

FIRE FLY

ONBOARD COMPUTER FOR FIRE BIRD VI

(c) NEX Robotics Pvt. Ltd.



Designed and Manufactured by: NEX Robotics Pvt. Ltd.

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Notice

The contents of this manual are subject to change without notice. All efforts have been made to ensure the accuracy of contents in this manual. However, should any errors be detected, NEX Robotics welcomes your corrections. You can send us your queries / suggestions at info@nex-robotics.com



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- **Robot's electronics is static sensitive. Use robot in static free environment.**
- **Read the Robot's manual completely before start using this robot**




Recycling:

Almost all of the robot parts are recyclable. Please send the robot parts to the recycling plant after its operational life. By recycling we can contribute to cleaner and healthier environment for the future generations.

Important:

User must go through hardware and software manuals before using robot and its accessories.

Safety precautions:

- PC and its electronics is static sensitive. Use robot in static free environment.
- Do not access any part of the PC unless it is in the antistatic environment and user is wearing antistatic strap.
- If PC's battery low buzzer starts beeping, immediately charge the batteries.
- To prevent fire hazard, do not expose the equipment to rain or moisture.
- Refrain from dismantling the unit or any of its accessories
- Charge the NiMH / Lithium Polymer battery only with the charger provided with the robot.
- Charge the Lithium Polymer battery in the open area and on the concrete or ceramic flooring.
- Never allow Lithium Polymer battery to deep discharge. If its deep discharged, charger will refuse to charge the battery because of safety concerns.
- Keep the robot away from the wet areas. Contact with water will damage the robot.
- To avoid risks of fall, keep your robot in a stable position.
- Do not attach any connectors while robot is powered ON.
- Never leave the robot powered ON when it is not in use.
- Before operating the robot, make sure that you have access to at least "Class A/B" type fire extinguisher.
- Read carefully paragraphs marked with  caution symbol.

