

# Open-Q™ 6490 SOM Dev Kit Android 13 Release Notes v1.0

Part Number PMD-00281

Revision A

---

Your use of this document is subject to and governed by those terms and conditions in the LICENSE AND PURCHASE TERMS AND CONDITIONS FOR Lantronix DEVELOPMENT PLATFORM KITS, which you or the legal entity you represent, as the case may be, accepted and agreed to when purchasing a Development Kit from Lantronix Technologies Corporation (“**Agreement**”). You may use this document, which shall be considered part of the defined term “Documentation” for purposes of the Agreement, solely in support of your permitted use of the Development Kit under the Agreement. Distribution of this document is strictly prohibited without the express written permission of Lantronix Technologies Corporation and its respective licensors, which they can withhold, condition or delay in its sole discretion.

Lantronix is a trademark of Lantronix, Inc., registered in the United States and other countries. Lantronix is a trademark of Lantronix Technologies Corporation, registered in Canada and other countries.

Qualcomm® is a trademark of Qualcomm® Incorporated, registered in the United States and other countries. Other product and brand names used herein may be trademarks or registered trademarks of their respective owners.

This document contains technical data that may be subject to U.S. and international export, re-export, or transfer (“export”) laws. Diversion contrary to U.S. and international law is strictly prohibited.

© 2024 Lantronix, Inc. All rights reserved.

## Contacts

### **Lantronix, Inc.**

48 Discovery, Suite 250,  
Irvine, CA 92618, USA  
Toll Free: 800-526-8766  
Phone: 949-453-3990  
Fax: 949-453-3995

### **Lantronix Technical Support**

<http://www.lantronix.com/support>

### **Sales Offices**

For a current list of our domestic and international sales offices, go to the Lantronix web site at <http://www.lantronix.com/about-us/contact/>

---

## Revision History

Date	Rev.	Comments
Oct 2024	A	Initial release.

For the latest revision of this product document, please go to <http://www.lantronix.com/support>.

---

# Table of Contents

Contacts	2
<b>Revision History</b>	<b>3</b>
<b>1 Introduction</b>	<b>6</b>
1.1 Purpose	6
1.2 Scope	6
1.3 Intended Audience	6
<b>2 Documents</b>	<b>7</b>
2.1 Applicable Documents	7
2.2 Reference Documents	7
<b>3 Development Kit Overview</b>	<b>8</b>
3.1 Introduction	8
3.2 Development Device Notice	8
<b>4 Software Access and Licensing</b>	<b>9</b>
4.1 Introduction	9
4.2 Software Use Restrictions	9
<b>5 Hardware Configuration</b>	<b>10</b>
<b>6 Software Release Functional Description</b>	<b>11</b>
6.1 Introduction	11
6.2 Software Release Version Information	11
6.2.1 Software Version Number Convention	11
6.2.2 Details of the release	11
6.3 Software Release Package	11
6.4 Programming the Development Kit with this Software Release	12
6.4.1 How to Set Up Android adb/fastboot	12
6.4.2 Installing the JFlash Package	13
<b>7 Features and Known Issues</b>	<b>14</b>
7.1 BSP Release v1.0 - Android 13 Supported Features	14
7.2 BSP Release v1.0 Features details	15
7.2.1 USB Type C (Client/Host)	15
7.2.2 USB Type A Host	16
7.2.3 USB Type-C DisplayPort	16
7.2.4 Concurrent USB Type-C DisplayPort and USB3 SS data	17
7.2.5 HDMI	17
7.2.6 miniDP	18

---

7.2.7	Camera	19
7.2.8	Audio	22
7.2.9	Multimedia	26
7.2.10	Ethernet	27
7.2.11	Wi-Fi	29
7.2.12	Bluetooth	30
7.2.13	Buttons	32
7.2.14	microSD	33
7.2.15	Debug UART	33
7.2.16	4G Modem (data-only)	33
7.3	Known Issues of Android 13 Release v1.0	35

# 1 Introduction

## 1.1 Purpose

This document describes the functionality and any known issues for the Lantronix Open-Q™ 6490 SOM Dev Kit Android BSP Version 1.0 software release.

To access the documentation and platform BSP software, please visit <http://www.lantronix.com>.

You will need to register your development kit first to access the Tech Portal.

## 1.2 Scope

This document describes the following for the Open-Q™ 6490 SOM Dev Kit Software Release 1.0:

- A description of the supported software capabilities and features
- Known issues with this release.

Instructions to build and install this software release are out of scope of this document. Such instructions are described in the BSP Programmers Guide document.

## 1.3 Intended Audience

This document is intended for users of the Open-Q™ 6490 SOM Dev Kit.

## 2 Documents

This section lists any parent and supplementary documents for the Open-Q™ 6490 SOM Dev Kit. Unless stated otherwise, applicable documents supersede this document and reference documents provide background and supplementary information.

### 2.1 Applicable Documents

Reference	Author	Title
A-1	Lantronix	Lantronix Purchase and Software License Agreement for the Open-Q™ 6490 SOM Development Kit <a href="https://www.lantronix.com/downloads/legal-terms/qualcomm-terms.html">https://www.lantronix.com/downloads/legal-terms/qualcomm-terms.html</a>

### 2.2 Reference Documents

These documents are available on the Open-Q™ 6490 SOM Technical Portal: <http://www.lantronix.com/support> (Dev Kit registration required).

