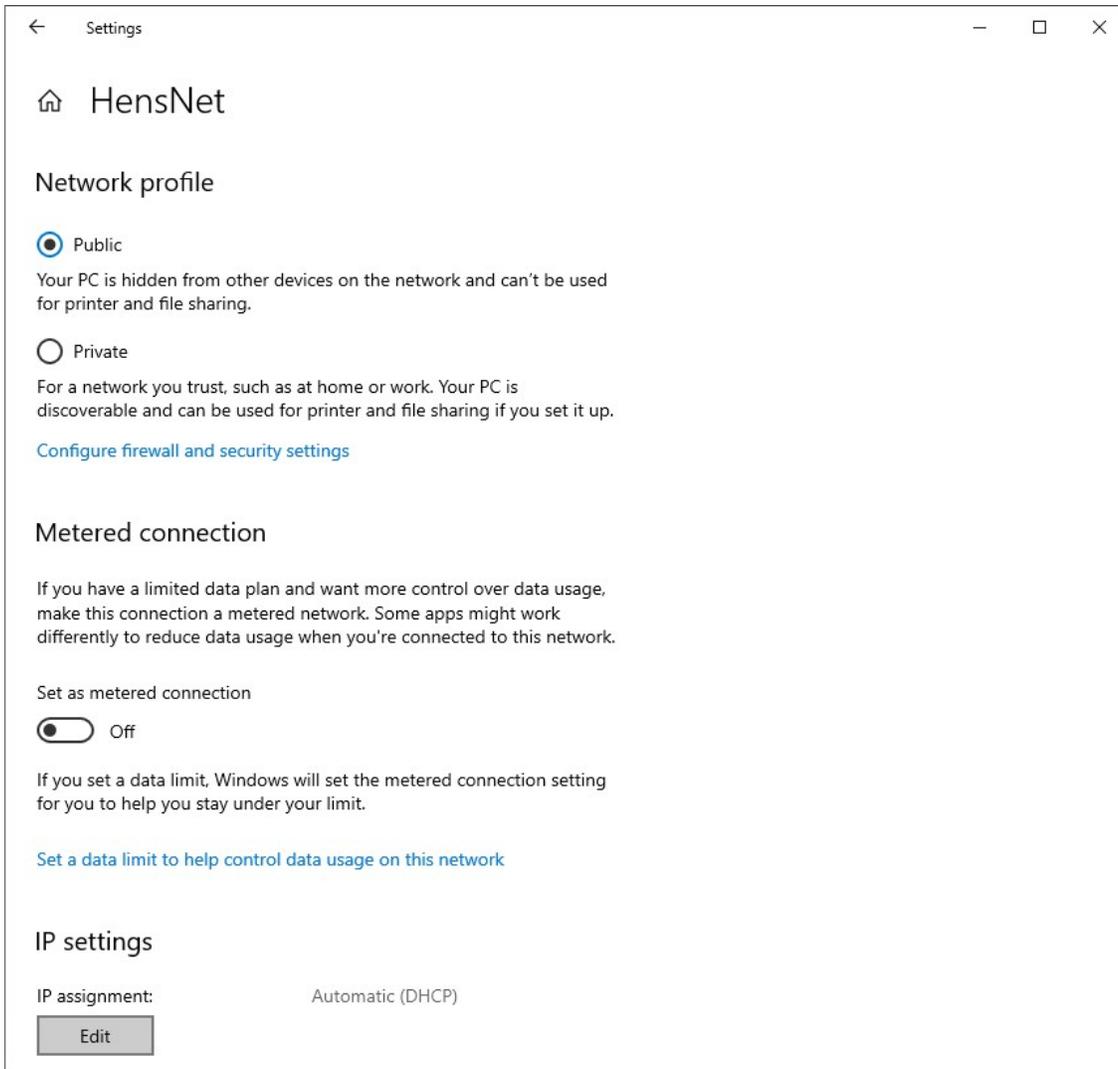
1) Go into Settings > Network & Internet



2) Select the Ethernet connection from the left hand list.