Fire Fly Onboard Computer Specifications

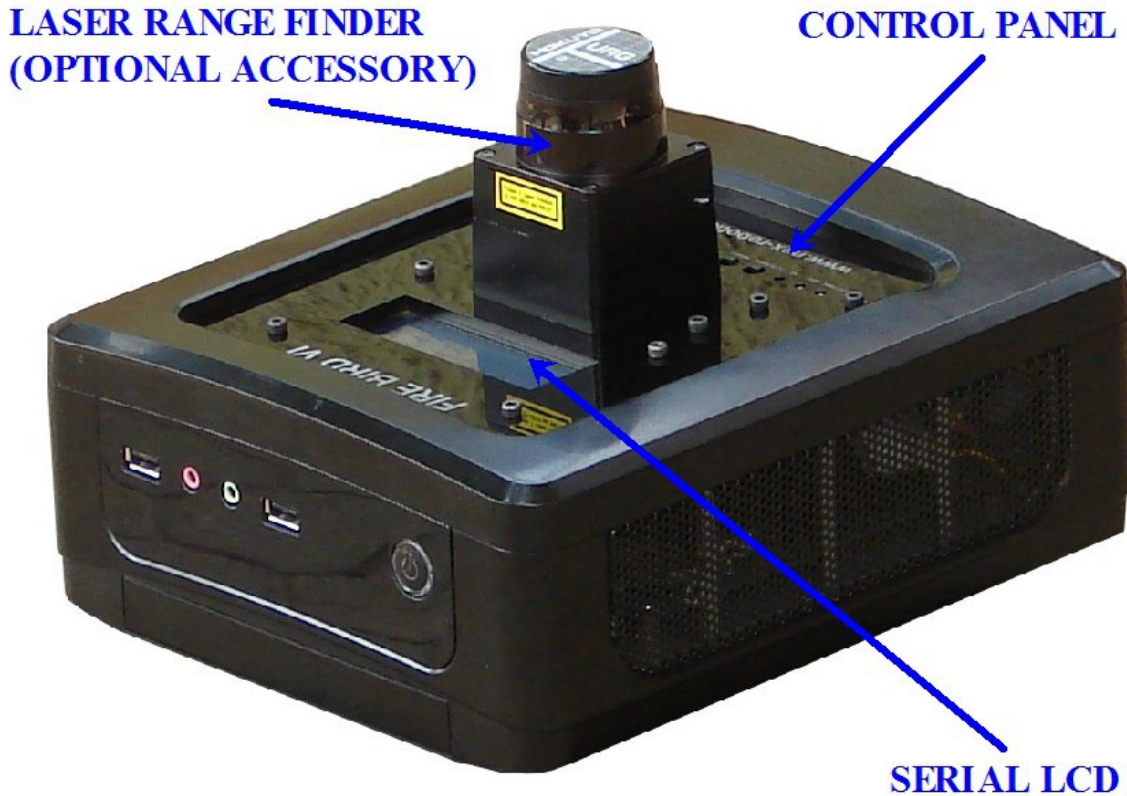


Figure 1: Fire Fly Onboard Computer for Fire Bird VI Robot

Dimension: 23.5cm x 20cm x 10cm

Weight: 1500gms

Power: 12V, 2Amps.

Supports hot swapping for power packs. No need to shutdown PC while replacing power packs

Battery monitoring and audiovisual warning against deep discharge of the battery

Processor: Intel ATOM

Motherboard: Intel Atom D525 / D2800

RAM: 2Gb DDR3 (upgradeable to 4Gb)

Hard Disc: 160GB and upwards. Solid state hard disk available on request

USB Ports: 7 USB 2.0 ports. 4 on back panel and 3 on the main board

RS232 Serial Ports: One / Two RS232 ports. One on the back panel and other on the main board

Parallel Port: One Parallel port on back panel (for D525 Motherboard)

SATA: Two SATA 3.0Gb/s connectors

LAN: 10/100/1000 Mb/s (Gigabit) Ethernet LAN using a RealTek 8111E Gigabit Ethernet Controller

PS/2 keyboard and mouse connectors

LED indicators: PC Power, HDD Power, System Power, Fuse Blow, Two Battery status indicators

Important:

For more information on the motherboard, refer to the motherboard's product manual which is located inside the Motherboard's DVD.

Control Panel



Figure 2: PC's control panel

Figure 2 shows the PC's control panel. Functions of switches and LEDs are mentioned in Table 1.

Label	Device
PC Power LED	LED glows if PC is turned on
HDD LED	Indicates status of the Hard disc
RF LED	Reserved
PC Power switch	Press this switch to turn on (boot) PC. (Provided main power switch is on)
Reset Switch	Press this to reset PC
Power LED	Indicates presence of power when Main Power Switch is turned on
Fuse Blow LED	Replace 5A internal fuse if this LED glows
BATT STAT LEDs	These 2 LEDs combined together indicates battery status. For more information refer to the Table 2 and 3.
Main Power Switch	This is a main switch. It connects battery to the PC.

Table1: PC control panel functions

Interfacing Onboard PC with the robot

Onboard PC is connected with the robot over RS232 bus to the UART3 on the mainboard. Serial LCD is connected to the I2C1 bus on the connector number 5. Both connectors comes from the shielded wire. Figure 3 shows the location of these connectors. For more information on the location of these connectors, refer to the robot's hardware manual.