Reference	Title
R-1	Open-Q™ 6490 SOM Development Kit User Guide
R-2	Open-Q™ 6490 SOM Development Kit Quick Start Guide
R-3	Open-Q™ 6490 SOM Development Kit Android 13 BSP Programmer Guide for v1.0

---

## 3 Development Kit Overview

### 3.1 Introduction

The Open-Q™ 6490 SOM Dev Kit provides a reference design from which customers can design, develop, test, and deploy their product solutions around the Open-Q™ 6490 SOM.

The Open-Q™ 6490 SOM Dev Kit comprises the Open-Q™ 6490/5430 family Development Kit Carrier Board together with the Open-Q™ 6490 SOM.

The dev kit is also a completely functional, kitted solution for application developers and OEMs to evaluate, develop, test, and deploy applications that utilize the 6490 Platform technology in a cost-effective manner.

### 3.2 Development Device Notice

This development device contains RF/digital hardware and software intended for engineering development, engineering evaluation, or demonstration purposes only and is intended for use in a controlled environment. This device is not being placed on the market, leased or sold for use in a residential environment or for use by the general public as an end user device.

This development device is not intended to meet the requirements of a commercially available consumer device including those requirements specified in the European Union directives applicable for Radio devices being placed on the market, FCC equipment authorization rules or other regulations pertaining to consumer devices being placed on the market for use by the general public.

See notes in 7.2 and 7.3 for any related feature or known issue.

This development device may only be used in a controlled user environment where operators have obtained the necessary regulatory approvals for experimentation using a radio device and have appropriate technical training. The device may not be used by members of the general population or other individuals that have not been instructed on methods for conducting controlled experiments and taking necessary precautions for preventing harmful interference and minimizing RF exposure risks. Additional RF exposure information can be found on the FCC website at <http://www.fcc.gov/encyclopedia/radio-frequency-safety>.



## 4 Software Access and Licensing

### 4.1 Introduction

As a part of your purchase of the Open-Q™ 6490 SOM Dev Kit, you are provided access to documentation and the pre-built binary SW package (JFlash package) in case you need to reprogram, upgrade, or downgrade the SW on your board. The JFlash package is available on the Files tab of the Open-Q™ 6490 SOM Technical Portal: <http://www.lantronix.com/support>

Other SW resources and documentation may be available for your product such as:

- Example applications
- Test utilities
- Android SW source code and build scripts.

If you do not find access to the resources you need, please contact your Lantronix Account Manager, Project Manager, or Lantronix sales.

### 4.2 Software Use Restrictions

The Open-Q™ 6490 SOM Dev Kit software is sold as a development platform kit as specified in the Lantronix License Agreement.

The Open-Q™ 6490 SOM Dev Kit software includes a number of Qualcomm software components which are subject to royalty fees in case of commercial use.

## 5 Hardware Configuration

This software release was tested on the Open-Q™ 6490 SOM Dev Kit This includes the 6490 SOM board, 6490/5430 family carrier board .(carrier HW version 2.1), power supply, IMX577, OV9282 camera board and supports 4GB LPDDR5/ 32GB eMMC5.1.

The Open-Q™ 6490 SOM from Lantronix is delivered to customers pre-programmed with an Android image.

# 6 Software Release Functional Description

## 6.1 Introduction

This section describes the Software release version information about programming the software release onto the Open-Q™ 6490 SOM Dev Kit.

## 6.2 Software Release Version Information

Software releases from Lantronix are based on an underlying Linux Foundation-owned and Qualcomm-maintained software baseline from Code Linaro (CLO), as well as binary images of Qualcomm proprietary software. The Lantronix SW packages include additional changes to support specific hardware features of the Open-Q™ 6490 SOM Dev Kit as well as other Lantronix -specific SW features.

### 6.2.1 Software Version Number Convention

The BSP software version of the Lantronix Open-Q™ 6490 SOM Dev Kit is a 2-digit version number signifying the major and minor software release (e.g., 1.0). This version is for Lantronix's internal tracking purposes, and for maintaining bug reports. Based on the version information Lantronix can provide better technical support to customers.

You can check your BSP software version number from the display under:  
"Settings->About Phone->Build number"

as follows:

lahaina-userdebug 13 TKQ1.240329.001 Open-Q\_6490\_13\_vX.Y test-keys

[where X= major, Y= minor (bugfix)]

### 6.2.2 Details of the release

**Linux Kernel Version:** 5.4.259

**Android Version:** Android 13

## 6.3 Software Release Package

This software release consists of the following items which can be found on the Open-Q™ 6490 SOM Dev Kit Technical Portal:

- **Open-Q\_6490\_Android-T\_v1.0\_JFlash.zip** – JFlash installation package containing prebuilt binary files to install directly onto the development kit. Refer to the subsequent sections in this document for detailed installation instructions.
- **Release Notes** – this document

## 6.4 Programming the Development Kit with this Software Release

To install this version of the SW on your device you need to use the JFlash installation tool which re-partitions the storage and flashes all the required images. There are several proprietary image partitions in addition to the open source Android system images. JFlash is a Java tool running on both Linux and Windows. In order to use JFlash you need to have the adb/fastboot utilities running on your PC. The following section describes how to set up adb/fastboot if you require it. Please visit <http://www.lantronix.com/support> to download the latest JFlash file for your board.

