



Getting Started Guide

mmWave LAB Object Data Over CAN

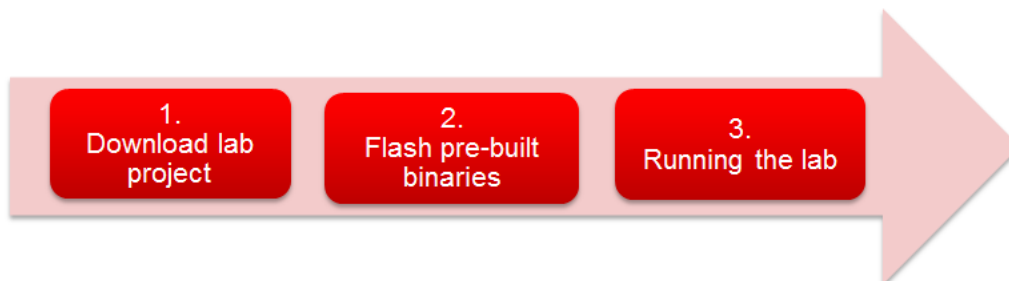
Overview

- This lab exercise demonstrates the ability of AWR-1642 TI-mmWave sensor to estimate and track the position (in the azimuthal plane) , the velocity of objects and sends the detections over CAN interface.
- The mmWave sensor AWR1642BOOST ES 2.0 is used for lab demonstration

Required Hardware


- AWR1642BOOST ES 2.0
- CAN adapter such as [PCAN-USBFD](#) to receive data on PC.
- Simple CAN BUS circuit board to connect multiple CAN lines on same bus.
- 5v/>2.5A Power Supply for AWR1642BOOST ES 2.0
 - <https://www.digikey.com/product-detail/en/cuiinc/SMI36-5-V-P5/102-3589-ND/5415060>

Getting Started



Step 1: Download the Lab Project

- The mmWave Lab projects are available as part of the TI CLOUD TOOLS under **Resource Explorer**

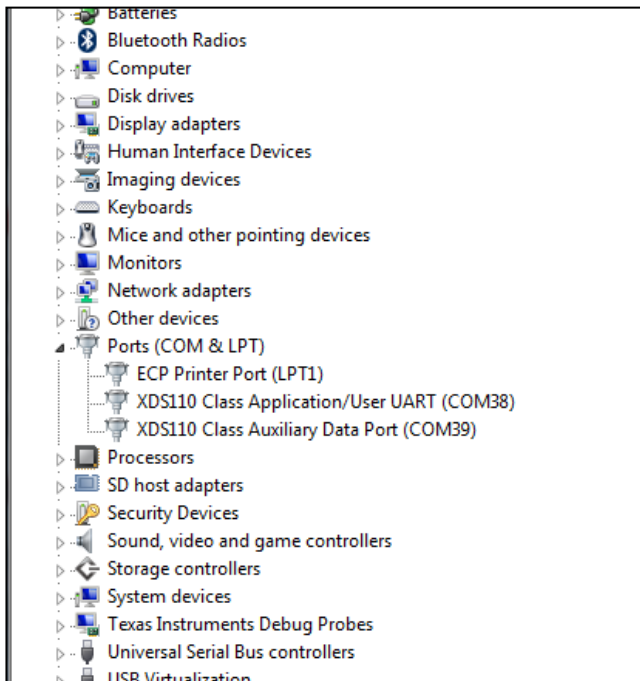
- Open the following page: <https://dev.ti.com/> and select **Resource Explorer**
- In the Resource Explorer Window, select **Software ► mmWave Sensors ► Automotive Toolbox**
- Click the Download button  in the window that opens on the right side
- Download and install the Automotive Toolbox zip file
- The pre-built binaries are located in the folder:
 - `\labs\ lab0005-Object-Data-Over-CAN\odoc_target\pre-built-Binaries\AWR1642BOOST\xwr16xx_odoc_ti_design_lab.bin`

