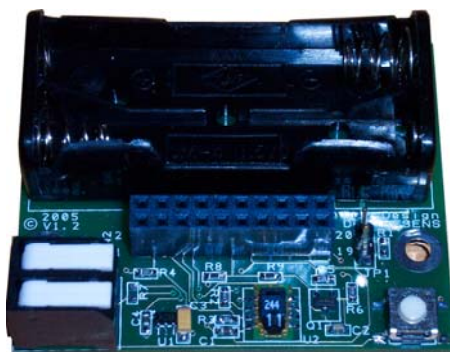# DLP-RF2SENS

** PRELIMINARY **
Temperature / Humidity Sensor Module

Overview

The DLP-RF2SENS is designed for use with the DLP-RF2 transceiver (purchased separately) and serves as a design example demonstrating several features of the DLP-RF2. The DLP-RF2SENS demonstrates a temperature and humidity sensor, battery power measurement system, door switch input, and the low-power mode of operation.

Using the pre-programmed SIPP™ firmware, the DLP-RF2 ships from the factory with functionality to support each of these features.

(Schematics for the DLP-RF2SENS are available for download upon purchase.)

Low-Power Mode

The DLP-RF2SENS holds Port Pin RX2/C1 low upon power up of the DLP-RF2. If using the SIPP firmware in the DLP-RF2 as shipped from DLP Design, upon power up the DLP-RF2SENS and DLP-RF2 board set will immediately enter low-power mode drawing less than 40 microamps of current from the two AAA batteries. The RF2 module will wake from the low-power mode either periodically (based on a preset value in the setup of the DLP-RF2) or in response to a change on the door switch input. Upon wake up, the DLP-RF2 will attempt to check in with the system controller. Once communications with the host controller are complete, the RF2 will return to low-power mode.

Refer to the datasheet for the DLP-RF2 for additional details on the low-power mode.

Door Switch

Wiring Terminal CN1 is provided on the DLP-RF2SENS for connection to a set of normally open or normally closed door switch contacts.   When the door switch contacts are opened or closed, the DLP-RF2 is brought out of sleep mode and a broadcast packet (Destination ID=0) is transmitted. The system controller transceiver (DLP-RF1 or DLP-RF2) responds to this packet by requesting the battery voltage, and/or temperature and humidity data. The system controller then has the option of instructing the DLP-RF2SENS and DLP-RF2 board set to return immediately to sleep.

Temperature & Humidity Sensor

The sensor used on the DLP-RF2SENS module is read via digital I/O lines from the DLP-RF2. The interface employed by the sensor is purely digital, so analog measurements are not required for the reading. The sensor is calibrated at the factory, and calibration constants are permanently stored within the sensor itself.

When not being read, the sensor enters a low-power mode in which it draws one microamp or less.

Published specifications for the sensor are as follows:

Temperature	°C	°F
Range	-40 to 123.8°C	-40 to 254.9°F
Accuracy	±2.0°C (-30 to 80°C)	±3.6°F (-22°F to 176°F)
Resolution	0.01°C	0.02°F
Repeatability	±0.1°C	±0.2°F
Response Time	5-30 Sec.	5-30 Sec.

Humidity	
Range	0-100%RH
Accuracy	±3%RH (20 to 80%RH), ±5%RH (0 to 100%RH)
Resolution	0.03%RH
Repeatability	±0.1%RH
Response Time	4 Sec.

Battery Power Measurement

The battery power measurement system works by placing a light load (approximately 10 milliamps) on the two AAA batteries and then measuring the battery voltage using the A/D converter in the DLP-RF2. A 2.1-volt voltage regulator is used as a voltage reference to set the maximum voltage for the A/D converter in the DLP-RF2. The connection from the batteries to the A/D converter is made via a voltage divider so that the battery voltage (~3.2V max) is within the range of the 2.1-volt reference after being divided by two.

A MOSFET switch is used to disable the battery power measurement circuitry when not in use such that no load is placed on the batteries.

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