\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Motivation \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

I want to learn techniques to debug my embedded hardware

So right now I just know that these are the techniques

1. Print debug msg in code and log it [SD card data logger would be great]
2. Hardware Debug: with JTAG like interface.
3. Unit testing with test framework

Well I currently know about 1 and I have a code snippet which prints out the ram usage. Also I have made a singleton pattern type debug class for AVR microcontroller series. ARM chips have a CMSIS debug print like function by default at its SWD pin I guess [TODO: verify the assumption]

But 1 is not enough for testing so looking forward to learn about 2 so let’s start

2. Hardware Debug: for this we need a hardware debugger Right now I have Atmel-ICE and for first time I will debug a m328p chip residing at an arduino .

You need to use Atmel studio for this. I will use atmel studio 7

Atmel –ICE can debug using :

* debugWIRE
* aWire
* JTAG
* SWD

now what is the purpose actually you can debug each variable set breakpoint make jumps and see how the actual mcu is behaving.

<http://www.crash-bang.com/debug-atmel-ice/> see this post to learn more but to do it on exact arduino uno board you will need some tweak <http://blog.solutions-cubed.com/debugging-arduino-sketches-with-atmel-studio-7/>

I am denoting some important points

* Mcu Connection with atmel ICE help doc is at bootloader folder [TODO: add wiring and pic here]
* Make sure your mcu dwen fuse is set
* Select Debug mode
* Set a breakpoint after which you want to see the variable values or other things. In real time hardware :D

“Quickwatch” feature

Always end your Debug mode else your mcu will lock up and then you will need a high voltage programmer to unlock to do it Click on the Debug menu, then Disable debugWIRE Mode and Close