Using the Viper Route Generator

Ensure the Viper Route Generator (VRG) application has been installed and up and running on the PC by clicking on the VRG icon. In order to install the VRG the target PC must be connected to the internet in order for the installation process to be able to download a required file (a dotnetframework file) from Microsoft.

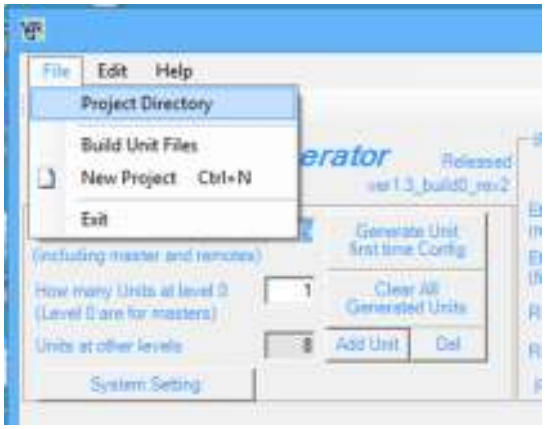
Install Both VRG and

Also ensure the user has administrative rights to the PC to allow installation. In this procedure the user should also install the Viper Tool Field (VTF). Follow the instructions in the Using the Viper Tool Field pdf to install the VTF application.

The VRG application is used to generate configuration files (.drp files) for all Vipers in the deployed Viper network. The Viper network is defined as all the Vipers on that frequency on that tower site.

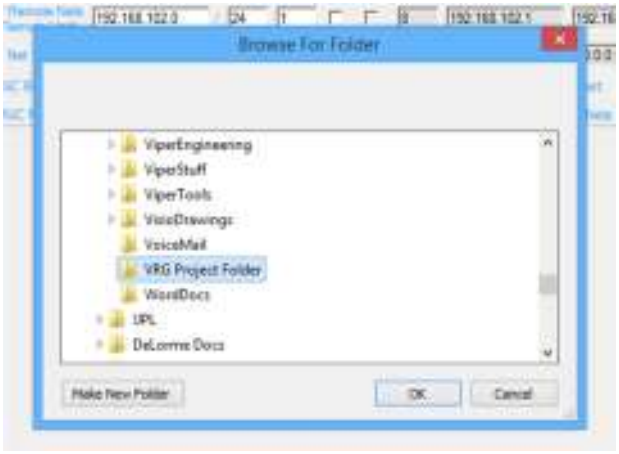
VRG Application

Under the VRG File menu choose the Project folder that the configuration .drp files will be saved to.



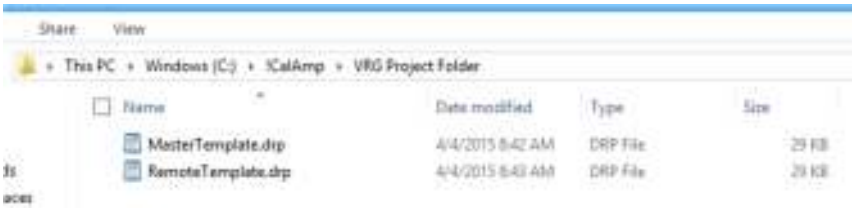
Select Project Directory

Then browse to the desired project folder. The user can create a project folder anywhere on the PC. In this example the folder VRG Project Folder was created. All the Viper configuration files will be stored in this folder.



Create a VRG Project Folder (the folder can be named anything)

The user must also save the desired Viper template files in this folder. The VRG application will use template files to generate the configuration files for the Vipers in the network. In this example only the Master Viper template file will be used. Refer to the Creating a Viper Template file pdf for details on to create a template file for a master or remote.



Master and Remote Template .drp Files

After the template files have been saved to the project folder the user is ready to generate IP addressing scheme for the Viper project. The user must know the following information:

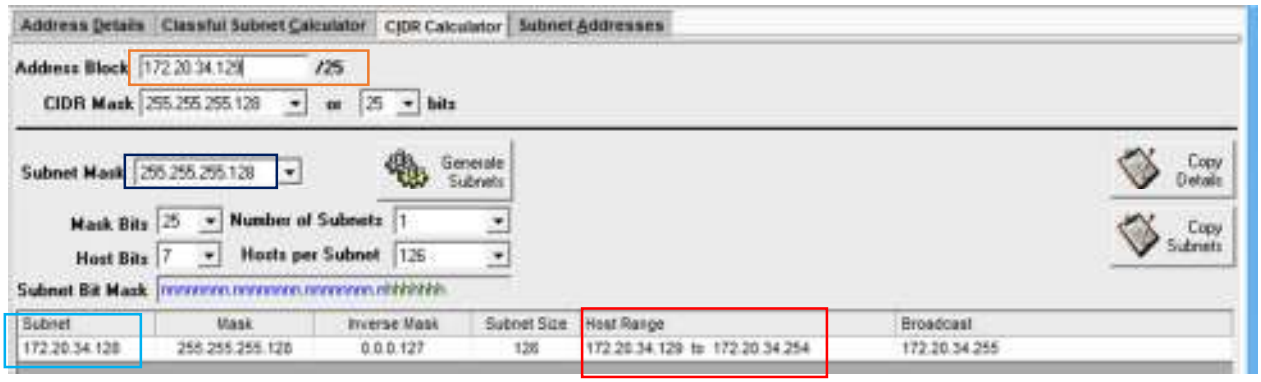
1. The number of Vipers to be deployed (generally spares are added to the deployment)
2. The Ethernet LAN IP address of the Master Viper
3. The subnet mask of the Master Viper
4. The Ethernet LAN IP address of the first Viper remote
5. The subnet mask of the first remote
6. The RF IP of the Master Viper
7. The subnet mask for the RF network

The VRG application uses the shorthand notation for subnet masks. For example the subnet mask shorthand notation is given in the table below. Instead of using the standard 255.255.255.0 type format a forward slash and a number is used as the format.

Subnet Mask	/X	Number of hosts
255.255.255.0	/24	254
255.255.255.128	/25	126
255.255.255.192	/26	62
255.255.255.224	/27	30
255.255.255.240	/28	14
255.255.255.248	/29	6
255.255.255.252	/30	2

Subnet Mask Shorthand Notation

The VRG application also uses Offset values to determine the actual IP address. The Offset value of an IP address is the number of hosts from the network ID. The network ID is the IP address ID of the Network determined by the subnet mask. The Solar Wind Subnet Calculator will be used to demonstrate how the network ID and the Offset id determined. The Solar Wind Calculator application is freeware and can be downloaded off the Internet.



Solar Wind Subnet Calculator

In the above example the host IP address is 172.20.34.129 on a 255.255.255.128 (/25) subnet mask. When the subnet mask is applied to the IP address the network ID is formed. In this example the network ID is 172.20.34.128. **This is not an IP address, it is the network ID.** The Offset is determined by the number of hosts from the beginning of the network ID. The Host Range shows the number of hosts (IP addresses) that can be on that subnet determined by the subnet mask. In this example the IP address of 172.20.34.129 is one host from the network ID IP address of 172.20.34.128., so the Offset would be 1. The IP address of 172.20.34.131 would have an Offset of 3, because it is 3 hosts away from the network ID of 172.20.34.128.

In the following project example the following information was provided.