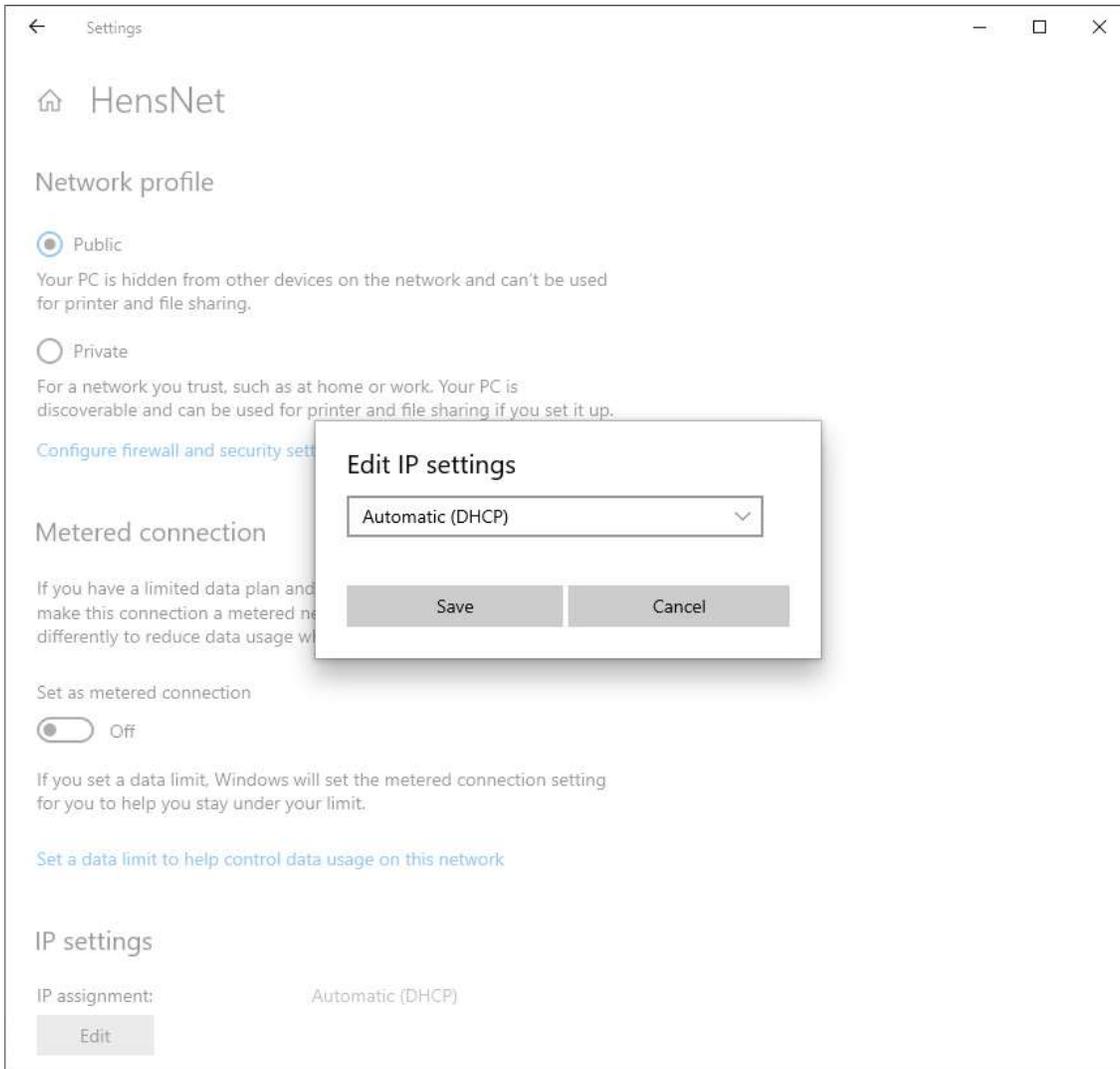
3) Click on the Ethernet network listed (in this example "HensNet").



