GETTING STARTED

Thank you for buying the TiniAVR™. We hope you will find the TiniAVR™ to be the incredibly useful small controller board we intended it to be, and easy to use as possible.

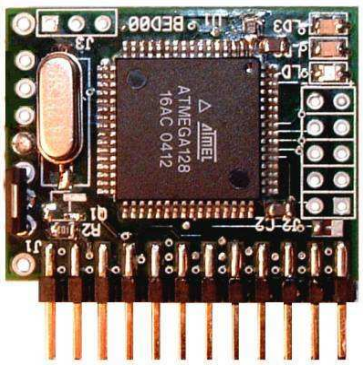


Figure1 - TiniAVR™

If you are new to the TiniAVR™, we know you will be in a hurry to see it working.

That's okay. We understand.

Let's skip the features and the tour and get right to the operation; those points can wait for later. Once we've got communications, then we can make some lights blink and know for sure we're in business. Let's make this "TiniAVR™" talk to us!

If you have the development interface board, which can come with the TiniAVR™ you are probably ahead, because the wiring to the power connector and the RS-232 connector is done for you.

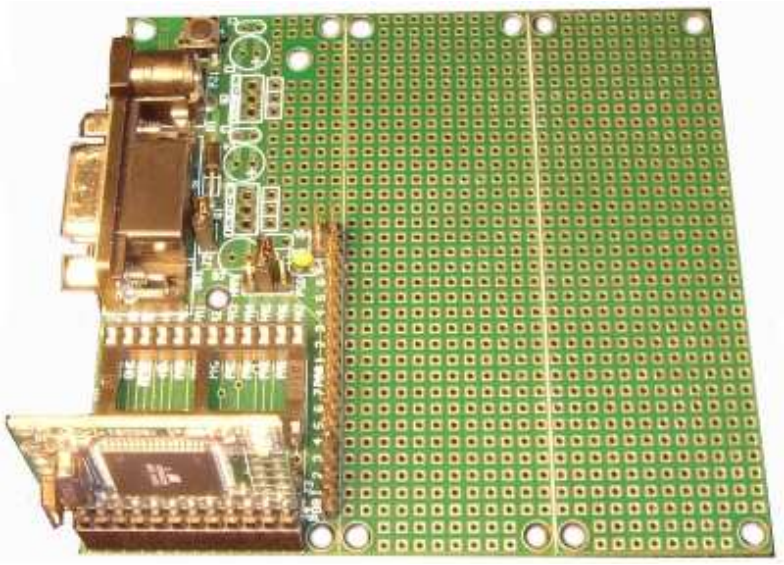
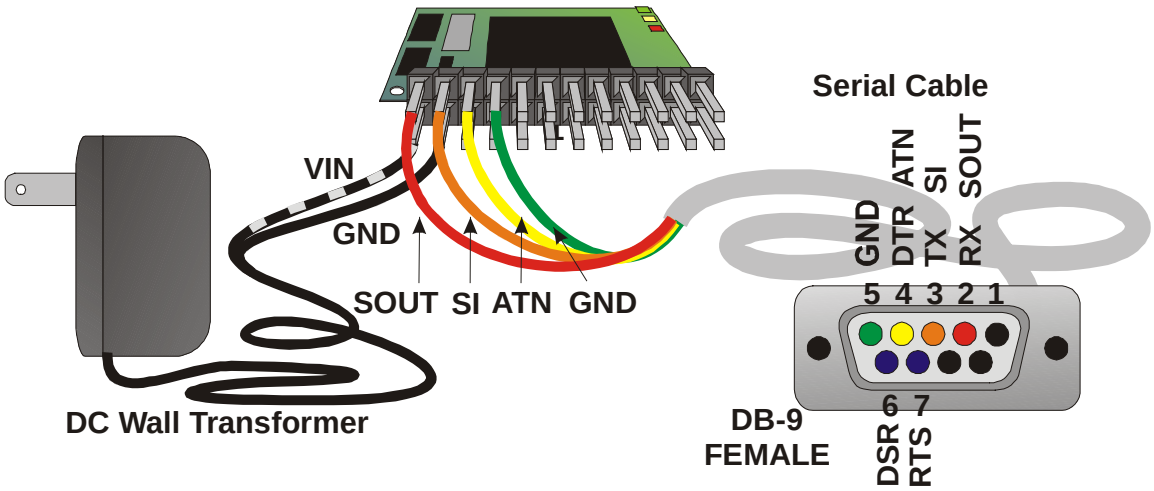