Master Viper: Eth LAN IP 172.24.39.138 255.255.255.0

Remote 1: Eth LAN IP 172.25.61.1 255.255.255.248
Remote 2: Eth LAN IP 172.25.61.5 255.255.255.248
Remote 3: Eth LAN IP 172.25.61.9 255.255.255.248
Remote 4: Eth LAN IP 172.25.61.13 255.255.255.248
Master Viper: RF IP 10.223.45.129 255.255.255.128

1. The number of Vipers to be deployed (generally spares are added to the deployment)
   1 master, 4 remotes + 3 spares = 8 total Vipers
2. The Ethernet LAN IP address of the Master Viper: 172.24.39.138
3. The subnet mask of the Master Viper: 255.255.255.0 (/24)
4. The Ethernet LAN IP address of the first Viper remote: 172.25.61.1
5. The subnet mask of the first remote: 255.255.255.248
6. The RF IP of the Master Viper : 10.223.45.129
7. The subnet mask for the RF network: 255.255.255.128

The user is ready to fill out the VRG registers:

Enter the total number of Vipers to be deployed in the Viper network as shown below. There is always only one master in the network so that will be left at the default value of 1.

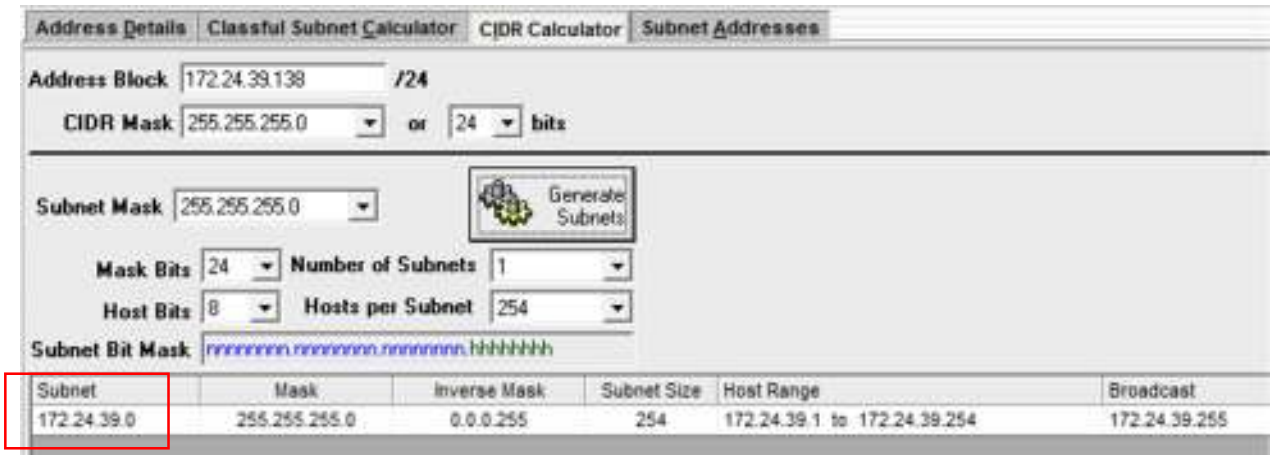
1. The number of Vipers to be deployed (generally spares are added to the deployment)
   1 master, 4 remotes + 3 spares = 8 total Vipers

Total Vipers

Determine the network ID IP address of the master Viper.

2. The Ethernet LAN IP address of the Master Viper: 172.24.39.138

Using the subnet calculator the network ID for 172.24.39.138 on a subnet mask of 255.255.255.0 is 172.24.39.0 network ID and so the Offset is 138 because 172.24.39.138 is the 138 host from 172.24.39.0.

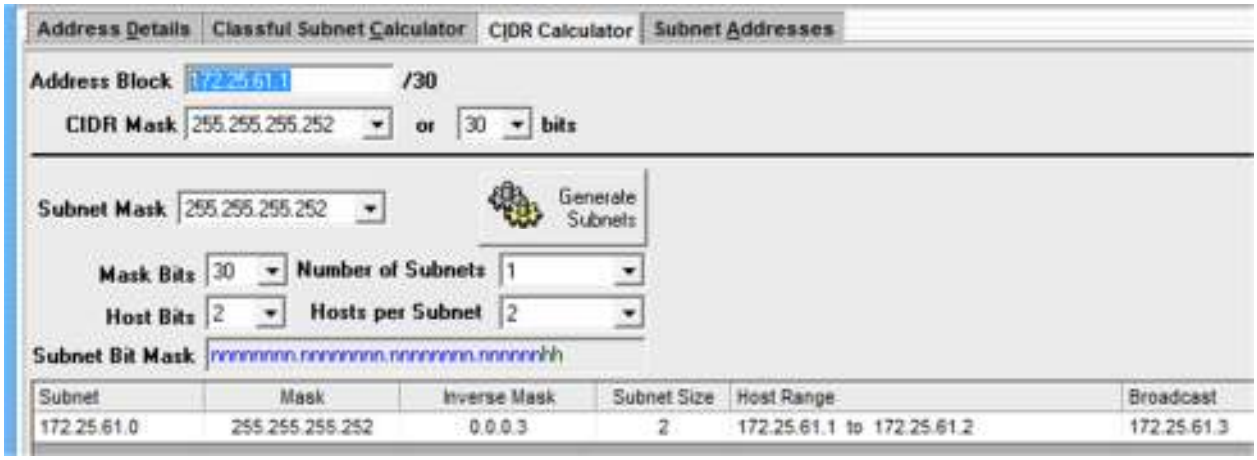


172.24.39.0 Network ID for 172.24.39.138 /24

Enter in the master Viper's subnet mask of /24 and the Offset of 138.

172.24.39.0 Network ID; Mask /24 and Offset 138

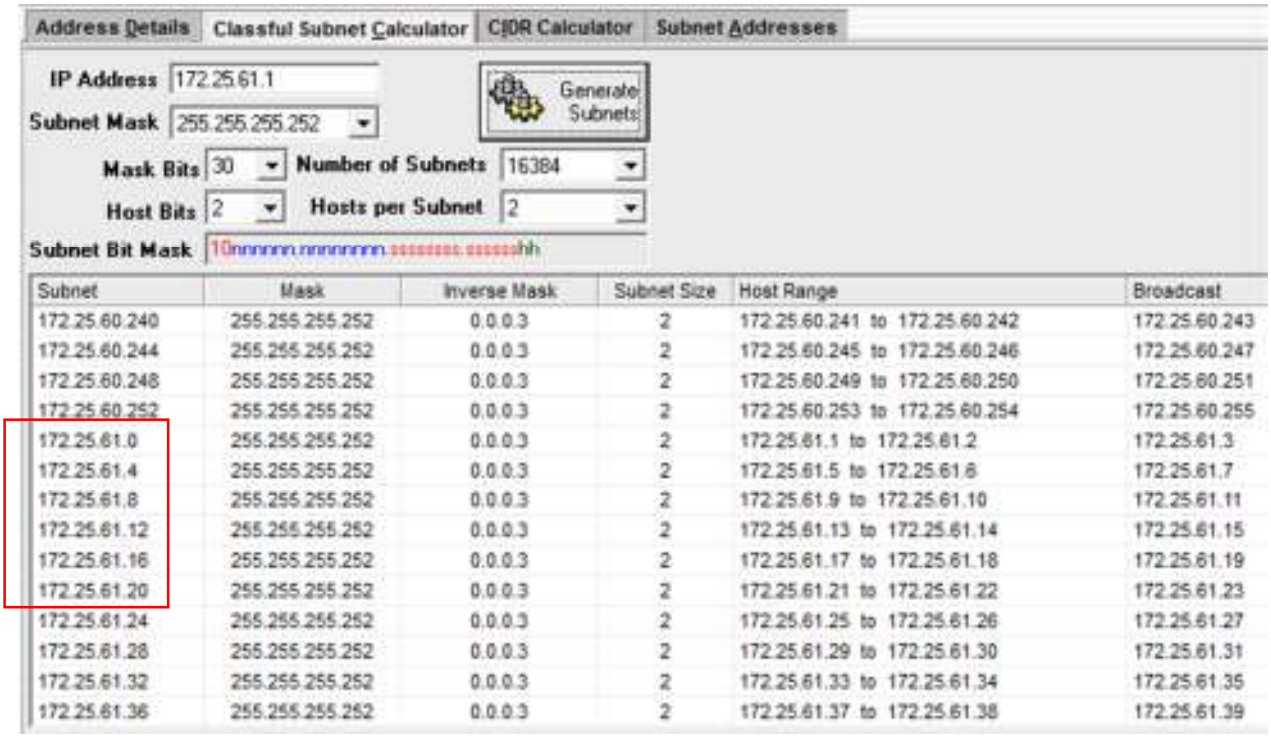
Determine the first remote Network ID, Mask and Offset.



