Communication

Description

This system consists of two pairs of computers with MK6s connected via USB or ethernet. These computers use PuTTY ssh connections to interface with the MK6s (as they are headless). Then python scripts on the computers facilitate data/logic interactions between the MK6 and the computers. There are user-interactable scripts to transmit, receive, and plot data. On the MK6s the “acme” service/program handles the physical radio transmission/reception part of the system.

Logging into MK6s

Username

```
user
```

Password

```
user
```

Connecting to MK6

Run the following commands upon connecting an MK6 to a PC:

```
ifconfig
```

If your interface for the Ethernet interface for the MK6 is named something like *enp0s10* then you will need to temporarily rename it. If you do not the MK6 connected will not be able to properly send data. I suspect this is because the MK6 is sending the data at *eth0* and you would have *enp0s10* instead. To fix this run the following commands to rename it:

```
sudo ip link set dev enp0s10 down
sudo ip link set dev enp0s10 name eth0
sudo ip link set dev eth0 up
```

Otherwise refer to these links to connect:

https://support.cohdawireless.com/hc/en-us/articles/5627683049487-Connecting-to-the-MK6

https://support.cohdawireless.com/hc/en-us/articles/360001707775-Connect-MKx-via-Ethernet

The MK6-PC program is dependent on Putty. So, make sure to have that installed.

To rename a USB Interface run these commands:

```
sudo ip link set dev enx7a5e9c71aa84 down
sudo ip link set dev enx7a5e9c71aa84 name usb0
sudo ip link set dev usb0 up
sudo ifconfig usb0 down
sudo ifconfig usb0 10.1.1.2 up
```

Powering the MK6

The MK6 PSUs attached are 12V 1-2 amps per Cohda specification. I donated one of them and the other is from Reza.

MK6 IPv6 Addresses for Putty

Serial Number: 04E548500C58

Ethernet MAC Address: 04:E5:48:50:0C:58

Serial Number: 04E54820145C

Ethernet MAC Address: 04:E5:48:20:14:5C

Converted IPv6 Address:

```
[fe80::6e5:48ff:fe50:c58%eth0]
```

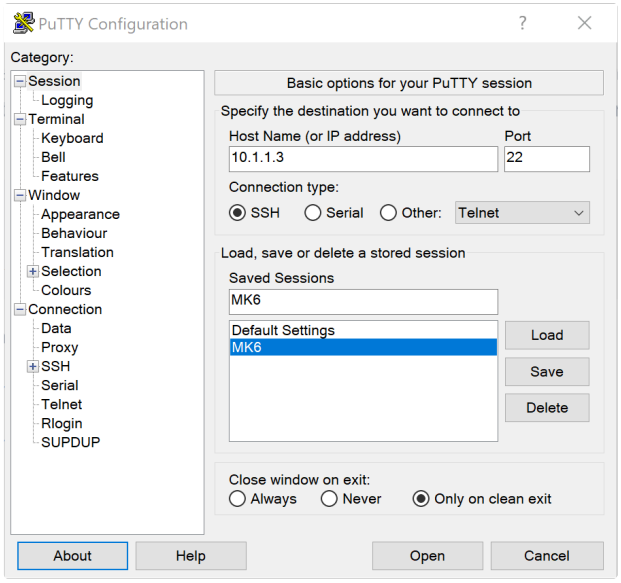
Address that works:

```
[fe80::6e5:48ff:fe50:12f8%eth0]
```

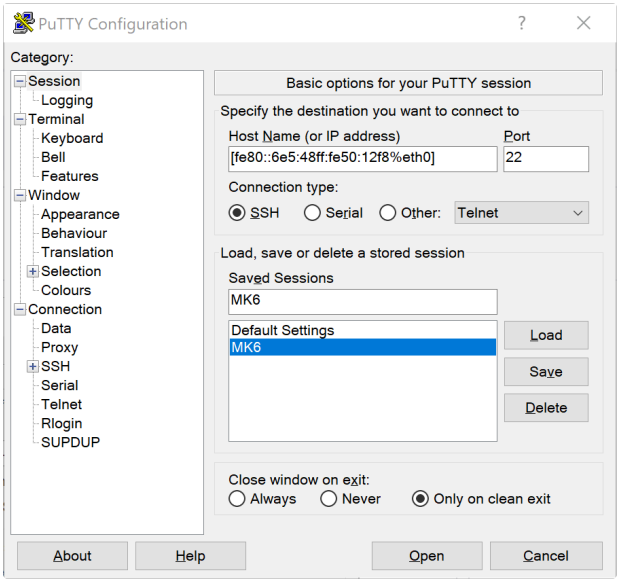
Converted IPv6 Address:

```
[fe80::6e5:48ff:fe20:145c%eth0]
```