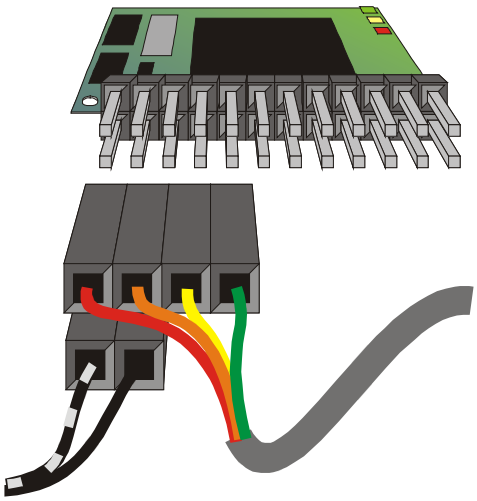
Figure2 - TiniAVR™ Development Kit

If not, you will have to make some special cabling and or adapters.

If you do not have the development board, you will need to hook up Power and ground to the TiniAVR™ board in some manner like this. For the purposes of this Getting Started Guide, you do not need to hook up the RS-232 serial port like shown in this picture below.



You can also use a setup similar to other Tini's™ as shown below. What we want it to get the power and ground connections hooked up. The TiniAVR™ has its own onboard voltage regulator, so any AC-DC power adapter that can provide from 6v to 9v DC will work OK.



First to flash the test program with the TiniAVR™, you will need to download the serial Bootloader program, **MegaLoad** from Microsyl web site and install on your PC,

http://www.microsyl.com/megaload/megaload.html

LED test program is available here,

http://www.newmicros.com/download/appnotes/AVR/leds.zip

Open the MegaLoad program and select the available comport. Baudrate set for 115200bps. Open the Leds.hex test program on the **File to be program in flash** box. As soon as the TiniAVR™ power is turned on (or press reset if the power is present), the flash memory will be programmed with the Leds.Hex in seconds. Now click on the Monitor button, enter the following numbers and observe the Leds,

1, 2, 4, 7, 0 Where 1, 2, 4, 7, will turn on the Red, Yellow, Green, and All respectively. 0 all off.

Now you should have a good feeling because you can tell your TiniAVR™ is working.

FEATURES

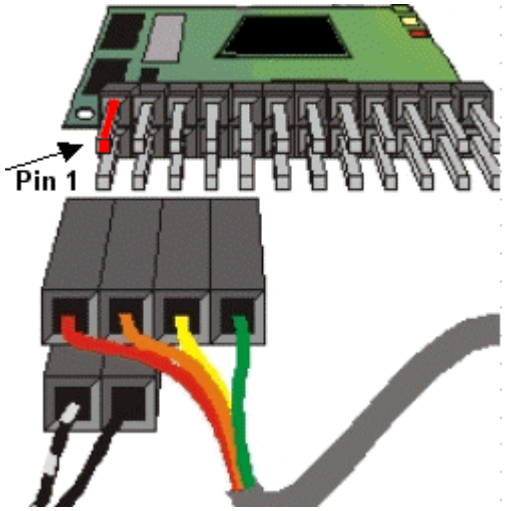
- AVR 8-bit CPU
- CPU oprerating range up to 16Mhz
- On-chip 2-cycle Multiplier
- Board Size: 1.0"(W) x 1.3"(L) x 0.6"(H)
- Weight: 0.4 Ounces
- On-chip Memory
    - 128K Bytes of In-System Reprogramming Flash
        - Endurance: 10,000 Write/Erase Cycles
    - 4K Bytes EEPROM
        - Endurance: 100,000 Write/Erase Cycles
    - 4K Bytes Static Ram
- Up to 26 General Purpose Digital I/O lines share functions with,
    - 8-Channel 10-Bit A/D share with JTAG I/O Pins
    - SPI Interface for In-System Programming
    - Two Serial Communication Interfaces (SCI)
        - UART0 dedicates for RS-232 serial interface
        - UART1, TTL signals shared with GPIOs
    - I2C Interface
    - JTAG connection for flash programming/debugging
    - Two 8-bit Timer/Counters
    - Six PWM channels with Programmable Resolution from 2 to 16 bits
    - Output compare modulator
    - Realtime Counter with seperate oscillator
    - Up to 8 external Interrupts
- Power-on Reset and Programmable Brown-out Detection
- Internal Calibrated RC Oscillator
- Six Sleep Mode: Idle, ADC Noise Reduction, Power-save, Power-down, Standby, and extended Standby
- Software Selectable Clock Frequency
- Atmega103 Compatibility Mode Selected by Fuse
- Onboard three user's leds
- Onboard 5.0V linear regulator
- A 2x12 header pin connector for Power, Serial, and I/O connections
- Serial Bootloader preloaded

I/O Connectors

Most of the CPU I/O's are brought out to J1, J2, and J3 Connectors.