### 6.4.1 How to Set Up Android adb/fastboot

Fastboot is a tool used to install an Android image from a Linux or Windows PC over a USB connection to the Open-Q™ 6490 SOM Dev Kit.

Android Debug Bridge (adb) is a debug interface over USB between your PC and the development kit. adb is not required for installing a software image, but its configuration on a PC is similar to that of fastboot and therefore adb configuration is included in this document for convenience.

fastboot and adb db for Linux (Ubuntu) and Windows 10 are supplied by Google's Android SDK Platform Tools (<https://developer.android.com/studio/releases/platform-tools.html>).

**NOTE:** Do not use "apt-get install" to install adb or fastboot on your Linux PC

Ensure fastboot and adb are in your PATH for your PC.

#### 6.4.1.1 Fastboot/adb Setup on a Linux PC

As described in Google's instructions for setting up a hardware device (<https://developer.android.com/studio/run/device.html>), your Linux development workstation USB driver configuration must be modified to recognize the development kit when you use adb or fastboot from Google's Android SDK Platform Tools.

Here is the configuration required for using adb and fastboot with the kit:

1. Create this file or edit this file as root in the folder /etc/udev/rules.d/ in your PC:  
51-android.rules
2. Add the following lines to the end of the file:  
#Fastboot low-level bootloader  
SUBSYSTEM=="usb", ATTR{idVendor}=="18d1", MODE="0777", GROUP="adm"  
  
# adb composite interface device 9025  
SUBSYSTEM=="usb", ATTR{idVendor}=="05c6", MODE="0777", GROUP="adm"
3. Restart the udev service on your PC using:  
\$ sudo service udev restart

#### 6.4.1.2 Fastboot/adb Setup on a Windows 10 PC

It is also possible to use fastboot and adb from a Windows 10 PC for software image programming and debugging. You will need to:

1. Download the Android SDK Platform Tools (<https://developer.android.com/studio/releases/platform-tools>) on your Windows 10 PC.
2. Unzip it somewhere to local drive. It will create platform-tools directory.

3. Edit Environment variable to add adb and fastboot to path. ( In environment variables set path to <local path>/platform-tools)
4. Plug in device in adb or fastboot mode. Windows 10 will start automatically to search for driver, and it will be found without user need to point to anything.
5. Once that is done, user can plug any of our products and adb/fastboot will work without any additional driver installations.

### 6.4.1.3 Put device into fastboot mode

If you need to put your development kit into fastboot mode before connecting via USB, two methods can be used:

1. If you already have adb connection type: adb reboot bootloader
2. On serial debug UART type “su” and then “reboot bootloader”

In either case above, the board will boot into fastboot mode, showing the following debug output on the serial debug UART:

Fastboot: Processing commands. This will result in the dev kit rebooting into fastboot mode

To verify successful communication between the PC and dev kit in fastboot mode, you can use following commands in command prompt or terminal window on your PC;

- fastboot devices  
A list in command output should contain your device’s serial number.
- “lsusb”  
In the output look for device with the vendor ID 18d1 and product ID d00d – Google Inc

## 6.4.2 Installing the JFlash Package

Once you have adb/fastboot installed, the USB VID/PID set up on your PC, and are connected to your dev kit, you can run the JFlash installation package to install the new software release onto the dev kit. Follow the instructions in the README.txt file included in the JFlash package.

NOTE: JFlash was verified on Java version 8 on Windows and Linux.

### 6.4.2.1 Setting up UART

Connect UART FTDI serial cable (Refer to user guide for connectors) with Minicom, Putty or TeraTerm on your host PC. On your Host PC set your UART settings to following

Baud Rate: 115200

Parity: None

Data Bits: 8

Hardware Flow Control: None

Software Flow Control: None

Stop Bits: 1

## 7 Features and Known Issues

### 7.1 BSP Release v1.0 - Android 13 Supported Features

Initial public release of Android 13 – Oct 2024

CLO manifests and Chipcode tag information:

<b>LA :</b>	LA.UM.9.14.4.r1-04900-QCM6490.QSSI13.0.xml
<b>QSSI :</b>	LA.QSSI.13.0.r1-13200-qssi.0.xml
<b>Meta Build ID :</b>	QCM6490.LA.3.1-00071-STD.PROD-1
<b>Chipcode :</b>	qcm6490-la-3-1_ap_standard_oem