172.25.61.0 Network ID; Mask /30 and Offset 1

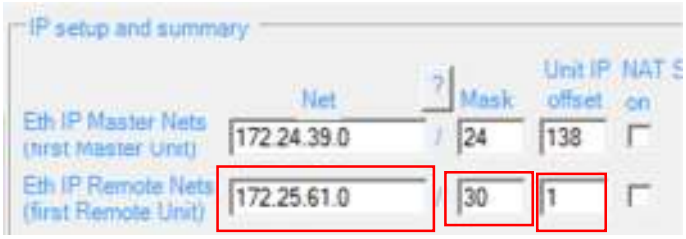
The user should note the rest of the remote's network ID as shown below. The network ID are 4 hosts apart because of the 255.255.255.252 subnet mask.

172.25.61.0
172.25.61.4
172.25.61.8
.
.
.
.



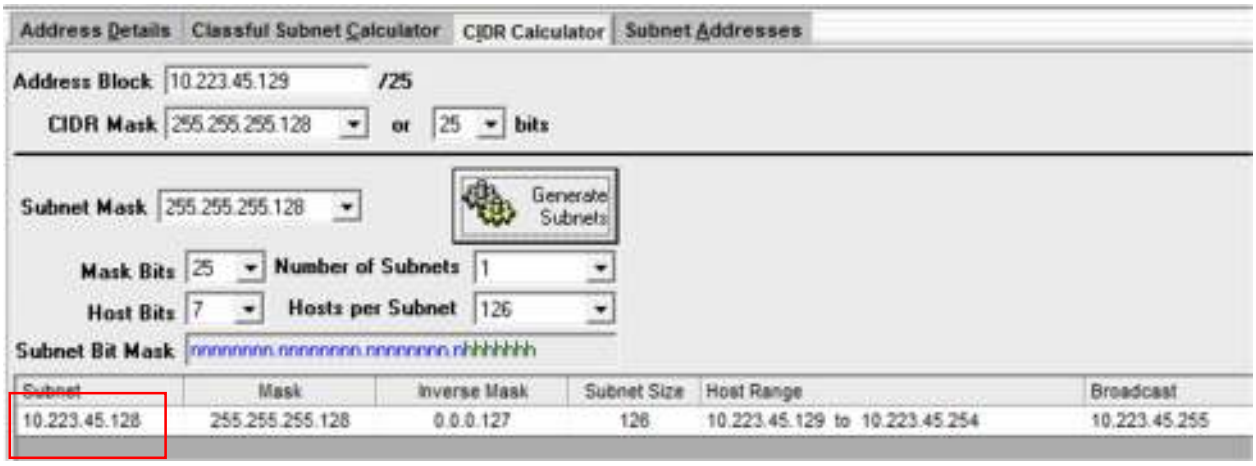
Subnet	Mask	Inverse Mask	Subnet Size	Host Range	Broadcast
172.25.60.240	255.255.255.252	0.0.0.3	2	172.25.60.241 to 172.25.60.242	172.25.60.243
172.25.60.244	255.255.255.252	0.0.0.3	2	172.25.60.245 to 172.25.60.246	172.25.60.247
172.25.60.248	255.255.255.252	0.0.0.3	2	172.25.60.249 to 172.25.60.250	172.25.60.251
172.25.60.252	255.255.255.252	0.0.0.3	2	172.25.60.253 to 172.25.60.254	172.25.60.255
172.25.61.0	255.255.255.252	0.0.0.3	2	172.25.61.1 to 172.25.61.2	172.25.61.3
172.25.61.4	255.255.255.252	0.0.0.3	2	172.25.61.5 to 172.25.61.6	172.25.61.7
172.25.61.8	255.255.255.252	0.0.0.3	2	172.25.61.9 to 172.25.61.10	172.25.61.11
172.25.61.12	255.255.255.252	0.0.0.3	2	172.25.61.13 to 172.25.61.14	172.25.61.15
172.25.61.16	255.255.255.252	0.0.0.3	2	172.25.61.17 to 172.25.61.18	172.25.61.19
172.25.61.20	255.255.255.252	0.0.0.3	2	172.25.61.21 to 172.25.61.22	172.25.61.23
172.25.61.24	255.255.255.252	0.0.0.3	2	172.25.61.25 to 172.25.61.26	172.25.61.27
172.25.61.28	255.255.255.252	0.0.0.3	2	172.25.61.29 to 172.25.61.30	172.25.61.31
172.25.61.32	255.255.255.252	0.0.0.3	2	172.25.61.33 to 172.25.61.34	172.25.61.35
172.25.61.36	255.255.255.252	0.0.0.3	2	172.25.61.37 to 172.25.61.38	172.25.61.39

Subnet mask 255.255.255.252



172.25.61.0 Network ID; Mask /30 and Offset 1

Determine the network ID for the RF IP for the master Viper.



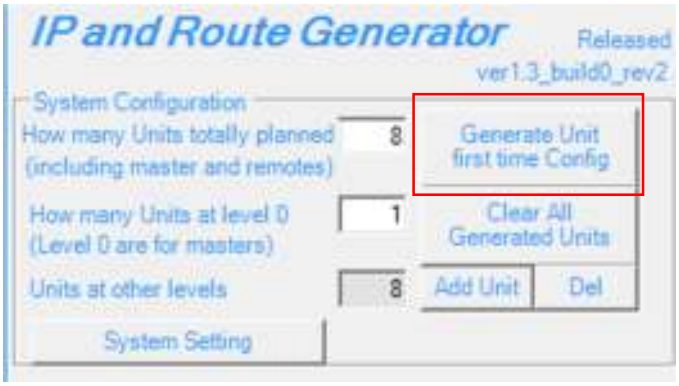
Subnet Mask 255.255.255.128

10.223.45.128 Network ID; /25 Offset 1

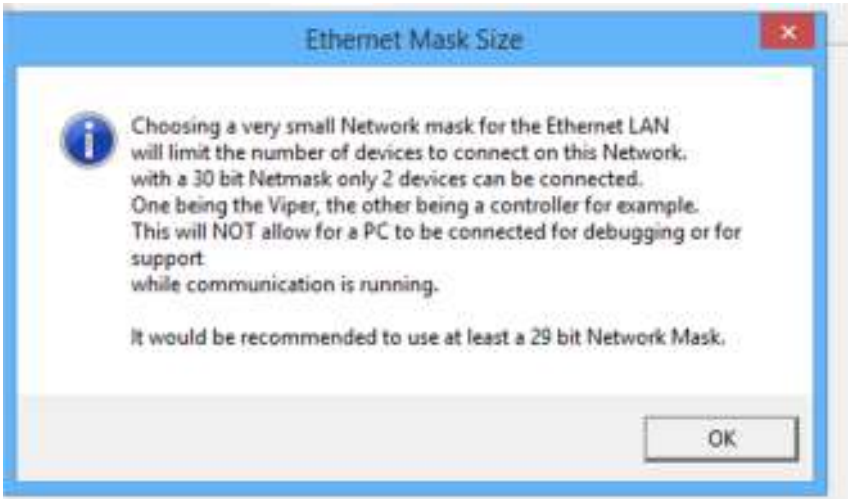
Double check all IP addresses and network IDs.

