MilCandy

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Version： 1.0

Wiki: http://www.seeedstudio.com/wiki/MilCandy

Bazaar: http://www.seeedstudio.com/depot/MilCandy-the-Easiest-Grove-Controller-p-1104.html

Document Revision History

Revision	Date	Author	Description
1.0	Sep 21, 2015	Victor.He	Create file

Contents

Disclaimer

For physical injuries and possessions loss caused by those reasons which are not related to product quality, such as operating without following manual guide, natural disasters or force majeure, we take no responsibility for that.

Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.

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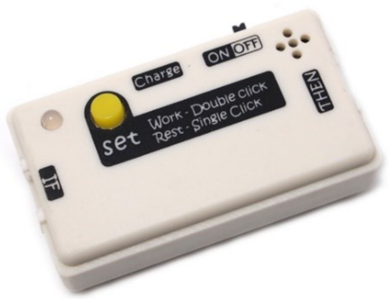
1. Introduction

The MilCandy is a tiny Arduino compatible platform based on AVR microcontroller Atmega168. It could be the easiest controller to manipulate your physical world. It.s an all-in-one design with cost and convenience in mind. It enables accomplishing simple AI tasks by plug-in sensor, actuator, and setting the triggering pattern via a few button clicks. Its Arduino based open source firmware could be updated for more complex logic.



2. Features

- Ships with Set-Trigger Firmware
- Arduino compatible
- Grove interface for sensors and actuators
- On-board LED indicator and light sensor
- All-in-one design with LiPo battery and enclosure
- Cost efficient
- Tiny and light

3. Specifications

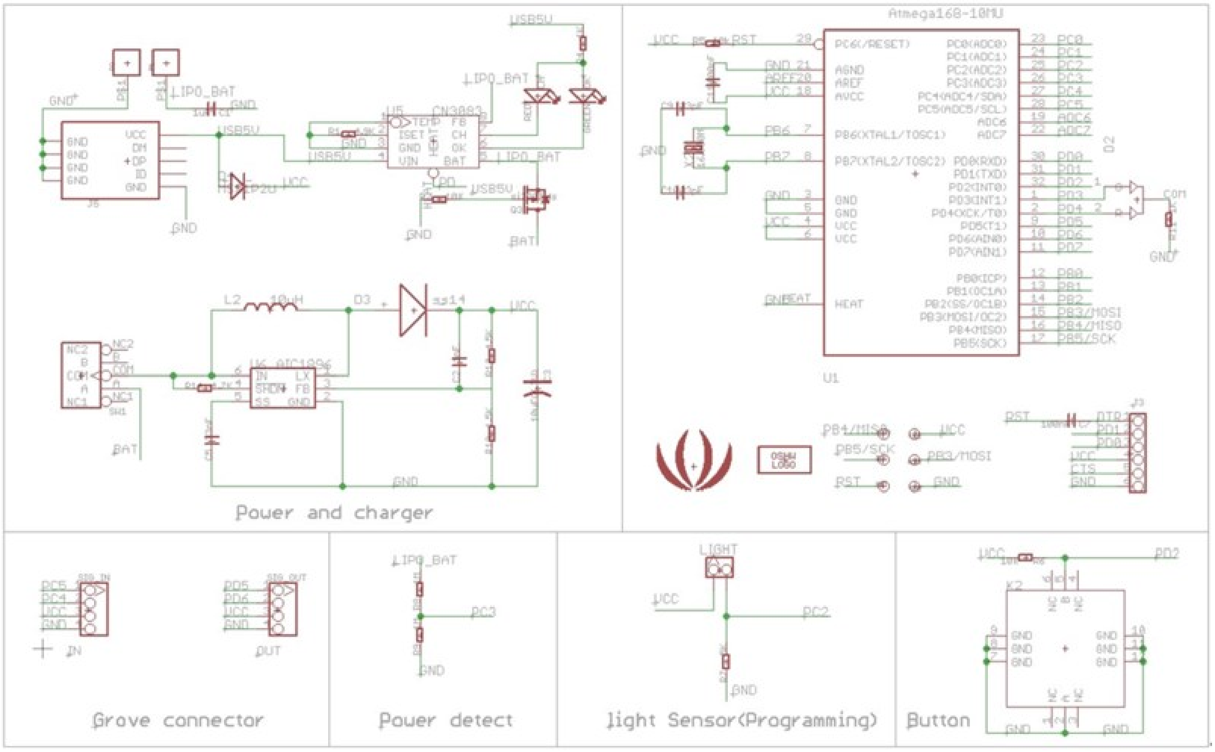
Weight	17g
Size	49.33 x 27.3 x 14.2(cm)
Battery Capacity	300 mAH
Current	<25 mA

