



Fire Bird V Omni Directional Robot is based on Fire Bird V ATMEGA2560 platform. It has three omni directional wheels 120 degrees apart. By changing velocity and direction of the wheels robot can move in any direction without changing its orientation.

Fire Bird V will help you get acquainted with the world of robotics and embedded systems. Thanks to its innovative architecture and adoption of the 'Open Source Philosophy' in its software and hardware design, you will be able to create and contribute to, complex applications that run on this platform, helping you acquire expertise as you spend more time with them. Fire Bird V is designed by NEX Robotics and Embedded Real-Time Systems lab, CSE IIT Bombay.

As a Universal Robotic Research Platform, Fire Bird V provides an excellent environment for experimentation, algorithm development and testing. Fire Bird V is evolved from Fire Bird IV and Fire Bird II which are being used in IIT Bombay to teach embedded systems and robotics. Its modular architecture allows you to control it using multiple processors such as 8051, AVR, PIC and ARM7 etc. Modular sensor pods can be mounted on the platform as dictated by intended applications. Precision position encoders makes it possible to have accurate position control. The platform can be upgraded to tank drive and Hexapod insect or any other desired form very easily. It is powered by high performance rechargeable NiMH batteries. A 2.4 GHz ZigBee module provides state of the art secure and multi-channel wireless communication up to a range of one kilometer.

Research Areas

- Artificial Intelligence
- Multi-Agents System
- Control systems
- Autonomous navigation
- Mobile sensor network
- Collaborative robotics

Real-Time systems
Automotive technologies

Unique Features

- Ideal for doing research in the areas of robotics, embedded systems, artificial intelligence and sensor networks etc.
- Enhanced mobility because of Omnidirectional locomotion
- Modular Design: Unique layered design gives versatility in design
- Hands-on learning platform
- Covers wide range of subjects like Microcontrollers, Embedded Systems, Mechatronics, Sensor Networks, Image processing.
- Detailed tutorials help in interactive learning.
- Ideal for doing research in the areas of robotics, embedded systems, artificial intelligence, sensor networks etc.
- Supports Microsoft Robotics Developer Studio (MRDS)
- Modular Design: Unique layered design gives versatility in design
- Powered by rechargeable 9.6V 2100mAh NiMh battery pack with smart battery charger
- High performance white line sensors with the illumination modulation facility for improved performance in line grid based navigation with improved power conservation
- Up to five IR range sensors covering front half of the robot with range up to 150cm for intelligent navigation
- Eight analog IR proximity sensors for close proximity detection up to distance of 20cm
- Eight directional light intensity sensors
- Supports three DC motors with position encoders
- Battery voltage monitoring and audible battery low warning for battery protection
- Battery current monitoring
- Closed loop motion control using position encoders
- 16x2 character LCD for displaying sensor data or any other information
- Easy to interface with PC using wired and wireless communication
- Supports 2.4GHz Wireless ZigBee for communication with multiple robots or with PC
- Extensive hardware and software documentation and many application notes and example C programs in AVR studio.
- Available in Hexapod, Omni directional robot, tank drive, Insect and 4 Wheel drive with gripper configuration
- Supports servo motor based wireless camera with pan and tilt motion, IP camera and sensor pods.
- Easy hardware integration for add on sensors like GPS, Magnetometers, accelerometers and gyroscope etc.

Note: This product will be shipped with in 20 days after the order confirmation

[Download Fire Bird V Flyer](#)

[List of international and national publications on the Fire Bird platforms](#)

[Current deployment](#)

[Videos of the Robots](#)

Specifications

Microcontroller

Atmel ATMEGA2560 as Master microcontroller

Atmel ATMEGA8 as Slave microcontroller

Sensors

Three white line sensors (extendable to 7)

Five Sharp GP2D12 IR range sensor (80cm) (One in default configuration) (Also supports GP2D120 (30cm) and GP2Y0A02 (150cm))

Eight analog IR proximity sensors (20cm)

Eight analog directional light intensity sensors

Two position encoders (extendable to four)

Battery voltage sensing

Current Sensing (Optional)

Servo mounted sensor pod (optional)

Wireless colour camera (optional)

Ultrasound scanner (optional)

Gyroscope and Accelerometer (optional)

Magnetometer (optional)

GPS receiver (optional)

Indicators

2 x 16 Characters LCD

Indicator LEDs

Buzzer

Control

Autonomous Control

PC as “Master” and Robot as “Slave” in wired or wireless mode

Distributed (multi robot) communication

Communication

Wireless ZigBee Communication (2.4GHZ) (Optional)

USB Communication

Wired RS232 (serial) communication

Simplex infrared communication (From infrared remote to robot)

Dimensions

Diameter: 28cm

Height: 15cm

Weight: 1800gms

Power

9.6V, 2100mAh Nickel Metal Hydride (NiMH) battery pack and external Auxiliary power using battery charger.

Battery Life

1.5 Hours when motors are operational 75% of the time

Locomotion

Three DC geared motors in differential drive configuration

- Top Speed: 24 cm / second
- Wheel Diameter: 51mm
- Position encoder: 30 pulses per revolution
- Position encoder resolution: 5.44 mm

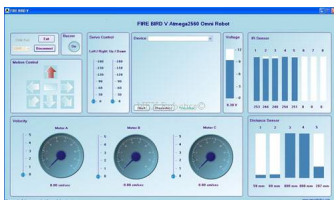
Software Support

- AVR Studio
- GUI based control
- Microsoft Robotic Developer Studio (MRDS) (limited)
- MATLAB

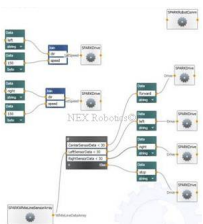
Kit Contains

- Fire Bird V Robot with all the sensors mentioned in technical specifications
- Documentation CD
- USB Programmer (ISP)
- Smart Lithium Polymer battery charger with balance charging (NR-BLIC-03)
- Serial cable
- 1 x USB Cable

Fire Bird V ATMEGA2560 Insect Robot control GUI for controlling robot in wired and wireless mode



Visual Programming Language in Microsoft Robotics Studio



Fire Bird V in Microsoft Robotics Developer Studio (MRDS)

