

RADAR

Module Radar

60GHz AoPCB mmWave Industrial Radar on Module
User Guide



Driver:

https://www.silabs.com/documents/public/software/CP210x_Windows_Drivers.zip

Package:

https://dev.ti.com/tirex/explore/node?node=AJoMGA2ID9pCPWEKPi16wg_VLyFKFf_LATEST

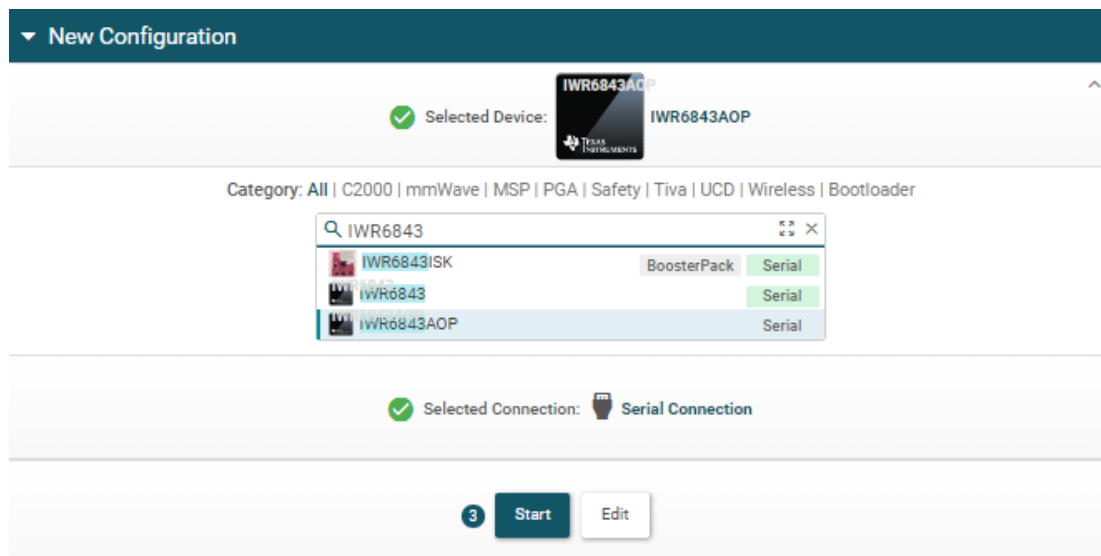
Firmware

Used package: Parking Garage Occupancy Sensor (it returns pos X, pos Y, vel X, vel Y, acc X, acc Y, pos Z, vel Z, acc Z)

Step-to-step to load Firmware to module (tool: Uniflash, you can download offline or use the cloud version):

In terms of cloud version (<https://dev.ti.com/uniflash/#!/>):

