



## DESCRIPTION

For a large spectrum of applications, including many Internet of Things (IOT) applications, knowledge of the position of the object can be useful or in some cases absolutely necessary for the service provided. In these cases GPS is rarely available since the cost, size and energy requirements are not compatible with IOT. This is even more the case for indoor applications, where there is no GPS signal; applications such as the location of valuable assets in buildings and warehouses.

To address these requirements CSEM has developed a tool-box of GPS-free wireless localisation technologies which may be adapted to specific use-cases, indoors or outdoors. Ranging, or distance, data can be acquired via Received Signal Strength Indication (RSSI), Signal to Noise Ratio (SNR), Time-of-Flight (ToF), etc, and applied to different networks including Bluetooth, WiFi, LTE-M, and LoRa. In many cases an existing network can be used requiring no further investment in infrastructure.

## FUNCTIONALITIES & CHARACTERISTICS:

- Localization of any objects communicating wirelessly provided an adequate infrastructure
- Tracking devices without modifying the infrastructure
- Integration with any type of radio capable of generating RSSI, SNR, ToF, etc.
- Compatible with LoRa® / LTE-M / NB-IoT / WiFi / BT/ UWB / RFID or customised hardware
- Easy port to handheld and servers devices
- Early data fusion to integrate obvious data rejection (Map Matching ...)

## EXAMPLE OF APPLICATIONS

- Pet/Persons-tracking, asset tracking, Smart Cities scenarios, safety ,Logistics, Security, Occupancy detection

## UNIQUENESS

CSEM's extensive experience with different wireless technologies and with ultra-low power RF-based localisation allows for the adaptation of an effective GPS-free localisation solution to your application needs. In addition, the combination of smart signal processing, data fusion and machine learning allows for filtering the received data streams to retain only the high quality data, thus increasing the accuracy of the estimated location. With experience gained from numerous real-world deployments and close collaboration with technology leaders such as Semtech (LoRa) and 3dB (UWB), CSEM is a recognised leader in GPS-free localisation.