Programmable Embedded Systems (EE60098)
Homework 2

Submitted By
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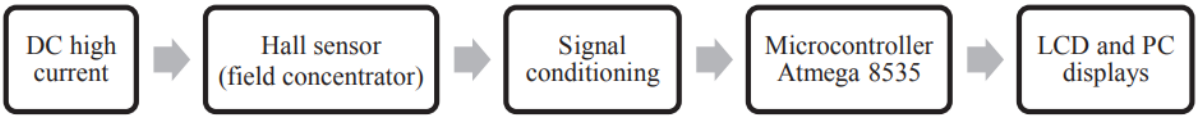
Design of a wireless Current Sensor - Use a Hall Effect Sensor to measure current (0-100A) and send it to another unit for display in wireless mode. Use 8-bit controllers and FSK. Use VCO for FSK and FM for wireless transmission.

The fundamental idea is to have a current sensor that uses the hall effect to measure current in the range 0 - 100 A (for non-contact detection of direct currents, using a hall element, a magnet-electric converting element.). The measurement is then transmitted via FM wirelessly and the microcontroller sends the received information to the display.

BLOCK DIAGRAM

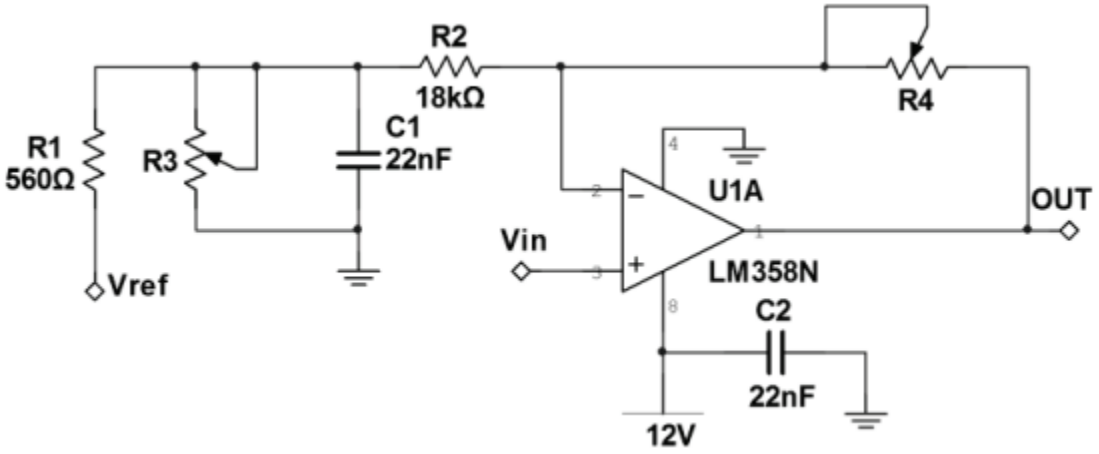


Component Details

Hall sensor

A Hall Effect based Linear Current Sensor is used. The range of input current that can be measured is 0-100A.