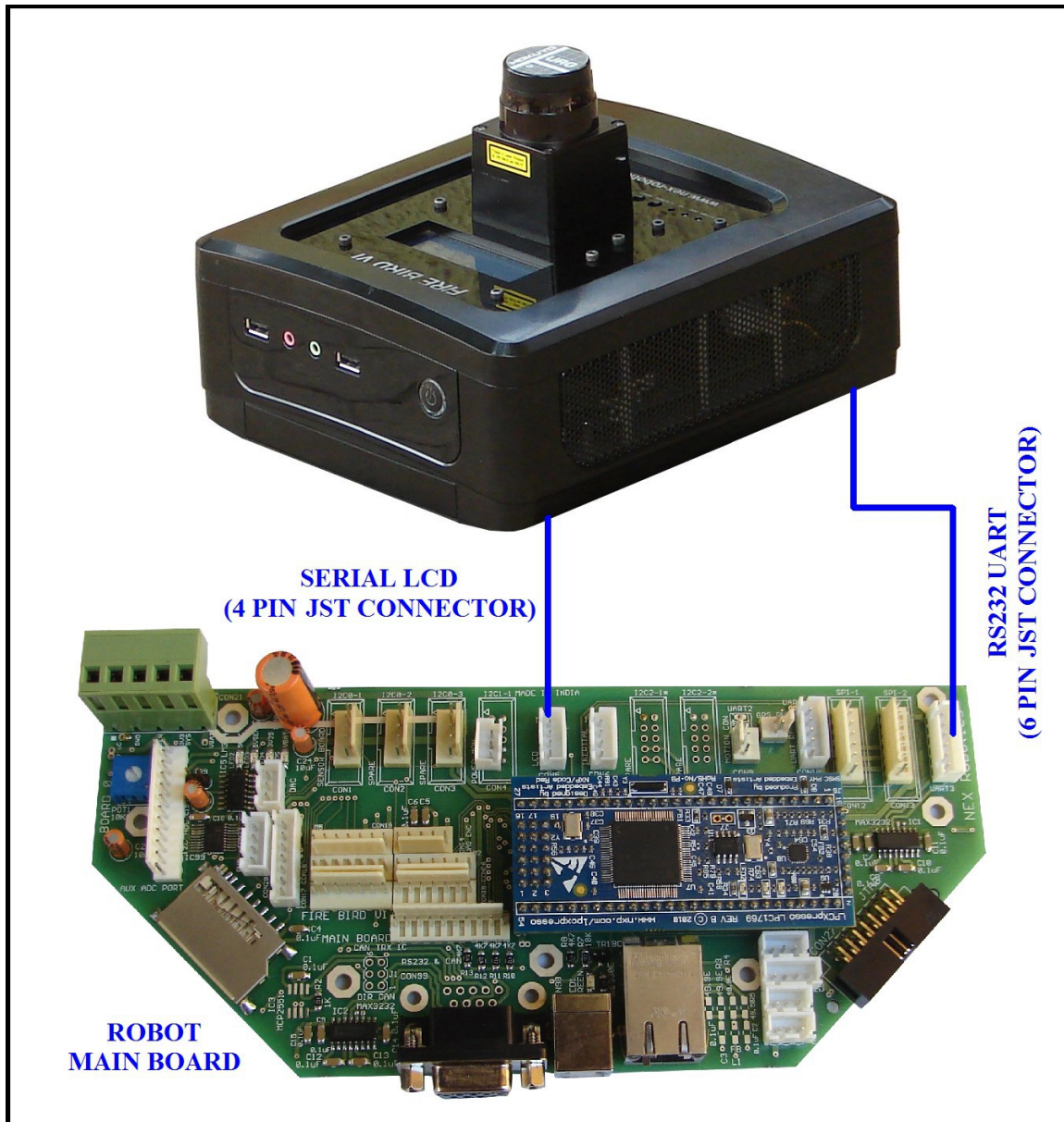


Figure 3: Serial LCD RS232 UART connections between main board and PC

Power Management Module

Power Management Module allows connecting two power packs to the PC without worrying about the difference between voltages of these power packs. This allows hot swapping of the batteries. IE. You can replace one discharged battery without shutting down the PC with fresh battery. It has 5Amp fuse with fuse blow LED indication for over current protection. It also monitors charge status of the battery pack and gives audio visual warning if battery is about to get discharged. Depending on the robot configuration ordered Robot and onboard PC is powered by NiMH / Lithium Polymer battery.

Battery Voltage NiMH Battery	LED and buzzer status indication
Above 13V	Yellow / Blue LED is ON
13V to 12V	Yellow / Blue LED blinks
12V to 11V	Red LED blinks
Below 11V	If battery voltage is below 11V for more than 5 seconds then Battery Red (LED1) blinks and buzzer beeps at 2Hz (fast beep). It will continuously do so even if battery voltage again goes above 11V. Only way to get out of this state is by switching off the robot and replacing the battery.

Table 2: Battery status indication for NIMH battery

Battery Voltage Lithium Polymer Battery	LED and buzzer status indication
Above 11.1V	Yellow / Blue LED is ON
11.1V to 10.2V	Yellow / Blue LED blinks
10.2V to 9.9V	Red LED blinks and buzzer beeps at 0.5Hz (slow beep)
Below 9.9V	If battery voltage is below 9.9V for more than 5 seconds then Battery Red LED blinks and buzzer beeps at 2Hz (fast beep). It will continuously do so even if battery voltage again goes above 9.9V. Only way to get out of this state is by switching off the robot and replacing the battery.

