Getting Started with Clyde

Speak Serial with Clyde,

or How to Give Direct Orders

Have you ever wanted to set Clyde's ambient light to a very specific colour? You're rubbing the Touchy-Feely leg in search of that perfect shade of red, it's coming soon, and suddenly Clyde decides to jump a few colours and you're back in the blues.. Again...In this short tutorial, we will learn how to control Clyde and set the ambient light to a specific colour of your choice in one short command. On the way to achieving this goal we will learn about the basics of serial communications with an Arduino board, and with Clyde.
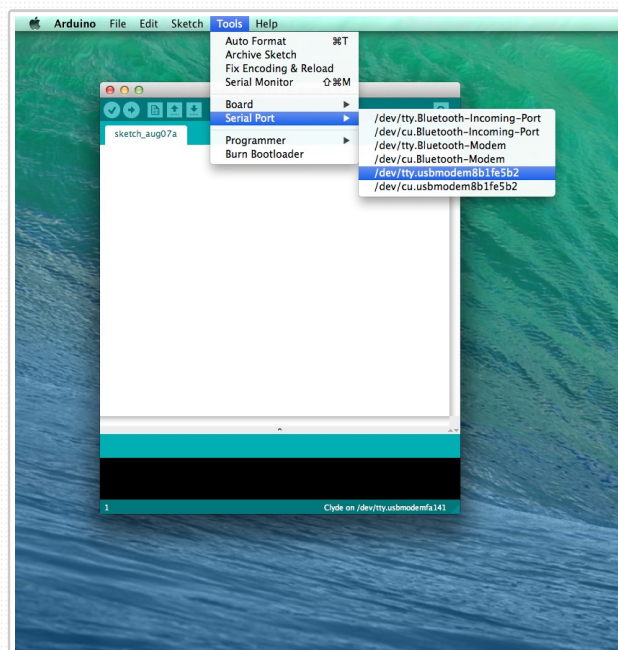
Prerequisites

As we will attempt to communicate with Clyde through a USB connection, it is imperative that the Arduino IDE be installed on your computer. If you're using Windows, then you should have already installed Clyde's driver. Please refer to "Getting Started with Clyde - Software"
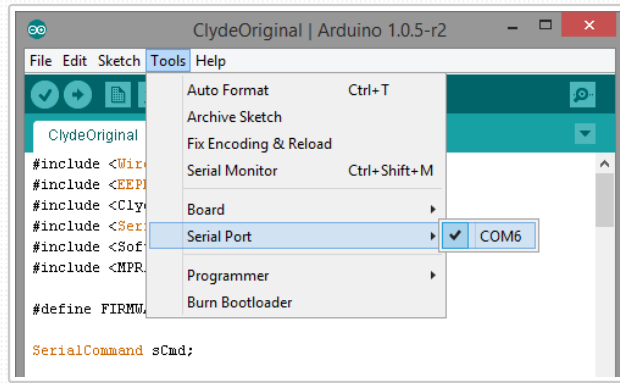
Setup

Clyde must be running its firmware, either out-of-the-box or the latest version from Github. Connect Clyde to your computer USB port, using the USB cable that came with Clyde. Set the Arduino IDE to communicate with that port. (Tools / Serial Port)
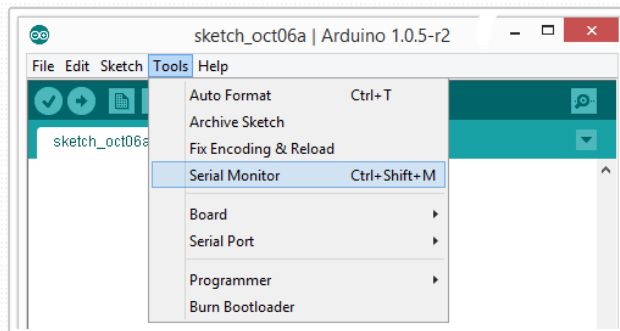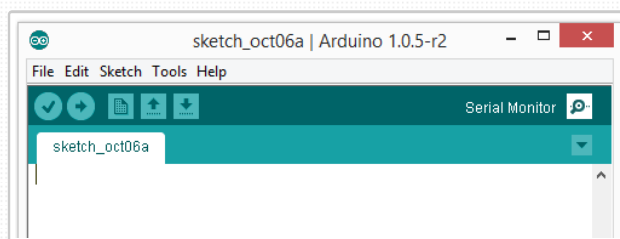
On Mac:

On Windows:

Getting the Serial Monitor Up

Start the Serial Monitor by going to "Tools / Serial Monitor"

Notice the keyboard shortcut, Ctrl+Shift+M, for fastest access.

You can also access the serial monitor by clicking on the looking glass icon, top left of your Arduino IDE

Once the serial monitor is up, using one of the above three methods, you're ready to send your first instruction.

Controlling the Task Lamp

Our first attempt at controlling Clyde through this USB leash is the simplest: turn the task lamp on and off, and control the task lamp intensity.