- Support for single Open-Q camera module based on 12.3MP Sony IMX577 image sensor.
  - Preview
  - Image captures up to 12.3MP
  - Video recording 4K@30
- Support for single Open-Q camera module based on 1MP Omnivision OV9282 image sensor.
  - Preview
  - Image captures up to 1MP
  - Video recording 720P@30
- microSD card as internal and removable storage (Class 10 128 GB)
- Debug UART interface via USB serial port (or serial pin header)
- WIFI
  - Standard mode 2.4/5GHz
  - AP mode
- Audio
  - Output speaker support
  - 4 DIMIC input support
- Bluetooth
  - HID host
  - File Transfer (with Android Phone)
  - A2DP source
- Bluetooth Low Energy
- USB Type C support for adb/fastboot interface
- USB Type C host support (HID, flash drive HS & SS)
- USB Type A Host support for:
  - HID
  - USB Flash drive (HS)
  - USB self-powered hub

- USB Type-C Super Speed and Display Port concurrency usage (Display up to 4K@30)
- eDP outputs through a DP connector
- HDMI through a HDMI connector
- Ethernet support up to 1Gbps
- Power button

## 7.2 BSP Release v1.0 Features details

The following sections provide detailed insights into the features within the context of Android 13.

### 7.2.1 USB Type C (Client/Host)

Please plug-in the USB Type-C cable or USB Type-C adapter for HID and Mass storage. It also supports the DisplayPort (see 7.2.3 USB Type-C DisplayPort).



- USB Type C client functionality support
  - QFIL
  - fastboot
  - adb
- USB Type C host functionality support (using USB Type C adapter)
  - HID devices: Wide range of input devices like keyboards, mice, and other HID peripherals.
  - USB (HS & SS) Mass storage devices for data transfer and storage purposes

## 7.2.2 USB Type A Host



- USB Type A host functionality support
  - HID devices: a wide range of input devices like keyboards, mice, and other HID peripherals.
  - USB HS Mass storage devices for data transfer and storage purposes
  - USB self-powered HUB

**NOTE:** Lantronix team validated USB HUB feature with the following product:

[ORICO 4 Port USB3.0 HUB with Micro B Power Port \(W5P-U3-100\) \(1 Year Warranty\) - Buy ORICO 4 Port USB3.0 HUB with Micro B Power Port \(W5P-U3-100\) \(1 Year Warranty\) Online at Low Price in India - Amazon.in](#)

## 7.2.3 USB Type-C DisplayPort





- Basic display port support:
  - Display through USB Type-C (with external USB Type-C Display adapter) at max 4K UHD@60
  - Video output (Home screen)

**NOTE:** This feature was verified with the following products:

4K@60:

Adapter: [https://www.amazon.in/StarTech-com-USB-DisplayPort-Adapter-CDP2DPUCP/dp/B074TTB7XQ/ref=sr\\_1\\_1?crid=2Z28RF75QRTQM&dib=eyJ2ljojMSJ9.2QdX-iEXdAWoBMQBGMsiQ.clmHpiwvJN5Oa9Rplg-8jZqAWdVyzV-zgSNXrRuxyCg&dib\\_tag=se&keywords=StarTech%2BCDP2DPUCP&nsdOptOutParam=true&qid=1728313838&sprefix=startech%2Bcdp2dpucp%2Caps%2C220&sr=8-1&th=1](https://www.amazon.in/StarTech-com-USB-DisplayPort-Adapter-CDP2DPUCP/dp/B074TTB7XQ/ref=sr_1_1?crid=2Z28RF75QRTQM&dib=eyJ2ljojMSJ9.2QdX-iEXdAWoBMQBGMsiQ.clmHpiwvJN5Oa9Rplg-8jZqAWdVyzV-zgSNXrRuxyCg&dib_tag=se&keywords=StarTech%2BCDP2DPUCP&nsdOptOutParam=true&qid=1728313838&sprefix=startech%2Bcdp2dpucp%2Caps%2C220&sr=8-1&th=1)

Monitor: <https://www.amazon.in/Acer-Monitor-FreeSync-Adjustable-Speakers/dp/B08J921K8C/?th=1>

4K@30

Adapter: <https://www.amazon.com/StarTech-com-USB-DisplayPort-Cable-White/dp/B01L3H5NOQ?th=1>

Monitor: <https://www.amazon.in/Acer-Monitor-FreeSync-Adjustable-Speakers/dp/B08J921K8C/?th=1>

1080@60

Adapter: <https://www.amazon.com/StarTech-com-USB-DisplayPort-Cable-White/dp/B01L3H5NOQ?th=1>

Monitor: <https://www.amazon.com/Dell-Computer-Ultrasharp-U2415-24-0-Inch/dp/B00NZTKOQI?th=1>

## 7.2.4 Concurrent USB Type-C DisplayPort and USB3 SS data

Concurrent usage of USB Type C DP and USB 3.0 SuperSpeed data is supported using USB Type C adapter.

Maximum supported resolution for DP is 4K@30

**NOTE:** This feature was verified with the following products:

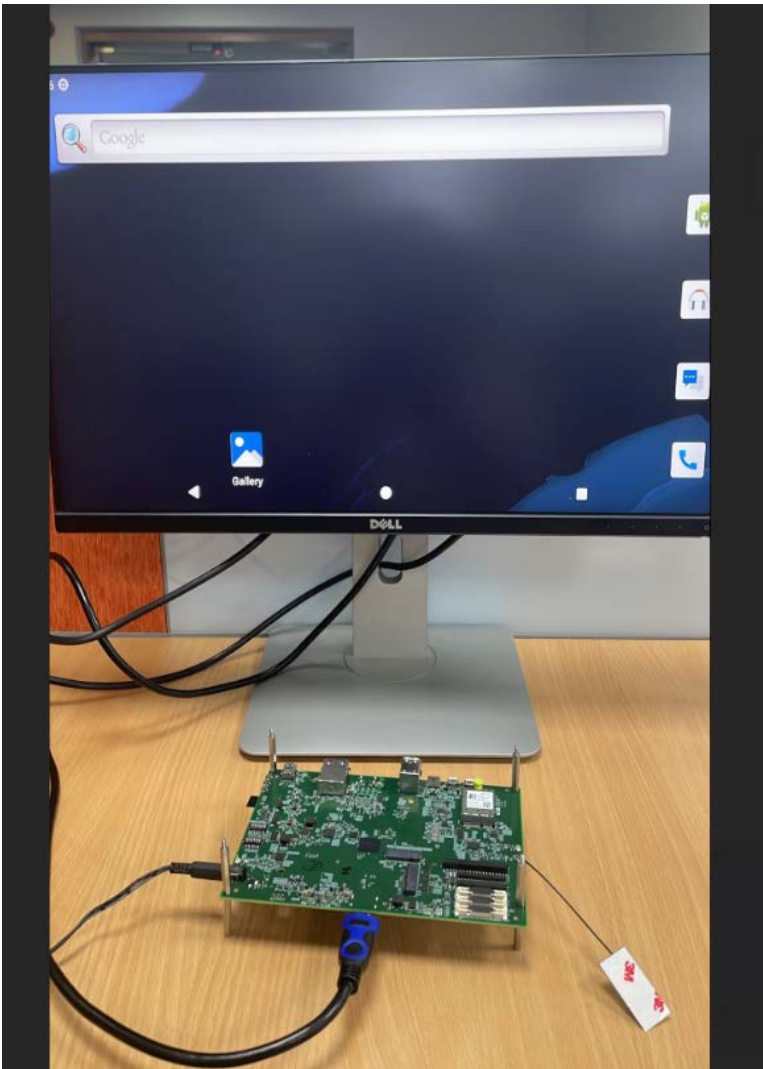
Adapter: <https://www.amazon.com/StarTech-com-USB-DisplayPort-Cable-White/dp/B01L3H5NOQ?th=1>

Monitor: <https://www.amazon.in/Acer-Monitor-FreeSync-Adjustable-Speakers/dp/B08J921K8C/?th=1>

USB Flash Drive supporting SS

## 7.2.5 HDMI

Supports HDMI display through HDMI connector.

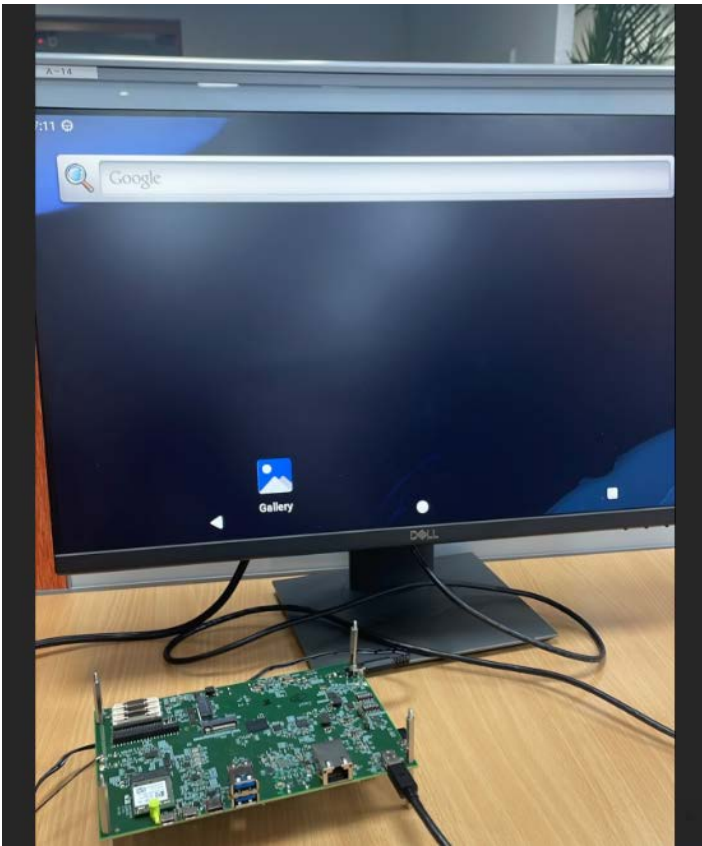


Monitor Link 1080P@60: <https://www.amazon.com/Dell-Computer-Ultrasharp-U2415-24-0-Inch/dp/B00NZTKOQI?th=1>

Monitor Link 4k@30: <https://www.acer.com/gb-en/monitors/business/cb2/pdp/UM.PB2EE.004>

## 7.2.6 miniDP

Supports miniDP through DP connector.