If all the IPs are correct the user is now ready to generate the hopping pattern or the Viper layout. The Viper layout is generally determined by the RF path study. The RF path study determines if a remote Viper has a RF path directly to the master or if it must use another Viper (repeater) to reach the master. In this example project all the remotes report directly to the master and there is no repeaters.

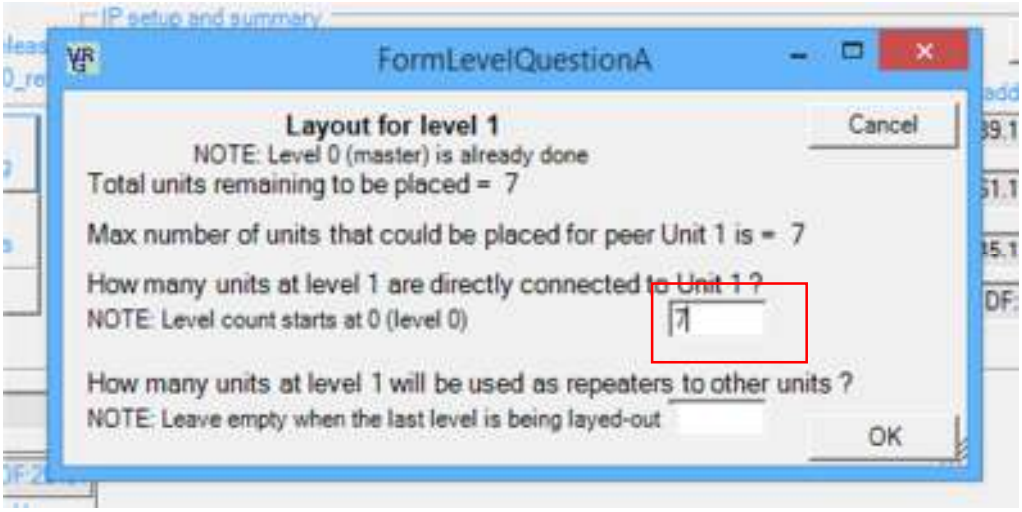
Click on the Generate Unit first time config button:



The user will be prompted with a warning message stating the Network Mask might be too small which will not allow for a debugging PC to be connected to the report Vipers.

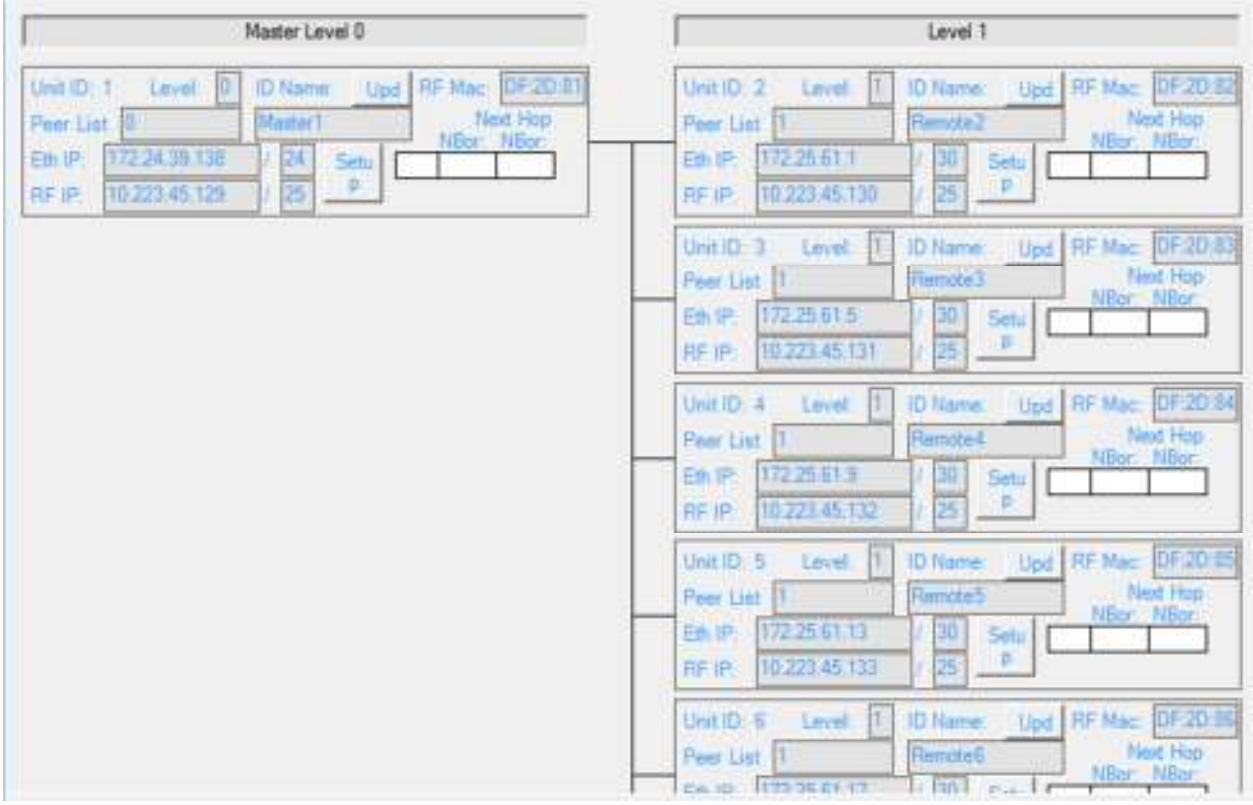


Warning Message to be Ignored Click OK



How many units at level 1 are directly connected to Unit 1? All 7 are.

The VRG application will generate a Viper layout of seven remotes that report directly to the master Viper as shown below. Double check the IP addressing scheme and correct if need be. Clear all units and start again if necessary.

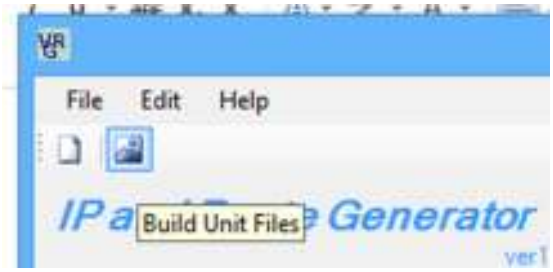


Double Check IP Addressing Scheme

If all the IPs are correct the user is ready to generate the actual configuration files.
The user can change the ID Name of the Viper Units. The ID Name will be the station name on the Viper's web pages. It will also be incorporated in the Viper configuration file name associated with the Viper. Remote ID Name for Unit 5 was changed to Pole_4 name which will appear the file name. Clcik the yellow Upd button to update the name.

Pole_4 will be in the file name

Under the File menu click on Building Unit Files or click on the small Build Unit Files icon.

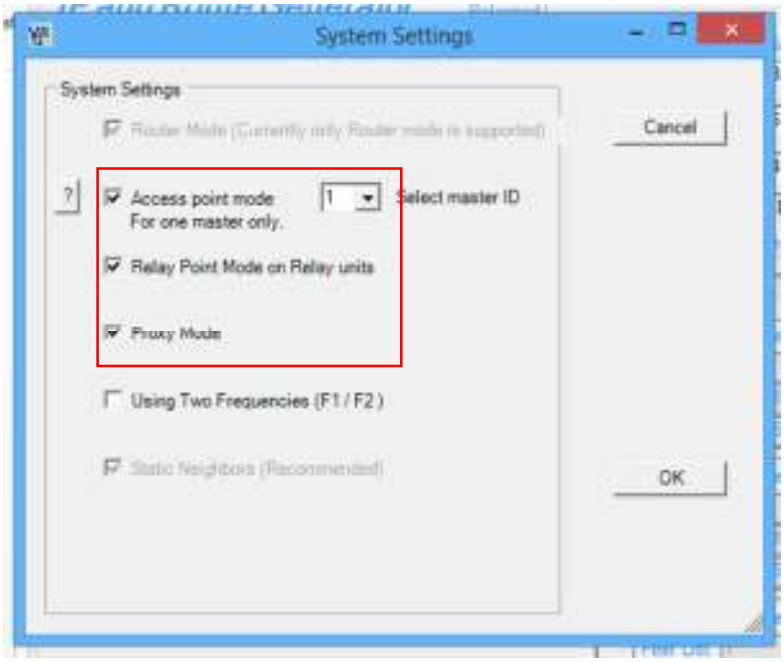


Click on either one of the two Build Unit Files buttons

The user will be prompted to enter the name that will be part of the folder name. The Tower Site name is generally recommend. Ensure that this will be unique because the user may have more than one Viper system at a particular tower site.

