Monitoring System Using BLE Mesh Network

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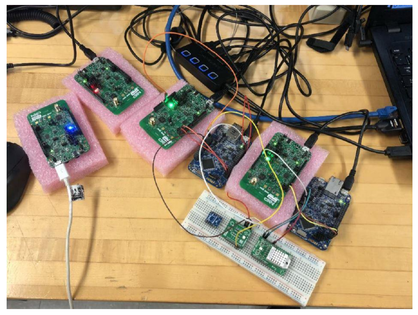
Introduction

BLE Mesh Networking to signal the presence of hazard at your home

- BLE mesh network which collects data from Light and Temperature sensors and updated to local server.
- Capacity to span very large physical areas and contain large number of devices.
- A self healing network with security.
- Useful for monitoring any environment and User friendly

Working setup

- FRDM K41Z as BLE nodes.
- FRDM K64F for collecting data from sensors.
- Voltmeter Click Module
- DC Power Supply
- Ambient light Click Module
- DHT22 Temperature Sensor)

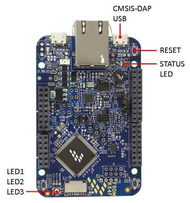


Implementation

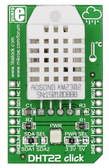
- For implementing we do the following steps:
- FRDM KW41Z development boards that include M0+ core microcontroller and BLE radio, are configured to act as Leaf nodes and Relay nodes to build the mesh network.
- The two sensors Temperature and Light are connected to FRDM K64 using I2C protocol and sensor data sent to KW41Z BLE Leaf node.
- The relay node retransmit the packet throughout the mesh to reach the destination node.
- The data from monitoring environment is displayed at the destination server.

Components of System

FRDM KW41Z



FRDM K64



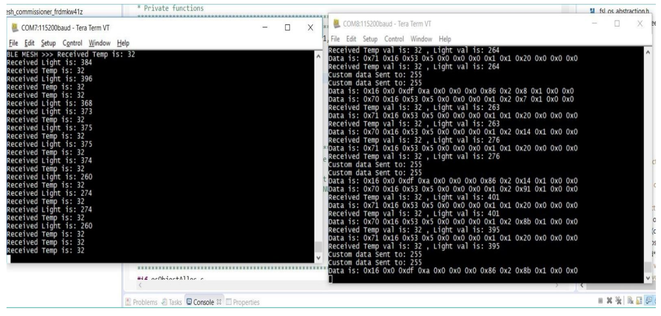
Temperature sensor

Ambient Light Sensor

Kinetis Design Studio

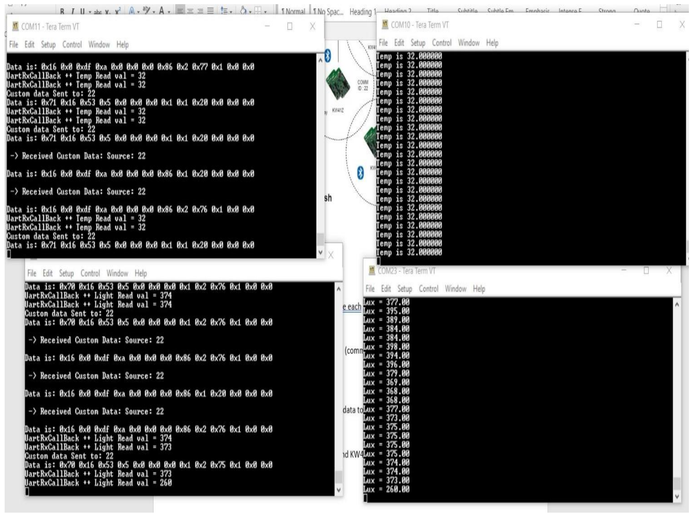
Mbed Compiler

Results



Measure of Temperature and Illuminance on Tera Term Terminal -1) Commissioner Node 2)Relay Node

Results



- Measure of Temperature and Illuminance on Tera Term Terminal 1) Leaf Nodes 2)Corresponding FRDMK64 of each Leaf Node

Conclusion & Discussion

- The BLE mesh network of MCU's was successfully created that collects the data from DHT and Ambient light sensors. The values from the DHT and ambient light sensors are sampled regularly and the same is updated to the Local Server. We could also set up communication between FRDM K64F and KW41Z successfully.

References

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