MANUAL FOR DUMMIES

**REQUIREMENTS**

**Hardware:**

1. Fire Bird V (robot, programmer, charger)
2. WiFly-EZX module for Fire Bird V
3. USB to serial converter board (for configuring WiFly module)
4. IP Camera
5. Wi-Fi Router
6. Tablet
7. Windows Laptop with Wi-Fi capability

**Software:**

1. For Fire Bird V - AVR Studio 4.17, NEX AVR STK500V2
2. For WiFly Module - WiFly Driver, USB to Serial COM driver, Bray Terminal
3. For IP Camera - Installation CD (provided with camera)

**INSTALLATION**

1. Setup the Wi-Fi Router
   1. Power On the router
   2. Connect Windows Laptop to the Router network using Wi-Fi. (e.g. For CISCO, default SSID: CiscoXXXXX )
   3. Open any web browser and type the address [192.168.1.1](http://192.168.1.1) in the URL bar (**set no proxy**)
   4. Default username : admin, password: admin
   5. Change the SSID of the network to some convenient name
2. Setup WiFly module drivers
   1. Put the WiFly module into the USB to Serial converter board
   2. Connect the USB to Serial converter board to the laptop
   3. Start Device Manager>Other Devices >Click on Unknown Device >Update Driver (If Installing for the first time )
   4. Install the drivers. (Path :FT232>CDM 2.08.24 WHQL Certified)
   5. Open Bray Terminal/tera term
   6. Select COM port and connect.
   7. Enter command mode. (By typing $$$) and type following commands for Auto pairing type of UDP connection.

set w a 0 //authorization: 0=open

set w j 1 //policy for joining the network, matched stored ssid

set w s <AAKASH> //SSID for the access point to connect

set wlan channel 0 // for scanning continuously

set ip proto 1 // enable UDP as the protocol

setip host <ip address> // set the IP address of remote host (TABLET)

setip remote <port> // set the remote port number on which the host is listening (UDP PORT ON TABLET: Default 68)

setip local <port> // set the port number on which the WiFly module will listen

save // saves the settings in config file

reboot // reboots the module so that the above settings take effect

**Setting up IP Camera. (CISCO WVC80N)**

1. Run the setup (Installation CD is provided along with the camera) and follow the instructions given in the setup guide.
2. Username : admin; password 1234
3. Obtain the camera IP address and lock the IP address in the router. Refer document\_problems.doc.
4. Install **AVR Studio 4.17** - Refer to installation steps given in [Fire Bird V ATMEGA2560 Software Manual](Fire%20Bird%20V%20ATMEGA2560%20Software%20Manual%202012-03-10.pdf) page 15.

**PROGRAMMING THE ROBOT** :

* **Writing the Embedded C program and creation of HEX file.**

1. Creating New project in AVR Studio :Refer to steps given in [Fire Bird V ATMEGA2560 Software Manual](file:///C:\Users\g33k\Desktop\Rajni%20Manual\Fire%20Bird%20V%20ATMEGA2560%20Software%20Manual%202012-03-10.pdf) Page 20
2. Open a New file and add the file to the folder “Source Files” located , on the left hand side of the “Code area” window ,in the main project folder.
3. Writing the code: Copy the contents of the code given below in the “code area” in AVR Studio 4.17.

The program is for controlling the Robot’s motion. Code is given here: <Source_Code.txt>

1. Generating HEX file: Select “Build” menu and click on “Rebuild All”. It will compile “Source\_Code.c” and will generate “<Project\_name>.hex” file for the Robot’s microcontroller in the “default” folder in the project folder.
2. You can verify successful compilation in the bottom most “Build” Window of the AVR Studio.

* **Burning the HEX file created above on the Robot’s microcontroller.**

1. Connect the programmer to the Laptop.
2. Go to Device Manager and observe that new Human Interface Device (HID) is installed.
3. Before proceeding ensure that you have AVR USB ISP STK500V2 folder which contains folder AVRDude which has files avrdude.exe and avrdude.conf .
4. Go to Start Menu- Run and type “cmd” to open command prompt.
5. In the command prompt navigate to the folder which contains avrdude.exe and avrdude.conf files.
6. On the command line type the command given below:

**avrdude -c stk500v2 -p m128 -P NEX-USB-ISP -U flash:w:”c:/example1.hex”:i**

NOTE: On the command line type the command as shown in the fig. below. Here **-p m128**refers to the microcontroller part number. The last section after w: , in quotes, specifies the location of hex file. In the command line edit the part number (Here we use m2560) and hex file location as required and connect the programmer to the target board using 10 pin FRC cable provided with the programmer and turn ON the target board. (Here turn on the Robot’s main board.)

1. Press Enter. You should see the programming status in the command prompt window. If there is any error, recheck ISP connection and command line parameters.
2. After successfully loading the HEX file, disconnect the programmer and power off the Robot’s main board.

**WIFLY MODULE**: (For Wi-Fi connection between tablet and the Robot)