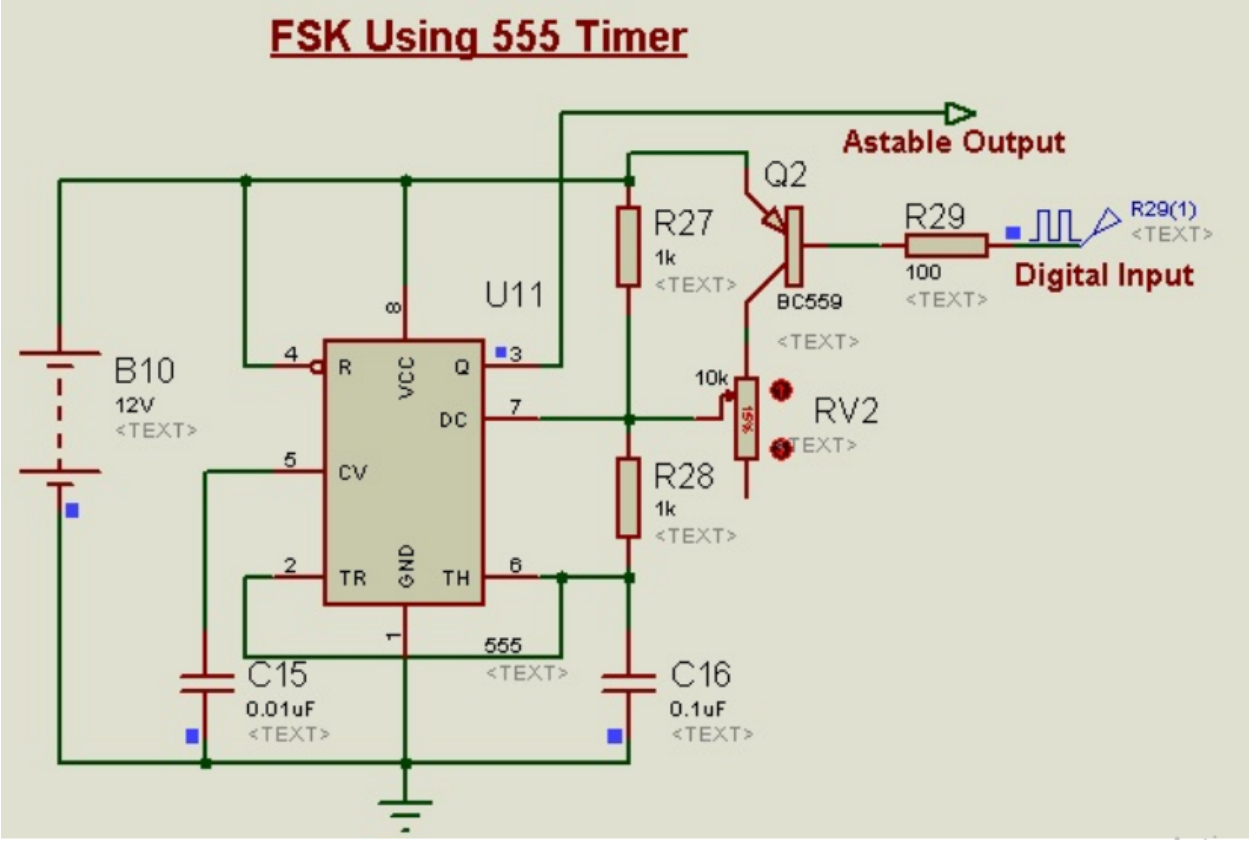
Signal Conditioning



The Vout is then read by the 10 bit ADC of the 8-bit microcontroller (ATmega328P) thus converting it to digital information.
This digital information is then transferred using FSK over FM to a receiver and another microcontroller that is programmed to display the received data.

