Sensor System

System Description

Contents

1 Overview

This document describes the *Sensor System*, a homogeneous, battery-powered sensing device used in a smart home environment. The system detects ambient light levels and motion presence.

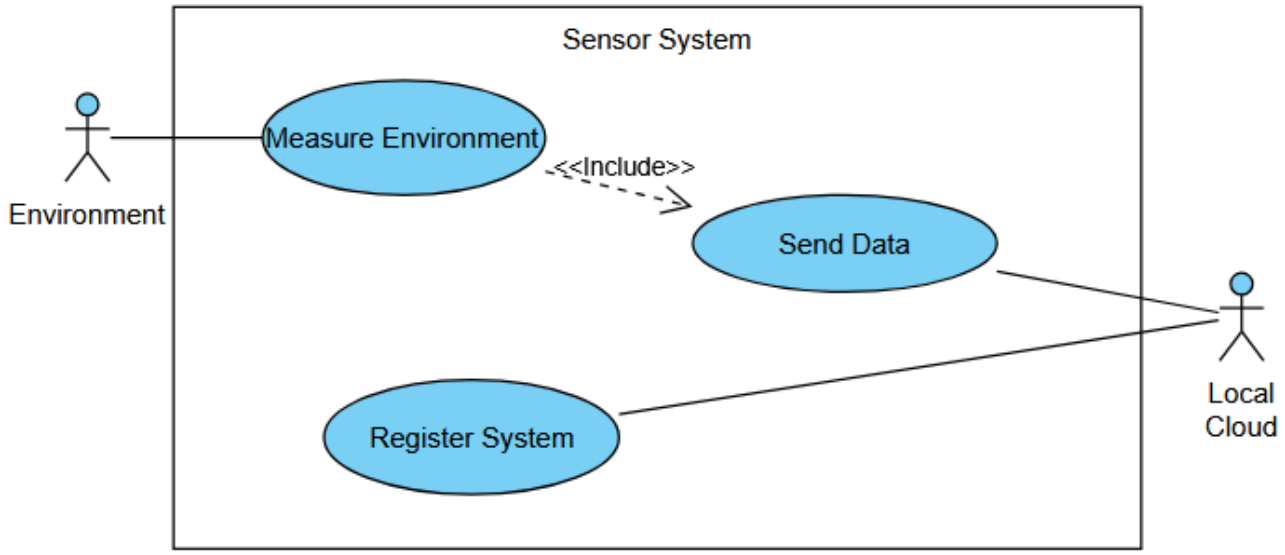

Figure 1 - Use Case Diagram of the Sensor System

The rest of this document is organized as follows. In Section 1.1, we reference major prior art capabilitites of the system. In Section 1.2, we the intended usage of the system. In Section 1.3, we describe fundmental properties provided by the system. In Section 1.4, we describe de-limitations of capabilitites ofn the system. In Section 2, we describe the abstract service functions consumed or produced by the system. In Section 3, we describe the security capabilitites of the system.

1.1 How This System Is Meant to Be Used

A *Sensor System* instance is to be deployed in a room of a smart home, to monitor environmental conditions. When motion level changes, the sensor sends the data through the service sendData. The data payload shall contain a timestamp, the device ID, and the light level and motion level detected.

Usage scenario :
- The light level is below the threshold
- A user enters the room : motion is detected and the service sendData is used
- *Light Controller System* decides to turn on the light

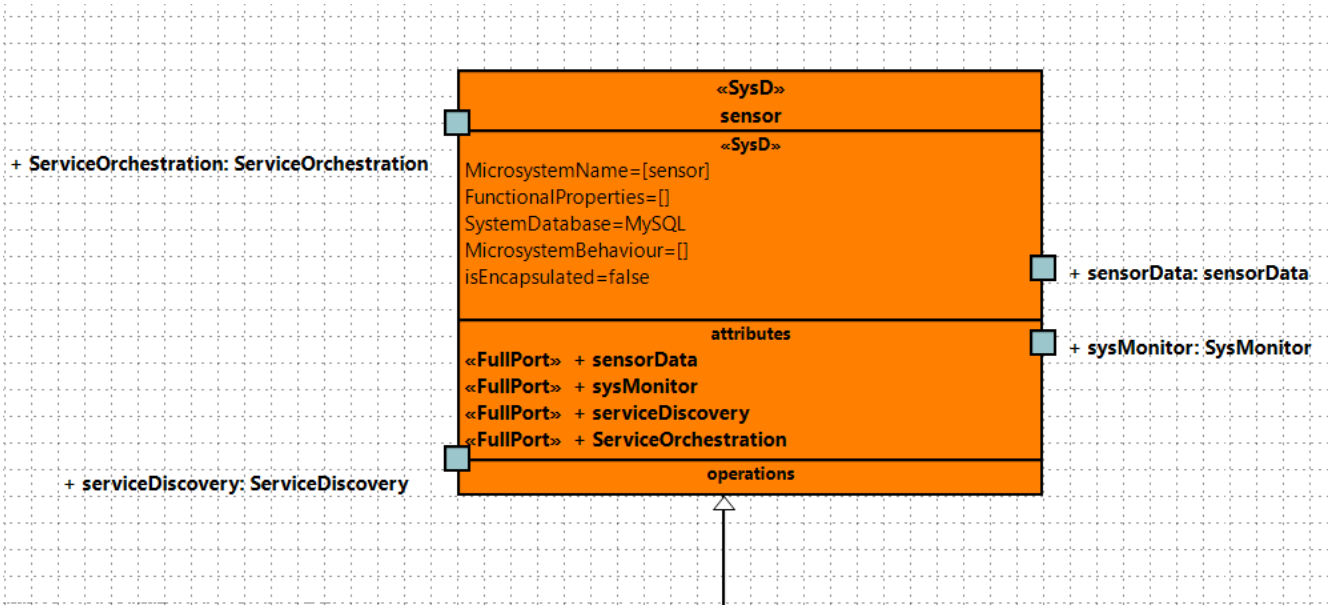

Figure 2 - Block Diagram of the sensor system (using Papyrus)

1.2 System functionalities and properties

1.2.1 Functional properties of the system

- Environmental Sensing :
  - The system shall measure the environment light level
  - The system shall detect the environment motion level
- Communication
  - The system shall combine both readings in a data payload
  - The system shall produce the sendData service

1.2.2 Data stored by the system

- Device ID
- Last reading levels of both motion and light values

1.2.3 Non functional properties

- Security :
  - The system shall protect the data obtained
- Energy consumption :
  - The system shall be event-based to minimize energy consumption

1.2.4 Stateful or stateless

The system shall be stateful and send data only when motion level changes.

1.3 Important Delimitations

- This system does not make lighting decisions or manage actuation
- This system does not perform a complex analysis of the data

2 Services

2.1 Produced service

Service Name : sensorData
Purpose : Provides motion and light data
Output fields : { timestamp, deviceID, lightLevel, motionState}
Frequency : Event-driven
SD Document : SD_sensorData

3 Security

The system operates within a Local Cloud and communicates directly with the Local Cloud core services.