9 DOF IMU

FOR FIRE BIRD VI

NEX ROBOTICS

www.nex-robotics.com

Designed and Manufactured by: NEX Robotics Pvt. Ltd.

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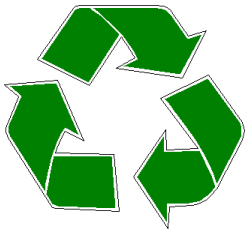
Notice

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

- **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.

9 DOF Inertial Measurement Unit Specifications

Fire Bird VI is equipped with 9 DOF Inertial Measurement Unit. The 9 DOF IMU consist of 3 axis digital accelerometer, 3 axis digital gyroscope and 3 axis digital magnetometer fitted into single module. As shown in figure 1 9DOF IMU consists of LSM303DLHC 3 axis Accelerometer and Magnetometer module and L3G4200D 3-axis gyroscope module.

The IMU module communicates with the main board using I2C1 interface. The I2C1 bus is shared with the serial LCD and Power Management module. The I2C address for L3G4200D is 0xD2, whereas I2C address for LSM303DLHC is 0xF2. A 4-pin relimate connector is connected from CON1001 of IMU board to CON6 of main board.

LSM303DLHC Module Features

3 magnetic field axis and 3 acceleration axis
Full scale range of ± 1.3 to ±8.1 gauss magnetic field
±2g/±4g/±8g/±16g user selectable full-scale acceleration ranges
16 bit data output
Embedded temperature sensor
6DOF orientation detection

L3G4200D 3 Axis Digital Gyroscope Features

250 dps : 8.75 mdps/digit
500 dps : 17.50 mdps/digit
2000 dps : 70 mdps/digit
16 bit data output
Embedded temperature sensor with 8-bit temperature data output
Integrated low- and high-pass filters with user selectable bandwidth

