

Lab Report 9

This assignment has two parts receiver and transmitter . The receiver code is taken from the previous assignment. The output of the receiver component is given as input in the transmitter component . The parallel output of bits given by the receiver is converted to serial output of bits by the transmitter.

RECEIVER:

States: Four states of the FSM are defined in case of this receiver as IDLE, START, STOP and Si.

1. IDLE: In this state the value of rx_in is 1. and during this state the receiver will not read any bit. If the value of rx_in changes from 1 to 0 then the state changes from idle to start.

2. START: If the value of rx_in remains 0 for 8 consecutive cycles of the clock rxclk then the state containing these 8 0's is referred to as start state and the next state occurred is Si. Else if 8 consecutive 0's doesn't occur then the state again changes to idle.

3. Si: This is the state in which after every 16 cycle of the clock a bit is read. After 8 consecutive Si states the state called STOP occurs.

4. STOP: Stop is the end state which comes after the sequence of 8 Si's . Before this all the 8 bits are read by the receiver. After the completion of this state the IDLE state comes. **GTKterm:** By this software the manual input was given which was read by the receiver.

TRANSMITTER:

Clock:

The clock of frequency 9600 Hz is used in the transmitter so as to produce the output bits.

tx_start:

tx_start is like a trigger which needs to be 1 for the transmitter to start working. So when the last bit is read by the receiver , at that time the value of tx_start changes to 1 , which behaves as a signal for the transmitter to start transmitting the signal and hence the state of the transmitter changes to start and after value 0 is assigned

to the output of transmitter which indicates the start bit . After this, the state changes to si and the value of tx_start changes to 0.

tx_out:

when the value of tx_start changes to 1, tx_out began to transmit the serial signal. The first bit of tx_out is 0. After this, it began to read the values of the vector output of receiver (i.e. B) until it reads all the 8 values of the bit vector. After this, tx_out changes to 1 and state changes to idle and waits for the next tx_start signal.

FINAL CONCLUSION:

The input given to the receiver using gtkterm is being typed twice on the screen as a result of the signal transmitted by the transmitter. The 2nd recurrence on the screen indicates the output of the transmitter.

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