

Embedded Systems Development

Task 8.1D Raspberry Pi I2C

Hardware Required

Raspberry Pi, BH1750 Ambient sensor (or another temperature sensor capable of being used with I2C, or even another SoC device e.g. Particle Photon, Arduino)

Software Required

Python IDE (or IDE for the programming language you are using)

Pre-requisites: You must do the following before this task

None

Task Objective

The aim of the task is to build an I2C application. The application can vary depending on what sensor you are using. For example, if you are using ambient light sensor, to read the environment light intensity using I2C. If you are using another I2C, perhaps to send a value/mock data across to the other device.

Steps:

1. Design a simple circuit board connecting the ambient sensor (or anything else you are using) to the I2C pins of the Raspberry Pi.
2. Write code that configures the sensor, reads data and prints out the results as categories of “too bright”, “bright”, “medium”, “dark” and “too dark” (or displays mock data).

Task Submission Details

Q1: Discuss the benefits of I2C serial communication.

Q2: Create a repository named SIT210_Task8.1D_RPi_I2C on Github. Upload your code to the repository. Include the link to your repository here.

Q3: Put a video demonstrating your system working on Youtube. Your video should include a brief description of how your system works and how you have programmed it.

Embedded Systems Development

For SIT730 Students Only

Using the light sensor as an example, explain how the library file handles the timing of the data transfer