GETTING STARTED

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

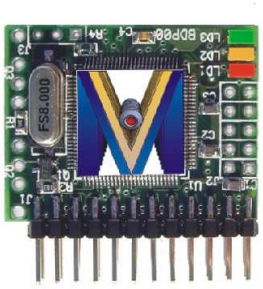


Figure1 - TiniPod™

If you are new to the TiniPod™, 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 discussion of Virtually Parallel Machine Architecture™ (VPMA) 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 "pod" talk to us!

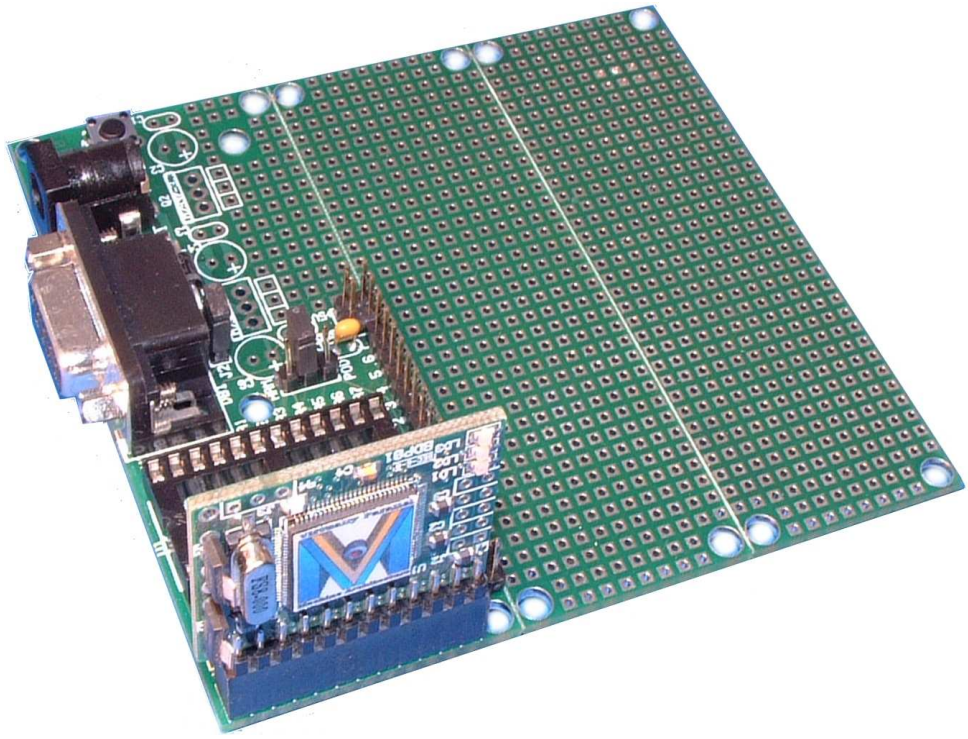
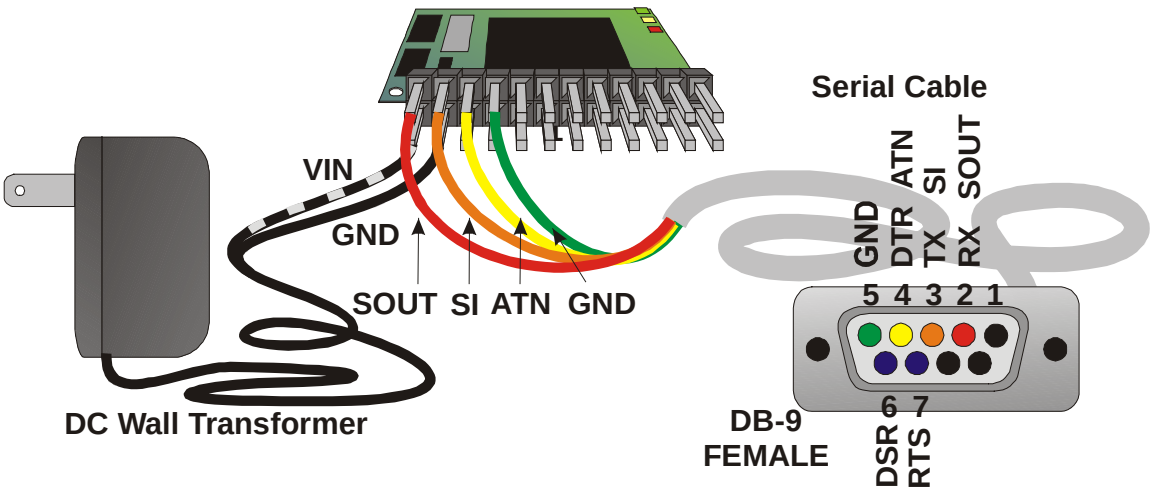