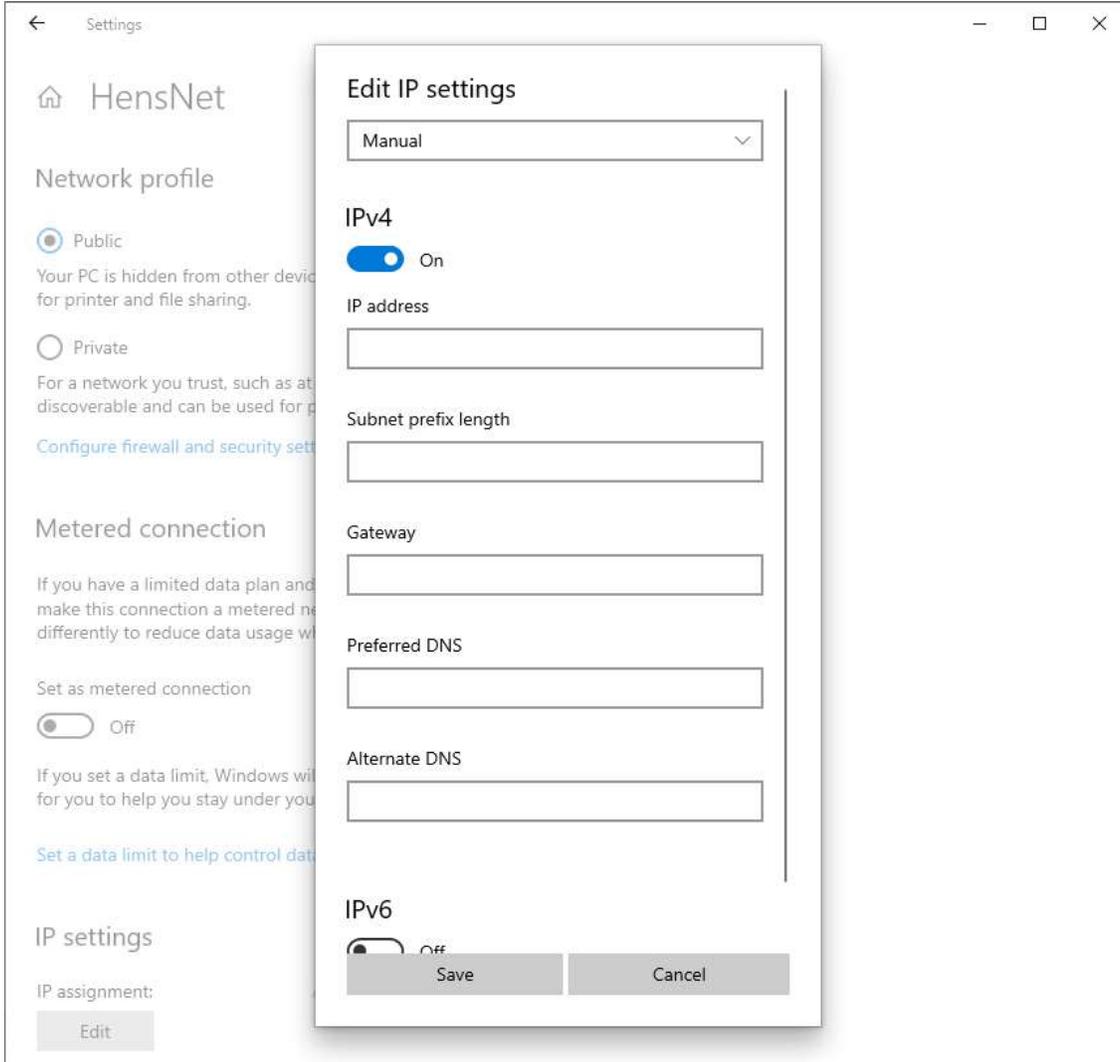
IP settings are shown towards the bottom of the page. In most instances this will be set to DHCP, as in our case.

4) Press the Edit button to access the settings.

If set to DHCP, a small window will appear with a drop down list to allow swapping to manual configuration from DHCP.

