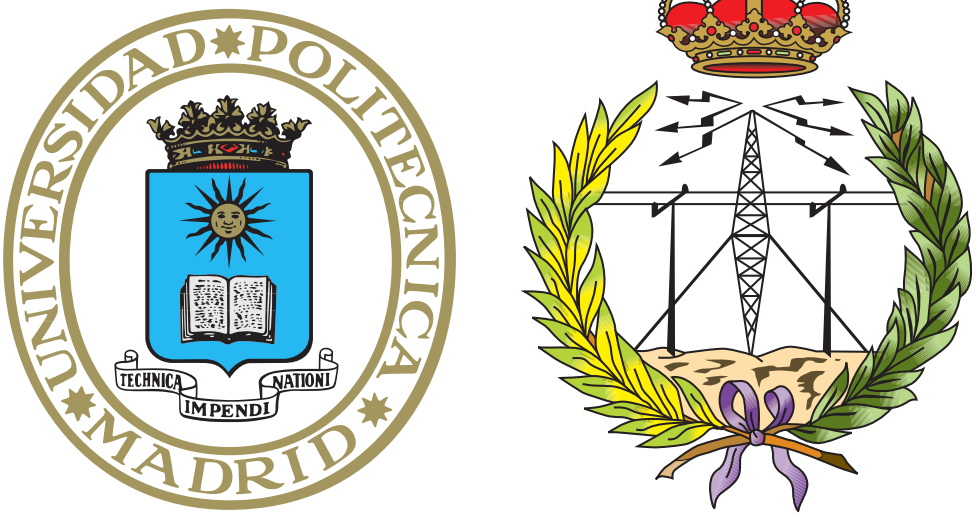
TECHNICAL UNIVERSITY OF MADRID
SCHOOL OF TELECOMMUNICATIONS SYSTEMS AND ENGINEERING

Semester Project



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Smart Lighting

UBIQUITOUS AND SECURE NETWORKS AND SERVICES

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Degree programme:	Master in Systems and Services Engineering for the Information society

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3.1 General use

Figure 3.1: General use

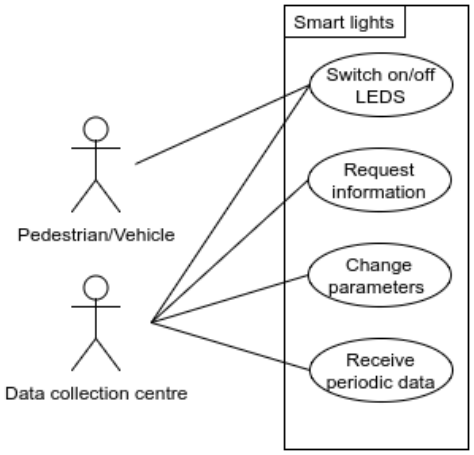

Table 3.1: General use

Scope and Objectives	The lights on the lampposts switch on/off depending on the information of the movement and light sensor of the motes (if the light is low and the movement sensor detects something, the lights turn on, otherwise they turn off). The data collection centre receives periodically this data and it is capable to change some parameters or request some information of the motes.
Actors	• Pedestrians/vehicles • Data control department of the city
Preconditions	• The sensor nodes are on • A pedestrian/vehicle comes/goes away from the node
Post-conditions	• The lights will turn on/off • All the measured information will be sent to the city data manager
Sequence Description	1. Obtain measurements of movement, temperature, humidity and light. 2. If there is a change in the movement sensor and the light measured is low, toggle the lights on the node. 3. Send the status of light to the data control department of the city.
Exceptions	The node is not able to communicate with the data control department of the city.

3.2 Receive Periodic Data

Figure 3.2: Receive Periodic Data

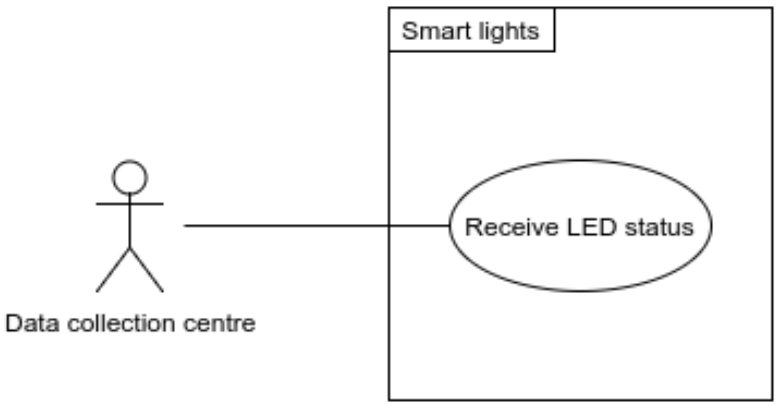

Table 3.2: Receive Periodic Data

Scope and Objectives	The motes are placed in the lampposts of the street getting information of the movement and the light. This information added to the LED status of the lamppost is sent to the data collection centre periodically.
Actors	Data control department of the city
Preconditions	• The sensor nodes are on • The sensor nodes have sufficient memory to store measured values when connection is off
Post-conditions	• The measured value is stored in memory • The measured value is sent to the data control department of the city
Sequence Description	1. Obtain measurement 2. Check the network 3. If network not available store data 4. Send all data to the data control department of the city
Exceptions	In case of error, report to the data control department of the city

3.3 Request data

Figure 3.3: Request Data

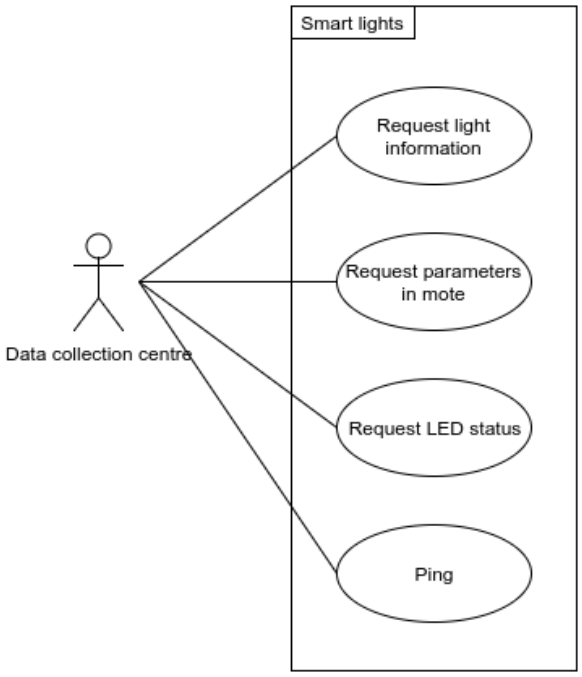

Table 3.3: Request Data

Scope and Objectives	The data collection centre have the possibility to request the information of the light and LED status of the motes and also the parameters that are using the motes. Furthermore, a ping functionality exists to check if the mote is alive.
Actors	Data control department of the city
Preconditions	• The sensor nodes are on • The sensor node is online to get the request
Post-conditions	The measured value and statuses are sent to the data control department of the city
Sequence Description	1. Check if node is online 2. If not then repeat x times 3. Request current data from node
Exceptions	The sensor node does not respond after x requests