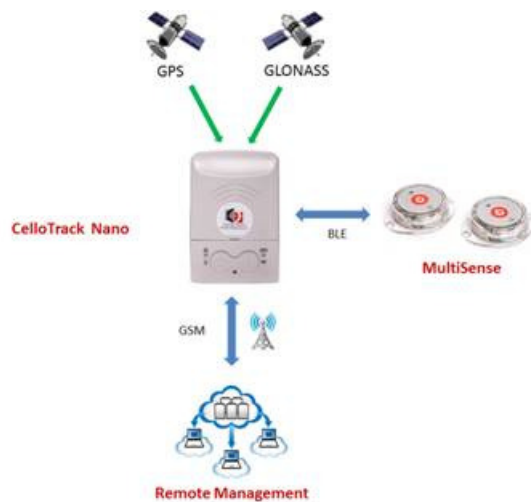System overview:

The MultiSense is a BLE (Bluetooth smart) wireless sensor network (WSN) device, based on CSR chip CSR1010 that transmits according to the following BLE Transmission policy:

- All the MultiSense units related to a nano system has the same configuration of the following timers:
    1. Relaxed (R) – parameter in PL: "Active sensors sampling relaxed timer". Used when the temperature and humidity are within their (configurable) limits.
    2. Violation(V) - parameter in PL: "Active sensors sampling violating timer". Used when the temperature and humidity are out of their (configurable) limits.
    3. Proximity(P) - parameter in PL: "Proximity & keep-alive transmission timer". Used all the time independently from the previous ones.
- If "TX on violations only" mode is enabled (configurable per MultiSense), the R timer shall be used for determine sensors sampling rate only (without transmission), but the V (when violation occurs) and P shall be working normally.
- Besides that, there are few asynchronous events that will cause a single transmission:
    1. Pressing the button.
    2. Impact or free-fall event generated by the accelerometer (crossing a pre-configured threshold).
    3. Sensing a change in the magnetic field (opening/closing of a door or window, that the permanent magnet is installed on).
    4. Crossing the light threshold to either direction (darkness ←→ light).

When the Nano (the hub) which comprises the same transceiver of CSR 1010, receives the advertisement it connects to the MultiSense using generic GATT profile, read the sensors readings and configure it.
The data passed is temperature, relative humidity, light level, 3D accelerometer XYZ readings, magnet sensor state, battery level and RSSI level.
Both transceivers (in the Nano and MultiSense) use an irreplaceable SMT chip antenna with not more than 2dBi gain.