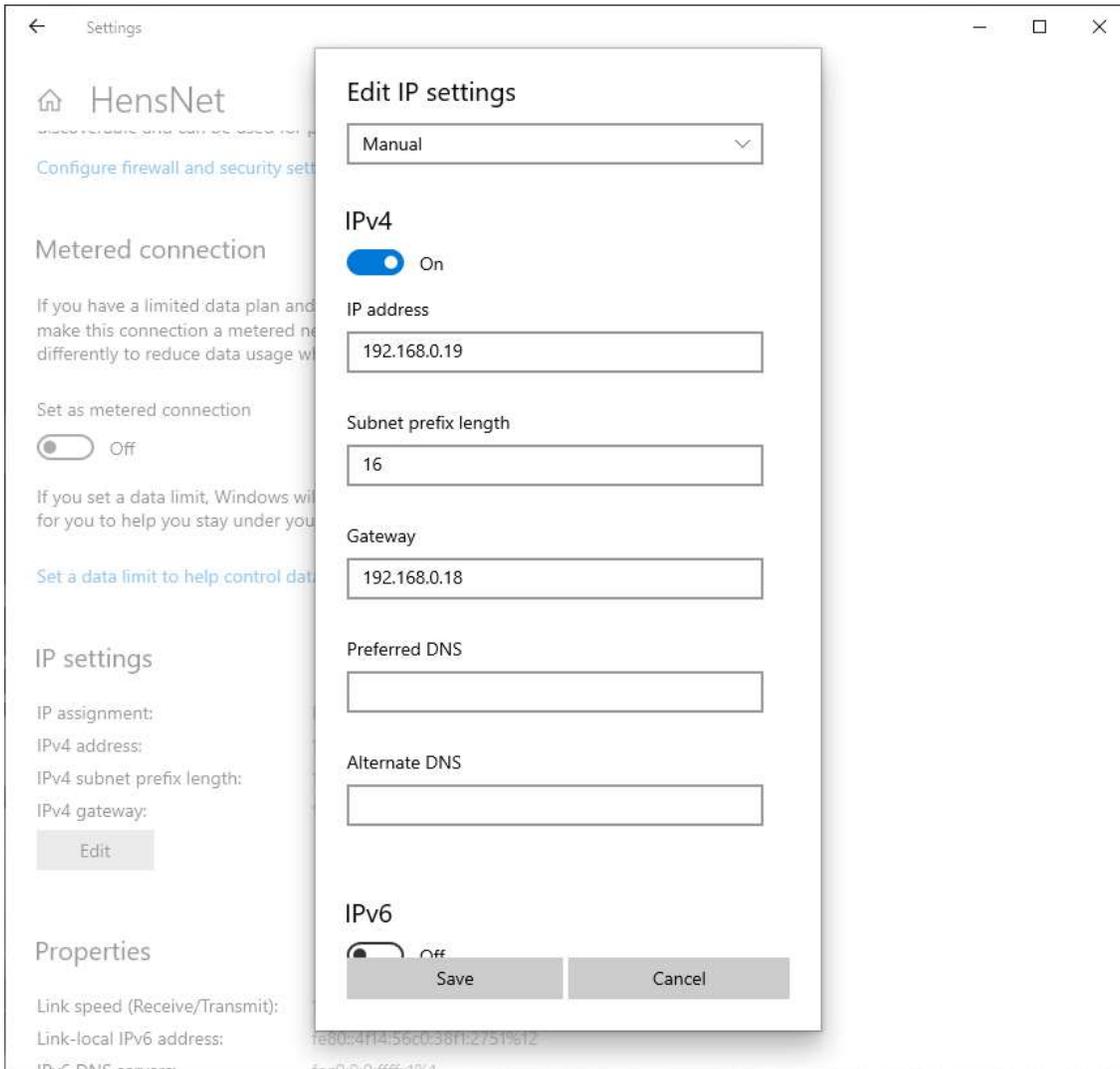


5) Select "Manual" and set the IPV4 switch to "On" to immediately display the manual addressing options.



6) Configure the IP address manually.

