

# A NODE LOCALIZATION SCHEME FOR ZIGBEE-BASED SENSOR NETWORKS FOR VEHICLE TRACKING

*Abstract—*

The localization problem consists in estimating the position of the nodes within the network. This is a crucial issue for location-dependant applications. This project presents an implementation of a localization scheme based only on the received signal strength (SS) in a Zigbee-based sensor network. This is done by taking advantage of the inherent radio communication capability present in each node. The algorithm is intended for an outdoor environment. It is based in a model, which infers distance between neighboring nodes using the SS. A coordinate system is then derived employing a multidimensional scaling (MDS) technique. The signal power level variability due to ground reflection is approached using Lloyd Effect (from optics) and incorporated in the model.

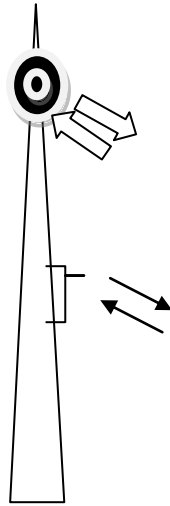
This project aims at designing utilizing this technology tracking system for vehicles such that the position of the vehicle is detected without using GPS by utilizing Zigbee and GSM communication. In this project the tracking is done depending on the feedback signal provided by the Zigbee communication, which is the core part of this project.

The proposed technique is intended as a solution in those applicative scenarios where the GPS system fails to work to intimate the status of the vehicle to the customer when the customer is outside. So here this project is stands for tracking system for vehicles such that the position of the vehicle is detected without using GPS by utilizing Zigbee and GSM communication and to give status of the vehicle whenever the owner needs, whether outside or inside. This project can also utilize for police for tracking a particular vehicle which is hijacked or else other reasons. You can see in **figure 1** how this is project is tracking the vehicle, tracking is done by density of the RF signal is traced. So here in figure 1 the RF signal density of GSM tower station 1 will be higher than tower 2 and 3. So the ID of the TOWER 1 will be received by the vehicle and the ID is send to the office through GSM communication. Like this the tracking is done.

Here the authorized person can monitor the vehicle where it is by just sending a request from his mobile by sms and the reply status is given by the vehicle where the vehicle is located.

**Figure1:**

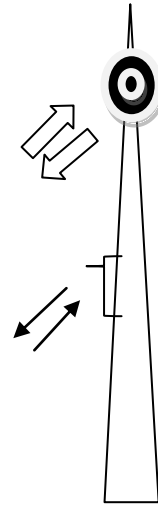
GSM Tower Station 2:



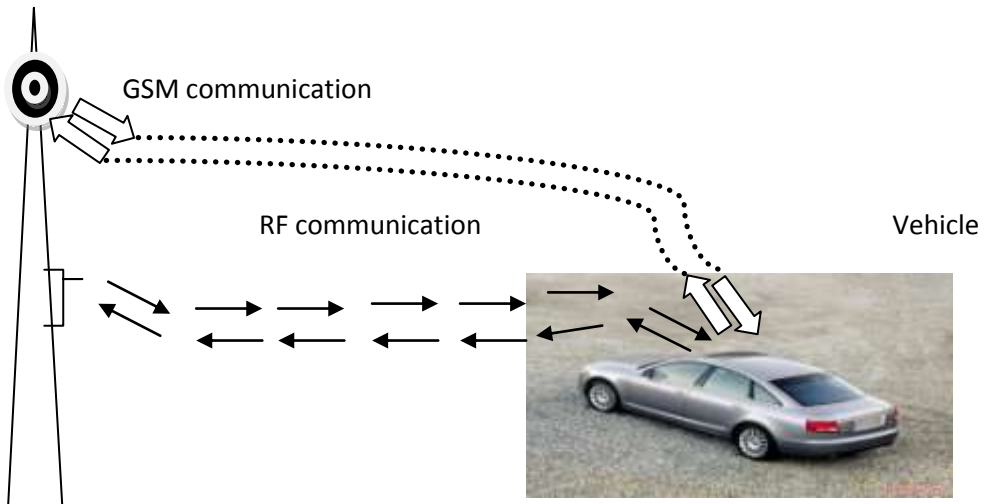
GSM communication

RF communication

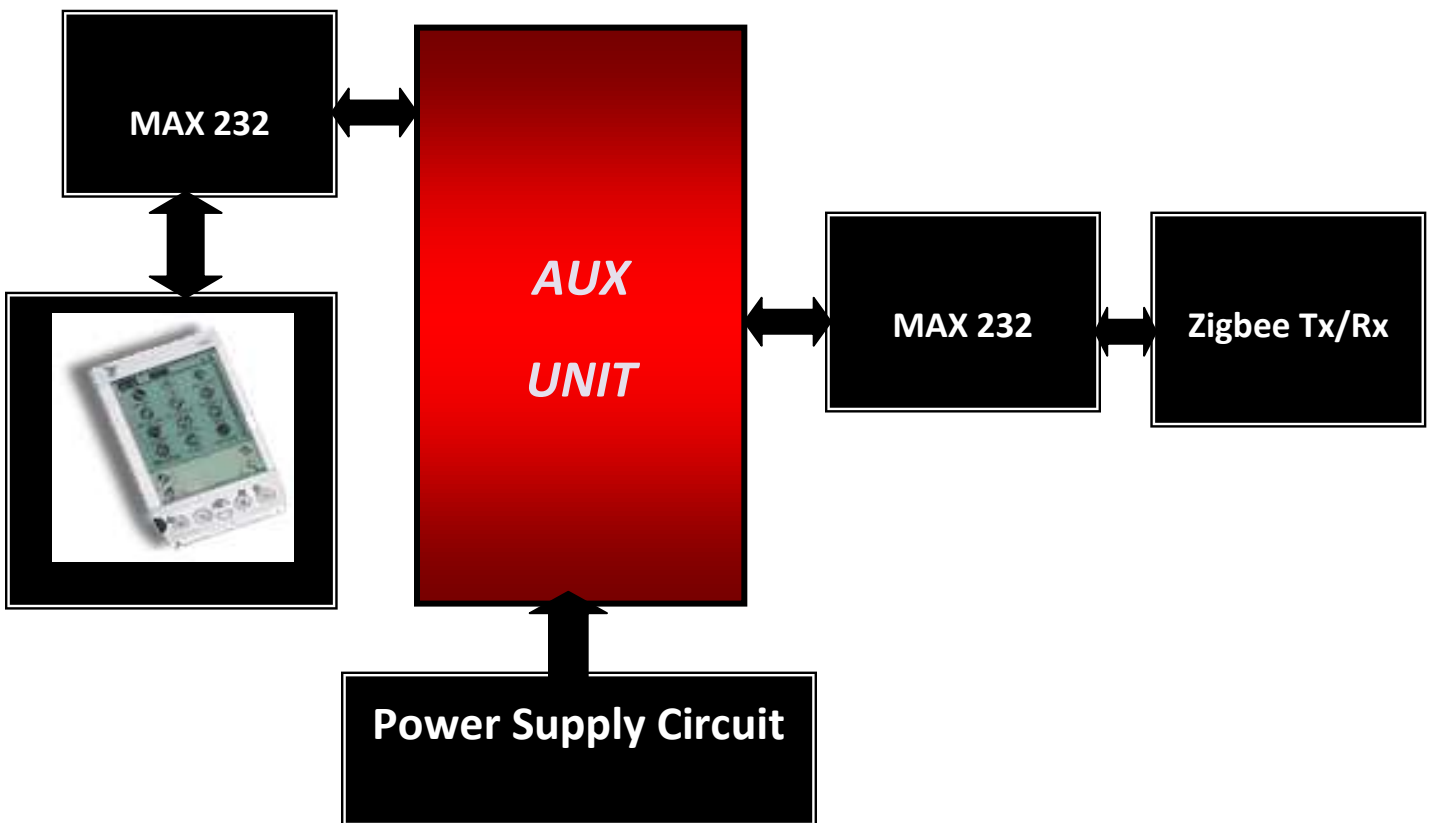
GSM Tower Station 3:



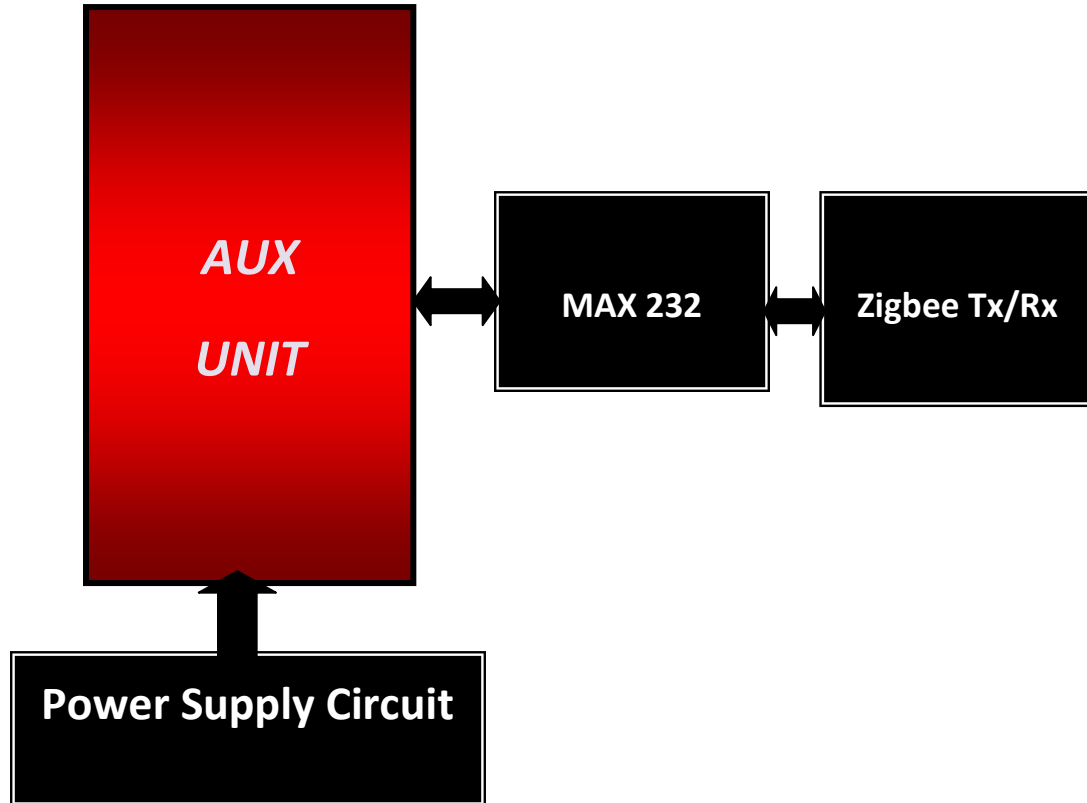
GSM Tower Station 1:



## Vehicle Unit



## Tower 1



## Tower 2