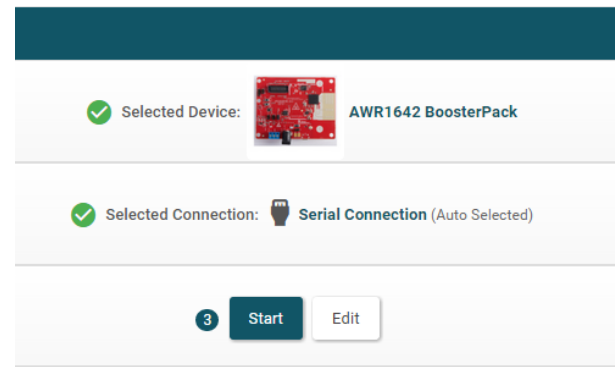
Step 2a: Flash Lab Binaries on AWR1642BOOST

- Power on the EVM using a 5V/2.5A power supply.
- Connect the EVM to your PC and check the COM ports in Windows Device Manager
- The EVM exports two virtual COM ports as shown below:
- XDS110 Class Application/User UART (COM_{UART}):
- Used for passing configuration data and firmware to the EVM
- XDS110 Class Auxiliary Data Port (COM_{AUX})
- Used to send processed radar data output
- Note the COM_{UART} and COM_{AUX} port numbers, as they will be used later for flashing and running the Lab.

COM_{UART}: COM38 **COM_{AUX}:** COM39

- The actual port numbers on your machine may be different
- Put the EVM in flashing mode by connecting jumpers on SOP0 and SOP2 as shown in the image.
- Open the **UniFlash** tool
- Download from TI.com/tool/uniflash
- In the **New Configuration** section, locate and select the appropriate device AWR1642BOOST
- Click **Start** to proceed

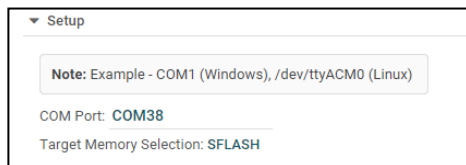




- In the **Program** tab, browse and locate demo binary file shown in Step 1



- In the **Settings & Utilities** tab, fill the **COM Port** text box with the Application/User UART COM port number (**COM_{UART}**) noted earlier

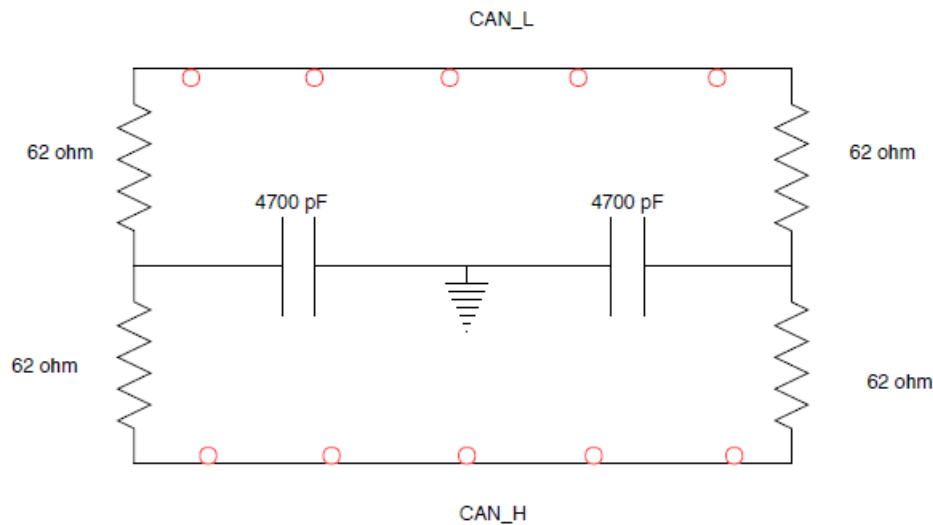


- Return to the **Program** tab, power cycle the device and click on **Load Images**
- When the flash procedure completes, UniFlash's console should indicate: [SUCCESS] Program Load completed successfully
- Power off the board and remove the jumper from only header **SOP2** (this puts the board back in functional mode)

Step 3: Run the Lab

- Install [XDS Emulation Package](#) on the PC host if needed from the following
 - http://processors.wiki.ti.com/index.php/XDS_Emulation_Software_Package.
- If CCS is installed on the PC host, the XDS Emulation package has already been installed during the CCS installation process.