Figure 2 - TiniPod™ Development Kit

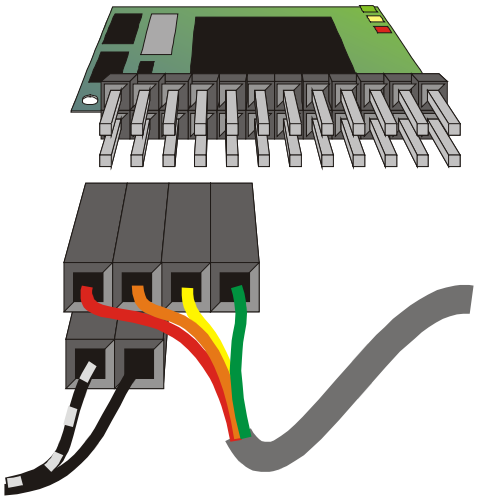
If you have the development interface board, which can come with the TiniPod™ you are probably ahead, because the wiring to the power connector and the RS-232 connector is done for you. If not, you will have to make some special cabling

We'll need PC running a terminal program. Then we'll need a serial cable to connect from the PC to the TiniPod™ (which, hopefully, you've already gotten from us). Then we need power, such as from a 6VDC wall transformer (which, hopefully, you've already gotten from us). (If not, you can build your own cable, and supply your own power supply from 6-9Vdc @ 300mA or higher. Instructions are in the back of this manual in Connectors.) If we have those connections correct, we will be able to talk to the TiniPod™ interactively.



These connections are all made on a few pins of J1, which is a male .1" dual row connector.

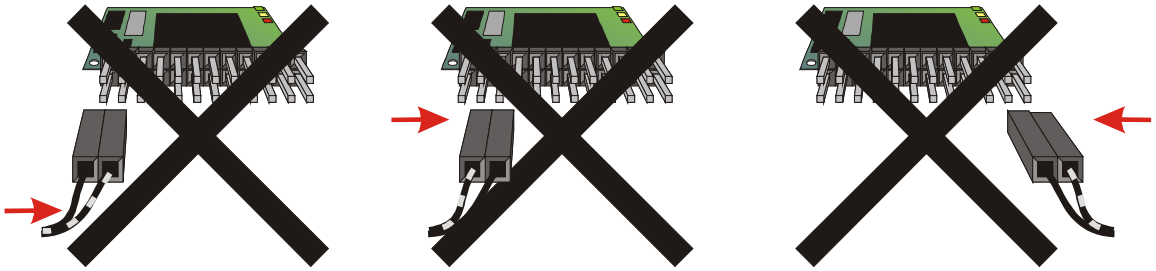
Generally, an intermediate double male header strip will be used to mate from J1 to the Wall transformer single row female connector, and to the Serial Cable single row female connector.



(There are other options we'll discuss later. If you are using your TiniPod™ with our Prototyping Board, these connections will be a little simpler. Follow directions in the Prototyping Board Manual if you are using it.)