4. Application ideas

- Smart Home/Farming.
- Environment Detection.
- Toy development platform/Arduino compatible projects.

Cautions: Depending On Your Application Misuse May Cause serious Danger.

5. Schematic and Hardware



Hardware included:

1. **Atmega168 Processor and UART connector** that can connect to UartSBee directly. MilCandy has Pre-installed the firmware "IFTTT", which helps you set your own logic via a few button clicks. Besides, you can also upload you own Arduino sketch to MilCandy using a UartSBee.

2. **Power and Charging Circuit**.

There is a 300 mAH battery included in the MilCandy, MilCandy use IC CN3083 to charge this battery. A Red LED will be on if CN3083 is charging battery, while the green LED will be on if the charging finished.

3. **Two Grove connectors.**

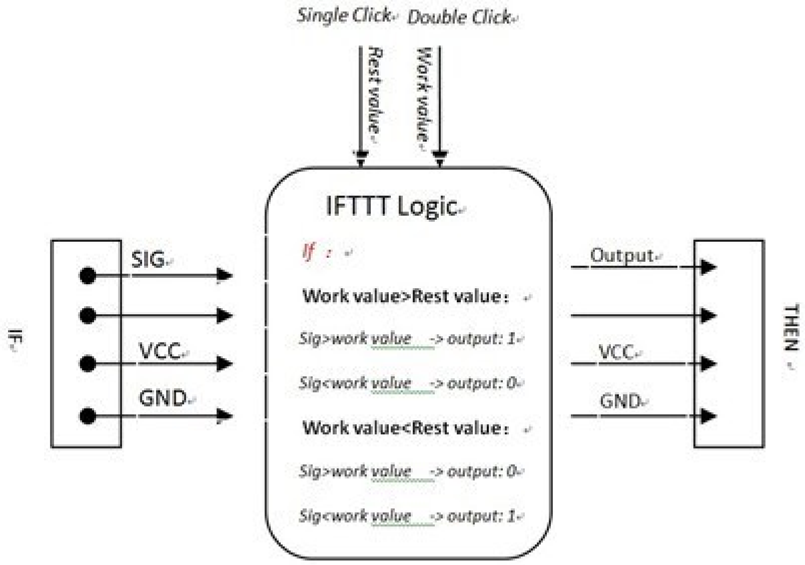
MilCandy can be connected to seeedstudio Groves with the 2 connectors. With these various Groves, MilCandy can be easy to measure or communicate with others. If using the IFTTT firmware, the “IF” port acts as input while the “THEN” as output. Also, you can re-make your own modules Grove-compatible easily.

4. **Light sensor/ Button / Power detect circuits**.

An on-board light sensor helps you make your project light-sensitive without extra Components. Also a Power detect circuits can be used to judge the battery state.

6. Firmware-IFTTT

MilCandy ships with pre-installed firmware – IFTTT. It makes Milcandy perfect for you if you hate anything about programming. You can easily set your own logic project like: “If there is not enough water for my rose in the flowerpot, then the LED should be on to remind me (or even open a valve to water the flower)”.



In the IFTTT logic, MilCandy always monitor the Sig(Pin4) of the “IF” port, and compares with the values defined when you clicks the button. Logic among the Sig/ Output/ Work value/ Rest value can be seen on the above picture.

