

Design (E) 314

Preliminary Report

PV System Efficiency Monitor

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[01/04/2024)]

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**Task 1: Hardware Design Details**

//Introduction to hardware elements

**LMT01 Sensor**

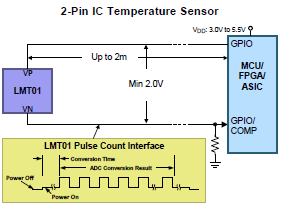
//what

The LMT01 device is a high-accuracy, 2 pin, temperature sensor with an easy-to-use pulse count current loop interface. The LMT01 has the pulse count interface which is used to determine the temperature. Where the number of output pulses is proportional to the temperature.

//how

The LMT01 temperature output is transmited over a single wire, using a train of current pulses that change from 34uA to 125uA. A simple resistor is then used to convert the current pulses to a voltage. When the temperature is determined the current level will remain below 34uA for at most 54ms while the LMT01 is determining the temperature. When the temperature is determined, the pulse train begins. Where the pulse train toggles from the low current 34uA to a high current level of 125uA. The pulse train maximum interval is 50ms. After the pulse count has been transmitted the current level will remain low for the remainder of the 50ms. The individual pulse frequency is 88khz. The LMT01 will continuously convert and transmit data when the power is supplied every 104ms.

//schematic

**Figure 1: LMT01 micro-controller connection Figure 2: LMT01 top view and pin**

// resistor values and input voltage

The LMT01 takes as input 5V source

//input voltage

// PIN connection

**Top push button**

//why

//how (connections)

//schematic

//resistor

//voltage

**LED circuit**

**Task 2: Software Design Details**

**Task 3: Testing of system to verify performance/functionality**