Your chief concern now, is not hooking the serial cable or power cable up on the wrong connector; the wrong pins on the right connector; or backwards or rotated on the right

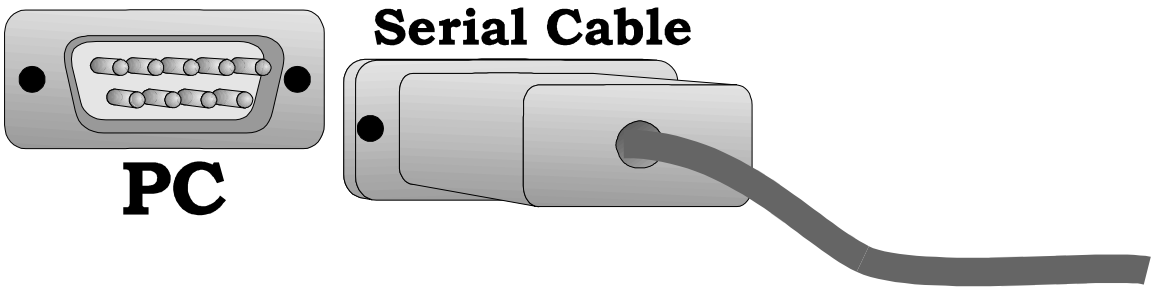
connector. Pay close attention how the connectors go on. There is no protection to prevent plugging in on the .1” dual row headers the wrong way.



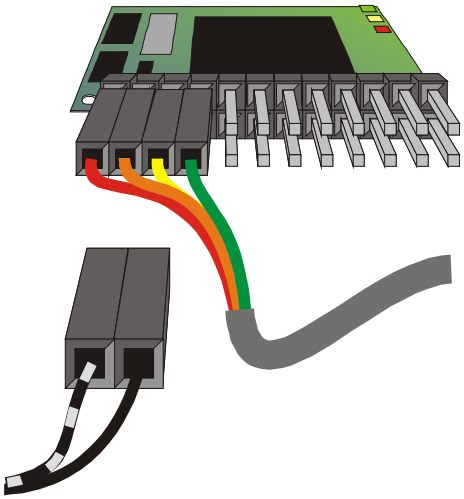
Once you have your serial cable and connectors, and wall transformer and connectors, ready, follow these steps.

Start with the PC: Install and run the NMITerm program, or, find and start Hyperterm. Set the terminal program for communications channel (COMM1, COMM2, etc.) you wish to use, and set communications settings to (15200, 8N1). Operate the program to get past the opening set ups and to the terminal screen, so it is ready to communicate. (If necessary, visit the chapters on NMITerm and Hyperterm if you have trouble understanding how to accomplish any of this.)

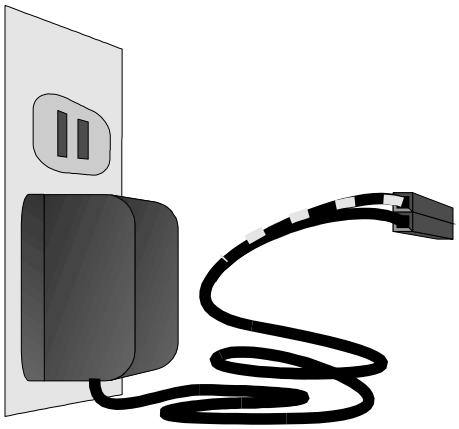
Hook the computer end of the serial cable (usually a DB-9 connector, but may be a DB-25, or other, on older PC’s) to the PC’s communication channel selected in the terminal program.



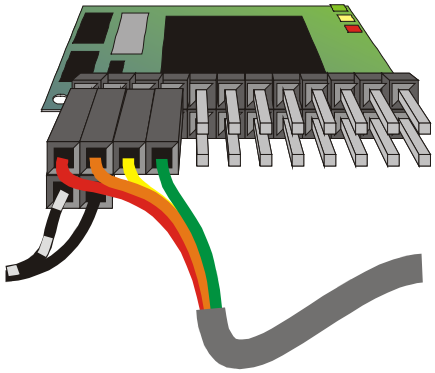
Now hook the TiniPod™ end of the serial cable to the TiniPod™ with connections as shown in the instructions. See the illustration here:



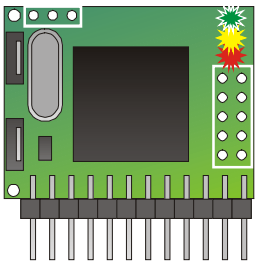
Plug the wall transformer into the wall, but do not plug it into the board yet.