Rest value and Work value are stored in the EEPROM of Atmega168 and are used to initialize the logic every time MilCandy powers up.

To set up your logic, you just need to follow the steps below:

- ***1. Connect the sensor or actuator you want to use in your project.***

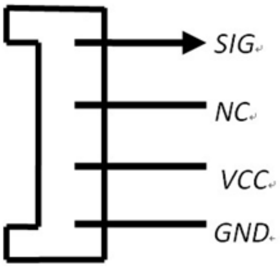
You can select the Grove modules you want to use in your project at SeeedStudio. First you need an **Input** Grove module to measure the parameter you want. Note that only an analog or single digital output Grove can be used as a MilCandy input. Because actually the IFTTT firmware always monitor the pin 4 of Grove input to decide whether the “Work State” comes or not.

You can select the following Grove Elements as MilCandy **Input** in SeeedStudio (the “IF” port) when using the IFTTT firmware:

Module name	Parameter to measure
Grove - 80cm Infrared Proximity Sensor	Distance
Grove - Button	On/Off

Grove - Electricity Sensor	Electricity
Grove - Gas Sensor(MQ2&MQ5)	Gas Quality
Grove - Light Sensor	Light
Grove - Magnetic Switch	Magnetic
Grove - Moisture Sensor	Moisture
Grove - PIR Motion Sensor	PIR Motion
Grove - Rotary Angle Sensor	Rotary Angle
Grove - Tilt Switch	Object Position
Grove - Sound Sensor	Sound
Grove - Temperature Sensor	Temperature
Grove - Touch Sensor	Human touch
Grove - Water Sensor	Water

If you want to use your own sensors that is not Grove-compatible, it is easy to re-make it. Just connect your signal output to pin4 of Grove connector and then the VCC and GND. *Note that only sensors that output an analog or single digital can be used in the IFTTT firmware*



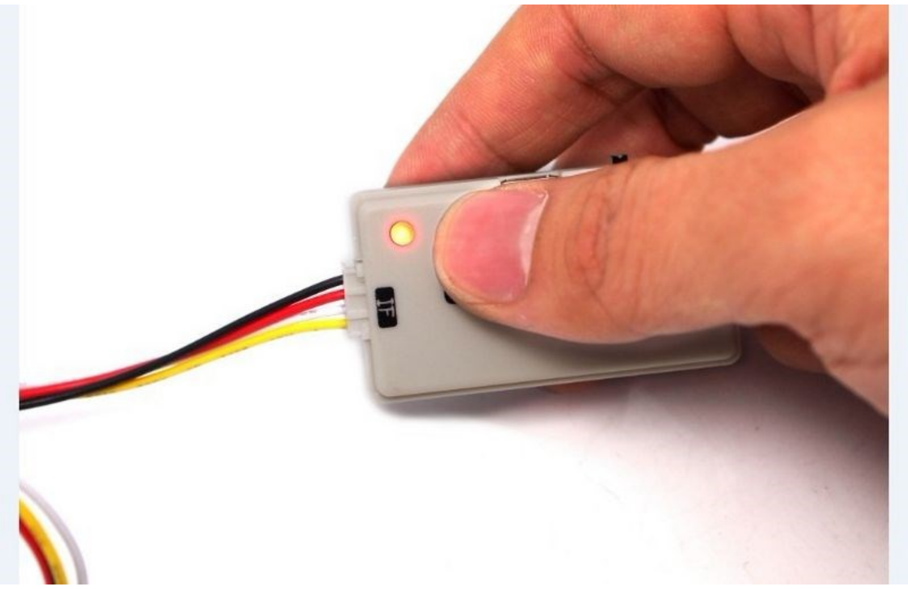
Now You can select the following Grove Elements as MilCandy actuator (the “THEN” port) when using the IFTTT firmware:

Module name	Action when triggered
Grove - Buzzer	Buzzer enabled
Grove - LED	LED On
Grove - Vibrator	Vibrate
Grove - Relay	Switch On/Off other circuits

In my project, I want MilCandy following logic to help me: If the moisture in the flowerpot is too low (moisture below some values), then the led should be on to remind me; if the moisture is no longer below the values after i water the flower, the led should be off. So I would need the Grove-moisture-sensor and the Grove-led. Connect the moisture sensor to the “**IF**” port and the LED to “**THEN**” port.

