Go-Kart Innovations

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Abstract - *The project converts the conventional go-kart into a smart go-kart with a smart function interfaced with the engine. This is designed for the driver safety and the security of the vehicles. Wireless control of the kart can make the vehicle smart. The intelligent vehicle can race in the race track with all the electronics devices installed to monitor and control the engine.*

*Key Words***:** Smart key, Go-kart, wireless, Engine control, Remote control.

1. INTRODUCTION

The innovations exist in each and everything in our day-to-day lives. It plays a major role everywhere. The innovations that we have made in our kart is to ensure the safety of the driver and to monitor the kart parameters, thus protecting the kart in case of any critical situations. The innovations that we have made in our kart are to monitor the battery charge level, fuel level, kill switch status, driver's emergency call to the team, safety intimation from the team to the driver, and starting/Stopping kart wirelessly.

2. List of Innovations

Following are the list of innovations in the Go-Kart.

- ➢ Wireless starting and stopping of kart.
- ➢ Driver fingerprint access.
- ➢ Battery charge level measurement.
- ➢ Fuel level indication.
- ➢ Kill switch status indication.
- ➢ Driver safety intimation from team.
- ➢ Driver emergency call to the team.

2.1. Wireless Starting and Stopping of Kart

The kart can be started wirelessly by using a relay whose signal pin is connected to the digital output pin of Node Mcu. The relay can be controlled through Cayenne Software. The relay bypasses the connection of starting switch to power supply and hence connected in parallel with the start switch. The pin connection of relay with Node Mcu for wireless starting is shown Fig.1

Fig.1

The kart can also be stopped by using another relay so that it becomes a wireless kill switch to the kart. The relay's signal pin is also connected to another digital pin of NodeMcu. The relay is connected in series with the start switch on normally closed condition so that the circuit is opened when relay is activated. The circuit connection of relay with NodeMcu for wireless killing is shown in Fig.2

Fig.2

2.2. Driver Fingerprint Access

The kart is provided with additional security feature, (i.e.) fingerprint lock. The kart can be started only when driver fingerprint is matched with the one which is recorded in the fingerprint module. The fingerprint module used is R307. More number of fingerprints can be saved in the module. The input of the fingerprint module is given to the Arduino. The digital output of the Arduino is connected to the relay which is connected in series with the power supply to the circuit. The kart is given power supply for starting only when the diver's fingerprint is matched. The pin connection of fingerprint with Arduino Uno is shown in Fig.3
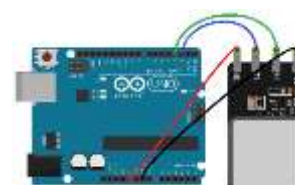

Fig.3

2.3. Battery Charge Level Measurement

Battery power supply is very important to the kart as it is helpful in starting the kart and for the power supply to other electronics devices in the kart. It is essential to monitor and maintain the battery charge level at all the time. Therefore, a voltage sensor is used to monitor the battery charge level, indicate the level on the display as well as on the cayenne dashboard interface. The circuit connection of voltage sensor with Arduino Uno and battery is in Fig.4
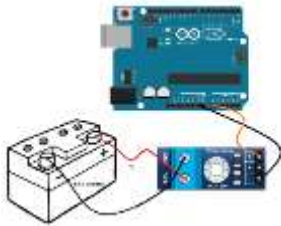

Fig4

2.4. Fuel Level Indication

The fuel plays a major role in the running of the kart. The fuel level has to be monitored to ensure the fuel required for the kart to run at a particular distance. A float sensor is used for this purpose. The float gauge is placed inside the fuel tank and the output of the float is connected to analog input of the Arduino Uno through an amplifier circuit. As the furl level increases the float raises thus changing the resistance value which is recorded and calibrated to indicate the fuel level in the tank of the kart. The connection of float sensor with amplifier circuit and Arduino Uno is shown in Fig.5
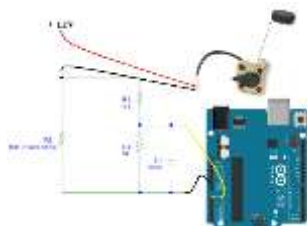

Fig.5

2.5. Kill Switch Status Indication

The kill switch's status is intimated to the driver as and to the service team. The kill switch's status is indicated to driver through a led and to the service team through the cayenne software. When the kill switch is pressed, it is indicated to the driver by powering the led light. The kill switch is shown I the Fig.6

Fig.6

2.6. Driver Safety Intimation from Team

The driver has to be alerted be intimated by from the team once any unwanted situations or anything wrong happens in the kart when the driver isn't aware of the problematic situation. This can be done by alerting through pressing emergency button on the cayenne dashboard which will make the emergency led glow which is connected to the digital output of NodeMcu. The glowing of led helps the driver to become alert and take the necessary actions. The led connection with NodeMcu is shown in Fig.7

Fig.7

2.7. Driver Emergency Call to Team

The driver can also alert the service team if any uncomfortable situation occurs to the driver or any problem occurs to the kart. This can be done by interfacing the emergency push button to the digital input of the NodeMcu. When the button is pressed, it will be indicated to the teammates through the cayenne dashboard. The push button connection with NodeMcu is shown in Fig.8
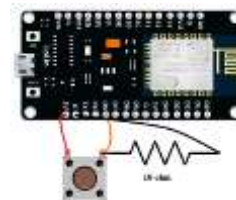

Fig.8

3. Dashboard

Cayenne is an IOT software with which we are able to control boards such as Node MCU all around the world. It is used from anywhere to control boards at any part of the world. It is a drag and drop IOT project builder that empowers developers to quickly create their own dashboard to control hardware components remotely and monitor sensor readings wirelessly.

Cayenne exits in form of both web site and also as an app. It is easy to control from both PC and Smartphone. Mobile view is shown in Fig.9 and PC view is shown in Fig.10

Fig. 9

Fig. 10

The first image shows Cayenne in the form of Smartphone app and the next image shows Cayenne in the form of website.

4. CONCLUSION

The innovations made in the kart mainly focusses on measuring the parameters of the kart and display it to the driver as well as to the team members so that they can monitor the status and ensure the safety of both the kart and the driver. We assure that these innovations make a way to the future of karting.

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BIOGRAPHIES

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