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| --- | --- |
|  |  |

WIRELESS COMMUNICATION INTERFACE SPECIFICATIONS:

1. 1. Range: at least 30m urban (non-line of sight).

(\*typical distance between a house and a detached garage in Regina, Saskatchewan)



1. Data Rate: Greater than 16Kbps (Data) (assuming 1KHz sample rate for Current Data)
2. Coexistence (interference immunity): Implement a scheme to prevent and /or recover from RF interference in the 2.4GHz band (e.g. FHSS, DSSS)

RANGE TESTING WITH XCTU:

DESCRIPTION:

Digi XCTU is a configuration and testing software that will be used to test the network performance under a variety of cases and scenarios.

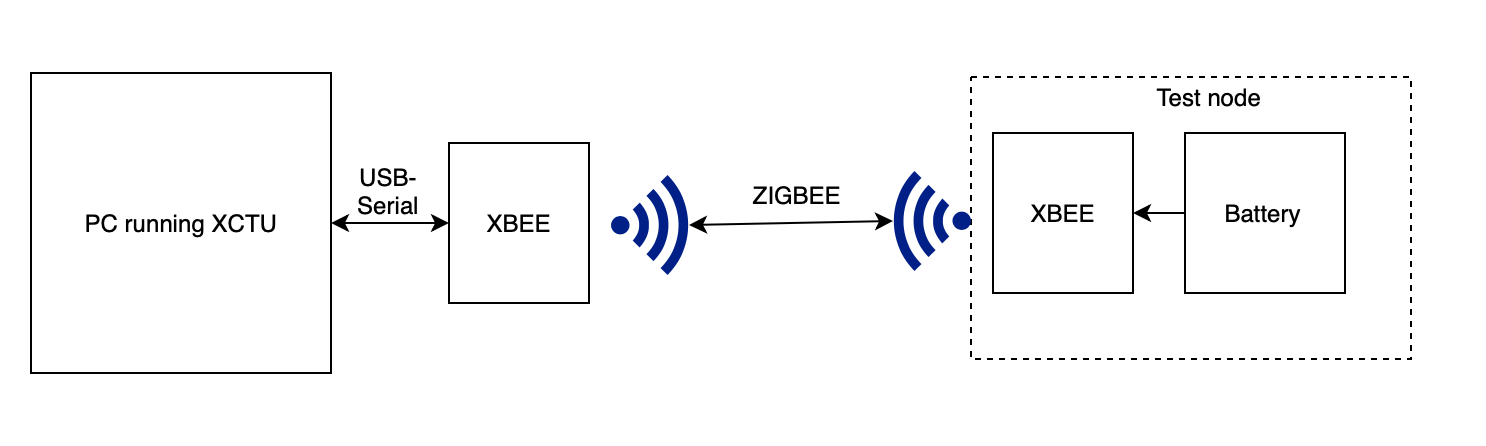
TEST REQUIREMENTS:

* PC with Xbee X-CTU
* 2x Xbee RF Nodes
* 1x USB to Serial Adaptor

INSTALL DIGI XCTU:

Digi XCTU can be downloaded and installed from <https://www.digi.com/products/iot-platform/xctu>

TEST SETUP:



TEST CASES:

Test Case 1:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Distance | Enclosure | Round Trip Time  (RTT) | Remote Power | Packets lost/Packets Sent  (Packet loss rate) |
| 10m | None |  |  |  |
| Plastic |  |  |  |
| Metal |  |  |  |
| 20m | None |  |  |  |
| Plastic |  |  |  |
| Metal |  |  |  |
| 30m | None |  |  |  |
| Plastic |  |  |  |
| Metal |  |  |  |

Test Case 2:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Distance | Scenario | Number of Walls/Floors | Round Trip Time (RTT) | Remote Power | Packets lost/Packets Sent |
| 10m | Through Walls |  |  |  |  |
| Between Floors |  |  |  |  |
| 20m | Through Walls |  |  |  |  |
| Between Floors |  |  |  |  |
| 30m | Through Walls |  |  |  |  |
| Between Floors |  |  |  |  |

INTEGRATION TESTING:

DESCRIPTION:

The aim of this test is to test the remote appliance switching and reading of current sensor simultaneously. A test program will run on the DEM and continuously send current readings to the CCU and also listen for switching commands. Another program will run on the CCU and will be responsible for displaying the received current readings and periodically send switching signals to the DEM. Both systems will have counters for indicating the number of transmitted and received packets to determine the throughput of the communications network in a variety of situations and a range of distances. For accuracy, the data received can be compared to measurements from an ammeter.

TEST REQUIREMENTS:

Hardware:

* CCU
* DEM prototype with subsystems (CT and switching Circuit)

Software:

* Commstest.py
* Commstestnode.c

TEST SETUP:

