ABSTRACT

Efficient Application of Time Division Multiple Access (TDMA) on RF Module using HT12E address lines

Efficient application of Time Division Multiple Access (TDMA) on RF Module using HT12E address lines comprises of address lines of HT12E encoder connected to an RF transmitter, TDMA to the RF module and controlling the encoder address bits allowing to address the respective receiver unit one at a time and allows to connect to 256 receivers in this manner and baling to send 256 X 4(bits) = 4096 instructions instead of just 4 (an exponential increase), using 2 receivers in one machine implementing the procedure and using 8 bits (thus 256 instructions) characterizing that the microcontroller gives 4 bits of parallel form of data and 8 bits of address line data to the encoder (HT12E), encoding them by turning this parallel data into serial form and this serial data is given to RF Module transmitter, this radio frequency (RF) transmission system employing Amplitude Shift Keying (ASK) with transmitter/receiver (TX/RX) pair operating at 434 MHz, the transmitter module taking serial input and transmitting these signals through R, the transmitted signals receiving several receiver modules placed away from the source of transmission, and the receivers passing on the serial data to the HT12D decoders using this serial data converting it to parallel form and comparing it to the particular address they are given, and this address is used to determine the sent data is meant for this particular receive, and if it is then the new data bits given out by decoder else they are ignored and old values are retained.

Figs. 1 & 2

WE CLAIM:

1. Efficient application of Time Division Multiple Access (TDMA) on RF Module using HT12E address lines comprises of address lines of HT12E encoder connected to an RF transmitter, TDMA to the RF module and controlling the encoder address bits allowing to address the respective receiver unit one at a time and allows to connect to 256 receivers in this manner and baling to send 256 X 4(bits) = 4096 instructions instead of just 4 (an exponential increase), using 2 receivers in one machine implementing the procedure and using 8 bits (thus 256 instructions) characterizing that the microcontroller gives 4 bits of parallel form of data and 8 bits of address line data to the encoder (HT12E), encoding them by turning this parallel data into serial form and this serial data is given to RF Module transmitter, this radio frequency (RF) transmission system employing Amplitude Shift Keying (ASK) with transmitter/receiver (TX/RX) pair operating at 434 MHz, the transmitter module taking serial input and transmitting these signals through R, the transmitted signals receiving several receiver modules placed away from the source of transmission, and the receivers passing on the serial data to the HT12D decoders using this serial data converting it to parallel form and comparing it to the particular address they are given, and this address is used to determine the sent data is meant for this particular receive, and if it is then the new data bits given out by decoder else they are ignored and old values are retained.

2. Efficient Application of Time Division Multiple Access (TDMA) on RF Module using HT12E address lines as claimed in claim 1, wherein the address bits are changed by using the microcontroller output which has HIGH or LOW as output to control these address lines.

3. Efficient Application of Time Division Multiple Access (TDMA) on RF Module using HT12E address lines as claimed in claim 1 and 2, wherein the address line is grounded when microcontroller PIN connected to it is LOW and is at 5V when microcontroller output at respective pin is HIGH thus correct programming of the microcontroller which control the address lines and thus control outputs of 256 receivers with decoder outputs to give 4096 bits.

Dated this 13th day of November, 2013.

(BHASKAR KUMAR DEY)

OF DASWANI & DASWANI

APPLICANT'S AGENT

APPLICATION NO: 1314/KOL/2012 NO. OF SHEETS: 02

NAME : JCB India Ltd SHEET NO. : 01

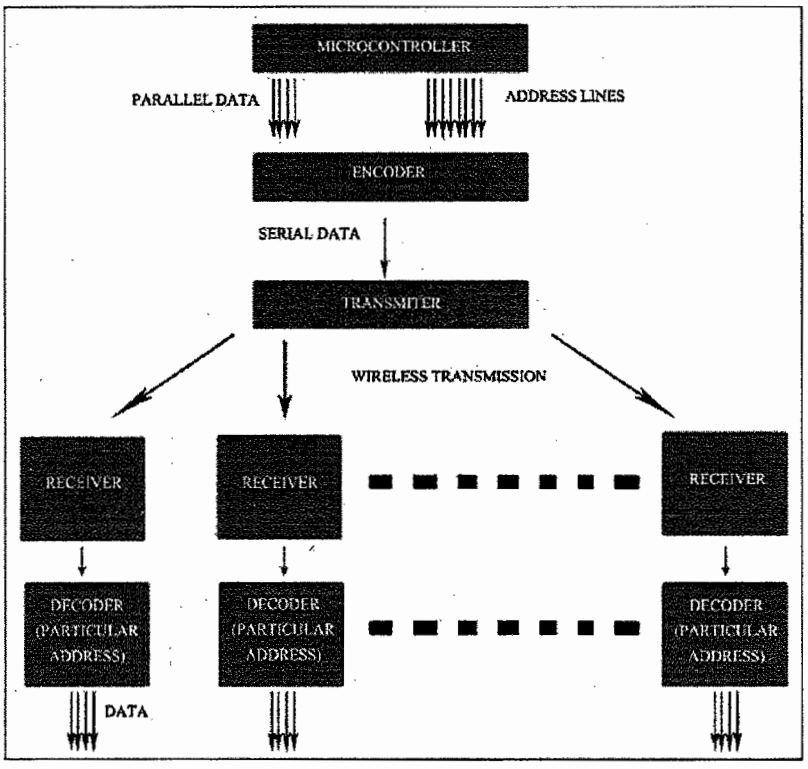

Fig.1

(BHASKAR KUMAR DEY)

OF DASWANI & DASWANI

APPLICANTS' AGENT

APPLICATION NO: 1314/KOL/2012 NO. OF SHEETS: 02

NAME : JCB India Ltd SHEET NO. : 02

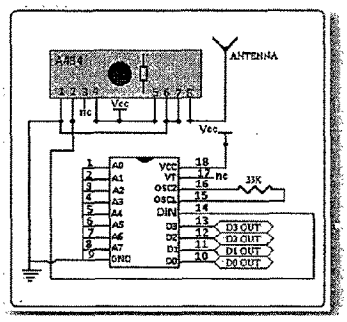

Fig. 2a

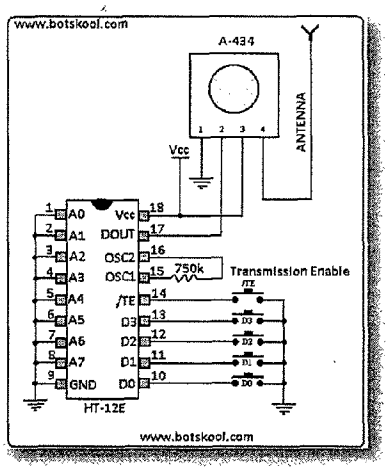

Fig. 2b

(BHASKAR KUMAR DEY)

OF DASWANI & DASWANI

APPLICANTS' AGENT

Object of the invention

The present invention relates to efficient application of Time Division Multiple Access (TDMA) on RF Module using HT12E address lines.

Field of the invention

The present invention relates to wireless communication in general, particularly the present invention relates to efficient usage of RF (Radio Frequency) Modules by applying TDMA to it to increase the number of instructions which could be sent.

Background of the Invention

The invention has 2 circuits one is transmitter the other is receiver circuit. The remote unit uses toggle switches to receive commands, these commands are received by a microcontroller (atmega32) [3] which processes them and sends signals through an RF transmitter with 433MHz which has HT12E encoder IC for serial transmission.

The receiver unit has 1 to 256 receivers connected to microcontroller (atmega32) through HT12D decoders at the receivers with different address bits (selected by grounding them or leaving them alone as by default they are at high.)

Brief description of accompanying drawings

Figure 1 relates to sending of data to multiple receivers through one transmitter in accordance with an embodiment of the present invention.

Figures 2(a) and 2(b) relate to use circuits for TX and RX without technique of present invention, without using any microcontroller to dynamically control the address lines

Detailed description of the preferred embodiments

Figure 1 shows:-

The microcontroller gives 4 bits of parallel form of data and 8 bits of address line data to the encoder (HT12E), it encodes them by turning this parallel data into serial form. This serial data is given to RF Module transmitter. This radio frequency (RF) transmission system employs Amplitude Shift Keying (ASK) with transmitter/receiver (TX/RX) pair operating at 434 MHz The transmitter module takes serial input and transmits these signals through RF. The transmitted signals are received by several receiver modules placed away from the source of transmission. The receivers pass on the serial data to the HT12D decoders which use this serial data convert it to parallel form and compare it to the particular address they are given, this address is used to determine if the sent data is meant for this particular receive, if it is then the new data bits given out by decoder else they are ignored and old values are retained.

Figures 2(a) and 2(b) shows:-

These are the usually use circuits for TX and RX without our technique, without using any microcontroller to dynamically control the address lines.

Summary of the Invention:

According to the present invention there is provided efficient application of Time Division Multiple Access (TDMA) on RF Module using HT12E address lines comprises of address lines of HT12E encoder connected to an RF

transmitter, TDMA to the RF module and controlling the encoder address bits allowing to address the respective receiver unit one at a time and allows to connect to 256 receivers in this manner and baling to send 256 X 4(bits) = 4096 instructions instead of just 4 (an exponential increase), using 2 receivers in one machine implementing the procedure and using 8 bits (thus 256 instructions) characterizing that the microcontroller gives 4 bits of parallel form of data and 8 bits of address line data to the encoder (HT12E), encoding them by turning this parallel data into serial form and this serial data is given to RF Module transmitter, this radio frequency (RF) transmission system employing Amplitude Shift Keying (ASK) with transmitter/receiver (TX/RX) pair operating at 434 MHz, the transmitter module taking serial input and transmitting these signals through R, the transmitted signals receiving several receiver modules placed away from the source of transmission, and the receivers passing on the serial data to the HT12D decoders using this serial data converting it to parallel form and comparing it to the particular address they are given, and this address is used to determine the sent data is meant for this particular receive, and if it is then the new data bits given out by decoder else they are ignored and old values are retained.

The address bits are changed by using the microcontroller output which has HIGH or LOW as output to control these address lines.

The address line is grounded when microcontroller PIN connected to it is LOW and is at 5V when microcontroller output at respective pin is HIGH thus correct programming of the microcontroller which control the address lines and thus control outputs of 256 receivers with decoder outputs to give 4096 bits.

The new technology is the control of address lines of HT12E encoder connected to an RF transmitter.

2 RF transmitters of same frequency can't work simultaneously as there will be interference between the two but we needed to send more than 4 bits (which allow for 16 instructions) to be sent. We achieved this by applying TDMA to the RF module and controlling the encoder address bits, this allowed us to address the respective receiver unit one at a time and allowed us to connect to 256 receivers in this manner thus we are able to send 256 X 4(bits) = 4096 instructions instead of just 4 (an exponential increase). We used 2 receivers in one JCB machine implementing the above procedure and using 8 bits (thus 256 instructions).

The address bits are changed by using jumpers and connecting them to ground but we have used the microcontroller output which has HIGH or LOW as output to control these address lines. The address line is grounded when microcontroller PIN connected to it is LOW and is at 5V when microcontroller output at respective pin is HIGH. Thus by the correct programming of the microcontroller we could control the address lines and thus control outputs of 256 receivers with decoder outputs to give 4096 bits.
We also exploited the fact that receivers in RF modules tend to latch on to the last received input and if we change the address line and go to another receiver, it just keeps the last input in memory. This property has always been criticized but we have used it to our advantage.