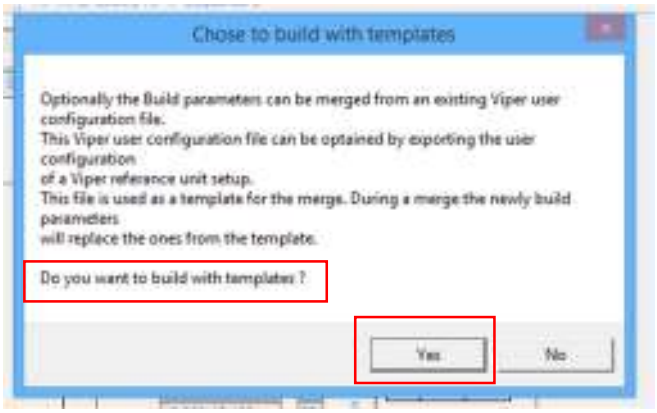
Enter Tower Name

The user will then be prompted to determine some Viper System Settings a parameters to be used. Always select Access Point mode, Relay Point mode and Proxy mode. Only select Using tow Frequencies only when two frequencies are actually be used.



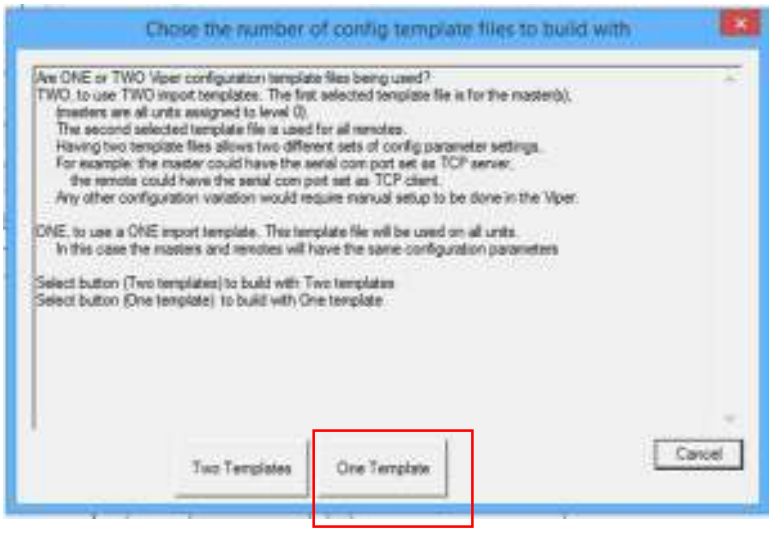
Always select the above

The user will be prompted if the project will use one or two templates, remember in the example project only the master template .drp file will be used.



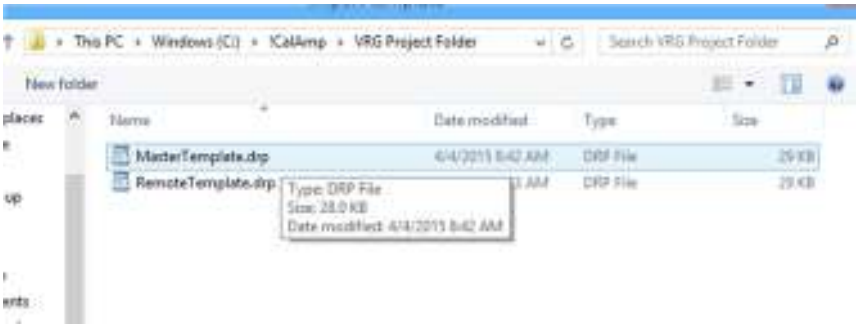
Click on Yes to build with template file

The user will be prompted to determine if one or two template files will be used. In this project example there will be only one MasterTemplate.drp file. However the user could use a Master and a Remote Template file. **If two templates files are required for the Viper project then the user will be prompted for the master template file first, then the user will be prompted for the remote template file.**



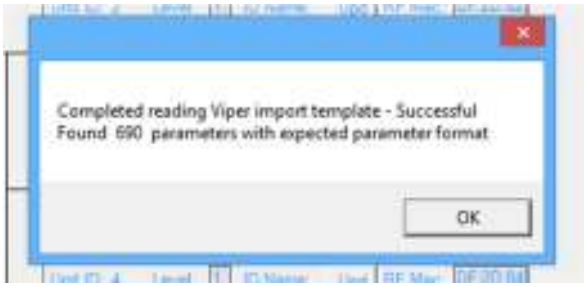
Click on One Template File

The user must browse to the location of the master template file that will be used as shown below.

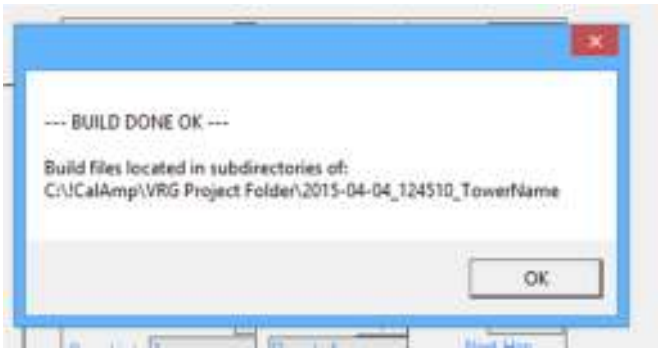


Select the master template file

The VRG will now generate all the Viper .drp configuration files and prompt the user when it is completed. Just click OK. The user will be prompted if there is an issue.

