Servo-Motor Operation With FS-TH9X Flysky Remote Controller Through FS-IA10B Receiver

By rajeeviitkgp11 in CircuitsArduino

Introduction: Servo-Motor Operation With FS-TH9X Flysky Remote Controller Through FS-IA10B Receiver

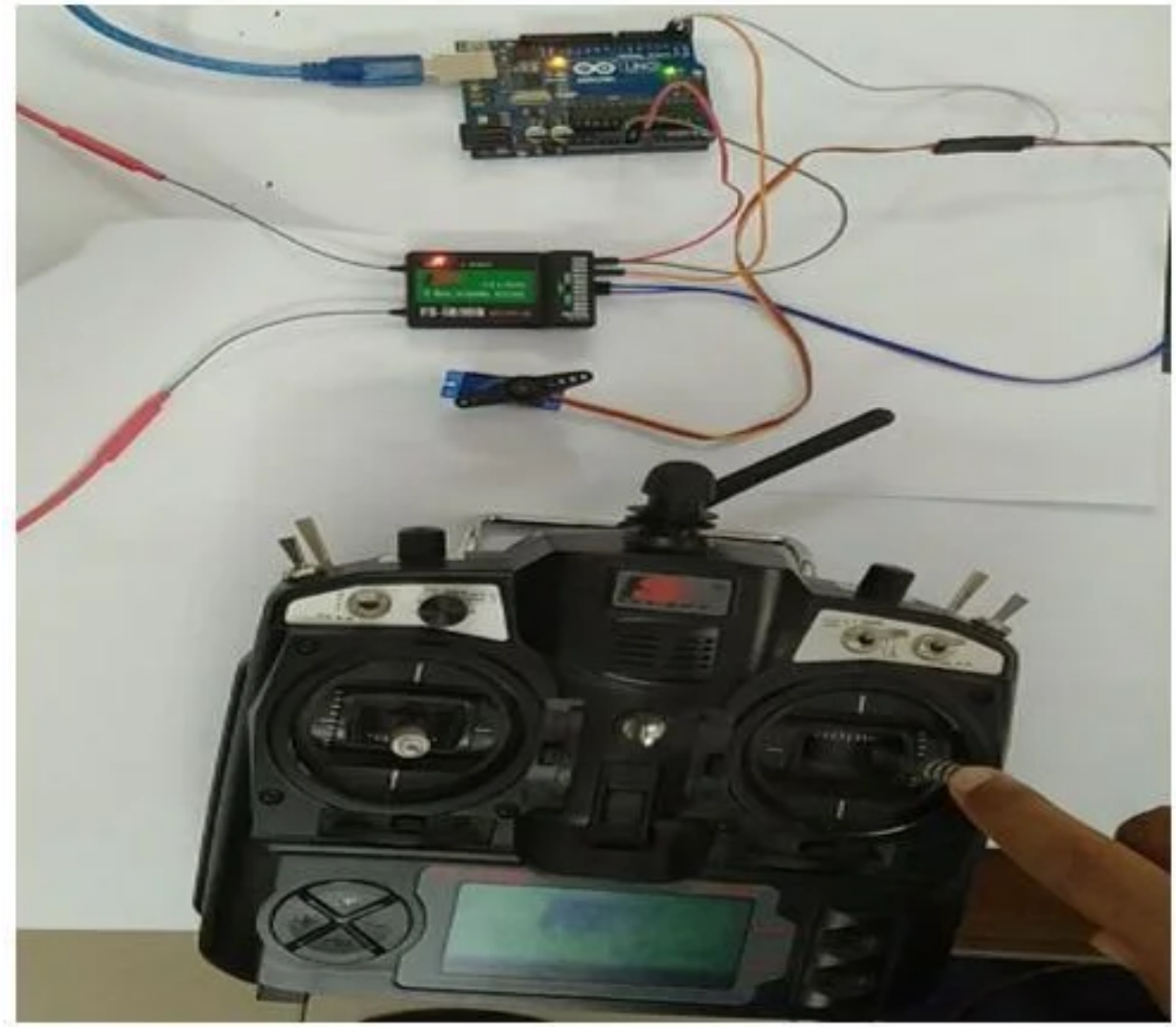

Fig. 1. Developed project

Servo-Motor operation with FS-TH9X Flysky remote controller through FS-IA10B Receiver

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Introduction:

In this remote-control electronics project, Servo-Motor was operated with the help FS-TH9X Flysky remote controller radio transmitter through 10 channel FS-IA10B receiver along with Arduino–Uno microcontroller board. Components required of operating the servo motor remotely consisted of Fly sky FS-TH9X remote controller radio transmitter, fly Sky FS-IA10B Radio Receiver, Arduino Uno mi

crocontroller board, Servo-Motor, power source, jumper wire and programming code. The selected radio transmitter transmits the signal in the ranges up to 1 km. RC robot or RC Excavator etc. may be developed from selected components with the help of this project. The project is specially devel oped for all the Radio control models, that offers super active and passive anti-jamming capabilitie s, very low power consumption and high receiver sensitivity. The developed project is shown in the Fig. 1.

The project is developed in two steps; (1) Validating the receive data from FS-TH9X transmitter in t he serial monitor of the Arduino IDE complier (3) operating the servo- motor using received data fro m FS-TH9X transmitter.

Components Required for development of this project: Following components are required to o perate the servo motor:

1. Arduino UNO microcontroller board = 01
2. FS-TH9X remote controller radio transmitter = 01
3. FS-IA10B radio receiver = 01
4. Battery 5V =01
5. Servo Motor = 01
6. Jumper wires = as per required

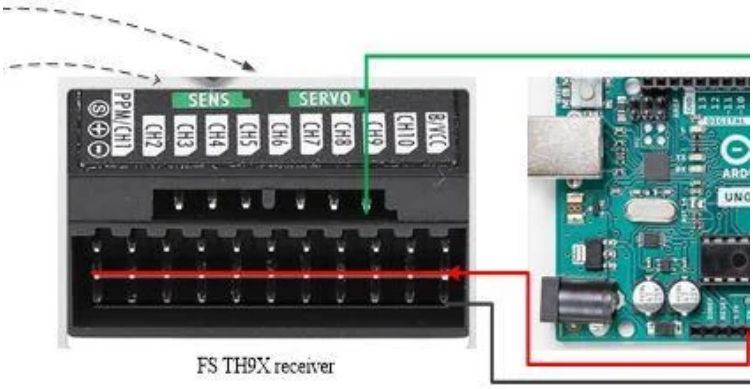
Brief description of Fly Sky FS-TH9X Transmitter:

This radio transmitter uses a high gain and high quality multi directional antenna. It is associated wi th a high sensitivity receiver; this radio system guarantees a jamming free long range radio transmi ssion. The transmitter works in the frequency range of 2.405 to 2.475GHz. This band has been divi ded into 142 independent channels, each radio system uses 16 different channels and 160 different types of hopping algorithm. The FS-i10 transmitter has a 10 channel facility and frequency 2.4GHz, AFHDS 2A (Automatic Frequency Hopping Digital System Second Generation) digital proportional computerized R/C system.

Brief description of FS-IA10B receiver:

This 10-channel receiver works for most models and is considered a “full range” so it can handle lar ger models as well as the smaller ones. Dual antennas give the FS-iA10B for unparalleled receptio n and interference rejection capability. For best results, makes sure the antennas are set at a 90-de gree angle from each other.

Step 1: Validating the Received Data From Transmitter to Ard uino UNO Board



tion diagram of FS-TH9X transmitter, FS-IA10B receiver w troller board

uino UNO board with FS-

	Connection point 2
↔	FS-IA10B receiver
↔	FS-IA10B receiver
↔	FS-IA10B receiver

Validation of received data required transmitter, receiver, Arduino-Uno microcontroller board and pr ogramming code. This receiver supports the ppm as well as I-bus protocol. Here I-bus protocol is u sed.

Arduino UNO board was powered from computer through USB A to USB-B. Receiver was powered by the power pin of Arduino UNO board. Rx of Arduino Uno was connected to I-Bus pin of FS-IA10 B receiver which is shown in Fig. 2. Throttle, Aileron, Elevator and Rudder stick of transmitter were rotated accordingly, corresponding values are shown in serial monitor. Connection between FS-IA1 0B receiver to Arduino UNO board is also tabulated in the Table1.

Programming code for receiving the data from the radio transmitter to board:

Attached Programming code is uploaded on Arduino Uno microcontroller board. Programming file c an be downloaded and it can be used directly for validating the received data from transmitter to th e Arduino microcontroller board.