Type the following command in the Serial Monitor Input textbox:

SET_WHITE 255

and click the send button. The SET_WHITE command must be in uppercase letters.

As you click the send button, the command will be transferred to Clyde, and Clyde's task lamp will turn on at full capacity! The serial command will answer with a curt 'OK' to let you know that your command has been dutifully executed. You can control Clyde without touching it : look Ma, no hands!

In a similar manner, you can turn the task lamp off by entering

SET_WHITE 0

and press send.

Oooh! Full control has never felt better! But wait! What are those two numbers, 255 and 0? Can we try other numbers? Well, let's try it and find out!
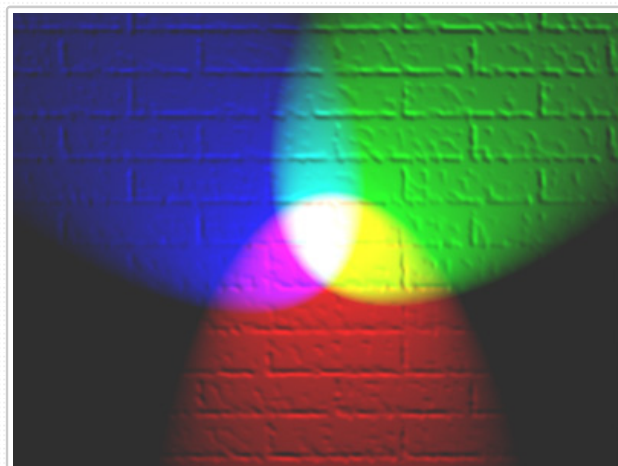
SET_WHITE 127

You've just dimmed your task lamp ! 127 being roughly halfway between 0 and 255, Clyde gave you roughly half illumination. You can enter any number between 0 and 255 and control the task lamp that way. Numbers outside of this range will just turn it to max capacity.

Understanding RGB

Ok, we had a bit of fun controlling the task lamp. I don't know about you, but I just had to turn it on and off multiple times, just to see Clyde being obedient. Children aren't that obedient, they leave the lights on all the time.

While that felt good for a while, it's still pretty simple. And Clyde does have another lamp, and that's the one that so tempting to play with. Let's get that perfect shade of red for the living room! How does one get the perfect red? Or the perfect any colour for that matter?

In computerland, there are a few methods to describe colours. Clyde uses the one called RGB: Red Green and Blue. That's based on primary colours. Wait! Primary colours are supposed to be Red, Yellow and Blue. That's kindergarden knowledge! Well, it is, if you're in art classes and you're playing with colour pigments. In computerland, the primary colours have been redefined to Red, Green and Blue (RGB), and the secondary colours are Cyan, Magenta and Yellow (CMY).

You can see in this image the three primary colours RGB, and secondary colours CMY where the primaries intersect (courtesy of Wikipedia)

Your screen pixels are able to generate almost all colours visible to the human eye using Red Green and Blue, and Clyde is just as able. And that's the good news.
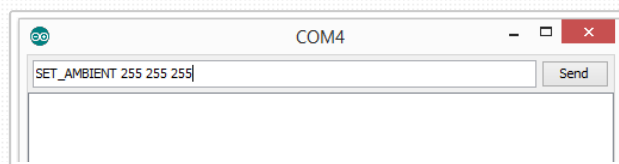
If you want to learn more about the RGB colour model, the Wikipedia link is very informative: RGB Color model (Wikipedia)

Now can we tell Clyde the exact shade that we want? Just like we did for the task lamp, we will tell Clyde what shade to use by giving numbers between 0 and 255, except we will have to give not one, but three numbers in a row, one for Red, one for Green and one for Blue, always in that order. Clyde will mix those numbers and serve us the resulting colour. For example, a pure red would have its Red value to maximum, and the Green and Blue values to nothing: 255 0 0 A pure Green would be 0 255 0, and a pure blue would be 0 0 255 If you want white, you need all colours to be at maximum values: 255 255 255. If you want Black, well, that's the same as turning it off, so all three values will be set to zero.

Turning the Ambient Light on and Off

Our first Serial command will be to turn the Ambient light fully on (and white). SET_AMBIENT is the command we need to send to control the ambient light, and we follow this by three RGB values. Here we're setting all primary colours to maximum values, so the end result will be white.

SET_AMBIENT 255 255 255

To turn the ambient light off, we would send the following command:

SET_AMBIENT 0 0 0

And that nice shade of red we were looking for?

SET_AMBIENT 255 99 71

You can google "RGB color wheel" for many links that will help you look up colours, or you can just have fun, and enter random numbers. Only numbers between 0 and 255 will have an effect, and they must always be three.

Issues with SERIAL library and Windows

The Serial library that ships with Clyde has random issues with Windows 8. If that is your current OS, and you're finding that Clyde is not behaving like it should when you send it Serial commands, but otherwise it's fine, then you can download a new Serial library and try again.

One such Serial library can be found on Github: Kroimon Serial Library

Download the zip file (bottom right of the Github screen), unzip, and overwrite the files found in /libraries/Serial Command with these new files. They should match one for one.

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