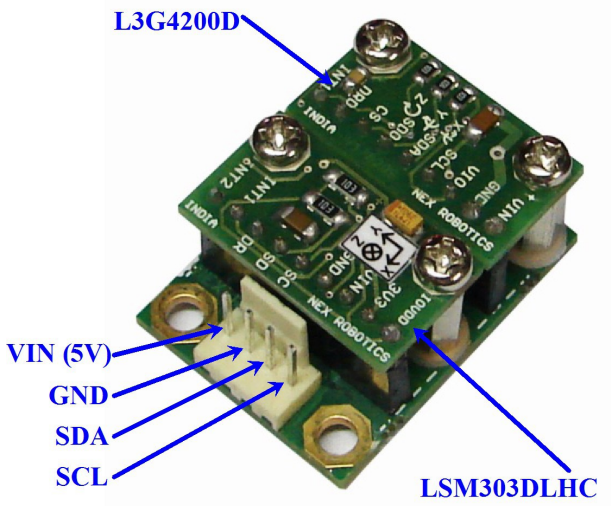


Figure 1: 9 DOF IMU pin connections

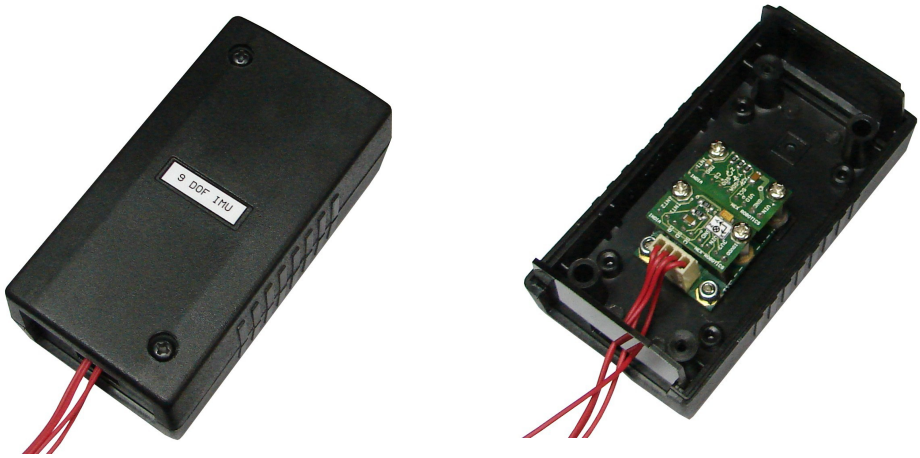


Figure 2: 9 DOF IMU inside enclosure

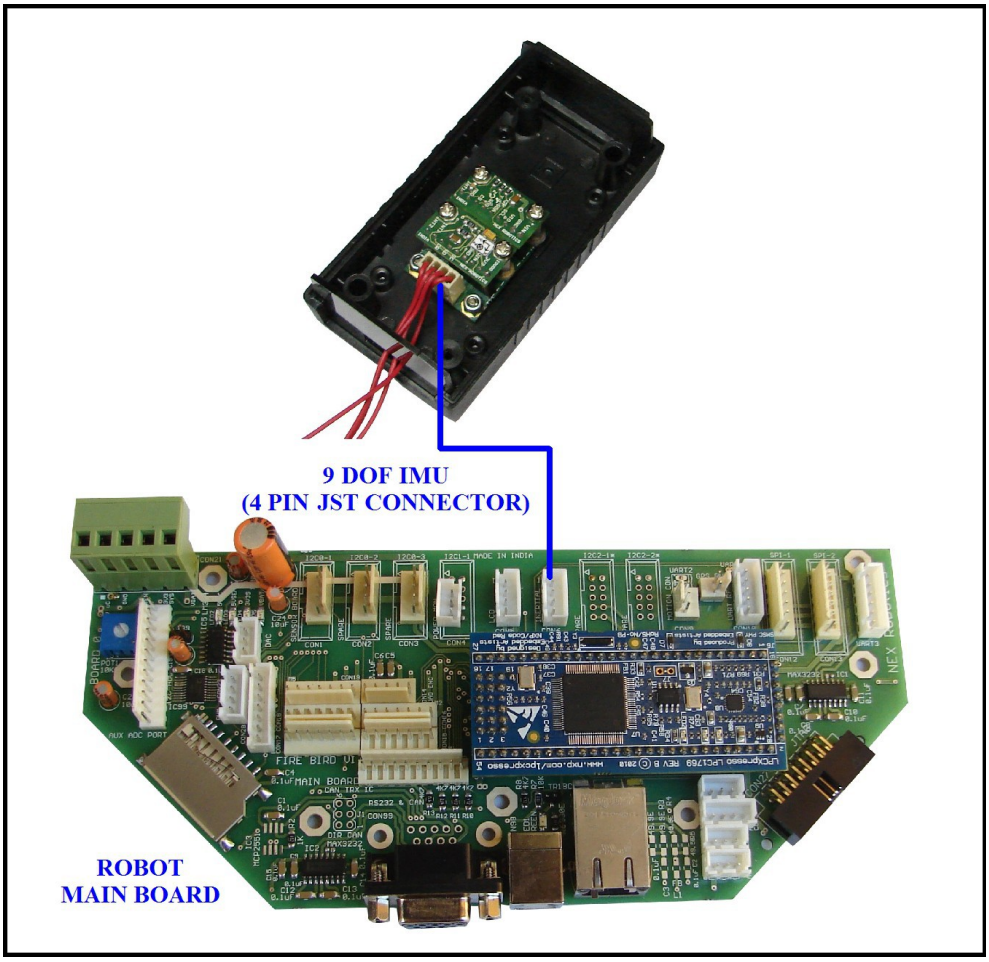


Figure 3: 9 DOF IMU interfacing with main board

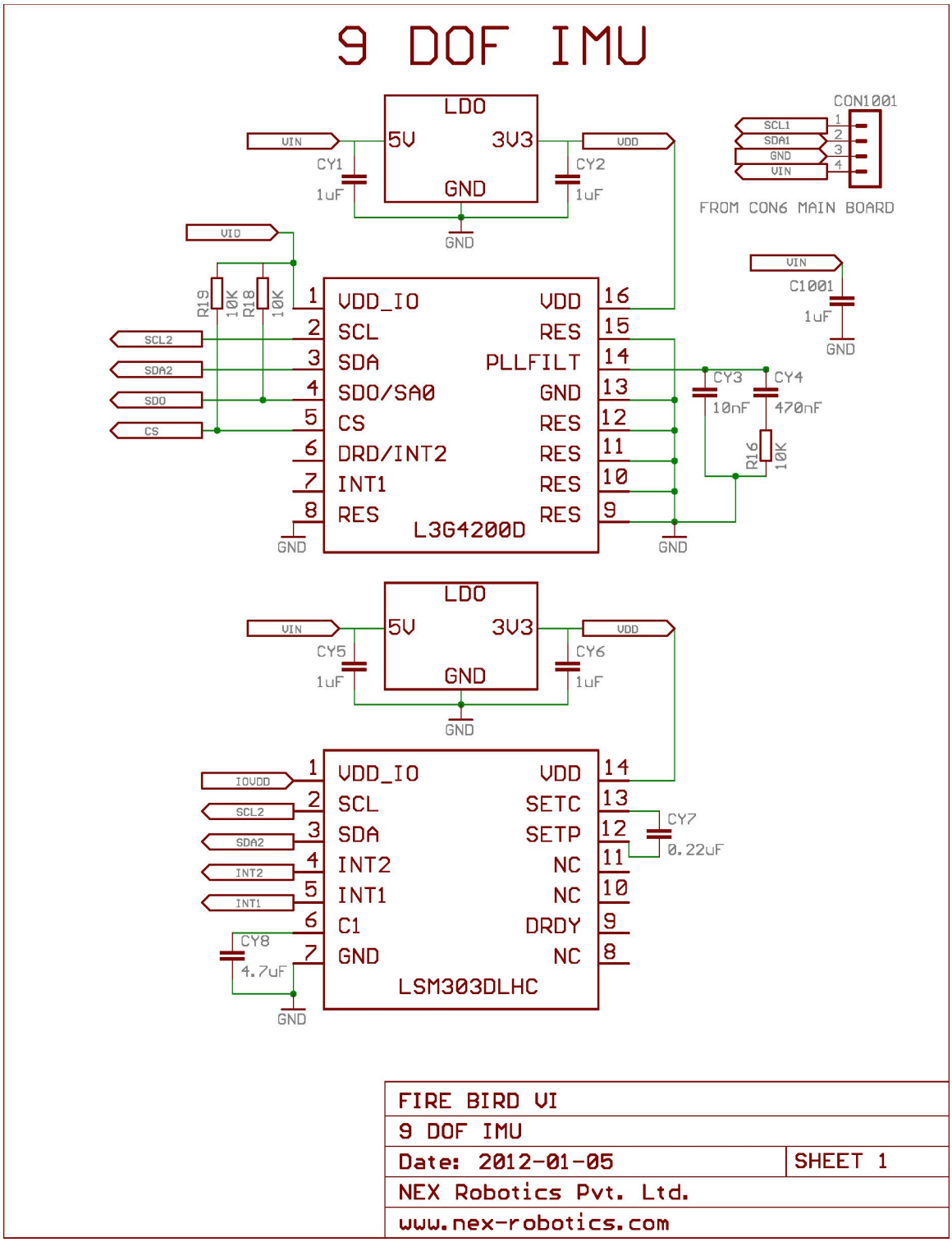


Figure 4: 9 DOF IMU schematics

Application Example for 9 DOF IMU