Attachments

Step 2: Operating the Servo-motor Using Received Data From FS-TH9X Transmitter

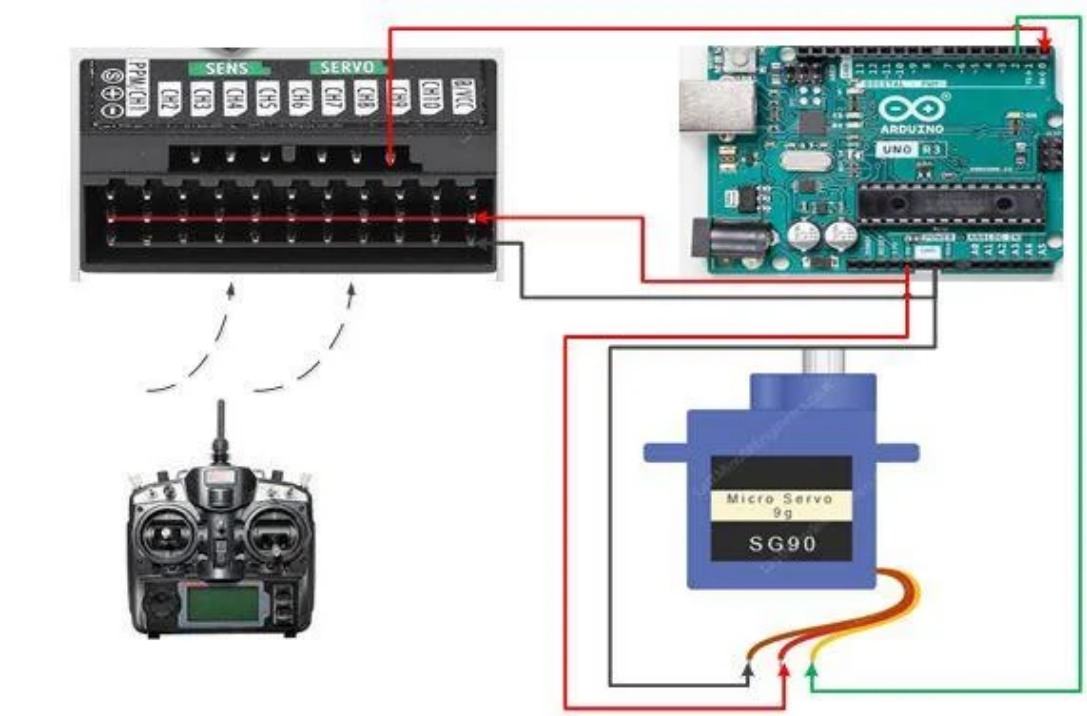


Fig. 3. Connection diagram developed project for operating the Servo-Motor SG90

t of Arduino UNO microcontroller witl

		Connection point 2
	↔	Micro servo motor 9G
)	↔	Micro servo motor 9G
	↔	Micro servo motor 9G
	↔	FS-IA10B receiver
)	↔	FS-IA10B receiver
	↔	FS-IA10B receiver