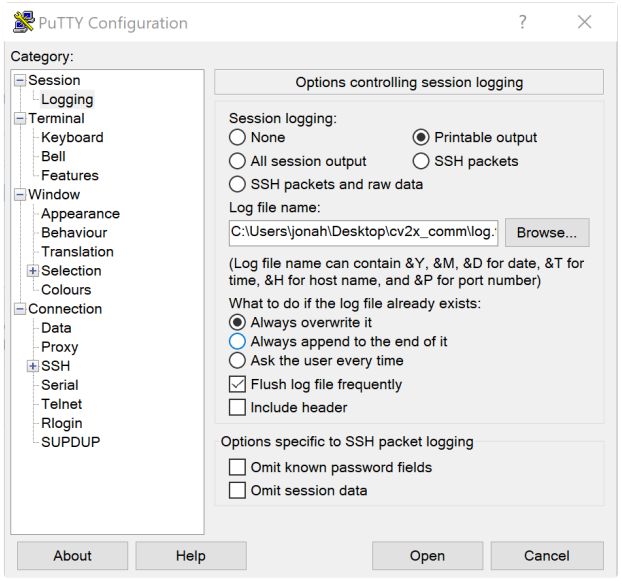
Putty Configuration



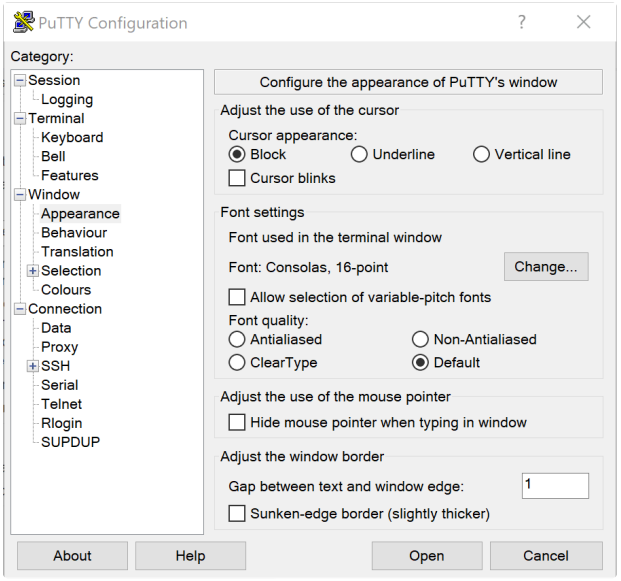
(USB) Set IP Address as follows



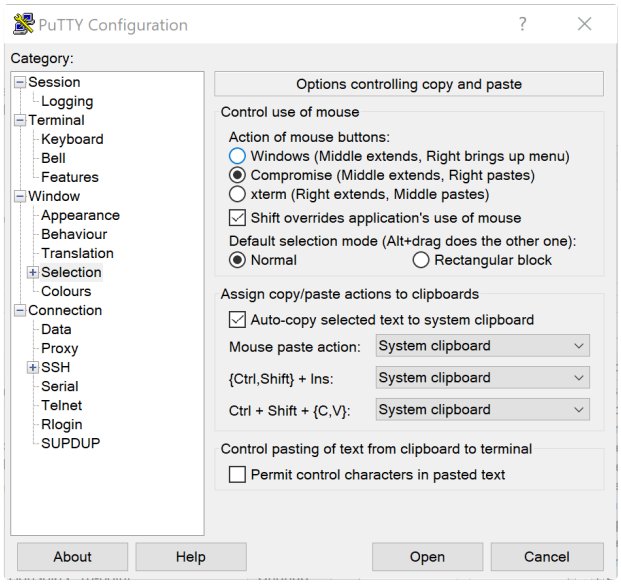
(Ethernet - varies) Set IP Address as follows



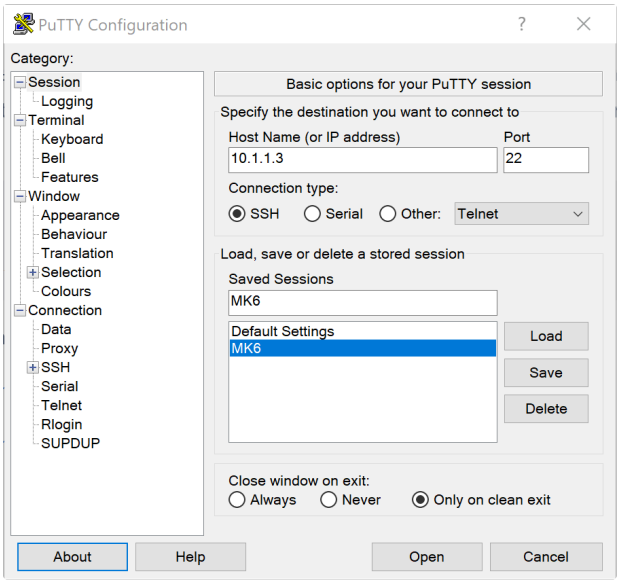
Set log path to where *log.txt* is stored



Optionally configure font/font size



Change these settings per system to allow copy/paste



Select/create MK6 saved session and press save (can load later)

Running MK6-PC Program

Make sure to use ports that are available. Check that addresses are IPv4. Use *ifconfig* to find IPv4 address of MK6. For an MK6 connected via USB the address is 10.1.1.3.

```
python3 main.py help
```

Locally Testing MK6-PC Program

```
python3 main.py tx 127.0.0.1 9000 1000 1000 1000
```

```
python3 main.py rx 127.0.0.1 9000 1000 1000
```

Installing Packages on the MK6

https://support.cohdawireless.com/hc/en-us/articles/6074194717455-Connect-MK6-to-WiFi-Access-Point-Hot-Spot

MK6 Time

From OS time, which is synchronized with GNSS using a utility known as chrony. When testing make sure to regularly sync PC times to the internet. PC clocks can drift hundreds of ms over several days.

MK6 Transmitter Lowest Power Specification Example (Do this for indoor testing)

```
acme -L 9000 -E -P 111 -x eth0 -d -W 0
```

Antenna Handling

Coaxial cables are used to connect C-V2X and GNSS antennas to the MK6. These cables should be bent/manipulated as little as possible because the more mangled the cord is the more mangled the signal out will be. The antenna array we are using costs around $150 and was included with the MK6 package. Also, make sure 50ohm terminators are on the DSRC antenna ports when you start an MK6. This prevents the ports from damaging themselves via unregulated internal amplification. The antenna array should be placed as close to the center of the testing vehicle as possible at the highest point of the vehicle.

Cohda Support

Any questions you may have can likely be answered here: https://support.cohdawireless.com/hc/en-us. Requests are typically answered by Daniel