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Research Paper Engineering

Speed Control Using FSK Module

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ABSTRACT

FSK module are used to speed control the automobile vehicles, In this system ASK module trans miter are placed automobile vehicles, FSK module receiver part are connect to the control room .The module are communicate through RF transmission mediam, FSK module receiver are inter facing with 8085 microcontroller, this controller are connected to the solenoid valve, this valve operated the oil flow of engine, the controller are operated according to the module trans mission instruction

Keywords : FSK module ,RF medium

Introduction

ASK module transportation systems apply robotic techniques to achieve safe and efficient driving. In the automotive industry, ask module are mainly used to give information to the driver and, in some cases, they are connected to a computer that performs some guiding actions, attempting to minimize injuries and to prevent collisions. One of the applications of it is the providing of assistance to the control of some of the vehicle elements, like the throttle pedal and consequently, the speed-control assistance. A cruise control system is a common application of these techniques. It consists of maintaining the vehicle speed at a user (driver) pre-set speed. These kinds of systems are already mass installed in top of the line vehicles. A second step in the development of the speed assistances is adaptive cruise control ACC is similar to conventional cruise control in that it keeps the vehicle pre-set speed. However, unlike conventional cruise control, this new system can automatically adjust speed in order to maintain a proper headway distance (gap) between vehicles in the same lane. This is achieved through a radar headway sensor, digital signal processor and a speed controller. If the lead vehicle slows down, or if another object is detected, the system sends a signal to the engine or braking system to decelerate. Then, when the road is clear, the system will re-accelerate the vehicle back to the set speed Previous research has shown that ACC can improve traffic conditions significantly ACC systems have been in market since Mitsubishi launched the “Preview Distance Control” for its Diamante model car in 1995. Toyota, Nissan, Jaguar, Mercedes, Lexus, BMW and some car component industries have introduced an ACC system, although only as an optional device for luxury vehicles. One limitation of these commercial systems is that they control the speed of the car only at speeds above 30–40 km/h and they fail at lower speeds in heavy traffic, where if the preceding car stops, the equipped car must stop too at a safe headway. Stop & Go systems automate the throttle control in this kind of situation. There are a lot of techniques to perform ACC., ASK module base control system technique is a low coast and high performance

FSK Module working system

A very useful application of the 565 PLL is as a FSK demodulator. In this 565 PLL the frequency shift is usually accomplished by driving a VCO with a binary data signal so that the two resulting frequencies corresponding to logic 0 and logic 1 state of the binary data signal. The frequencies corresponding to logic 1 and logic 0 states are commonly called the mark and space frequencies. Several standards are used to set the mark and space frequencies. For example, when transmitting teletypewriter information using a modulator-demodulator (modem for short), a 1070 Hz-1270 Hz (mark-space) pair represents the originated signal; while a 2025 Hz – 2225 Hz (mark-space) pair represents the answer signal.

FSK Module interfacing Circuit Description

The FSK generator is formed by using a 555 as an astable multivibrator whose frequency is controlled by the state of transistor Q_1. In other words, the output frequency of the FSK generator depends on the logic state of the digital data input. One hundred and fifty hertz is one of the standard frequencies at which the data are commonly transmitted. When the input is logic 1, transistor Q_1 is off. Under this conditions, the 555 works in its normal mood as an astable multivibrator; that is, capacitor C_1 charges through R_3 and R_2 to 2/3 V_{CC} and discharge through R_2 to 1/3 V_{CC} as long as the input is at 1 state. The frequency of the output wave form is given by the equation

$$F_0 = 1.45/(R_A + 2R_B)C = 1070 \text{ Hz}$$

The Value of R_1, R_2, R_3 are selected so that f_0 represents a mark frequency (1070 Hz). On the other hand, when the input is logic 0, Q_1 is on (saturated), which in turn connect to a resistance R_1 across R_3. This action reduces the charging time of the capacitor and increase the output frequency which is given by the equation

$$F_0 = 1.45/(R_A||R_C + 2R_B)C = 1270 \text{ Hz}$$

By proper selection of R_1, this frequency is adjusted to equal the space frequency of 1270 Hz. The difference between FSK signals 1070 Hz and 1270 Hz; this difference is called frequency shift. As shown in figure 1-1, the output of the 555 FSK generator is then applied to the 565 FSK demodulator. Capacitive coupling is used to at the input to remove a dc level. As the signal appears at the input of the 565, the loop locks to the input frequency and tracks it between the two frequencies with the corresponding dc shift at the output. Resistor R_4 and capacitor C_9 determine the free-running frequency of the VCO, while, C_5 is a loop filter capacitor that establishes the dynamic characteristics of the demodulator. Here C_5 must be chosen smaller than usual to eliminate overshoot on the output pulse. A three-stage RC ladder (low-pass) filter is used to remove the carrier component from the output. The high cutoff frequency (f_H = 1/2 ∏RC) of the ladder filter is chosen to be approximately halfway between the maximum keying rate of 150 Hz and twice the input frequency, that is, approximately 2200 Hz. The output signal of 150 Hz can be made logic compatible by connecting a voltage comparator between the output of the ladder filter and pin 6 of the PLL. The VCO frequencies is adjusted with R_4 so that at f_{IN} = 1070 Hz a slightly positive voltage is obtained at the output.