Monitor Link 1080P@60: <https://www.dellstore.com/p-series-p2419h-monitor.html>

Monitor Link 4k@60: <https://www.acer.com/gb-en/monitors/business/cb2/pdp/UM.PB2EE.004>

## 7.2.7 Camera

This release supports two Open-Q™ camera modules based on the 12.3MP Sony IMX577 image sensors and 1MP Omnivision OV9282 image sensor.

### 7.2.7.1 IMX577 general support

Connect IMX577 camera to J5 connector and switch configuration should be SW6 PIN2 to OFF.

The IMX577 camera supports the following features using the Snapdragon Camera app included with the release:

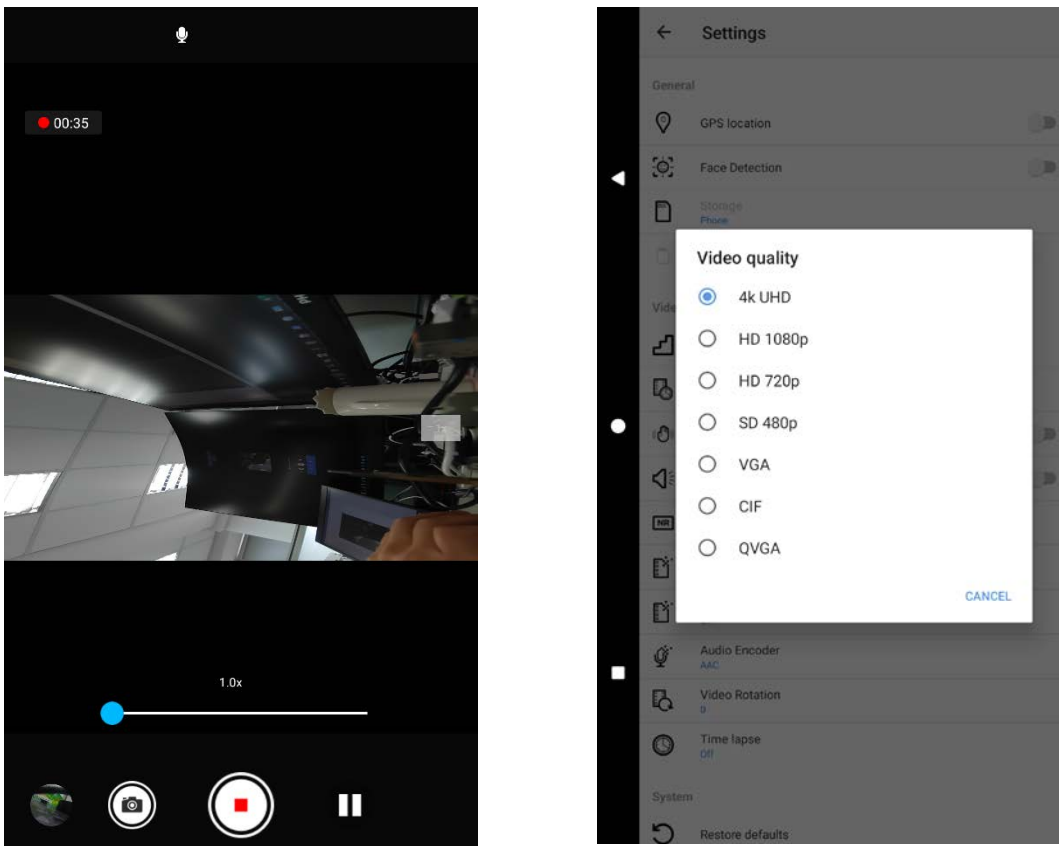
- Preview
- Image captures up to 12.3MP.
- Video recording up to 4K@30.



Preview:



Recording:

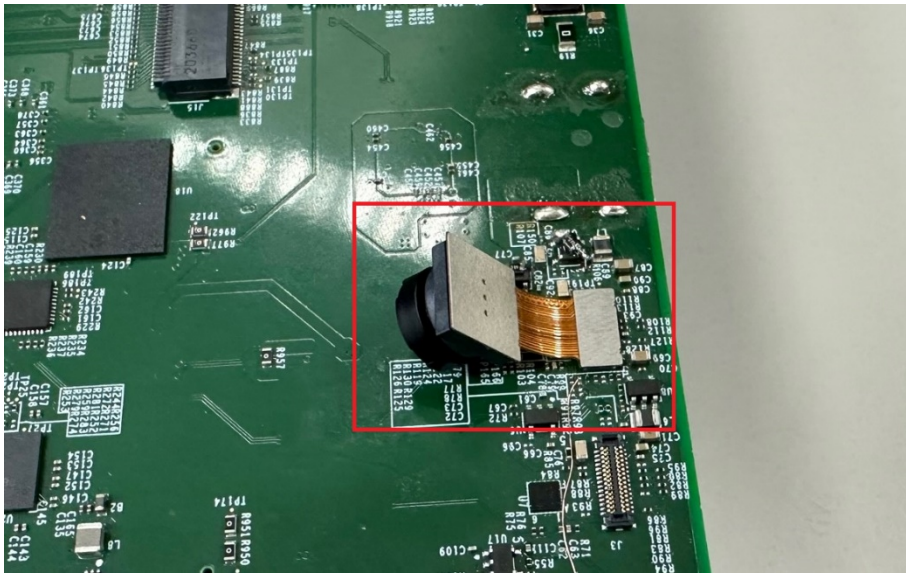


### 7.2.7.2 Omnivision OV9282 general support

Connect OV9282 camera to J4 connector and switch configuration should be SW6 PIN2 to ON.