Application example named IMU_DEMO for the 9 DOF IMU is located in "FireBird VI Examples.zip" file present in the Experiments folder in the documentation CD. For this application example, ensure that serial LCD and 9 DOF IMU is connected to the robot. This application example displays data from 3 axis accelerometer, 3 axis gyroscope and 3 axis magnetometer on the LCD.

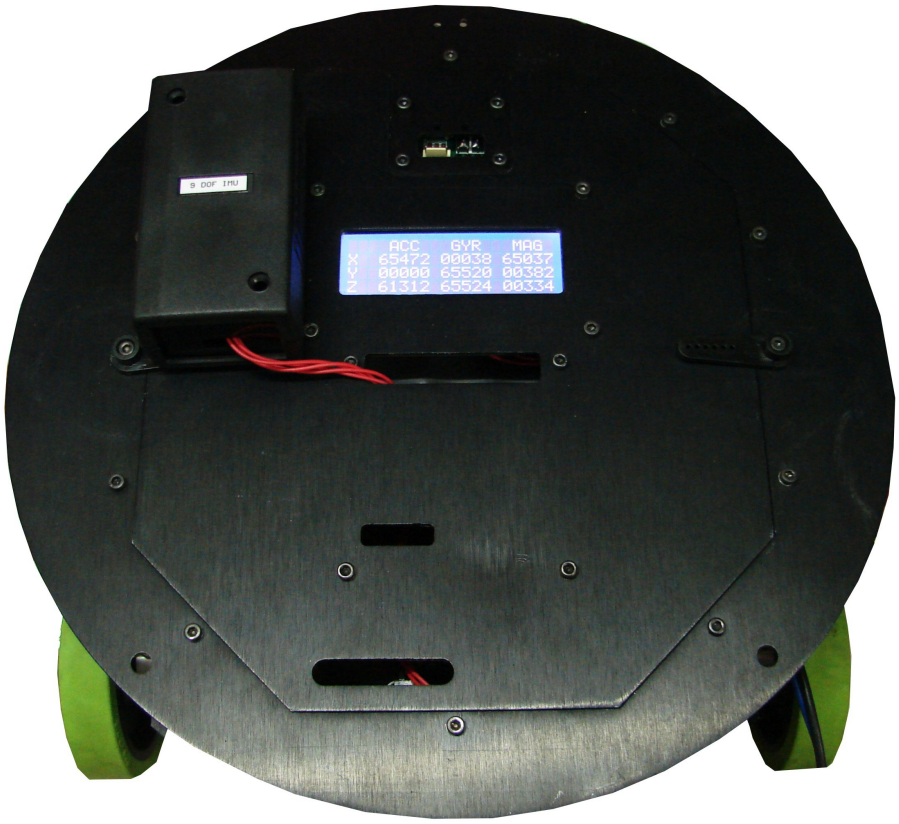


Figure 5: 9 DOF IMU interfacing with the robot