Now, while watching the LED's plug in the wall transformer connector to the power pins on the TiniPod™ board. Be *very* careful not to get a misalignment here, because it will likely kill the board. See the illustration here:



All three LED's should come on. If the LED's do not light, unplug the power to the TiniPod™ quickly.



Now check the screen on the computer. When the power is applied, before any user program installed, the PC terminal program should show "IsoMax™ Vx.x" (or whatever the version currently is, see upgrade policy later at the end of this chapter).

If the LED's don't light, and the screen doesn't show the message, unplug the power to the TiniPod™. Go back through the instructions again. Check the power connections, particularly for polarity. (This is the most dangerous error to your board.) If the LED's come on but there is no communication, check the terminal program. Check the serial connections, particularly for a reversal or rotation. Try once more. If you have no

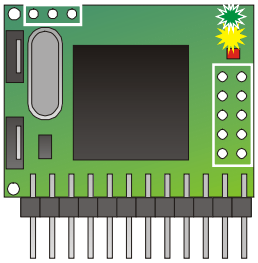
success, see the trouble shooting section of this manual and then contact technical support for help, before going further. Do not leave power on the board for more than a few seconds if it does not appear to be operational.

Normally at this point you will see the prompt on the computer screen "`IsoMax™ Vx.x`". Odds are you're there. Congratulations! Now let's do something interactive with the TiniPod™.

In the terminal program on the PC, type in, "`WORDS`" (all in "caps" as the language is case sensitive), and then hit "`Enter`". A stream of words in the language should now scroll up the screen. Good, we're making progress. You are now talking interactively with the language in the TiniPod™.

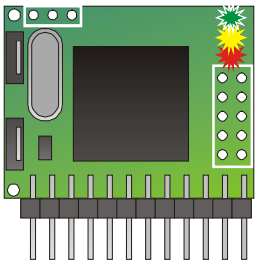
Now let's blink the LED's. Port lines control the LED's. Type:

```
REDLED OFF
```



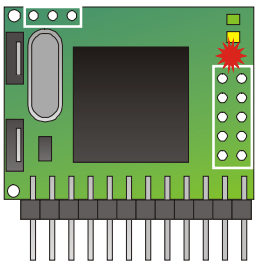
To turn it back on type:

```
REDLED ON
```



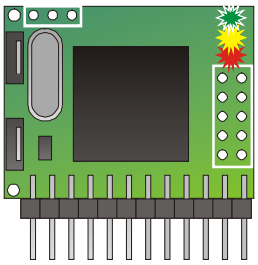
Now let's use the Yellow and Green LED's. Type:

```
YELLED OFF GRNLED OFF
```



To turn it back on type:

```
YELLED ON GRNLED ON
```



So. Now you should have a good feeling because you can tell your TiniPod™ is working. It's time for an overview of what your TiniPod™ has for features.

First though, a few comments on IsoMax™ revision level. The first port of IsoMax™ to the TiniPod™ occurred on May 19, 2004. While the core language was functional as it was, we really wanted to add more support words. Currently V0.7 is being shipped, which has support words for many of the built in hardware functions. As we approach a more complete version, eventually we will release V1.0. We want all our original customers to have the benefit of the extensions we add to the language. Any TiniPod™ purchased prior to V1.0 release can be returned to the factory (at customer's expense for shipping) and we will upgrade the V0.x release up to V1.0 without charge.

FEATURES

- Board Size: 1.0"(W) x 1.3"(L) x 0.4"(H)
- Weight: 0.3 Ounces
- Operating Temp: 0 to + 70 Deg C. Industrial Temp, -40 to +85 Deg C is available for special order. Please call for detail.
- DSP56F803 MPU, 16-bit processor
- Up to 40 MIPS at 80 MHZ core frequency
- On-chip Memory
    - Flash EEProm
        - 32K x 16-bits words Program Flash
        - 2K x 16-bit words Boot Flash
        - 4K x 16-bit words Data Flash
    - RAM
        - 512 x 16-bit words Program Ram
        - 2K x 16-bit words Data Ram
- 16 General Purpose Digital I/O lines share functions with
    - 4 wire SPI Interface
        - Full-duplex synchronous operation on four-wire interface
        - Master or Slave mode
        - Programmable lenght transmissions, 2 to 16 bit
        - Four master mode frequencies(max = bus freq/2)
        - Maximum slave mode frequency = bus frequency
    - 6 General Purpose Timers
        - Each channel has its own timebase, 4 16-bit timers
        - Count up/down
        - Cascadable
        - Four channels, each programmable as input capture or output compare
        - Input capture trigger rising edge, falling edge, or any edge
        - Output capture action Set, reset or toggle
        - External sync input
    - 6 Pulse Width Modulation outputs, or Digital outputs, or 6 Digital Inputs only,
        - 15-bit counter with programmable resolutions down to 25ns

