Antenna. MiXiM does not support antenna modelling.

Interferences. We use Decider802154Narrow.

Radio propagation. We use Simple path loss model that calculates path loss and Log normal shadowing model that calculates deviations.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SimplePathlossModel.alpha</td>
<td>Path loss exponent</td>
<td>3.5</td>
</tr>
<tr>
<td>SimplePathlossModel.carrierFrequency</td>
<td>Carrier frequency</td>
<td>2.412e+9 Hz</td>
</tr>
<tr>
<td>LogNormalShadowing.mean</td>
<td>Mean attenuation</td>
<td>0.5 dB</td>
</tr>
<tr>
<td>LogNormalShadowing.stdDev</td>
<td>Standard deviation of the attenuation</td>
<td>0.25 dB</td>
</tr>
<tr>
<td>LogNormalShadowing.interval</td>
<td>Interval</td>
<td>0.001 s</td>
</tr>
<tr>
<td>connectionManager.sat</td>
<td>Minimum signal attenuation threshold</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Radio. We use model for CC2420 chip, module Nic802154_TI_CC2420.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decider802154Narrow.sfdLength</td>
<td>Length of Start Frame Delimiter</td>
<td>8</td>
</tr>
<tr>
<td>Decider802154Narrow.modulation</td>
<td>Modulation type</td>
<td>MSK</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.phy.thermalNoise</td>
<td>Strength of the thermal noise</td>
<td>-110 dBm</td>
</tr>
<tr>
<td>BasePhyLayer.sensitivity</td>
<td>Sensitivity of the physical layer</td>
<td>N/A</td>
</tr>
<tr>
<td>BasePhyLayer.maxTXPower</td>
<td>Maximum transimission power of the physical layer</td>
<td>N/A</td>
</tr>
<tr>
<td>BasePhyLayer.usePropagationDelay</td>
<td>Simulate transmission delay</td>
<td>true</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.phy.headerLength</td>
<td>Length of the phy header</td>
<td>48 bits</td>
</tr>
</tbody>
</table>
**MAC.** We use module **CSMA802154** (IEEE 802.15.4-2006 non-beacon enabled CSMA protocol) without MAC acknowledgements.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSMA802154.headerLength</td>
<td>MAC packet header length</td>
<td>72 bits</td>
</tr>
<tr>
<td>CSMA802154.queueLength</td>
<td>Size of the MAC queue</td>
<td>100</td>
</tr>
<tr>
<td>CSMA802154.bitrates</td>
<td>Bit rate</td>
<td>250000 bps</td>
</tr>
<tr>
<td>CSMA802154.ccaDetectionTime</td>
<td>Cca detection time</td>
<td>0.000128 s</td>
</tr>
<tr>
<td>CSMA802154.aTurnaroundTime</td>
<td>Time to switch radio from Rx to Tx state</td>
<td>0.000192 s</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.mac.rxSetupTime</td>
<td>Time to setup radio to reception state</td>
<td>0.001792 s</td>
</tr>
<tr>
<td>csma.txPower</td>
<td>Tx power</td>
<td>N/A</td>
</tr>
<tr>
<td>CSMA802154.macMaxCSMABackoffs</td>
<td>Maximum CSMA backoffs</td>
<td>5</td>
</tr>
<tr>
<td>CSMA802154.aUnitBackoffPeriod</td>
<td>Base unit for all backoff calculations</td>
<td>0.00032 s</td>
</tr>
<tr>
<td>CSMA802154.backoffMethod</td>
<td>Backoff method</td>
<td>exponential</td>
</tr>
<tr>
<td>CSMA802154.macMinBE</td>
<td>Minimum backoff exponent</td>
<td>3</td>
</tr>
<tr>
<td>CSMA802154.macMaxBE</td>
<td>Maximum backoff exponent</td>
<td>8</td>
</tr>
<tr>
<td>csma.contentionWindow</td>
<td>Number of backoff periods of the initial contention window</td>
<td>2</td>
</tr>
</tbody>
</table>

**Network.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BaseNetwLayer.headerLength</td>
<td>Length of the network packet header</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Application.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BasicApplication.packetSize</td>
<td>Length of the application packet</td>
<td>N/A</td>
</tr>
</tbody>
</table>
**Energy consumption.** MiXiM supports a *linear model*. Model for CC2420 chip is defined in module Nic802154_TI_CC2420.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nic802154_TI_CC2420.rxCurrent</td>
<td>Rx current</td>
<td>18.8 mA</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.txCurrent</td>
<td>Tx current</td>
<td>17.4 mA</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.sleepCurrent</td>
<td>Sleep current</td>
<td>0.000021 mW</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.setupRxCurrent</td>
<td>Setup Rx current</td>
<td>0.6391 mA</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.setupTxCurrent</td>
<td>Setup Tx current</td>
<td>0.6845 mA</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.rxTxCurrent</td>
<td>Rx → Tx current</td>
<td>18.8 mA</td>
</tr>
<tr>
<td>Nic802154_TI_CC2420.txRxCurrent</td>
<td>Tx → Rx current</td>
<td>18.8 mA</td>
</tr>
</tbody>
</table>

**Battery.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SimpleBattery.nominal</td>
<td>Nominal battery capacity</td>
<td>N/A</td>
</tr>
<tr>
<td>SimpleBattery.capacity</td>
<td>Battery capacity</td>
<td>N/A</td>
</tr>
<tr>
<td>SimpleBattery.voltage</td>
<td>Nominal voltage</td>
<td>N/A</td>
</tr>
<tr>
<td>SimpleBattery.resolution</td>
<td>Capacity is updated at least every resolution time</td>
<td>N/A</td>
</tr>
</tbody>
</table>