



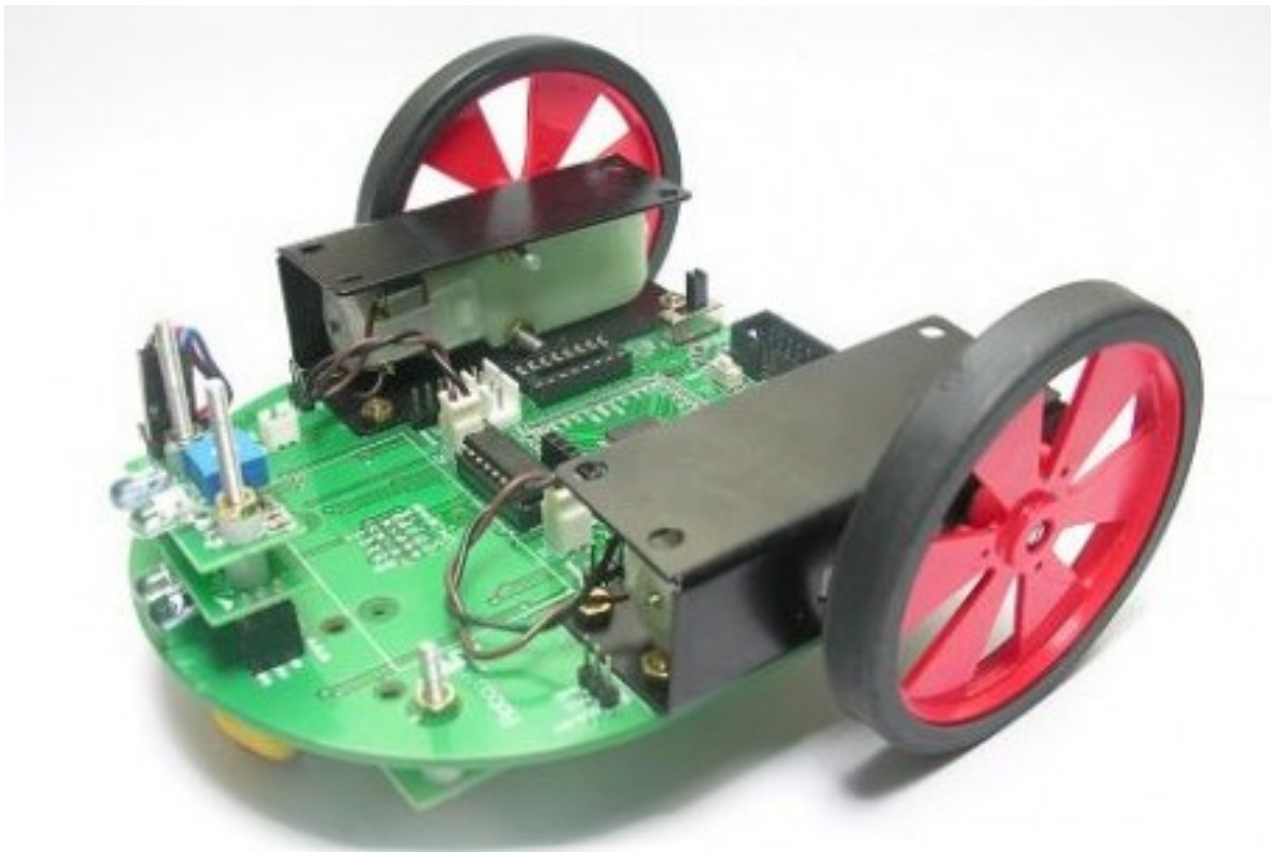
Learn how to Change the World with Automaton*

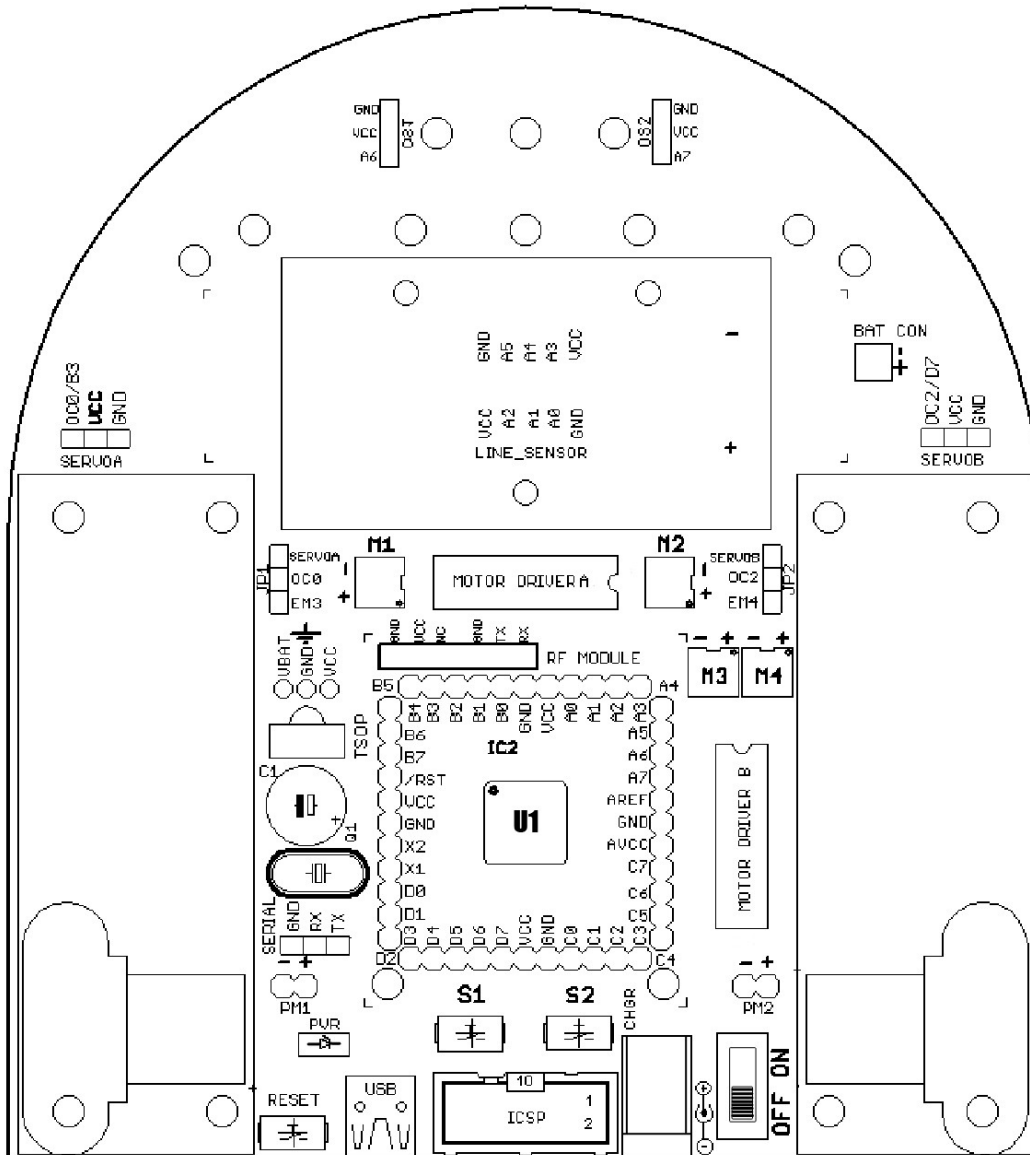
*Automaton - A self-operating machine or mechanism, especially a robot

Robotic Kits

The Nexus Swarm Robot Kit is the official robot for the Nexus competitions. It is a complete, high-performance mobile platform featuring two gearmotors, five reflectance sensors, two IR Cube detector sensors, two Leds, and two user pushbuttons, all connected to a C-programmable Atmega16 AVR microcontroller. Capable of line following, GRID solving, Swarm Robot Application and much more the Sage Bot is a great first robot for ambitious beginners and a perfect second robot for those looking to move up from non-programmable or less advanced beginner robots.

AVR SWARM Robot Kits

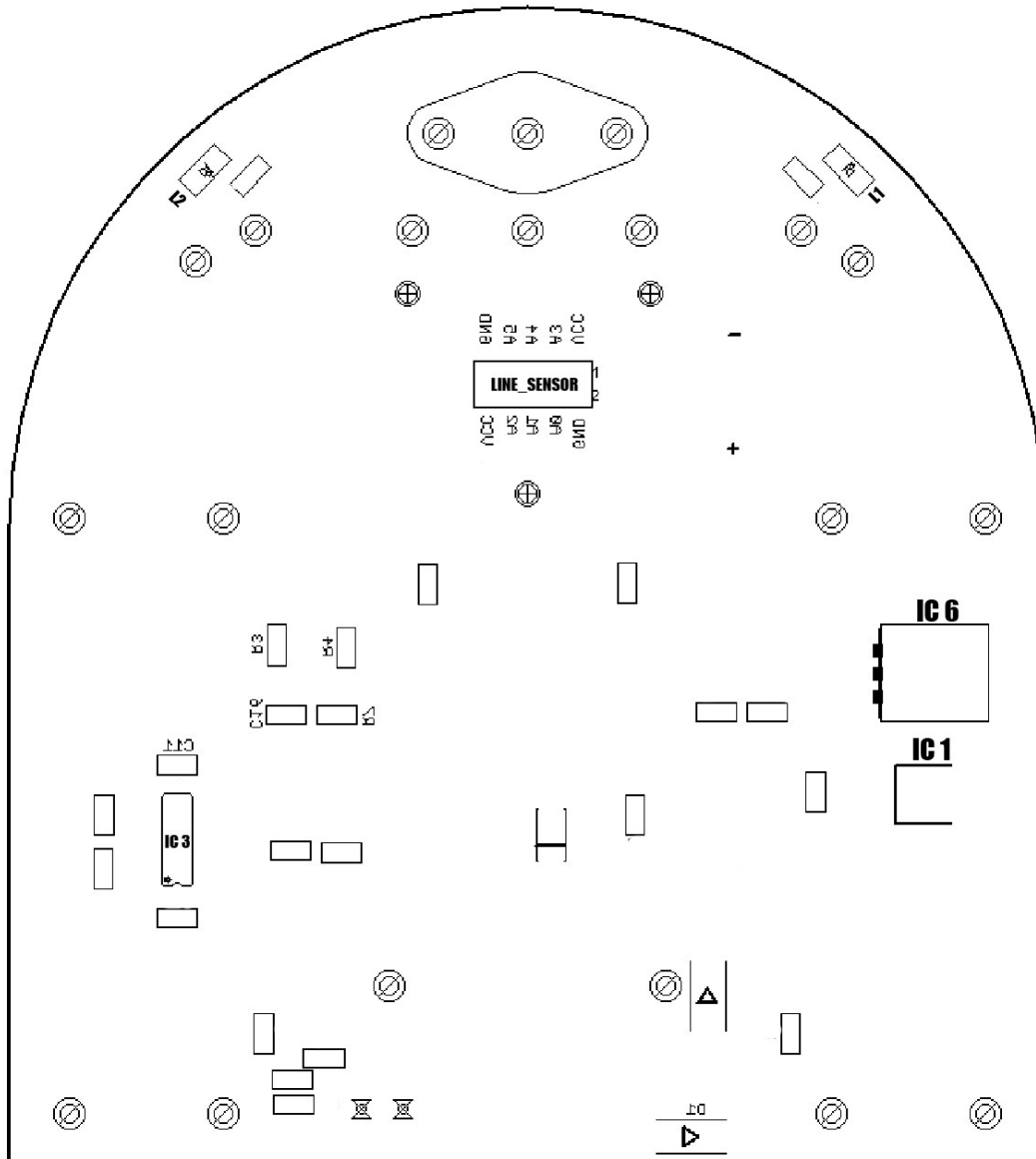




Top View of the board

Above, we have shown a schematic of the actual electronic board that has been provided with the Kit. You can say that this is the brain of the robot. It contains all the controller IC's and other circuitry so that you can write your own programs and make the kit work according your wish. Below we have listed some of the important components that are worth listing.





Bottom View of the board



Know your Kit

Symbol	Device	Details
U1	Atmega16A	8 Bit Microcontroller
USB	USB Cable Connector	Standard mini USB-B connector
SERIAL	Rx, Tx, GND Connection	
RF Module	Conn. for RF Pro	Sold separately
TSOP	IR Remote Sensor	Sold Separately
CHGR	Charger Connector	
ICSP	In-Circuit Serial Programmer	
LINE_SENSOR	TCRT Module Connector	TCRT-5000 Digital Included
MOTOR DRIVER A	L293D Driver IC	Included in kit
MOTOR DRIVER B	L293D Driver IC	Not provided
IC6	7805 Voltage Regulator	Included in Kit
IC1	Alternate Low current Voltage Regulator (1117 variant)	Not included in the kit (For future expansion)
IC3	MAX232	Included in Kit
OS1, OS2	Obstacle Detection Sensors	Pins A6, A7 respectively
PM1, PM2	Pololu Motor Connectors	
L1, L2	LED indicators	Pins B0, B1 respectively
S1, S2	Switch Inputs	Pin D2 and D3 respectively
M1, M2	Motor Connectors	Included in kit (6V), [See Pg. 5 of document]
M3, M4	Motor Connectors	Not included in the kit (For future expansion), [See Pg. 5 of document]
SERVO A/B	Servo Motor Connectors	Servos sold separately
JP1, JP2	Servo/ Motor Select	See Pg. 6 of document
Q1	External Crystal	Not Provided
RESET	Controller RESET	
PWR	Power Indicator LED	
BAT CON	Battery Connector	Battery voltage 7-15V



AVR SWARM Robot Kit

Pin Description

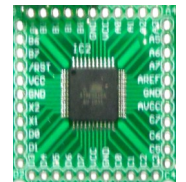
Device	Pin
M1	C1, C0
M2	C6, C7
M3	B4, B5
M4	B6, B7

Device	Pin
L1	B0
L2	B1
S1	D2
S2	D3

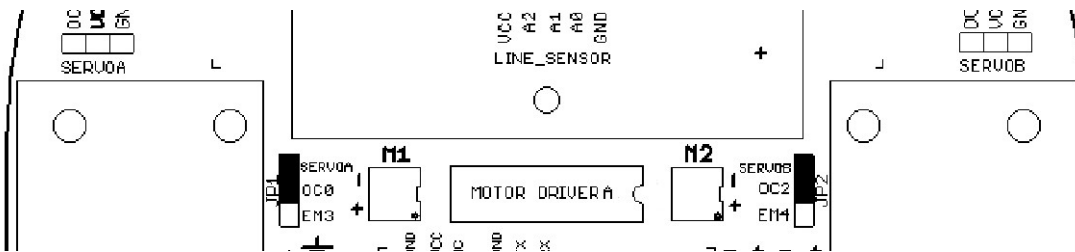
Device	Pin
TSOP	B2
OS1	A6
OS2	A7
TCRT Module	A0-A5

NOTE

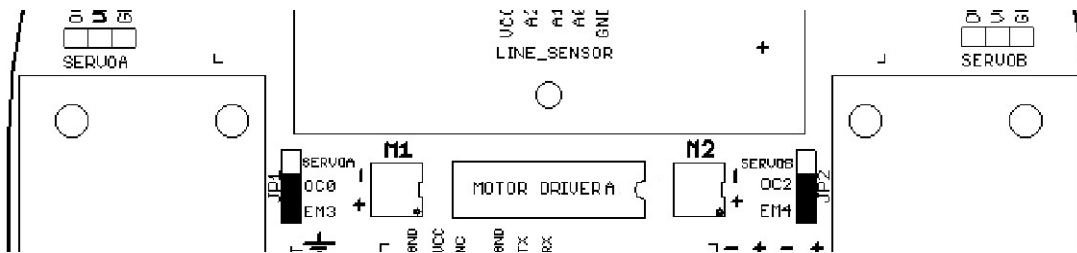
If one wishes to use a different but compatible microcontroller for the board, a breakout board may be soldered on to the board after de-soldering the Atmega16 using the holes provided around the microcontroller IC. Image shown along side.



JP1 / JP2 connections:



If the jumpers are connected as shown in the above figure, OC0 and OC2 pins of the Atmega16 get connected to the OC pins on the SERVOS.



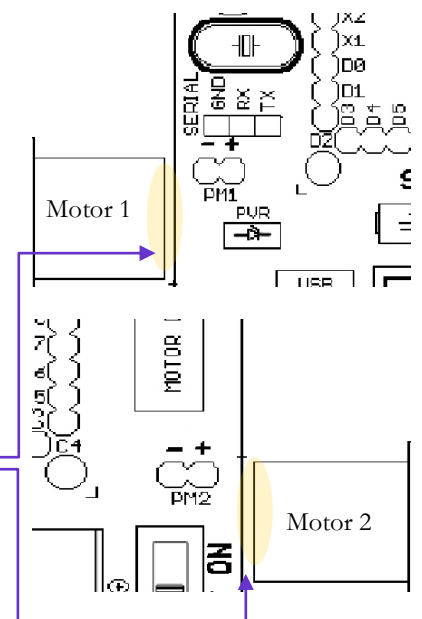
If the jumpers are connected as shown in the above figure, OC0 and OC2 pins of the Atmega 16 get connected to Enable pins of Motors M3 and M4.

Pololu Motor Connectors

You can now expand your Swarm Robotic Kit by connecting the Pololu Motors. Alongside is the image that shows these expansion pins.

Below is the method to connect these motors to the board:

- Make use of 2-pin burg-strip and solder it at the points marked as PM1 and PM2.
- Connect a 2-pin to 2-pin jumper from either M1/M2/M3/M4 to each of the PM1 and PM2 connectors provided on the board.
- After this, locate the motor connection points as shown alongside. Now connect the two Pololu motor at these two with the help of two 2-pin female and male relemate connectors (male-female relemate connector pair is the one similar to the already provided with the motors in the kit.)



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For documentation refer-

AVR Swarm Robot Kit

<http://www.robosoftsystems.co.in/roboshop/index.php/robot-kits/nexus-swarm-kit.html>

For other products refer-

<http://www.robosoftsystems.co.in/roboshop/>



Organization

