

# HW Trigger Using 1642 Radar

## Hardware Requirements

1. [DCA1000EVM](#) with modifications
2. xWR1642BOOST
3. Microcontroller to send HW trigger pulses

## Software Requirements

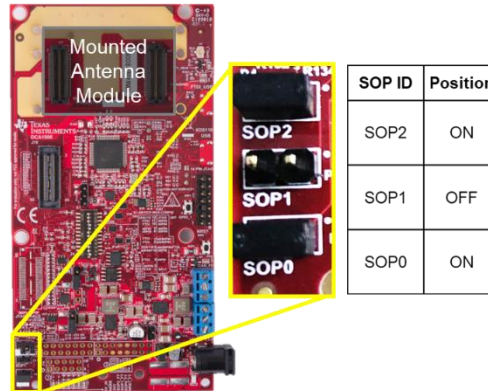
1. [TI mmWave SDK 3.5.0.4](#)
2. [TI Uniflash](#)
3. [TI mmWave Studio 2.1.1.0](#)
4. Josiah's single or dual radar GUI
  - a. Requires MATLAB

## Hardware Set Up

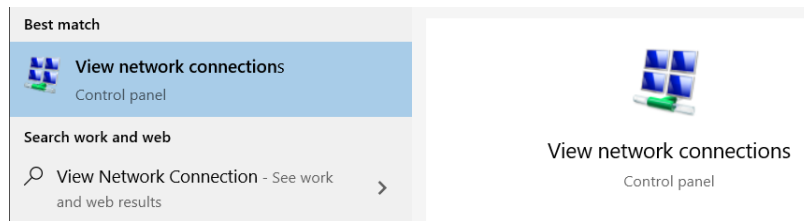
1. DCA1000EVM
  - a. Remove R120
    - i. Suggested [here](#)
  - b. Connect to the xWR1642Boost with 60 pin connector as shown on page 16 [here](#)
  - c. Connect to the PC over USB on the RADAR\_FTDI/J1 connector and over Ethernet
  - d. Connect 5V/3A power
2. xWR1642Boost
  - a. Connect to microcontroller (MCU)
    - i. From [Josiah's E2E post](#):
      1. For IWR1642Boost, on page 10 of PROC049B(002)\_Sch.pdf, AR\_SYNC\_IN is pin 9 of J6 (**IMPORTANT**)
      2. For AWR1642Boost, On page 10 of PROC011C(002)\_Sch.pdf, AR\_SYNC\_IN is pin 9 of J6 (**IMPORTANT**)
      3. For newest revisions, the R165 resistor is already shorted, enabling the HW trigger input
      4. Ground is pin 4 of J6 or pin 2 of J5
  - b. Connect to the PC over USB
  - c. Connect 5V/3A power

## Software Set Up

1. Flash the SDK demo to the xWR1642Boost (See [SDK 3.5.0.4 User Guide](#) section 4.2)
  - a. Set the device to Flash Programming Mode by bridging SOP0 and SOP2. Similar bridging is shown on the MMWAVEICBOOST in step 5 [here](#) and below



- b. Power cycle the xWR1642Boost
  - c. Once the device is properly connected to the PC, download the demo firmware using Unifash
    - i. Typically under the path:  
 "C:\ti\mmwave\_sdk\_03\_05\_00\_04\packages\ti\demo\xwr16xx\mmw"
  - d. Once the download is complete, set the device to Functional Mode by bridging only SOP0 and remove the bridge on SOP2
  - e. Power cycle the xWR1642Boost
2. Setup the DCA1000EVM on the proper IP address (See the [DCA1000VEM Quick Start Guide](#))
  - a. Once the device is properly connected to the PC, open the start menu and search "View Network Connections"



- b. Inside the "Network Connections" of Control Panel, right click on the Ethernet port of choice and select "Properties"
  - c. "Local Area Connection Properties" window will open. Right click on "Internet Protocol Version 4 (TCP/IPv4)".
  - d. "Internet Protocol Version 4 (TCP/IPv4)" window will open. Set the IP address field to 192.168.33.30, or the desired IP address if different
    - i. See our other documentation on changing the IP address of the DCA1000EVM using the DCA1000 CLI Utility (necessary for a dual radar setup)
  - e. The Subnet mask field can remain the default 255.255.255.0
  - f. Press "OK" on all the windows and you can close "Network Connections"
3. Open the Josiah's single/dual radar GUI
  - a. Under the "dual-radar-gui" repository, open "dual\_radar\_gui.mlapp."
  - b. App Designer window will open to the app of your choice in the previous step
  - c. Press "Run" at the top of the page
  - d. The app will open and all the indicators will be red

- i. Assuming you have installed mmWave Studio 2.1.1.0 to the typical location, it will open normally. Otherwise, it will ask you to find the installation location of mmWave Studio 2.1.1.0
- e. Ensure the Start Freq (GHz) field is 77 GHz
- f. Press "Connect Radar 1"
- g. A window will appear asking to select a serial COM port. Select the COM port corresponding to the entry in device manager labeled "XDS110 Class Application/User UART".
- h. Press "Prepare DCA 1"
- i. Enter the desired chirp parameters
- j. Press "Configure Radar"
- k. Press "Start" to start the capture
  - i. The DCA1000EVM will start waiting for data over LVDS
  - ii. The xWR1642Boost will wait for HW trigger from MCU
    - 1. If everything is working properly at this point, the DS3 LED on the xWR1642Boost will be turn on
- l. Start the MCU sending pulses
  - i. If everything is working properly the DATA\_TRAIN\_PRG LED on the DCA1000EVM will be flashing while the radar is triggered
- m. Press "Stop" to stop the radar once you are done