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Kandigital Bike Operating System

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Abstract: In the modern world, now a days the Micro-Controller plays a vital role in the world's automation and as well as safety purpose. It also reached a peak on its application in motor-bikes and others. Generally today's people are filled with a lot of tensions, appointments, etc. Only the bike owner can operate this bike by using thumb scanner, this also protects the bikes from thefts. In the following topics the discussion about the principles and functions of this automatic bike which is now in a research, which is now almost completed successfully. This application may reach the people so quickly.

Key words: Generally today's people · Operate this bike · Reach the people so quickly

INTRODUCTION

Embedded Systems are a combination of hardware & software designed to perform a specific function. Embedded system is nothing but programming the microcontroller for various applications. The first embedded system was built for the toys with built-in automatic answering. The working of the tape inside the toy were controlled by the micro controller. Since it was very costly to use a full-fledged computer to control the system of intelligent machines, the concept of using a micro controller containing all the controlling program and connecting it with the input and output unit was introduced.

Embedded system characteristics can be divided according to user's viewpoint and developer's viewpoint.

User's Viewpoint: It is Single function dedicated only to a task or tasks, also its Size and low Cost. This power consumption is also very low.

The main characteristics of these embedded systems are that they are Real-Time and reactive it responds to environment in real time. One of the disadvantageous characteristics of these types of systems is that they are safety critical. Failure of hour per week/second per weak can be life threatening.

Developer's Viewpoint: Concurrent development of hardware and software: hardware/software Co design. Variety of Microprocessors and microcontroller.Variety of operating systems is available in the technical world. Mostly the Real Time (RTOS): May not even have any OS (operating system)services like 'printf'.Requires specialized development tools.Debugging is extremely difficult.Hardware and software should be extremely robust.

In the literature discussing microprocessors, we often see the term embedded system. Microprocessor and microcontrollers are widely used in embedded system products. [1-4].

An embedded product uses a Microprocessor (or Microcontroller) to do one task and one task only. A printer is an example of embedded system since the processor inside it performs one task only; namely getting the data and printing it. Contrast this with a Pentium-based PC (or any x86 IBM – compatible PC). A PC can be used for any number of applications such as word processor, print-server, bank teller terminal, video game player, network server, or Internet terminal. Software for a variety of applications can be loaded and run. Of course the reason a PC can perform myriad tasks is that it has RAM memory and an operating system that loads the application software that is typically burned into ROM. An x86 PC contains or is connected to various embedded

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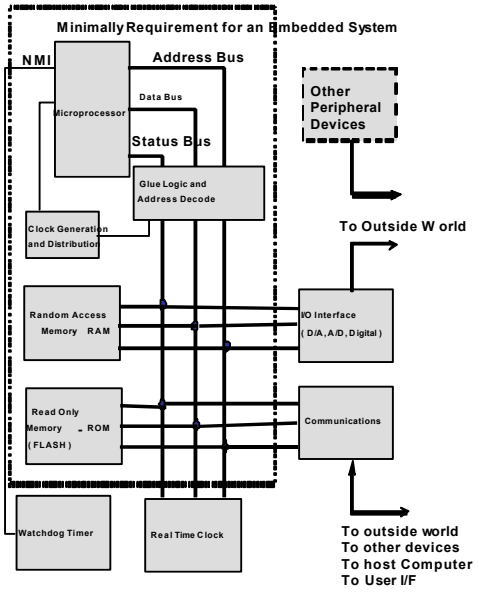
A typical embedded system



Source: Arnold S. Berger 10

Fig. 1: Referenced Block [3, 4]

products such as the keyboard, printer, modem, disk controller, sound card, CD-ROM drive, mouse and so on. Each one of these peripherals has a microcontroller inside it that performs only one task. For example, inside every mouse there is a microcontroller to perform the task of finding the mouse position and sending it to the PC.

There are four major 8-bit microcontrollers. They are Motorola's 6811, Intel's 8051, Zilog's Z8 and PIC 16X from Microchip Technology. Each of the above microcontrollers has a unique instruction set and register set: therefore, they are not compatible with each other. Programs written for one will not run not on the others. There are also 16-bit and 32-bit microcontrollers made by various chipmakers. Naming of any controller depends upon data bus of that controller.

With all these different microcontrollers, what criteria do designers consider in choosing one? Three criteria in choosing microcontrollers are as follows:

- Meeting the computing needs of the task at hand efficiently.
- Availability of Software development tools such as compilers, assemblers and debuggers and
- Wide availability and reliable sources of microcontroller.
- Also depends upon the cost.

The main feature of this work is, there is no key needed to start and lock the bike & also we need not to turn on the petrol knob for petrol flow. All are done automatically by using thumb once.