Mode 2

ode

tor according to the connection

of different stick of FS-TH9X t

	FS-TH9X Transmitter
	Aileron
	Elevator
	Throttle
	Rudder

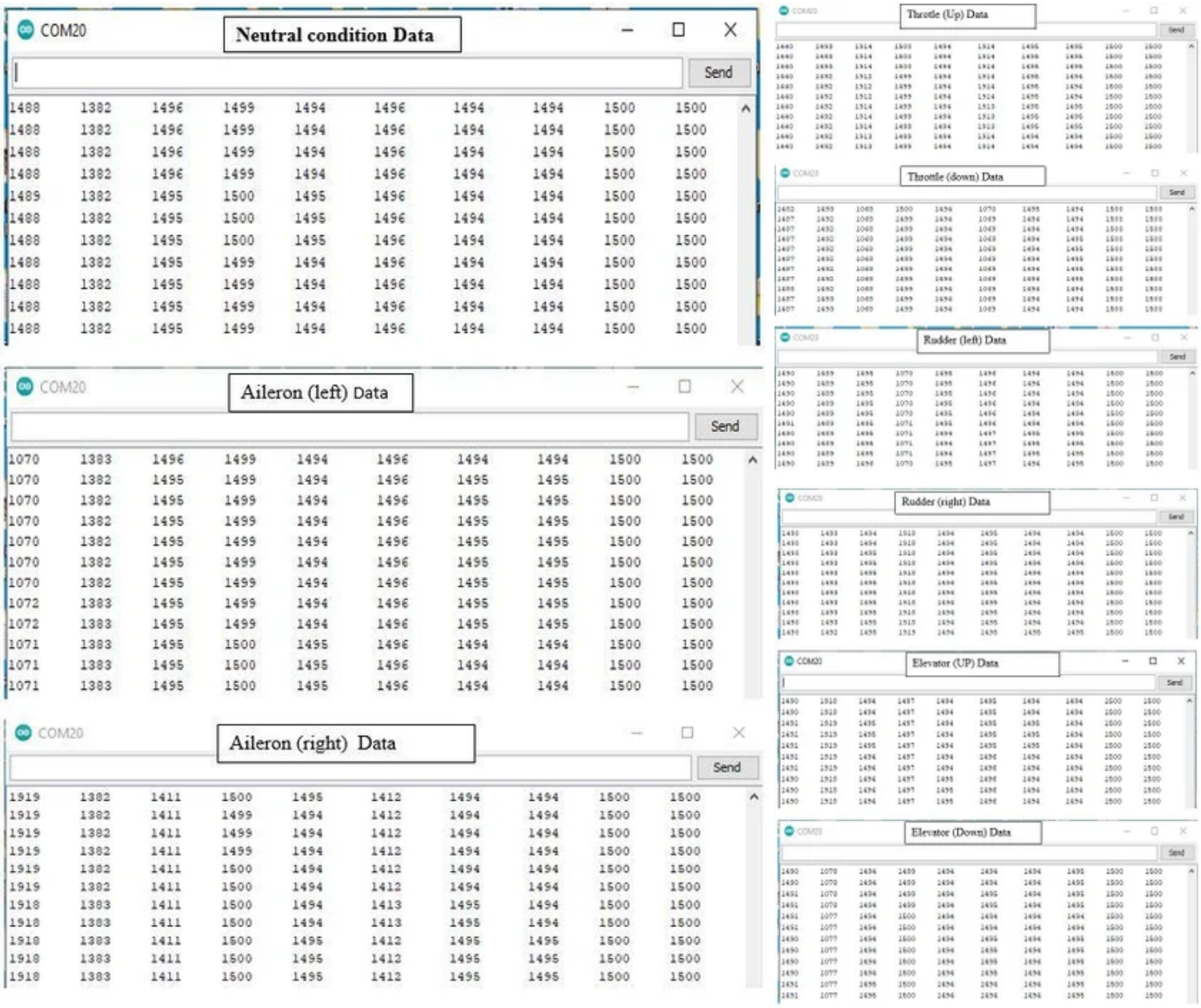
Servo motors have three wires: power, ground, and signal. The power wire is typically red, and sho uld be connected to the 5V pin of Arduino board. The ground wire is typically black or brown and sh ould be connected to a ground pin of Arduino board. The signal pin is typically yellow or orange and should be connected to any digital pin on the Arduino board. Connection diagram of developed tuto rial is also shown in the Fig. 3.

Before uploading the programming code in Arduino UNO microcontroller, Rx connection should be disconnected from board for successful uploading the code on the microcontroller. Same receiving data validation programming code was uploaded in Arduino UNO microcontroller for operating the s ervo motor. Connection of Arduino UNO microcontroller board to the Micro-Servo motor is tabulate d in table 2.

After successful uploading the programming code in the microcontroller, connect the I-bus pin of re ceiver to the Rx pin of Arduino board.

During the experiment, it can be seen with the rotation of aileron stick; servo is rotated while single wire of servo motor was connected to D2 pin of Arduino board. Similarly, with the rotation of Elevat or stick; servo was rotated while single wire of servo motor is connected to D3 pin of Arduino board. Corresponding digital pin and other stick name is tabulated in the table 3. According to uploaded pr ogramming code and mode 1 setting of FS-TH9X transmitter, movement of Aileron signal was proc essed through D2 digital pin of Arduino board. Similarly, movement of Elevator signal was processe d through D3 digital pin of Arduino board and rest of thing is shown in table 3.

Step 3: Serial- Monitors Data During the Validation of Data Is Shown in the Fig. 5:



Serial- monitors data during the validation of data is shown in the Figure of this step