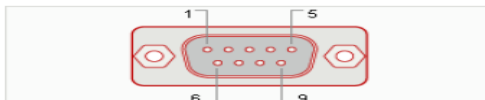
- Execute the Demo GUI located in:
 - `\\labs\lab0005-Object-Data-Over-CAN\odoc-host\gui\gui_exe\MMWAVECANVISUALIZER.exe`
 - [The executable provided only works in a Windows operating system](#)
- CANBUS circuit



- Connect the CAN lines on the AWR1642BOOST to the CANBUS circuit.
- Connect the PCAN-USBFID CAN lines to the CANBUS circuit

Pin assignment on the PCAN-USBFID.

Pin assignment D-Sub



Pin	Pin assignment
1	not connected / optional +5V
2	CAN-L
3	GND
4	not connected
5	not connected
6	GND
7	CAN-H
8	not connected
9	not connected

Note: The AWR1642BOOST has only 1 CANFD so there is no need to use the CANBUS circuit. The CAN lines can be connected directly to PCAN-USBFID . If there are multiple AWR1642BOOST then use the CANBUS circuit.

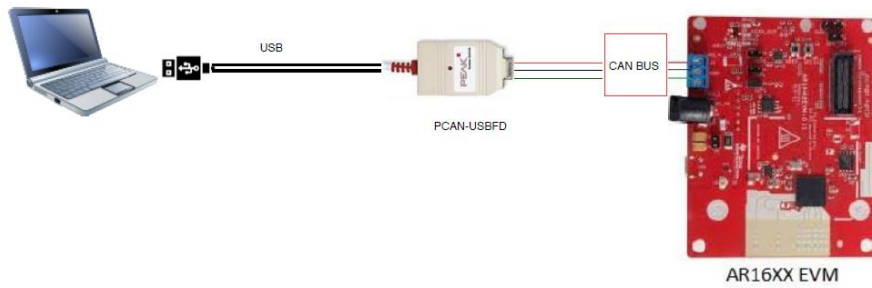


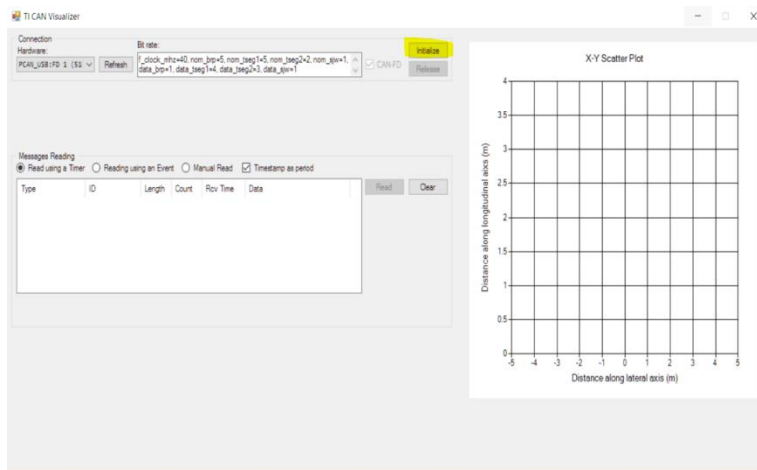
Figure 1 AWR1642BOOST CAN Connection

- Check that PCAN-USBFD is connected to the PC host running the application.
- Open the MMWAVECANVisualizer.exe

Note: MMWAVECANVisualizer.exe is developed based on the SDK([pcan-basic.zip](#)) from Peak-System for the PCAN-USBFD



- Initialize the PCAN-USBFD



- Turn ON the AWR1642BOOST that is flashed with the image. The point cloud should be seen on the X-Y scatter plot. CAN messages are seen in the “Messages Reading” Window.