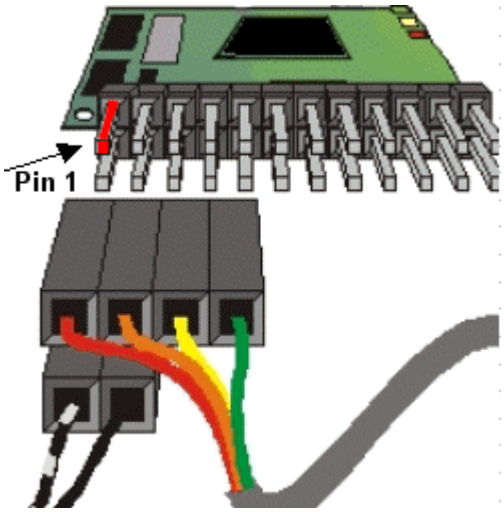
        - 6 independent outputs or 3 complementary pairs of outputs
        - Center aligned or Edge aligned pulses
        - Automatic dead time insertion for complementary outputs
- Serial Communication Interface (SCI), one RS-232 serial channel
- CAN 2.0 A/B module
    - SN65HVD230 CAN Transceiver
    - Multiple boards can be network (MSCAN)
    - Ideal for harsh or noisy environments, like automotive applications
    - Programmable bit rate up to 1Mbit
- JTAG/OnCE port for flash programming/debugging
- Stop Mode, Wait Mode, and Sleep mode.
- WatchDog Timer/COP module
- Onboard three user's leds
- Onboard 5.0V & 3.3V linear regulators
- 2x12 header pin connector for I/O's, Power, & Serial connection

I/O Connectors

16 I/O's are brought out to J1, where JTAG signals on J2, and CAN bus transceiver signals on J3 Connectors.

J1

SOUT	1	2	VIN
SIN	3	4	GND
ATN'	5	6	RESET'
GND	7	8	+5V
PWMA0/ISA0	9	10	PWMA1/ISA1
PWMA2/ISA2	11	12	PWMA3/FAULT0
PWMA4/FAULT1	13	14	PWMA5/FAULT2
TD1	15	16	TD2
TA0	17	18	TA1
TA2	19	20	TA3
PE4/SCLK	21	22	PE5/MOSI
PE6/MISO	23	24	PE7/SS



J1, Signal Descriptions:
SOUT: Serial Output from TiniPod, RS-232 level
SIN: Serial Input to TiniPod, 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
PWMA0-5 : Pulse Width Modulation, or digital output only.
ISA0-2, FAULT0-2 : Digital input only
TD1-2, TA0-3: Timers, PWM's, or GPIO's
PE4-7: SPI signals, or General Purpose I/O's

J2, JTAG interface

+3.3V	1	2	GND
TDI	3	4	GND
TDO	5	6	TMS
TCK	7	8	DE
RESET	9	10	TRST

J3, CAN BUS interface

1	CANH
2	GND
3	CANL

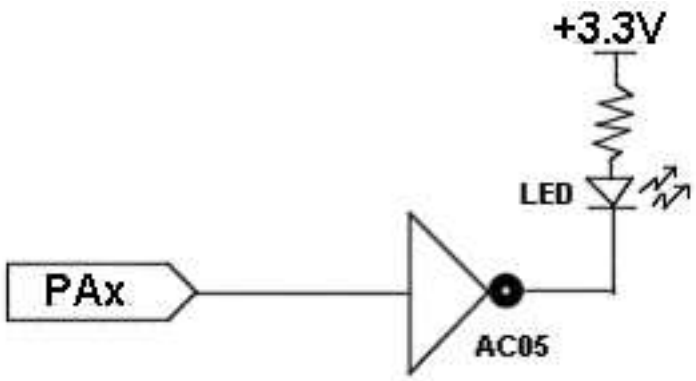
Peripheral Controlled Ports:

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.