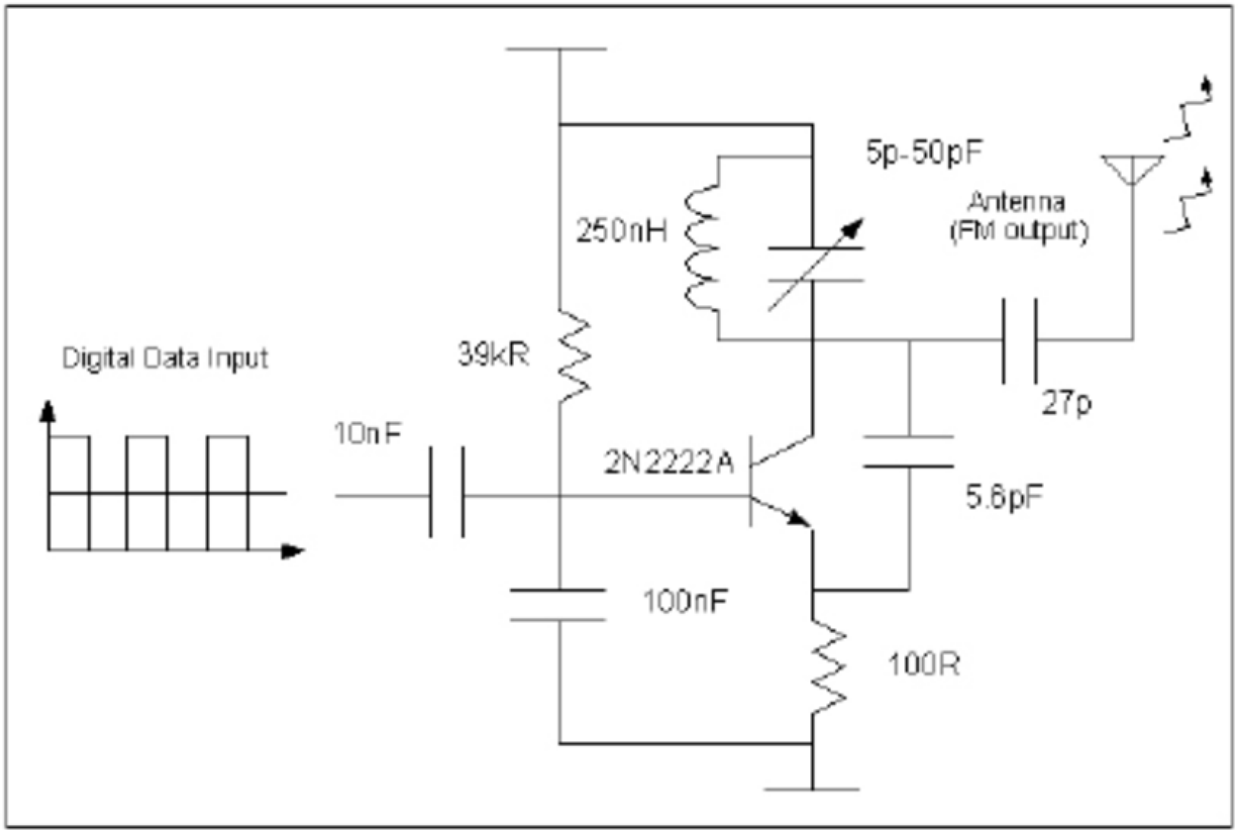
FSK

We realise the select input using a transistor as a switch with a timer to generate the required modulated output



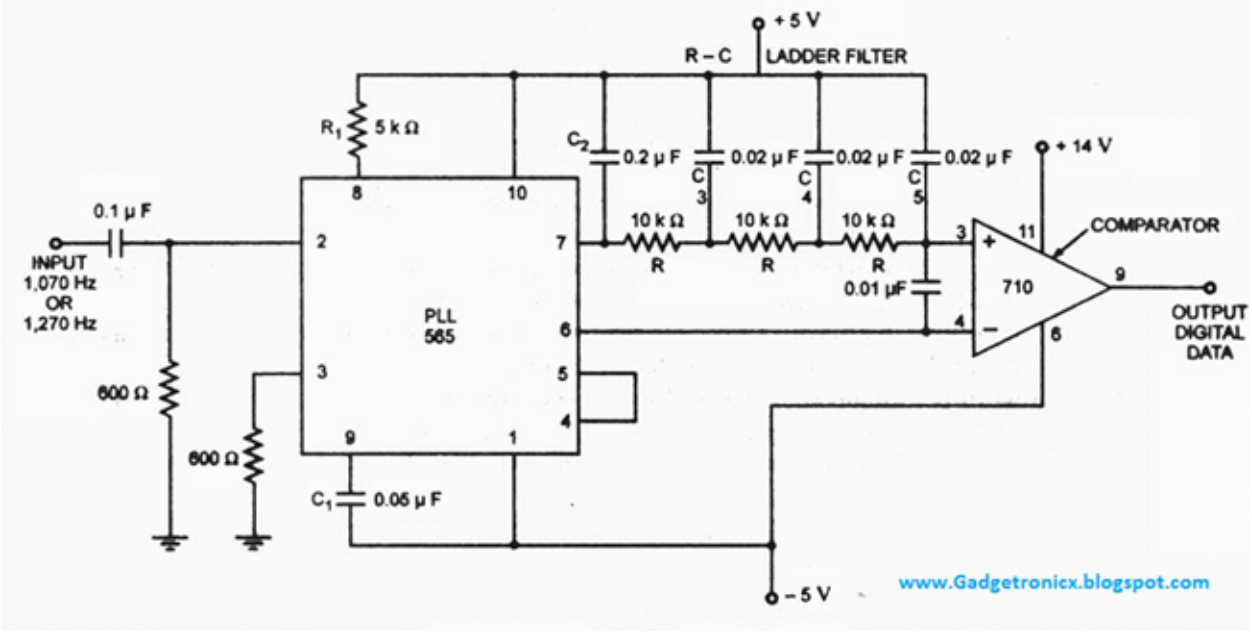
FM transmitter

The data is transmitted using an FM transmitter



The sent signal is then received by an FM receiver followed by which we demodulate the FSK signal.

FSK demodulator



The bitstream is now read by another 8-bit microcontroller and the output is displayed on a connected display using the appropriate program.

Display unit