- Configuration -> START



- Choose file .bin in the package -> LOAD -> Load firmware successfully

 **Program to read data and display on GUI (source on GITHUB)**

Run on linux

READ DATA NODE (TTC Algorithm): *roscore -> rosrund aev_pkg ttcRadar*

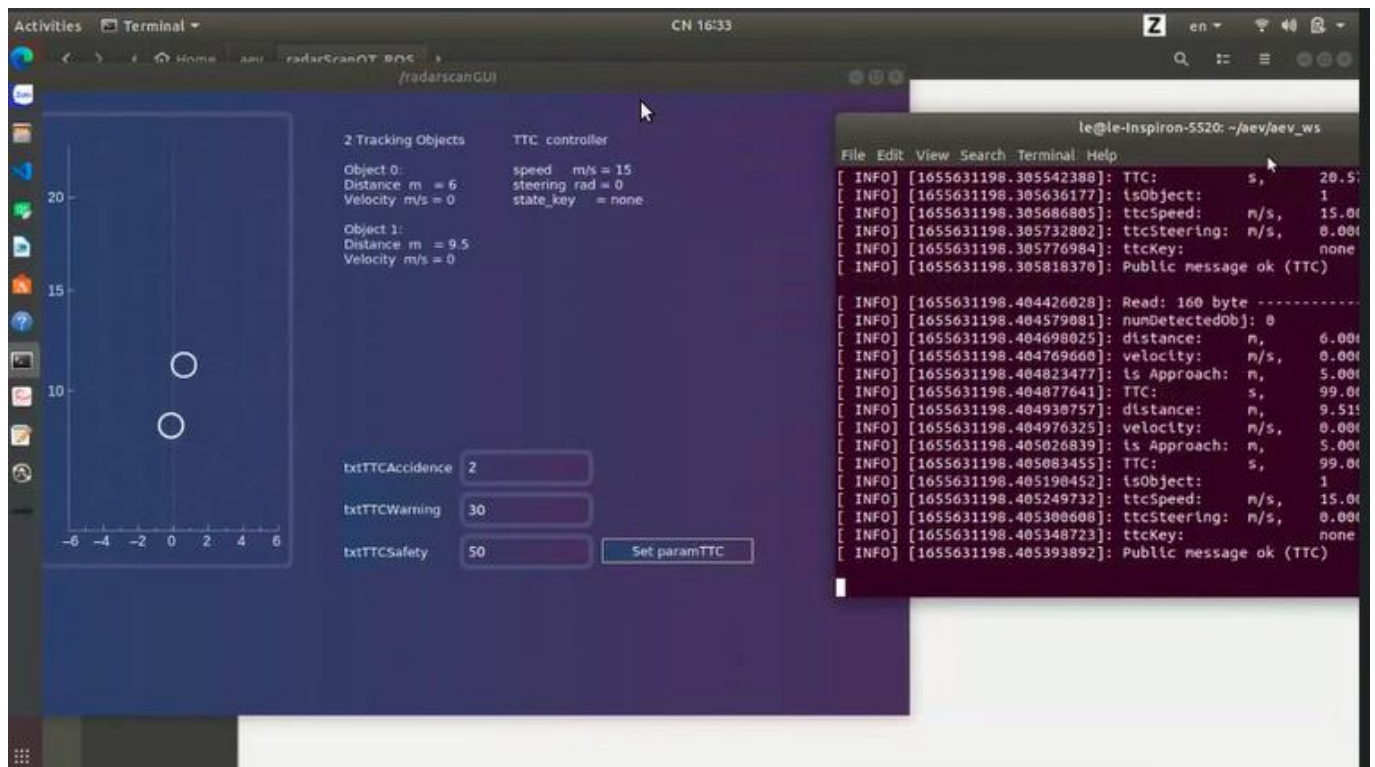
```
[ INFO] [1655634329.485243012]: Read: 64 byte -----,
2 1 4 3 6 5 8 7 4 0 5 3 64 0 0 0 67 104 10 0 162 1 0 0 159 115 44 158 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 [ INFO] [1655634329.485330395]: numDetectedObj: 0
[ INFO] [1655634329.485385961]: 55
[ INFO] [1655634329.485444288]: lsObject: 0
[ INFO] [1655634329.485515130]: ttcSpeed: n/s, 15.000000
[ INFO] [1655634329.485558777]: ttcSteering: n/s, 0.000000
[ INFO] [1655634329.485588140]: ttcKey: t
[ INFO] [1655634329.485604893]: Public message ok (TTC)

[ INFO] [1655634329.585210339]: Read: 128 byte -----,
2 1 4 3 6 5 8 7 4 0 5 3 128 0 0 0 67 104 10 0 163 1 0 0 207 161 93 159 0 0 0 3 0 0 0 0 0 0 0 2 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 32
0 0 0 243 104 217 191 96 247 160 64 209 23 182 63 0 0 0 44 21 147 63 185 244 45 65 44 21 147 63 0 0 0 9 0 0 0 8 0 0 0 46 223
0 0 172 253 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 [ INFO] [1655634329.585387679]: numDetectedObj: 0
[ INFO] [1655634329.585476228]: 56
[ INFO] [1655634329.585582374]: lsObject: 0
[ INFO] [1655634329.585748255]: ttcSpeed: n/s, 15.000000
[ INFO] [1655634329.585853495]: ttcSteering: n/s, 0.000000
[ INFO] [1655634329.585910630]: ttcKey: t
[ INFO] [1655634329.586006539]: Public message ok (TTC)
```

Base on the values returned, TTC Algorithm calculates and processes. Finally, TTC gives 5 information:

- isObject
- ttcSpeed
- ttcSteering
- ttcKey
- Message public OK

Display on GUI: `roscore -> rosrund radarscan_pkg radarscangui`



Tracking objects panel

- There are 2 objects tracked by Radar
- Distance: The distance between object and car
- Velocity: The velocity of object

TTC Controller panel

- Speed: The speed of car
- Steering_rad: The current degree of steering and adjust to MPC to avoid obstacles when radar finds obstacles that are close to car
- State key: **i**: safety, no action; **none**: adjust steering rad

ParamTTC setting panel

- txtTTCAccidence: highly likely to happen collisions
- txtTTCWarning: likely to happen collisions
- txtTTCSafety: no collisions