PA0 => Red Led

PA1 => Yellow Led

PA2 => Green Led



RS-232 Transceiver Enable/Disable

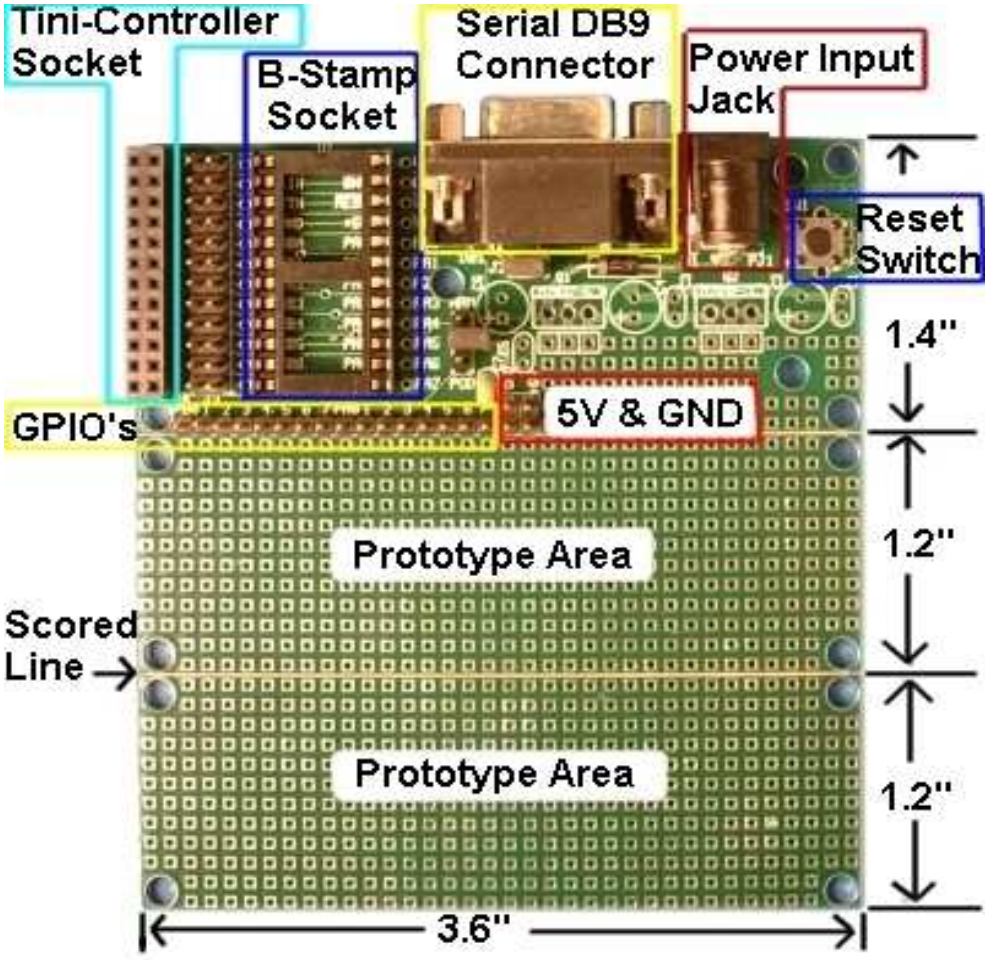
PE3 controls the Receiver Input – An output low signal on PE3 will enable the RS-232 receiver, and high is disable.

PA3 controls the Transmitter Output – An output high signal on PA3 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 PE3 & PA3 are default to inputs after reset.