J1

SOUT	1	2	VIN
SIN	3	4	GND
ATN'	5	6	RESET'
GND	7	8	+5V
PB0	9	10	PD2
PB1	11	12	PD3
PB2	13	14	PE2
PB3	15	16	PE3
PB4	17	18	PE4
PB5	19	20	PE5
PB6	21	22	PE6
PB7	23	24	PE7



J1, Signal Descriptions:

SOUT: Serial Output from TiniAVR, RS-232 level
SIN: Serial Input to TiniAVR, RS-232 level
ATN': Alternative reset via serial DTR signal
VIN: Power Input Voltage, 6-12Vdc
GND: Ground, or power return
RESET': Controller Reset signal
PB0-7, PD2-3, PE3-7 : General Purpose I/O's

J2, JTAG interface, or GPIO's

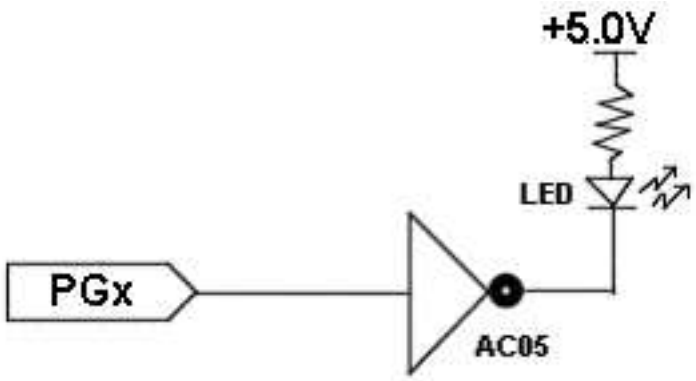
VREF(VDD)	1	2	GND
PF0	3	4	PF1
PF2	5	6	PF3
PF4	7	8	PF5
PF6	9	10	PF7

J3, I2C interface, or GPIO's

1	PD1
2	GND
3	PD0

Peripheral Controlled Ports:

LEDs are buffered by the AC05 inverter. An output high signal on the port pin will turn the LED On, and low is Off. The following I/O ports are being used for this purpose.
PG0 => Red Led
PG1 => Yellow Led
PG2 => Green Led