The OV9282 camera supports the following features using the Snapdragon Camera app included with the release:

- Preview
- Image captures up to 1MP.
- Video recording up to 720P@30



Preview

Recording

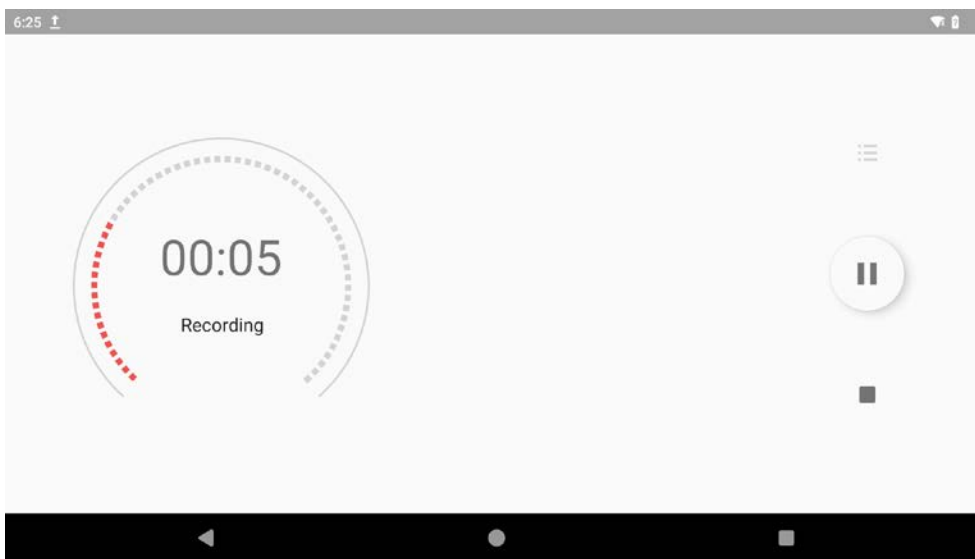


## 7.2.8 Audio

The Android 13 release is able to record and play audio with details in the following sections.

### 7.2.8.1 Record using Sound Recorder App

On 6490 dev kit we can run the Sound Recorder apk (part of the image) to start the recording