Table 3: Battery status indication For Lithium Polymer Battery

Powering up the Onboard PC

Depending on the configuration ordered onboard PC is powered by 11.1V, 5000mAH 3 cell high discharge Lithium Polymer Battery or 15V 5000mAH NIMH battery. PC has two power cables. One power cable comes out from bottom and other cable comes out from the back panel. Both power cables have “T” type male connector. In normal configuration PC's battery is mounted in the robot's battery bay and its connected to the PC using long power wire which is coming from the bottom of the PC. If you want to use PC for extended amount of time, you can connect 12V DC supply to the small power cable which is coming out from the back panel of the PC.

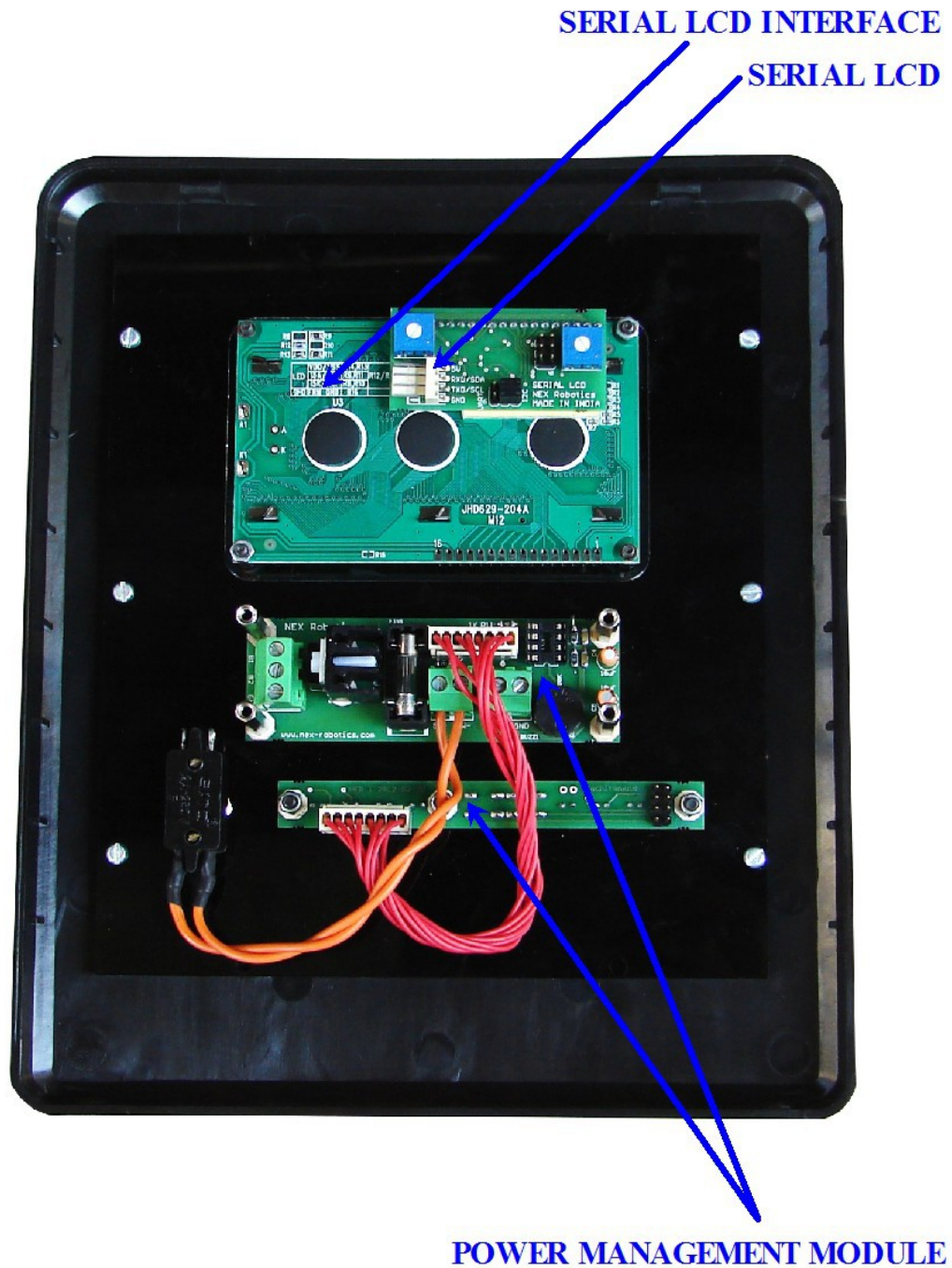


Figure 4: Power management module circuit board



Figure 5: Fire Bird VI robot mounted with the onboard PC