RS-232 Transceiver Enable/Disable

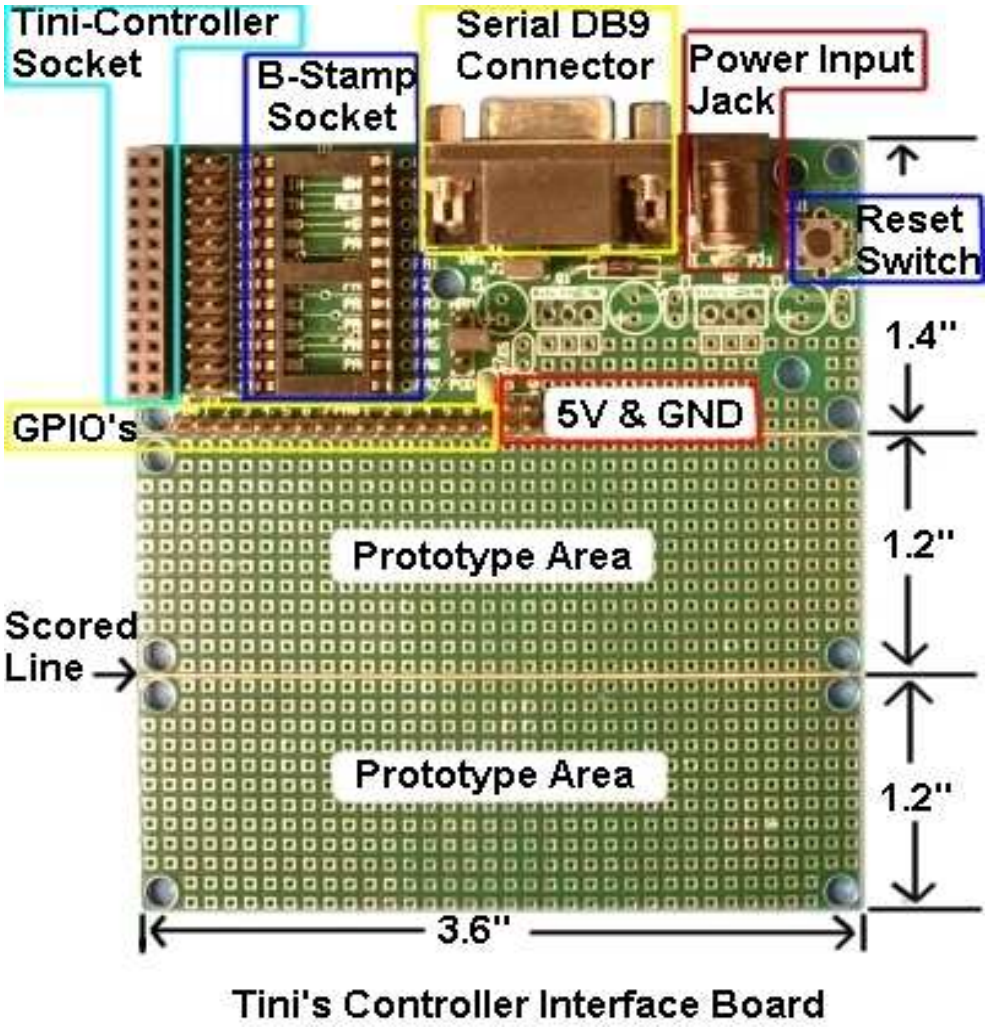
PC0 controls the Receiver Input – An output low signal on PC0 will enable the RS-232 receiver, and high is disable.

PC1 controls the Transmitter Output – An output high signal on PC1 will enable the RS-232 Transmitter, and low is disable.

By default, the RS-232 chip is configured for Normal Operation through the Pull-Down & Pull-Up resistors on Pin 1 & 16 respectively, since PC0 & PC1 are default to inputs after reset.

Interface Board

The TiniAVR™ Development Kit comes with the controller Interface Board. Onboard the Power jack, DB9 serial connector, reset switch, GPI/O headers installed, and prototyping areas provided for convenience and easy to hook up.



Tini's Controller Interface Board

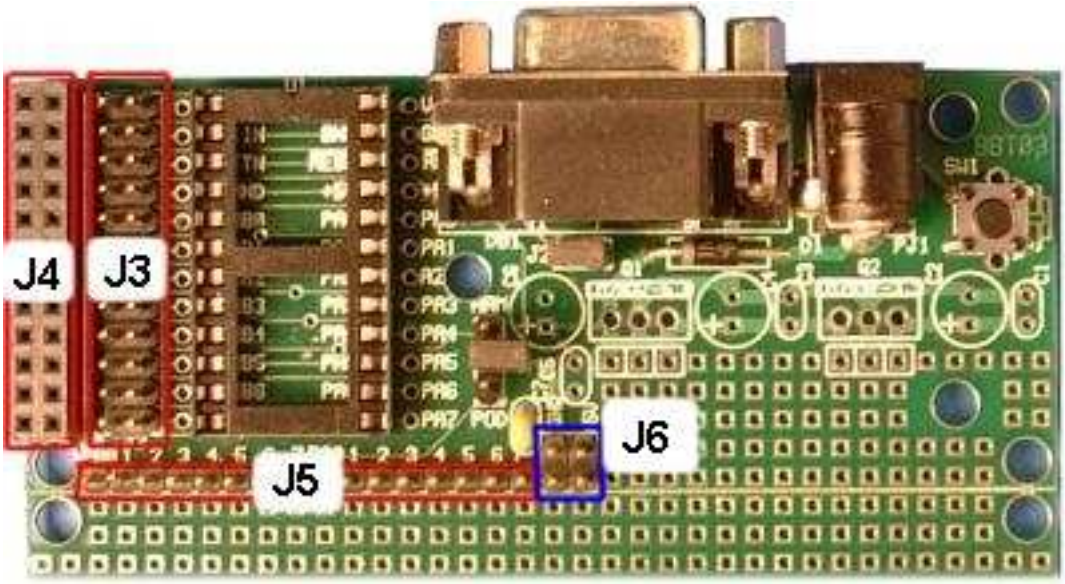
I/O Connections & Descriptions

PJ1: Power Jack, accepting 6-12VDC

DB1: Serial DB9F connector

SW1: Reset switch

Controller GPI/O's are brought out to J3, and J5. Where J4 is the stacking connector for the Tini's controller module. J6 is GND & 5V signals come from the Tini's Controller pin 7 & 8 respectively.



