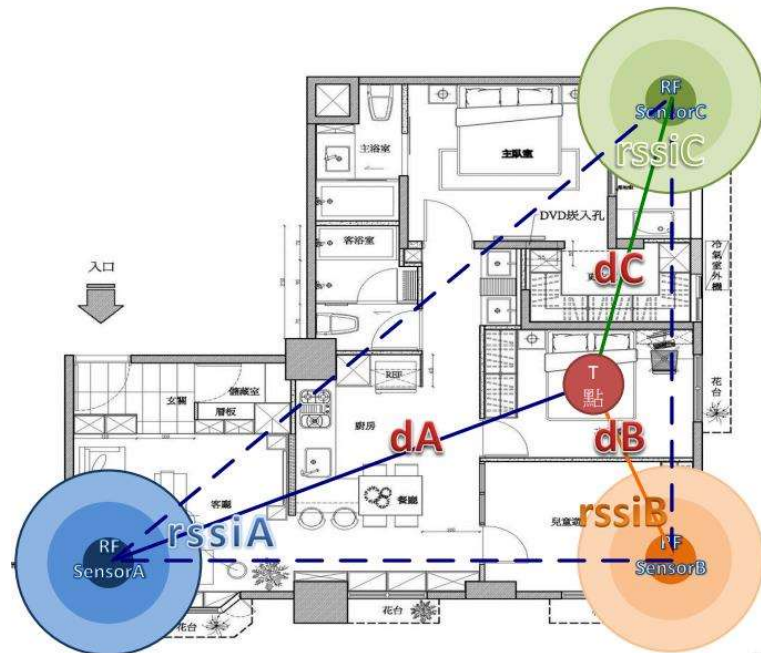


#### (4) RF Indoor Localization Engine

##### 甲、摘要

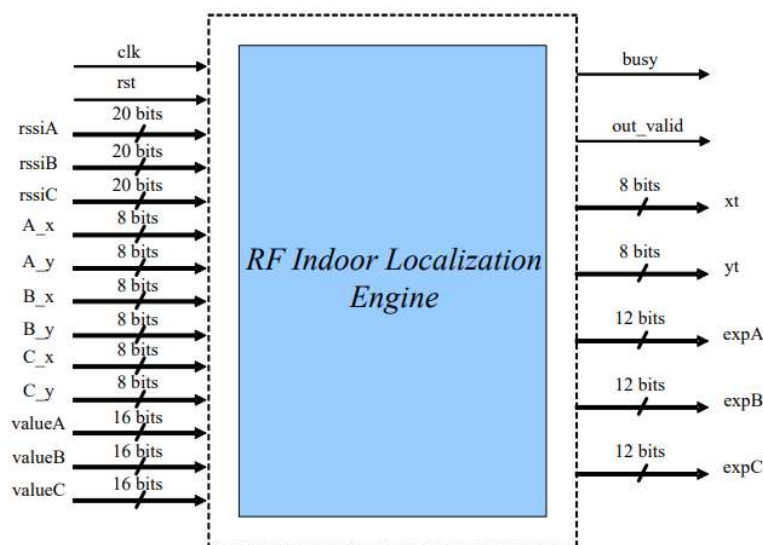
利用固定三點 Sensor 輸出的訊號強度 RSSI 來定位。



圖一、設計原理

##### 乙、想法

利用 RSSI 值來計算距離遠近  $d = 10^{((\text{abs}(\text{RSSI}) - \alpha) / (10 * n))}$ ，再利用三距離的勾股定理求出 T 點，其中指數運算是利用查表所得。由於比賽結果是要比 power，所以有利用 clock gating 及用 register 減短 combinational path 來使 power 降低。



圖二、系統方塊圖

### 丙、結果

```
T71: your xt=16 yt=0c = expect xt=16 yt=0d => difference= 1 => PASS
T72: your xt=36 yt=23 = expect xt=37 yt=23 => difference= 1 => PASS
T73: your xt=34 yt=26 = expect xt=34 yt=27 => difference= 1 => PASS
T74: your xt=0d yt=06 = expect xt=0d yt=07 => difference= 1 => PASS
T75: your xt=37 yt=19 = expect xt=37 yt=19 => difference= 1 => PASS
T76: your xt=10 yt=06 = expect xt=10 yt=07 => difference= 1 => PASS
T77: your xt=25 yt=18 = expect xt=25 yt=19 => difference= 1 => PASS
T78: your xt=21 yt=13 = expect xt=22 yt=13 => difference= 1 => PASS
T79: your xt=31 yt=15 = expect xt=31 yt=15 => difference= 0 => PASS
T80: your xt=1f yt=10 = expect xt=1f yt=11 => difference= 1 => PASS
T81: your xt=22 yt=21 = expect xt=22 yt=21 => difference= 0 => PASS
T82: your xt=12 yt=11 = expect xt=13 yt=11 => difference= 1 => PASS
T83: your xt=2e yt=1c = expect xt=2e yt=1d => difference= 1 => PASS
T84: your xt=0f yt=0e = expect xt=10 yt=0f => difference= 2 => PASS
T85: your xt=24 yt=0f = expect xt=25 yt=0f => difference= 1 => PASS
T86: your xt=30 yt=10 = expect xt=31 yt=11 => difference= 2 => PASS
T87: your xt=34 yt=1e = expect xt=34 yt=1f => difference= 1 => PASS
T88: your xt=37 yt=16 = expect xt=37 yt=17 => difference= 1 => PASS
T89: your xt=22 yt=09 = expect xt=22 yt=09 => difference= 0 => PASS
T90: your xt=34 yt=2b = expect xt=34 yt=2b => difference= 0 => PASS
T91: your xt=36 yt=21 = expect xt=37 yt=21 => difference= 1 => PASS
T92: your xt=16 yt=0e = expect xt=16 yt=0f => difference= 1 => PASS
T93: your xt=30 yt=17 = expect xt=31 yt=17 => difference= 1 => PASS
T94: your xt=2e yt=19 = expect xt=2e yt=19 => difference= 0 => PASS
T95: your xt=16 yt=12 = expect xt=16 yt=13 => difference= 1 => PASS
T96: your xt=18 yt=11 = expect xt=19 yt=11 => difference= 1 => PASS
T97: your xt=36 yt=2b = expect xt=37 yt=2b => difference= 1 => PASS
T98: your xt=2b yt=09 = expect xt=2b yt=09 => difference= 0 => PASS
T99: your xt=36 yt=2f = expect xt=37 yt=2f => difference= 1 => PASS

Send RSSI & Compare Over!
-----

-----

Congratulations! All data have been generated successfully!

-----PASS-----

Simulation complete via $finish(1) at time 61060 NS + 0
./testfixture.v:183          #(`CYCLE/2); $finish;
exit 0
```

圖三、驗證結果正確且達 Rank A