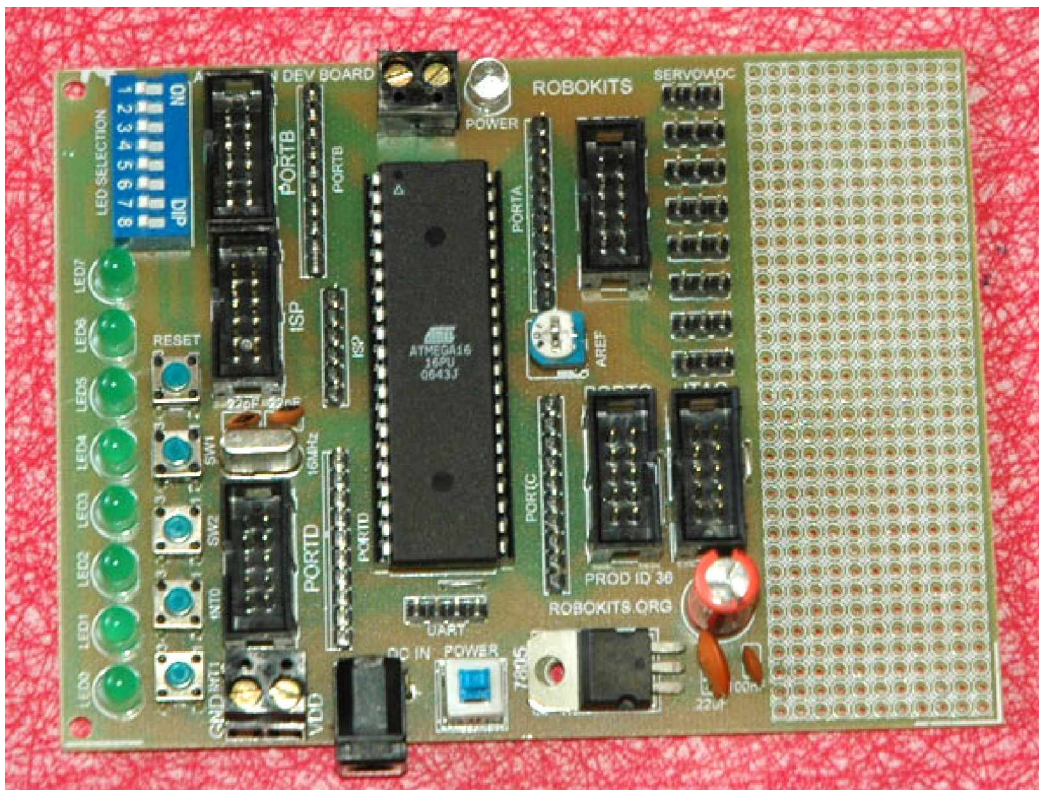




AVR 40 Pin Development board



User Manual

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Thank you for purchasing the AVR 40 Pin Development Board. This unit has been carefully engineered and tested to provide superior performance. This document covers the features and operation of the AVR 40 Pin Development Board.

This is an easy-to-use board using the popular Atmel ATmega16/32 microcontroller. The board includes everything you need to learn, develop or using for a robotic application. It is ideal for any kind of autonomous or manual controlled robot.

Features

- Small Size : 117 x 89 mm
- Can be easily power from an AC – DC source or Battery
- On Board Regulator with filters and Operating voltage from 6V - 20 V
- 8 LED's selectable though DIP Switches
- 5 Switches including reset
- 2 Switches on interrupt pins
- Power on/off toggle switch
- 16MHz crystal for maximum speed
- AREF setting potentiometer
- Frosted Blue Power Indicator
- JTAG PORT Connector for debugging
- All ports easily accessible through standard 10 pin FRC and single line male header strip connectors.
- 8 ADC/Standard servo compatible connectors
- All Pins accessible through male header with standard .1” header pins
- Serial Programmer and PC-MCU serial link included
- All required connectors included.
- Programmer, Serial port and Power Supply are provided externally which helps keeping the board size small.