It is often quite natural for everyone to leave the bike key somewhere and search for it while going out, particularly in the morning while getting ready to go office or college, searching the bike key leads us to a big tension & finally if we lost the bike key we have to go to a mechanic to replace a new key. Sometimes some may forget to lock the bike, which leads to theft. Some may forget to open the petrol knob for petrol flow, which leads the bike automatically, when bike doesn't run.

These kinds of problems are fully solved by this module & theft proof techniques are also introduced.

Ride Mode: The ignition circuit gets connected, the bike lock gets opened & also the petrol starts flowing to the engine.

Hold Mode: The engine is stopped for purposes like to be used in traffic Signal it is unnecessary to hold the bike in on condition till we get the signal. After getting the signal we can restart the bike by kicking the kicker.

Lock Mode: The ignition circuit gets disconnected, the bike is locked, petrol flow is stopped & also the password gets locked. After entering in this mode, we can restart the bike only after entering the password. For each mode a button is provided. If we press this button, the tank cap gets opened automatically. After fuelling the tank we can close it by simply pressing the cap downwards.

Bike Lock: A proper mechanical setup has been fixed at the spindle of the stepper motor (12V, 4 steps). The motor is programmed to rotate in both clock and anti-clock wise. When the motor rotates in clockwise direction, the bike gets locked & when it rotates in Anti-clock wise direction, the bike lock gets opened. The conventional lock in the bike can be replaced by this setup & we can also use this setup in front or back wheel for extra safety.

Setup

Fuel Flow: Solenoid valve is used for petrol flow. It is an automatic valve, which is used for liquid flow controlling. When power is given the valve gets opened & it is closed when power supply is cut off. These are available in two categories. One is normally closed type and another is normally opened type. The solenoid that we are using here for the petrol flow from the tank to the engine is 3/8 inch, 12v, one inlet- one outlet & normally closed type.

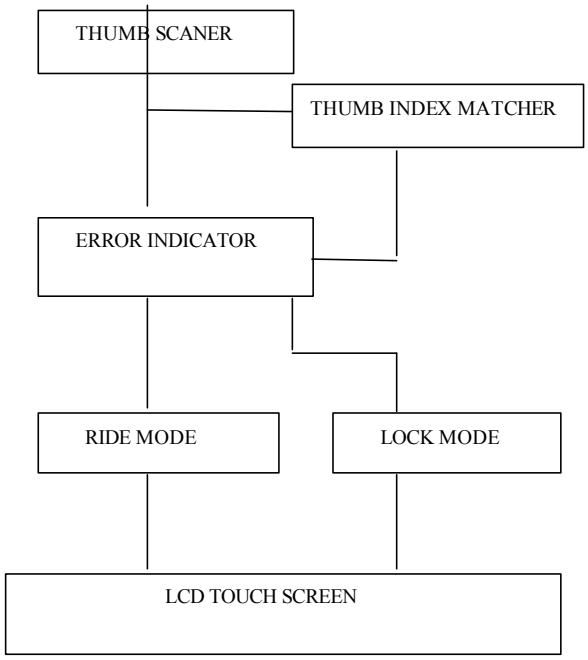


Fig. 2: BlockDiagram of Digital Bike.

Petrol Tank Cap Operation: The cap is designed as a magnetic lock. This lock is designed such as when power supply is given the lock gets opened. After fuelling the tank, we can close the tank by simply pressing the top of the cap downwards.

Technology: This work is based on embedded technology with help of thumb scanner.

Applied Embedded Technology: A thumb scanner is present in the place of key holder. The output of thumb scanner is given as input for the microcontroller in bike, which controls bike lock, unlock and fuel flow and fuel tank cap.

Special Features

Theft Proof: An alarm starts lauding on these conditions

- If any unknown person impress his thumb index
- If the main wire is cut down

Battery Power Indication: This project draws power from the bike battery itself and no separate power source is needed. A red light glows whenever the battery goes down & immediately the system draws power from a additional battery provided which is capable of providing power up to five hours and within this five hours we can recharge the main battery [5-7].

Thumb Index Adding or Removing: We can add or remove any of our close friend and relative's thumb index in thumb scanner memory. For adding any index holding the thumb impression of person, who index is already existing in memory up to indication of a yellow light provided after words thumb of person who's index needed to add is hold on the scanner up to indication of a green light For removing any index holds the thumb, which is going to be removed up to indication of a red light. This red light indication is followed only by indication of yellow light and green light.

We are using LED's for indication purpose. This is visible in day times.

Provinding Extra Locks: By using the techniques we can provide extra locks for front and back wheels.

Design of the Device: The device must be designed as waterproof, damage proof.

Advantages: Simple circuit, operation is also simple. Power consumption is low & cost is very less.

Disadvantage: A person close to bike owners only can use this bike. But unauthorized person for our bike can't use it during the absence of authorized person.

CONCLUSION

This work enables the bike-rider to enjoy the digital technology in bike & also it provides complete safety for the bike. It saves fuel in very large amount. Especially it is very useful for short-tempers.

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