

HyperFirmata Overview

<https://goo.gl/MQQNG1>

Firmata is a generic protocol for communicating with microcontrollers from software on a host computer. It is intended to work with any host computer software package. Right now there is a matching object in a number of languages. It is easy to add objects for other software to use this protocol. Basically, this firmware establishes a protocol for talking to the Arduino from the host software. The aim is to allow people to completely control the Arduino from software on the host computer.

Standard Firmata is firmware for the Arduino that supports the firmata protocol. With Standard Firmata, a host computer can monitor all the digital and analog inputs, and also control all outputs, such as for LEDs, motors and servos.

With Standard Firmata, HyperStudio was able to interact with the Arduino, and in particular, HyperStudio could change its display based on sensor inputs, and HyperStudio buttons could turn on/off LEDs, motors, servos.

There are block programming languages like Snap4Arduino and ScratchX that use (and require) Standard Firmata for I/O to an Arduino from the block programs.

HyperFirmata is the variant of Standard Firmata created for me by Damian Peckett that added touch sensing to Standard Firmata.

HyperFirmata is required for the HyperDuino for Chrome app to interact with sensors, and to turn on/off LEDs, motors, servos, etc.

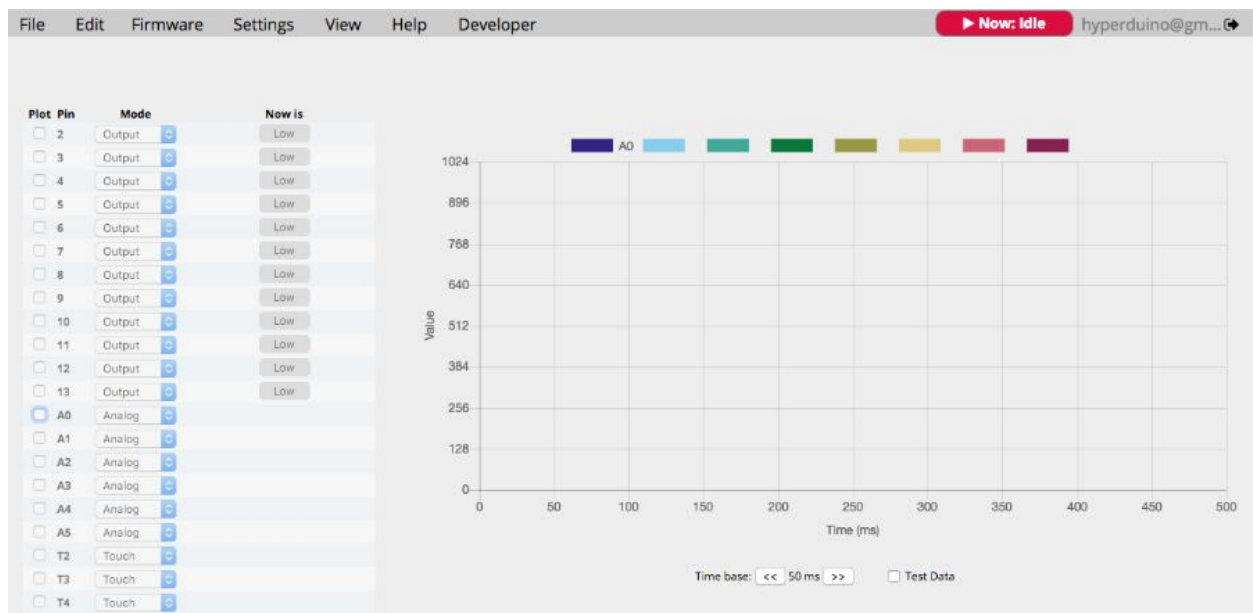
HyperFirmata at startup blinks (turns on/off) all output pins 5-10 times at startup as it is calibrating itself to the startup condition of the touch sensors. This might seem quite undesirable to unilaterally "push the button" on everything attached to an Arduino (we don't recommend HyperFirmata for pacemakers :) but it's very desirable and useful for student projects to know that all their LEDs are connected correctly, and I find it useful myself even in applications with motors attached because the pulse to all output pins is very brief, and so motors make just a little tiny motion that to me confirms that they're working).

HyperFirmata-MB (for micro:bit) makes a micro:bit appear as an Arduino with HyperFirmata (or Standard Firmata) to HyperStudio, ScratchX, Snap4Arduino and the HyperDuino app for Chrome. [Click here for more information on how to install HyperFirmata-MB.](#)

The HyperDuino Controller app ([beta here](#)), and the MakerBit Controller app ([beta here](#)), have a "Data View" that includes direct display and setting of both Arduino and micro:bit pins, and in that sense, have restored the availability of something akin to Firmata Test.

Data View in HyperDuino (or MakerBit) is a quick way of checking the actual input pin conditions or setting output pins.

One added feature of the Data View in HyperDuino/MakerBit over Firmata Test is a simple graph over a specified time range of the input values.



(this screen doesn't show the analog data graphed, but does show the general appearance of the Data View window)

Both HyperFirmata and HyperFirmata-MB respond and work with the Firmata Test app. Occasionally I've seen a problem where some of the pins in the Firmata Test list are "missing" (gaps in the list where a pin # should be) but a reset of the Arduino fixed that, as sometimes just re-connecting the serial port. I think it's a timing (handshake at start up) issue with HyperFirmata.