Optional items

- AVR Microcontroller (Selectable among None, ATmega16 and ATmega32)
- PC-MCU link (Selectable among none, serial and USB port)
- AVR programmer (Selectable between none, serial, parallel and USB port)

This Product Includes

- AVR 40 Pin Development Board
- CD containing all required software's and sample codes in WINAVR
- DC 12V adapter

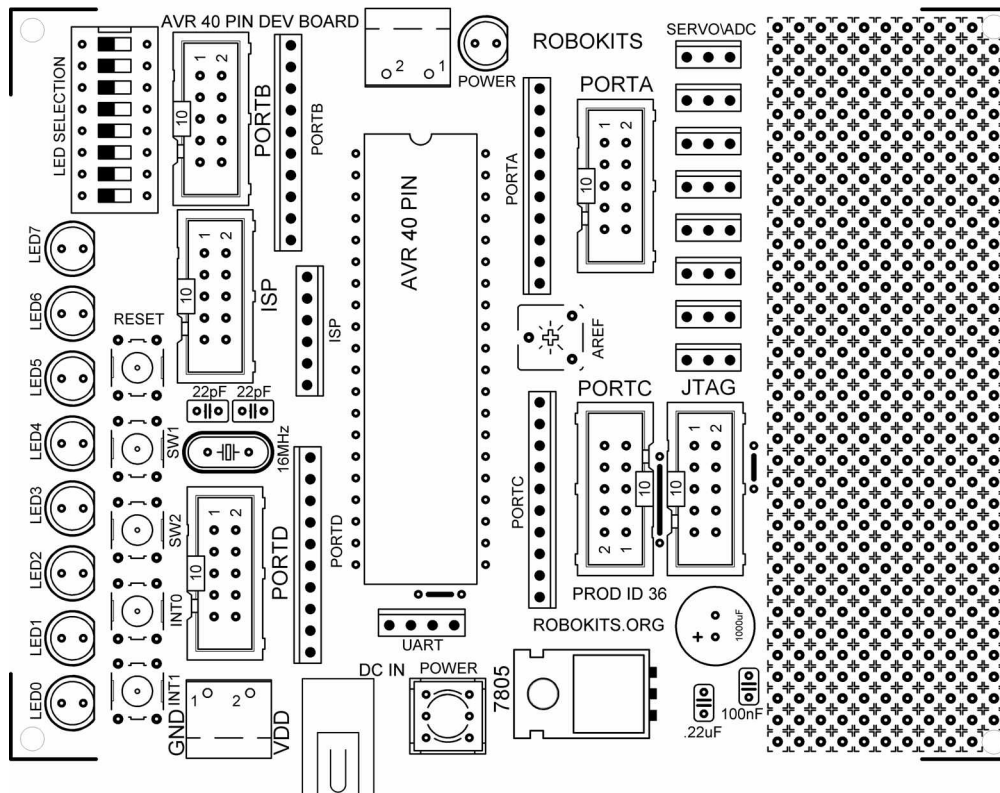


Setting up the Board

Providing Power Supply

- You can provide the power supply to the board from any DC source from 6V to 20V.
- The microcontroller is preprogrammed for Blinking LED's. This is the default program provided on CD in folder named Blink.
- To provide the supply from AC adapter plug the jack in the DC IN socket.
- To power up the board using any DC source use VDD terminal as +VE terminal and GND as -VE terminal.
- Be careful while applying power otherwise the regulator IC will blow up.
- To give supply other than power supply provided open the screws, insert the supply wires and fasten them again.

Board Top Layout





Board Information

Switches

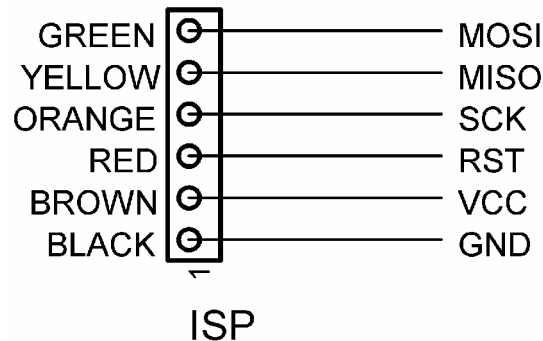
- There are five small and one big switch on the board to facilitate user.
- The toggle switch written with POWER on the top is to control power supply to the board.
- The one written Reset at bottom is a Reset switch for microcontroller.
- Switches SW1, SW2, INT0 and INT1 are connected with microcontroller pins PD.0, PD.1, PD.2 (INT0), PD.3 (INT1) respectively.
- Two switches named INT0 and INT1 are connected to external interrupt pins for general use.
- These switches do not affect the operation of the pins they are connected with. So, you can use this microcontroller I/O pins for other use also.

LED's

- There are nine LED's on the board.
- Blue LED at the right bottom corner is power indicator.
- Rest eight led's named LED0 to LED7 are connected to PB.0 to PB.7 respectively.
- All LED's are selectable through individual DIP Switches so that those pins can be used for other external purpose.
- Put the switch off to use the Pin as normal I/O pin.