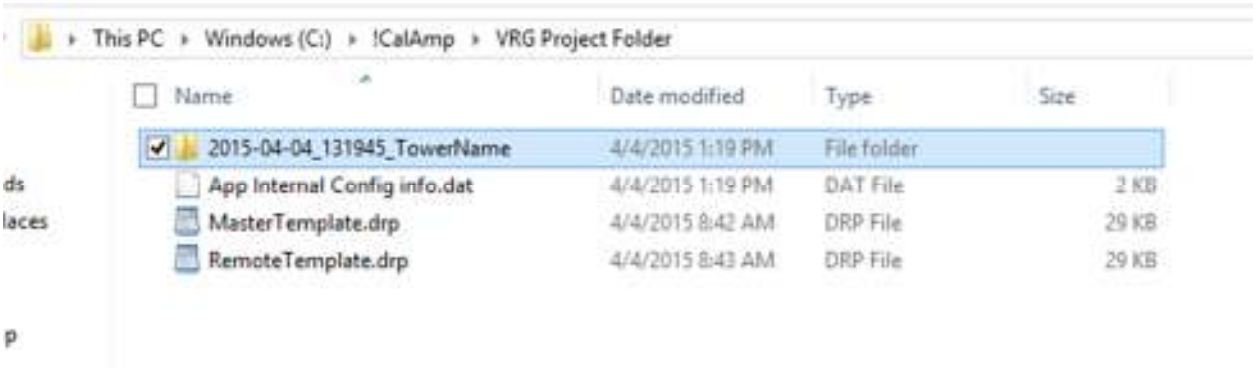


Completed

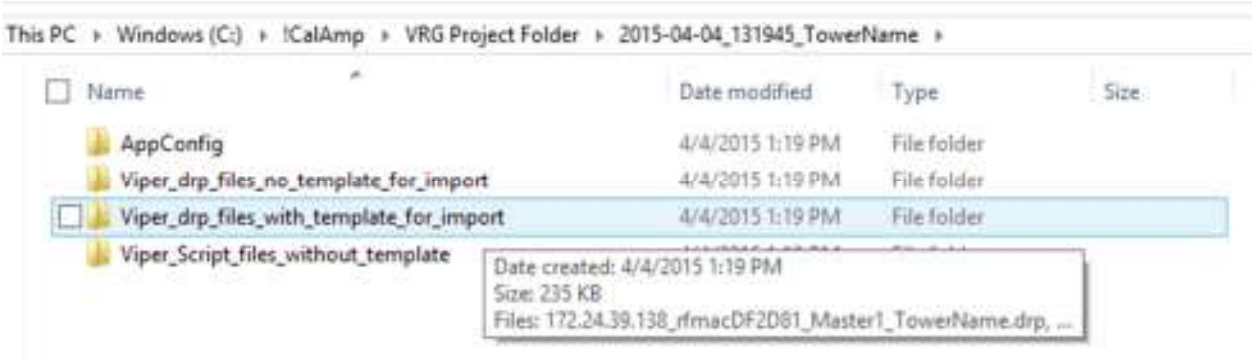


The build is done

The user can check to ensure the files were created. Browse to the project folder and check the files.

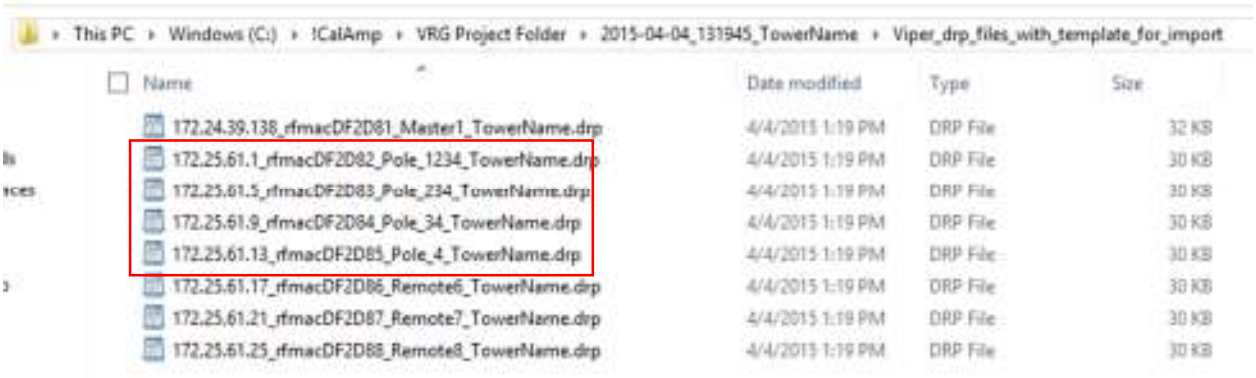


Open the folder the VRG created



Select the Folder Viper_drp_files_with_template_for_import

Select the Folder Viper_drp_files_with_template_for_import this folder will contain the files the user will import in to each Viper.



Notice the Pole name was added to the units that had the ID name modified

These are the .drp files that will be imported into each Viper.

Note:
If the user intends to configure another Viper project the user should select a new project folder and modify the template file for the new frequencies, bandwidth setting (channel type) and power output. See below. A master template file should be kept in a read only folder and copies of the master template .drp file be used. The channelType dictates the bandwidth and data rate for the Viper. Typically the 4 FSK modulation is used as the standard default. In this example 27 is 4 FSK for a 100 kHz channel radio which is 128 kbps.

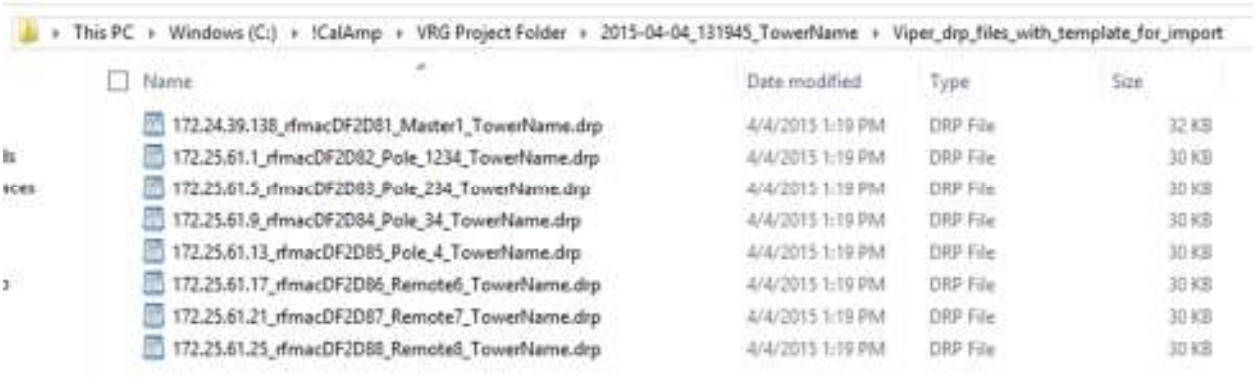
```
radio.alarm.revPwr.enabled= 1
radio.alarm.revPwr.off.db= 5.000000
radio.alarm.revPwr.on.db= 3.000000
radio.channel.01.channelType= 27
radio.channel.01.ctrlColor= 1
radio.channel.01.rxFreq= 219.650000
radio.channel.01.txFreq= 219.650000
radio.channel.01.txPowerLevel= 10.0
radio.channel.01.txPowerLevelBin= 100
radio.channel.02.channelType= 3
radio.channel.02.ctrlColor= 1
radio.channel.02.rxFreq= 0.000000
radio.channel.02.txFreq= 0.000000
```

Refer to the CLI rev F pdf manual to determine channelType for the particular Viper project.
The user may also want to check the security phrase used for each district to ensure it is correct as well.

```
oip.defaultGateway.enable= 1
oip.duplicate.detection.enable= 1
oip.encryption.enable= 0
oip.encryption.phrase= Dataradio
oip.nar.enable= 0
oip.tcp.proxy.enable= 1
```

Using the Viper Tool Field

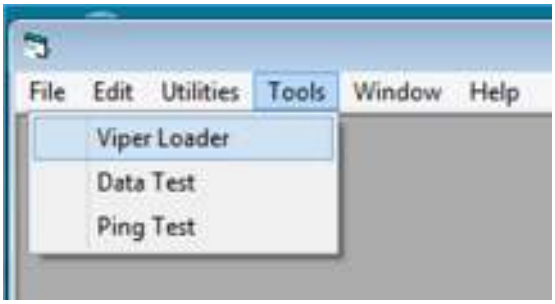
If the user needs to import a VRG generated .drp file into a Viper using the Viper Tool. Connect a PC running the Viper Tool to the Ethernet LAN port of the Viper (ensure the VRG files are stored in a folder on that PC as well).