J4

SOUT	1	2	VIN
SIN	3	4	GND
ATN	5	6	RESET
GND	7	8	+5V
PB0	9	10	PA0
PB1	11	12	PA1
PB2	13	14	PA2
PB3	15	16	PA3
PB4	17	18	PA4
PB5	19	20	PA5
PB6	21	22	PA6
PB7	23	24	PA7

J3

SOUT	1	2	VIN
SIN	3	4	GND
ATN	5	6	RESET
GND	7	8	+5V
PB0	9	10	PA0
PB1	11	12	PA1
PB2	13	14	PA2
PB3	15	16	PA3
PB4	17	18	PA4
PB5	19	20	PA5
PB6	21	22	PA6
PB7	23	24	PA7

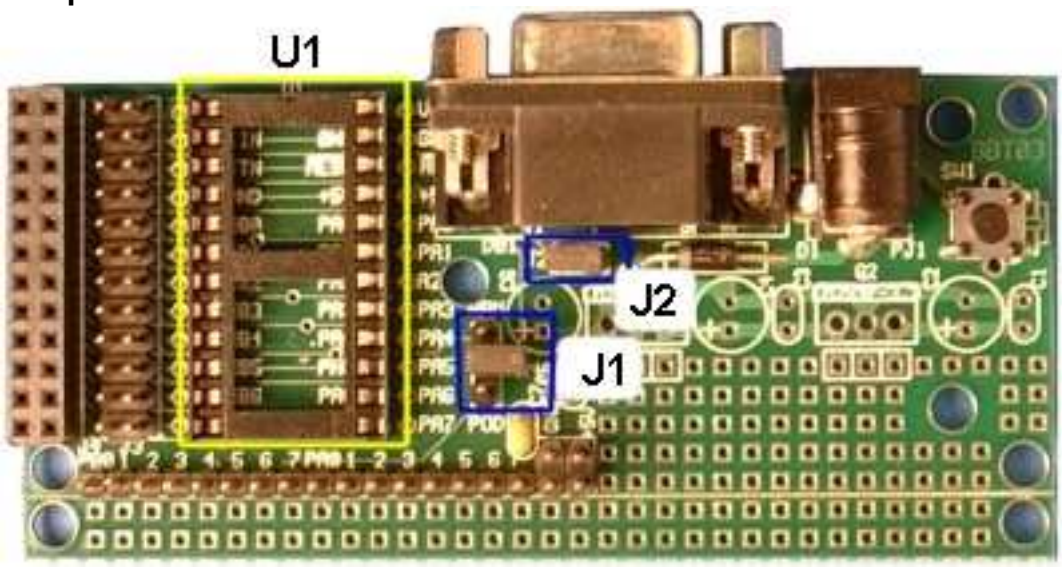
J6

GND	+5V
1	2
3	4
GND	+5V

J5

PB0	PB1	PB2	PB3	PB4	PB5	PB6	PB7	PA0	PA1	PA2	PA3	PA4	PA5	PA6	PA7
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Jumpers



J1: Serial Boot jumper supports TiniARMs & TiniPod Controllers. Remove jumper for normal operation.

J2: Jumper for serial DTR to Tini's controller ATN signal. This jumper provides an alternative controller reset through serial DTR signal. Remove jumper when it is not in used.

J1

1	P0.14
2	GND
3	PE4

ARMs jumpers on 1 & 2

Pod jumpers on 2 & 3

J2

ATN	2	1	DTR

Miscellaneous

U1: Socket supports Basic Stamp 24 pin modules .

SOUT	1	24	VIN
SIN	2	23	GND
ATN	3	22	RESET
GND	4	21	+5V
PB0	5	20	PA0
PB1	6	19	PA1
PB2	7	18	PA2
PB3	8	17	PA3
PB4	9	16	PA4
PB5	10	15	PA5
PB6	11	14	PA6
PB7	12	13	PA7