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Adventures with the Trinket and Trinket M0
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Adventures with the Trinket and Trinket M0

by languer on 05 May 2018 23:47

Recently I started re-using the Trinket platform and started anew using the Trinket M0 platform. I would like to use this post to document some things I've found useful so hopefully others can benefit.

Sometimes I "forget" the IDE settings when I switch platforms. Below are the most used settings I normally use:
Uno

- Board: Arduino/Genuino Uno
- Programmer: AVSISP mkII

Trinket

- Board: Adafruit Trinket 8MHz
- Programmer: USBTinyISP

Trinket M0

- Board: Adafruit Trinket M0
- Programmer: USBTinyISP or Atmel EDBG

languer

Posts: 26
Joined: 17 May 2013 18:02

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Re: Adventures with the Trinket and Trinket M0

by languer on 06 May 2018 00:05

To enable low power mode on the Trinket and wakeup from sleep some specific AVR registers have to be "touched" in a somewhat specific sequence. Some of these limitations are because the Trinket doesn't support all the Uno libraries due to its limited memory. In summary, to go to sleep in low power mode the watchdog must be set, the ADC disabled (for maximum power savings), all peripherals must be placed in low power mode. and the MCU must be placed in low power sleep mode. Doing these reduces the power consumption on the Trinket (3V) from about 9mA to about 30uA.

More detailed information can be found here: Adafruit Trinket Platform - Low Power Mode
Last edited by languer on 12 May 2018 18:18, edited 1 time in total.

languer

Posts: 26
Joined: 17 May 2013 18:02

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Re: Adventures with the Trinket and Trinket M0

by languer on 06 May 2018 00:15

Just started playing with the Trinket M0 and found the Serial function works well, but I could not get the SerialEvent to work. SerialEvent allows something similar to true asynchronous Comms (in that you don't have to wait in a loop for incoming messages and can let the internal buffer handle the "events"). An example is shown here. This does not mean one can just blast the MCU with RS232 data, but with some care one can "multi-task" with some clever time allocation to each "process".

Turns out that in order to use serialEvent, serialEventRun needs to be defined within the libraries. The libraries do not appear to have this function defined for the M0. Adding this definition to the program allows the serialEvent to work properly.

Code: Select all | TOGGLE FULL SIZE

```
void serialEventRun(void) {
  if (Serial.available()) serialEvent();
}
```

languer

Posts: 26
Joined: 17 May 2013 18:02

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Re: Adventures with the Trinket and Trinket M0

by languer on 11 Jun 2018 02:48

Continuing to play with the M0 I started looking at low power libraries. This is a brief summary of my experience with the following libraries:

- Arduino Low Power
- RTCZero
- Adafruit SleepyDog

The Arduino Low Power should have worked, but there must be some compatibility issue between the Trinket definition and the Arduino M0 library related to the USB serial port definitions as the following error kept popping up: "ArduinoLowPower.cpp:20:6: error: 'SerialUSB' was not declared in this scope". Regardless as how I tried to define SerialUSB the error message kept showing up (so this needs to be addressed deeper in the sub-libraries I think).

The RTCZero library compiled but it did not fully worked. Sometimes it sort of bricked the Trinket and some other times it worked up to the point where the interrupt was called out. Should I find anything down the road I will update here.

The Adafruit SleepyDog worked the best. The SerialUSB was not able to operate after waking up the MCU from sleep, but according to GIT that may be a known issue. The SleepyDog library requires the Adafruit Arduino Zero ASF Core Library installed.

Using the SleepyDog library I obtained the following current consumption numbers:

- Current Draw in as-is condition ~ 10.8mA
- Current Draw Turning Off DotStar ~ 10.2mA
- Current Draw Turning Off DotStar, and Sleep ~ 1.45mA
- Current Draw Power LED removed, DotStar removed ~ 9.28mA
- Current Draw Power LED removed, DotStar removed, and Sleep ~ 0.385mA

languer

Posts: 26
Joined: 17 May 2013 18:02

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