VRG configuration files to Import into the Vipers

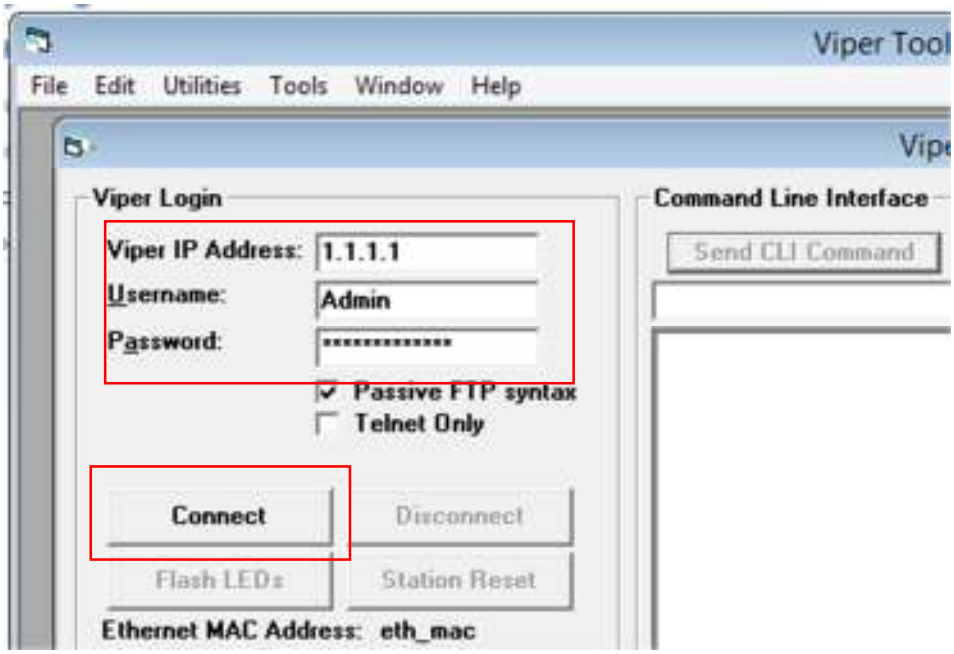
Ensure the PC's network interface configuration has been set to the Viper's LAN IP network to ensure Ethernet connectivity. The Viper's maintenance IP address of 1.1.1.1 is a handy IP address to use in most cases. This will allow the user to connect to multiple Vipers and check IP addressing without configuring the PCs network interface after each Viper configuration.

Click on the Viper Tool icon to startup the application. Under the Tools menu click on Viper Loader.



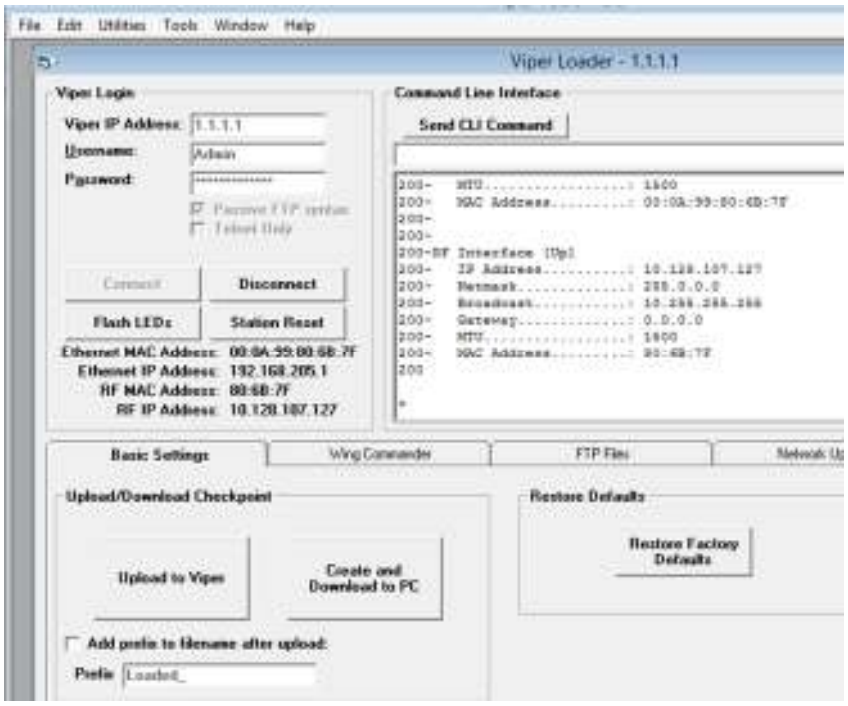
Viper Loader

Ensure the that the maintenance IP of **1.1.1.1** , Username **Admin** and the Password **ADMINISTRATOR** are correct, then click on the connect button.



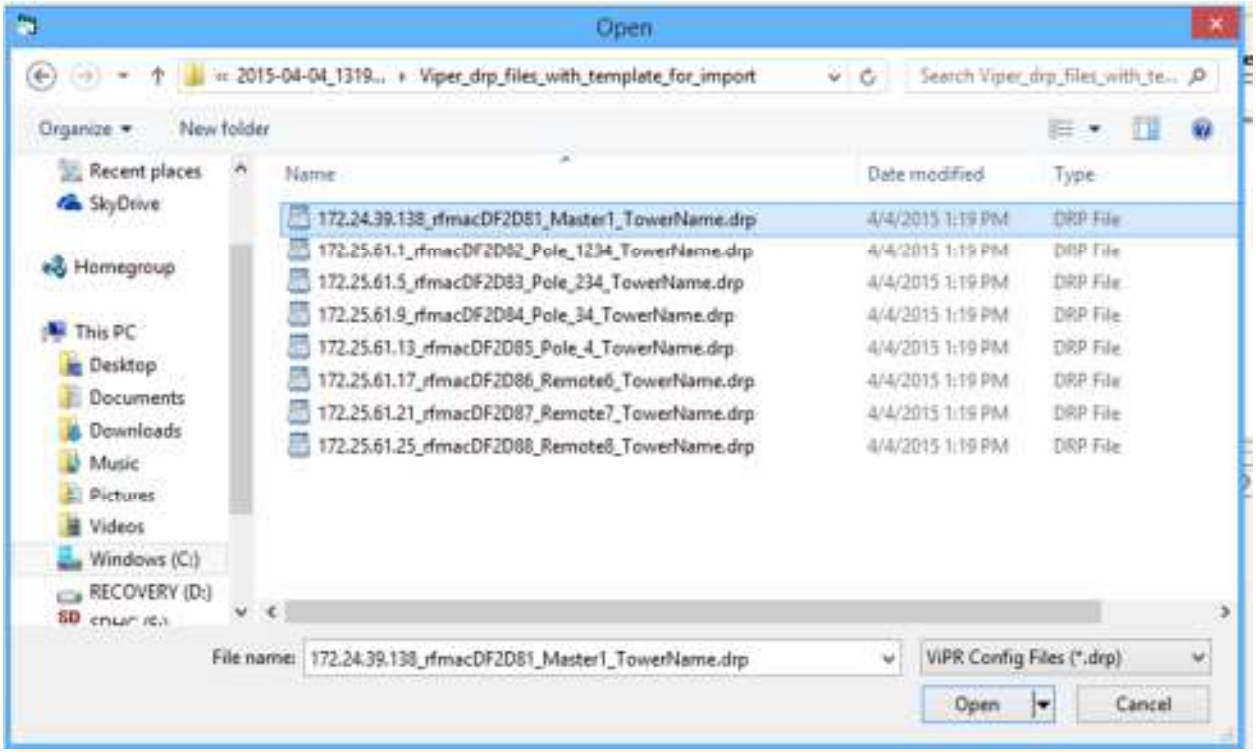
Click Connect

If the IP address, Username and Password are correct then the Viper will connect to the local viper via the Ethernet port. The IP config will be displayed in the text panel and the Disconnect button will be enabled.