CIRCUIT PARTS LISTS
Resistors (all ¼-watt, ± 5% Carbon)

R_1 = 50 kΩ set at 39.24 kΩ potentiometer, R_2 = 47 Kω, R_3 = 50 kΩ potentiometer

R_4 = 10 kΩ potentiometer, R_7, R_8, R_9 = 10 kΩ R_{10} = 27 kΩ R_{11} = 100 Ω

Capacitors
C_1, C_2 = 0.01 μF, C_3 = 0.1 μF C_4 = 0.001 μF

Semiconductor

IC1=NE555Timer

IC2=NE565

FSK Signals and Demodulation
Frequency shift keying (FSK) is the most common form of digital modulation in the high-frequency radio spectrum, and has important applications in telephone circuits. This article provides a general tutorial on FSK in its many forms. Both modulation and demodulation schemes will be discussed frequency. The shift is the frequency difference between the mark and space frequencies. Shifts are usually in the range of 50 to1000 Hertz. The nominal center frequency is halfway between the mark and space frequencies. Occasionally the FM term "deviation" is used. The deviation is equal to the absolute value of the difference between the center frequency and the mark or space frequencies. The deviation is also equal, numerically; tone-half of the shift.FSK can be transmitted coherently or no coherently. Coherency implies that the phase of each mark or space tone has a fixed phase relationship with respect to a reference. This is similar to generating an FSK signal by switch

BINARY FSK
Binary FSK (usually referred to simply as FSK) is a modulation scheme typically used to send digital information between digital equipment such as tele-printers and computers. The data are transmitted by shifting the frequency of a continuous carrier in a binary manner to one or the other of two discrete frequencies. One frequency is designated as the "mark" frequency and the other as the "space" frequency. The mark and space correspond to binary one and zero, respectively. By convention, mark corresponds to the higher radio frequency. Figure 1 shows the relationship between the data and the transmitted. The most commonly used signal parameters for describing an FSK signal are shown in figure. The minimum duration of a mark or space condition is called the element length. Typical values for element length are between 5 and 22 milliseconds, but element lengths of less than 1 microsecond and greater than 1 second have been used. Bandwidth constraints in telephone channels and signal propagation considerations in HF channels generally require the element length to be greater than 0.5 millisecond. An alternate way of specifying element length is in terms of the keying speed. The keying speed in "bauds" is equal to the inverse of the element length in seconds. For example, an element length of20 milliseconds (.02 seconds) is equivalent to a 50-baud keying speed. Frequency measurements of the FSK signal are usually stated in terms of "shift" and centering between two fixed-frequency oscillators to produce the mark and space frequencies. While this method is sometimes used, the constraint that transitions from mark to space and vice versa must be phase continuous ("glitch" free) requires that the shift and keying rate be interrelated. A synchronous FSK signal which has a shift in Hertz equal to an exact integral multiple (n = 1, 2,...) of the keying rate in bauds, is the most common form of coherent FSK. Coherent FSK is capable of superior error performance but non-coherent FSK is simpler to generate and is used for the majority of FSK transmissions. Non coherent FSK has no special phase relationship between consecutive elements, and, in general, the phase varies randomly. Many different coding schemes are used to transmit data with FSK. They can be classified into two major groups: synchronous and asynchronous. Synchronous transmissions have mark-to-space and space-to-mark transitions in synchronism with reference clock. Synchronous signals do not require a reference clock but instead rely on special bit patterns to control timing during decoding. Compares synchronous and asynchronous keying. A very common asynchronous coding system is the 5-bit Bau dot code with leading start(release) and trailing stop (latch) elements. Originally designed for use with mechanical teleprinters, the system is "latched" until a "release" element is received, causing the printer to interpret the next 5 element intervals as code bits. The binary values of the 5 bits correspond to a particular character. In the two character patterns correspond to the characters "C" and "W" respectively. The 5 "information" bits are immediately followed by a stop or "latch" bit lasting a minimum of 1.42 element lengths. The latch bit stops the printing decoder until the decoder is again started by the next "release"

The length of the latch bit may be very long between characters, especially in the case of manually generated characters where the operator types more slowly than the system can transmit characters. The non integer minimum latch element length of 142 elements and the random nature of manual character generation emphasize the asynchronous nature of this scheme. A common synchronous system uses Moore ARQ coding. The Moore code is a 7-bit-percharactercode with no start or stop elements .Bit synchronization is maintained by using a reference clock which tracks the keying speed of the received signal. Character synchronization is maintained by sending periodic "idle" or "dummy" characters between valid data characters.

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