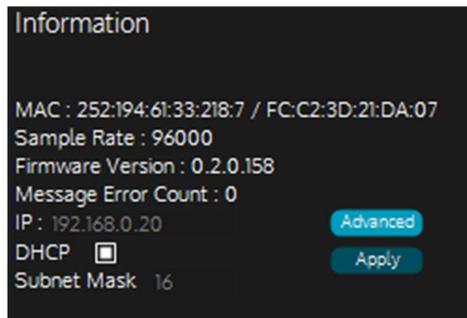
Based on the IP address and subnet mask of the device, we now populate these settings. Our advice would be to set the IP address to be one less than the device's and the Gateway to one less again. So, if the IP address of the device was 192.168.0.20 and the subnet mask was 16, we would type the following values in:



Leave the DNS fields blank. Press "Save" and you're done.

7) Open D-Net and go online.

The device should be discovered and be fully controllable. Test with the Global Mute button and confirm that this is working.



Access the device's IP address settings on the System tab, and press the "Advanced" button. Either set a static IP address in the correct range, or reselect DHCP.

Remember to press "Apply".

The device will most likely go offline now, and you will have to reset your PC's network interface to DHCP (and reconnect it physically to the network, as well as plugging your device back into the network).

8) Reestablish a connection with the device normally on the network.

Once the IP configuration of the computer has been returned to normal, open D-Net once again and go online to confirm that all previous devices are visible as well as the one that has just been reset to DHCP (or the preferred static IP address).

Direct Connection to a Computer (Mac OS)

The next step is to set the computer's wired network IP address to be in a suitable range to allow visibility of the static IP erroneously assigned to the device.

Plug an ethernet cable directly into the Comms socket on the rear of the device and into the Ethernet port on the computer. We also recommend temporarily turning off WiFi if in use on the computer.

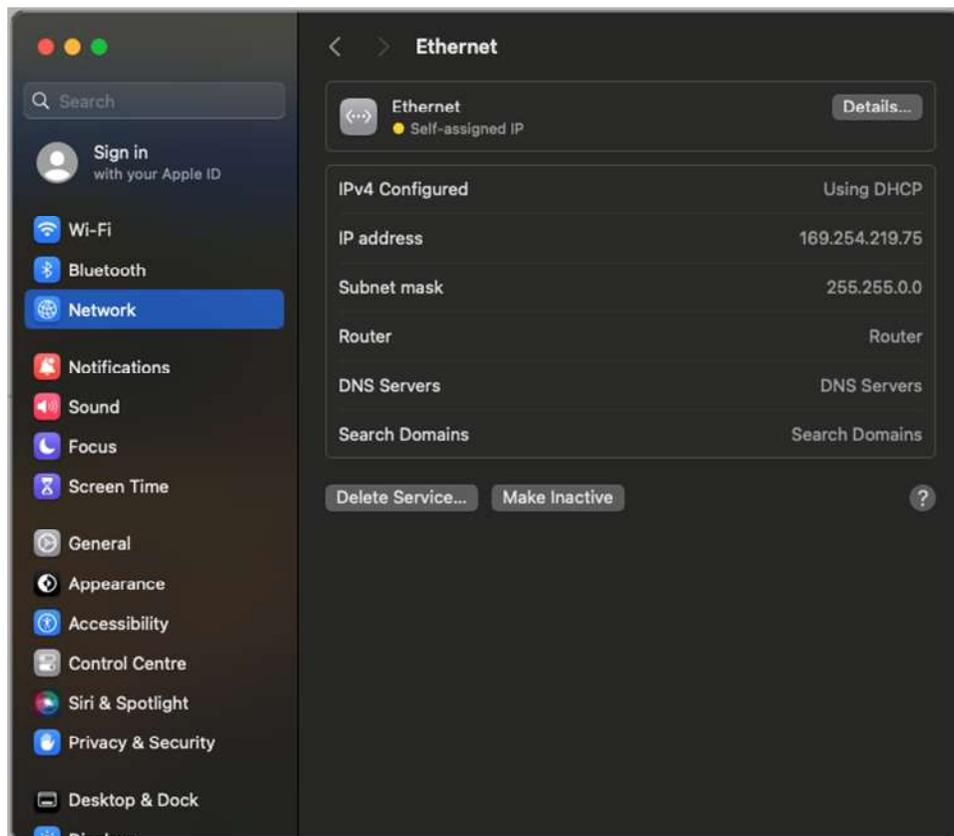
1) Click on the Apple icon and then System Settings:



2) Open "Network":

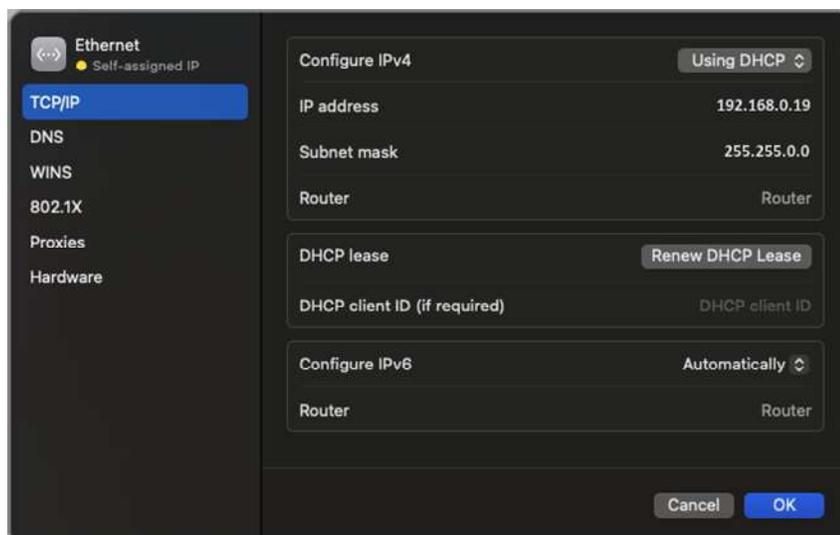


3) Select “Ethernet” and then the “Details” button.



4) In the network settings, select TCP/IP, and select “Manually” from the “Configure IPV4” option.

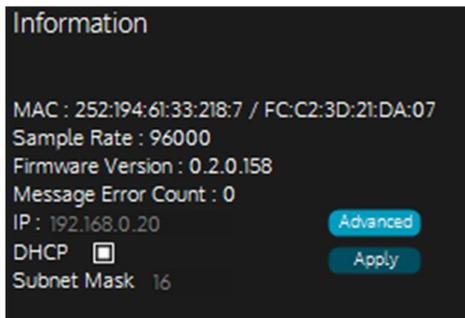
Our advice would be to set the IP address to be one less than the device’s and make sure the subnet mask matches that of the device. So, if the IP address of the device was 192.168.0.20 and the subnet mask was 16, we would type the following values in:



Click OK and you’re done.

5) Open D-Net and go online.

The device should be discovered and be fully controllable. Test with the Global Mute button and confirm that this is working.



Access the device's IP address settings on the System tab, and press the "Advanced" button. Either set a static IP address in the correct range, or reselect DHCP.

Remember to press "Apply".

The device will most likely go offline now, and you will have to reset your PC's network interface to DHCP (and reconnect it physically to the network, as well as plugging your device back into the network).

5) Reestablish a connection with the device normally on the network.

Once the IP configuration of the computer has been returned to normal, open D-Net once again and go online to confirm that all previous devices are visible as well as the one that has just been reset to DHCP (or the preferred static IP address).

Conclusion

The use of static IP addressing for VM and VR products is only recommended when network infrastructure does not allow DHCP addressing, or where the possibility of the IP address changing could affect operation, such as controlling the devices with third party hardware such as a Q-Sys or Crestron controller.

Note that VR1 and VR2 devices do NOT require the devices they are to control to have static IP addresses. Their addressing of other devices is through a combination of MAC address and device type.

Not having a DHCP server on a network will mean that devices use "link local" addressing and will still operate normally and be controllable with D-Net connected to a simple switch.