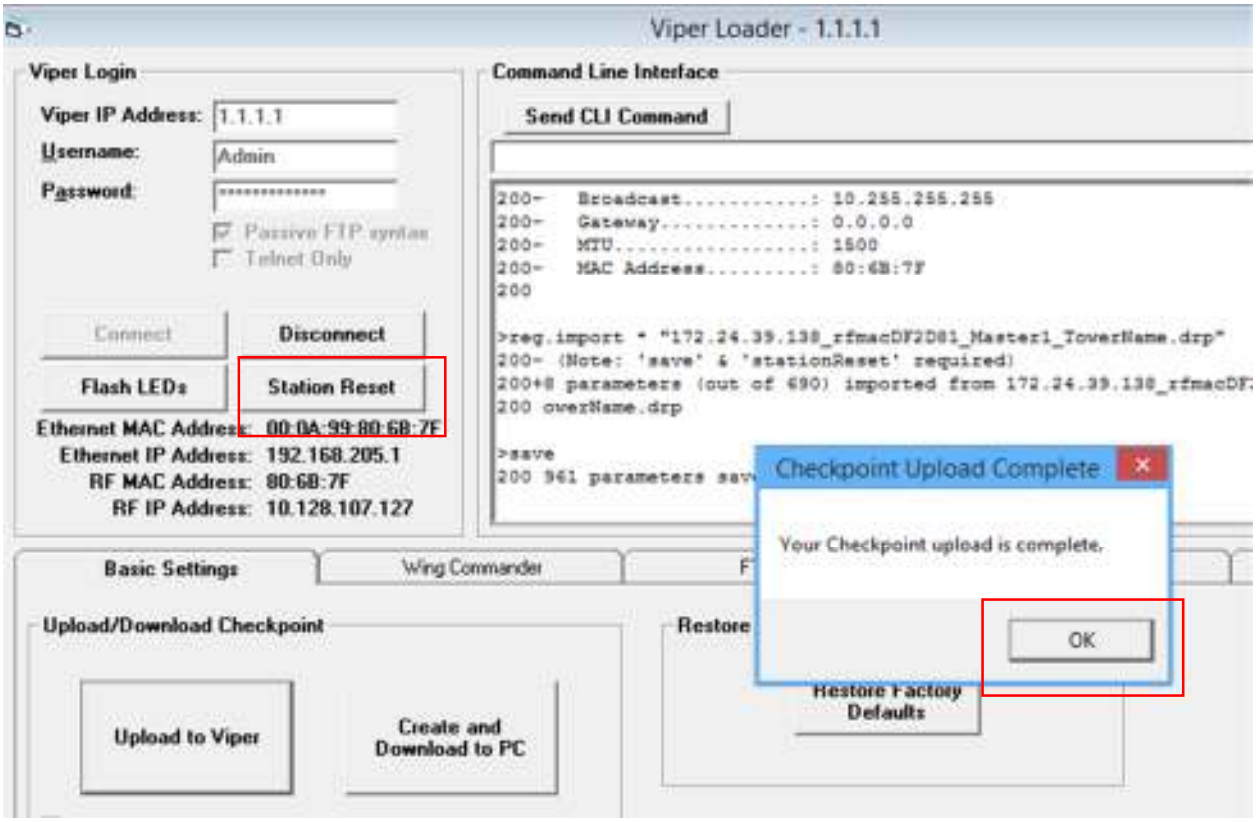
Connected

To transfer the master's Viper file generated by the VRG click on the Upload to Viper under the Base Settings tab. The user will be prompted to browse to the desired .drp Viper configuration file.



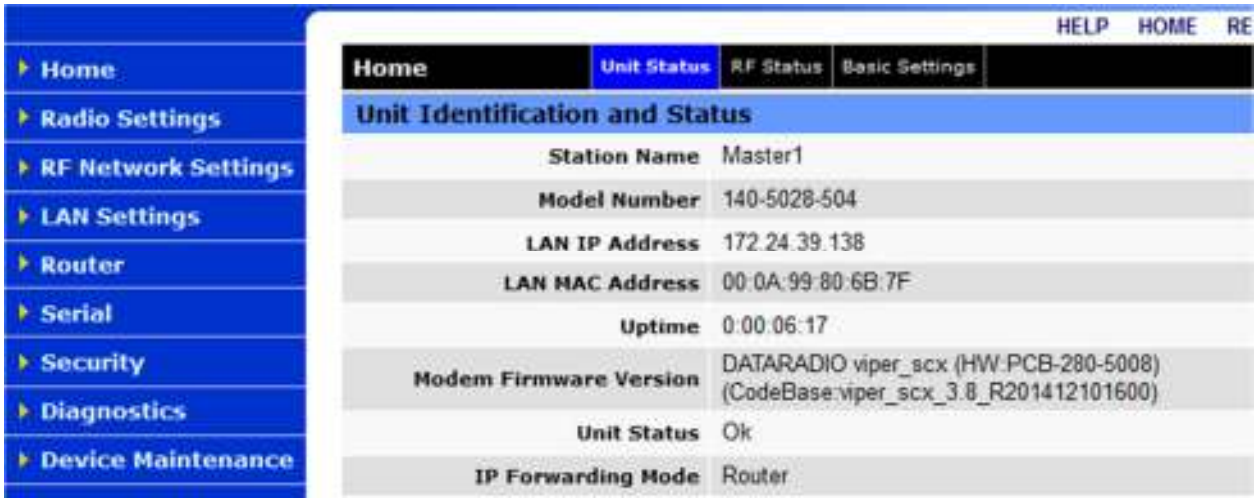
Select the master VRG generated configuration .drp file

The Viper Tool will FTP that file to the Viper and then import the file into the Viper as the current configuration.



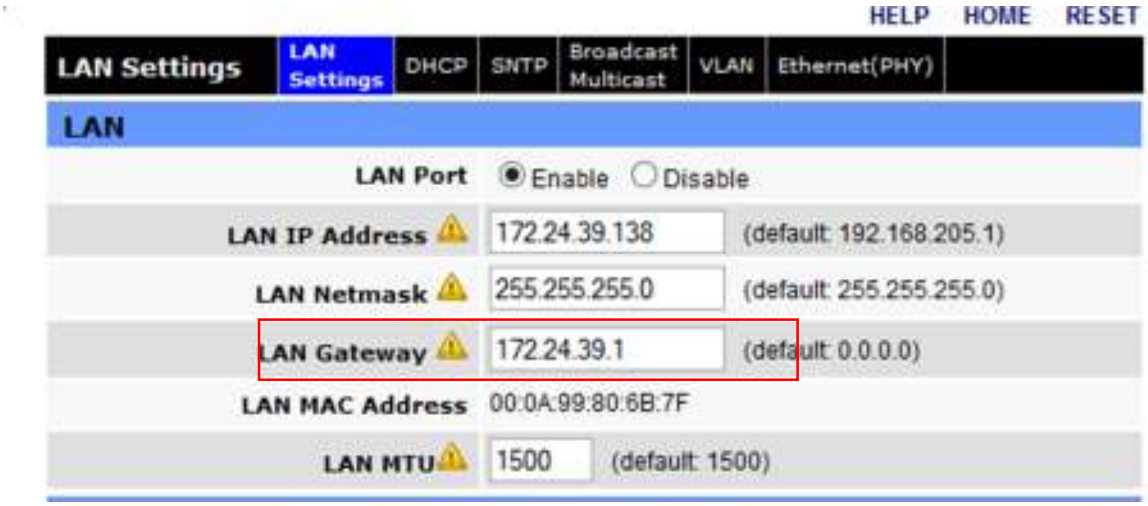
Click OK and Station Reset buttons

Clicking on the Station Reset button will cause the Viper to reset and take on the imported configuration files new IP address as shown below.



New IP configuration that was imported in.

The user should check the LAN Default Gateway to ensure the gateway is set correctly in the master Viper only. This is not set by the VRG application or contained in the template files for the master the remote Vipers are set. The IP 172.24.39.1 was entered in the LAN Gateway. The Viper must save and reset as well.



Ensure the Save and Reset are clicked

This completes the procedure.