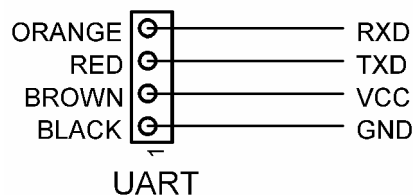
ISP (In System Programming) Connector

- 6 pin male header denoted by ISP on the board is used to program AVR.
- The pins are connected to MOSI (PB5), MISO (PB6), SCK (PB7), RESET, VCC and GND (Near Crystal).



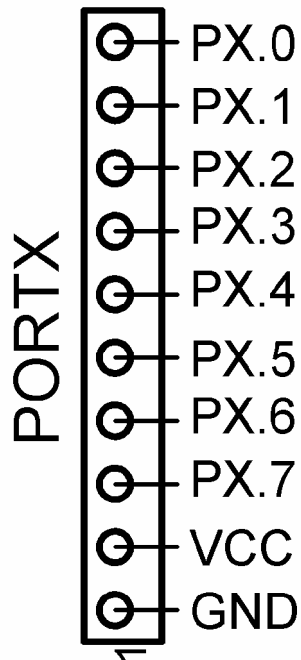
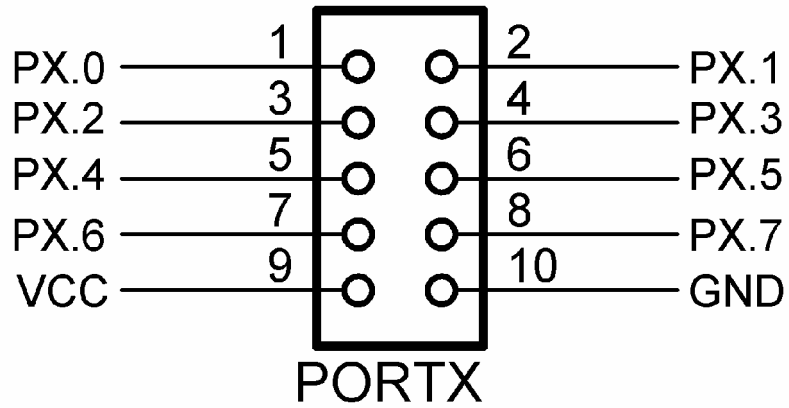
UART Connector

- 4 Pin male header denoted by UART on the board.
- Used for serial communication between MCU & PC or MUC & MCU of same or different made.
- The pins are connected to RXD (PD0), TXD (PD1), VCC and GND (Near DC Jack).



PORTA, PORTB, PORTC & PORTD Connectors

- All 8 port pins and VCC and GND are accessible through male header pins and 10 pin FRC connectors.



AREF Potentiometer

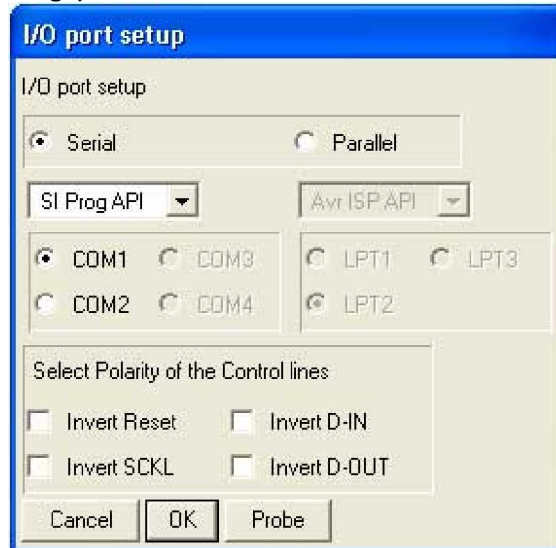
- For setting reference voltage for ADC at AREF pin of microcontroller.