- ***2. Teach MilCandy your logic.***

Power up the MilCandy, the led would blink green to show the heartbeat every 3 seconds. Now, You need to defined the "Work state" and "Rest state" of MilCandy. In "Work state", the output ("THEN" port) would outputs logic HIGH; and in "Rest state", the output will be logic LOW. Define the "Work state" by Double Click the button, while define the "Rest state" by Single Click the button. The status led would blink red once or twice to show you the setting has been set correctly.



In my project, I need to first define the "Rest state", which means the "THEN" port outputs logic LOW to switch off the connected module(Grove-LED). And Then define the "Work state", which means the "THEN" port outputs logic HIGH, to enable the Grove-LED.

That is:

If there's enough moisture -> "Rest state" -> Unable the Grove-LED

If there's not enough moisture ->"Work state" -> Enable the Grove-LED

Ok, Now I am setting my logic:

First, Put the moisture sensor into soil that you defined as "I think the moisture in this kind of soil is enough for my rose", and single click the button, to define the "Rest state". The status led would blink red once to show you the setting has been completed correctly.

Second, Put the moisture sensor into soil that you defined as" I think the moisture in this kind of soil is not enough, MilCandy needs to remind me to irrigate my rose", to define the "Work state", the red led would blink twice to show you the setting has been completed correctly.

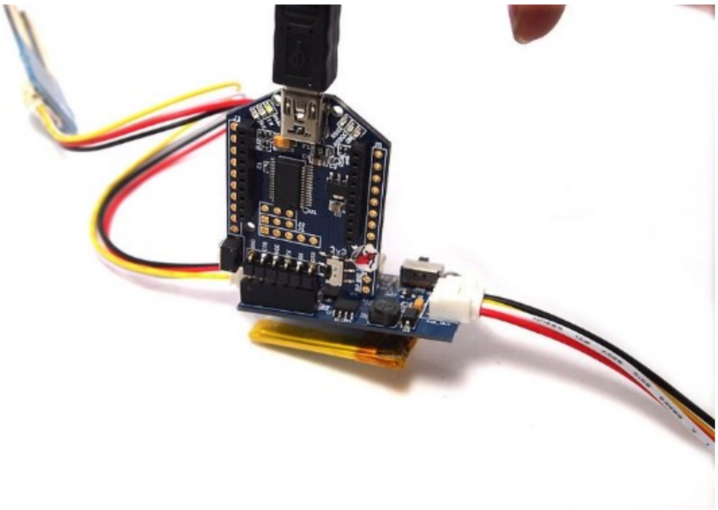
- **3. Ready to work**

Reset your MilCandy and your MilCandy is ready to work now.

When the moisture sensor in the soil measures lower moisture than the state you defined as the "Work state", then the connected Grove-LED will remind you "hey, I am thirty", after water the flower the Grove-LED switch off again.

7. Download Your Own Arduino Sketch

MilCandy is also Arduino compatible, you can download your Arduino Sketch with the seeedstudio UartSBee. Note that you need to select the “Atmega168” when uploading the firmware.



8. More Application

A Temeratuce-Contrlled USB Fan at Instructables And YouTube

9. Support

If you have questions or other better design ideas, you can go to our forum or wish to discuss.

10.Version Tracker

Revision	Descriptions	Release Date
MilCandyv0.92	Initial public release	2012/3/9

11.Resources

MilCandy Schematic

MilCandy firmware v0.92b

12. Licensing

13.External Links

Links to external webpages which provide more application ideas, documents/datasheet or software libraries