Interface Board

The TiniPod 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

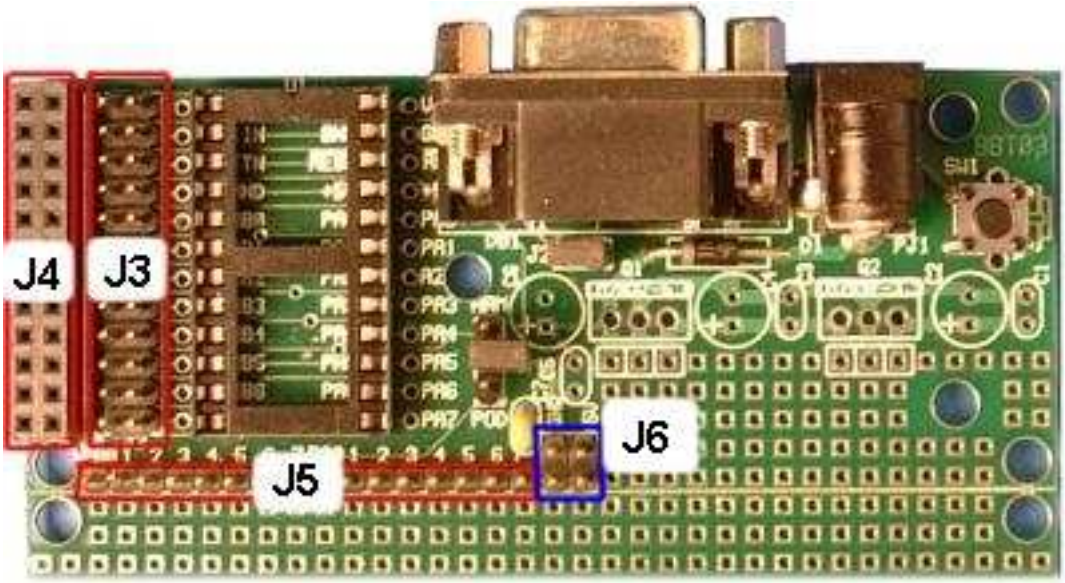
I/O Connections & Descriptions

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

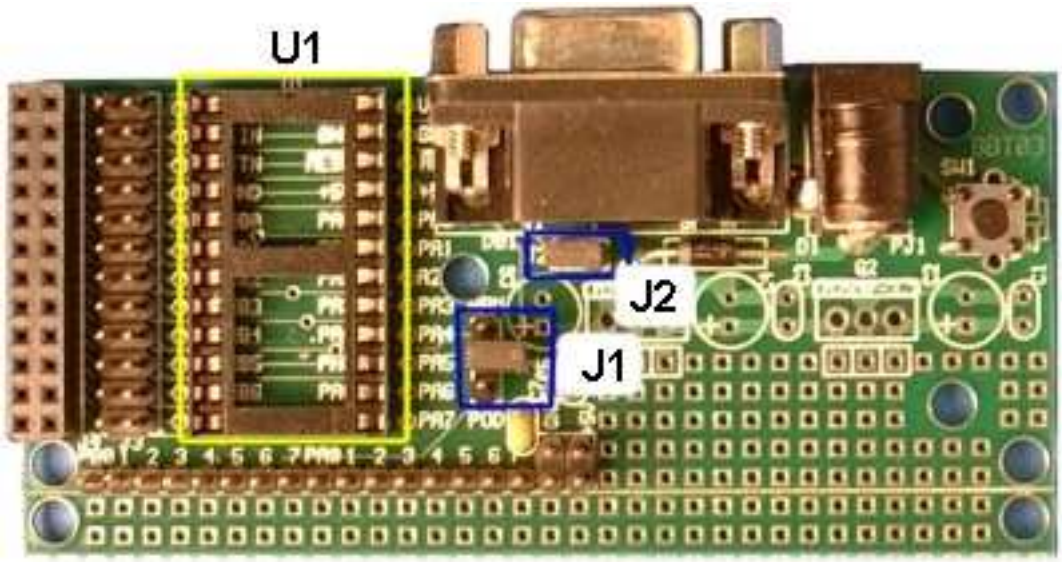
J5

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

J6

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

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