Connecting the Serial Link

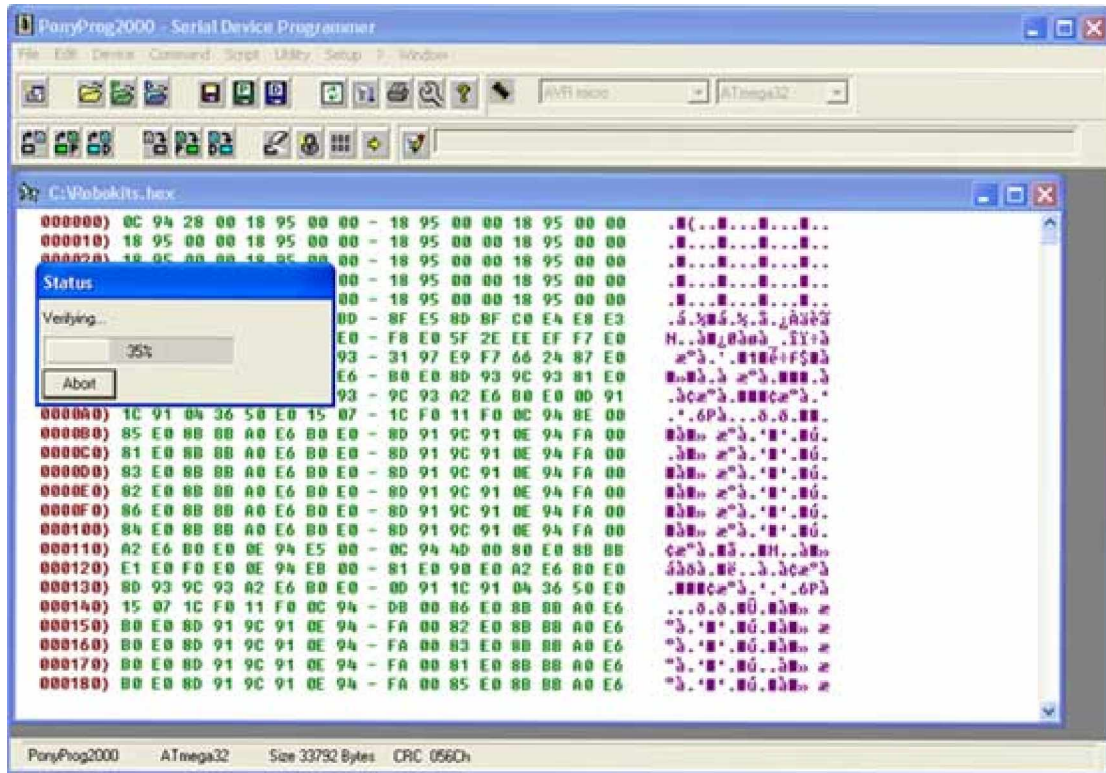
- Connect the PC-MCU serial link to serial port.
- Insert the female header in the board as shown in figure. (Keep black wire towards dc in side)
- You can communicate with microcontroller with PC software like Hyper Terminal. Set appropriate baud rate and com port to setup the communication.
- See sample code for more details.

Programming the Microcontroller

- To program the microcontroller use the provided serial programmer.
- If any other programmer is selected please see help file of that programmer.
- Inset the programmer port to serial port of your pc.
- Inset the female header to the board as shown below. (Black wire at the Crystal side)
- You can use the programming software Pony Prog for programming. (Use following Settings)



- You can also directly program the microcontroller with WinAVR. Use tools ->Program option. If you find the error make correction in provided make file.



- To quickly program you can use Robokits.bat provided on the CD. Copy your compiled hex file and the bat file in a folder and rename the hex file as Robokits.hex. Run Robokits.bat to program the device through serial programmer.
- We suggest ponyprog to program the fuse bits. It can also be done by AVRdude. See the AVRdude manual for more information.
- If you are programming fuse bits thought AVRdude, you can use this link to calculate fuse bits. <http://palmavr.sourceforge.net/cgi-bin/fc.cgi>



Using sample codes

- **Sample codes are provided in WinAVR.**
- **WinAVR is free source GNU C compiler for AVR microcontroller series.**
- **First install WinAVR from CD.**
- **Open Programmers notepad which is IDE for WinAVR.**
- **Open any Robokits.c file provided in the CD in folder sample programs.**
- **Change related Makefile if using any different programmer or MCU (Need not to be changed for normal board with serial programmer).**
- **Use Programmer documentation which you are using.**
- **To compile use Tools – Make All**
- **To program use Tools – Program**

Service and Support

Service and support for this product are available from Robokits India. The Robokits Web site (<http://www.robokits.org>) maintains current contact information for all Robokits products.

Limitations and Warrantees

The AVR 40 Pin Development Board is intended for personal experimental and amusement use and in no case should be used where the health or safety of persons may depend on its proper operation. Robokits provides no warrantee of suitability or performance for any purpose for the product. Use of the product software and or hardware is with the understanding that any outcome whatsoever is at the users own risk. Robokits sole guarantee is that the software and hardware perform in compliance with this document at the time it was shipped to the best of our ability given reasonable care in manufacture and testing. All products are tested for their best performance before shipping, and no warranty or guarantee is provided on any of them. Of course the support is available on all of them for no cost.

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