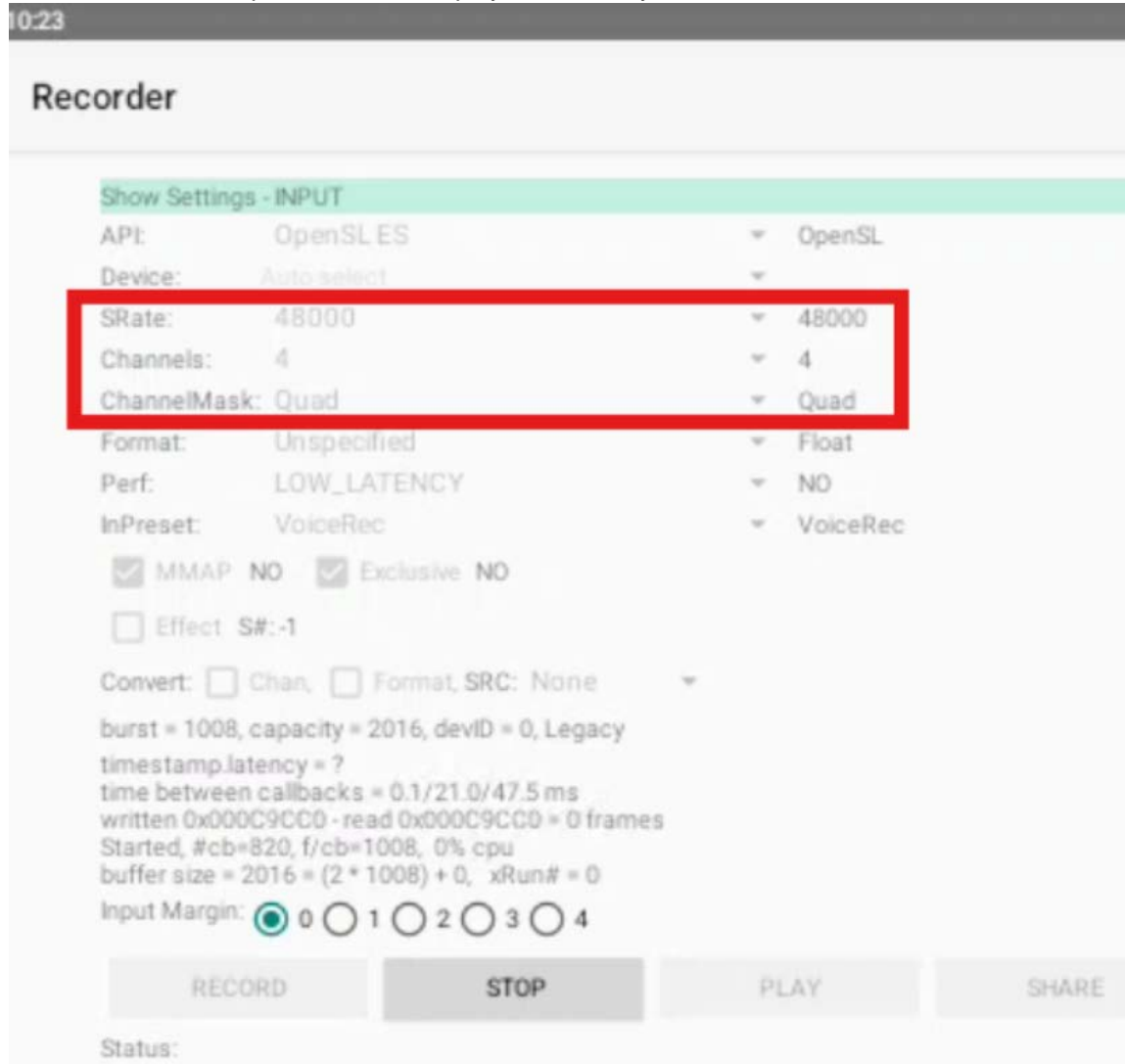


Recorded file can be played from the Sound Recorder app or Music app.

### 7.2.8.2 Record using Oboe App

To demonstrate that 4 DIMICs can record at the same time on Android Level use Oboe Tester apk (can be downloaded from the net).

In the Oboe Tester Apk in Record and play make sure you select 4 mic and Quad Channel Mask



Then record audio. Recorded audio has input from all 4 DIMICs. To confirm all 4 audio channels are recorded you can copy recorded file to PC and check in Audacity application or in KM media player.

### 7.2.8.3 Record using tinymix commands

Recording using all 4 DIMICs on kernel level can be done by executing following commands:

```
tinymix 'MultiMedia1 Mixer TX_CDC_DMA_TX_3' '1'
tinymix 'TX_CDC_DMA_TX_3 Channels' 'Four'
tinymix 'TX_AIF1_CAP Mixer DEC2' '1'
tinymix 'TX DMIC MUX2' 'DMIC0'
tinymix 'TX_DEC2 Volume' 95
tinymix 'TX_AIF1_CAP Mixer DEC4' '1'
tinymix 'TX DMIC MUX4' 'DMIC1'
```



```
tinymix 'TX_DEC4 Volume' 95
tinymix 'TX_AIF1_CAP Mixer DEC3' '1'
tinymix 'TX DMIC MUX3' 'DMIC4'
tinymix 'TX_DEC3 Volume' 95
tinymix 'TX_AIF1_CAP Mixer DEC1' '1'
tinymix 'TX DMIC MUX1' 'DMIC5'
tinymix 'TX_DEC1 Volume' 95
tinycap /data/qmic.wav -c 4 -r 48000 -T 10
```

#### 7.2.8.4 Playback using speaker

To play a file on speakers using the Music app, follow these instructions below:

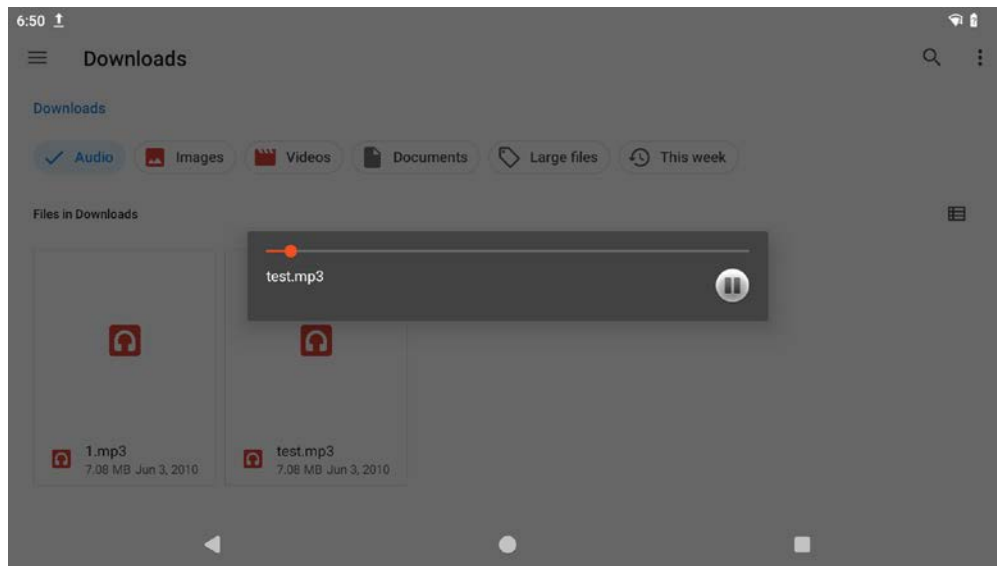
- o Connect the speaker



- o ADB push a sample audio file (test.mp3) onto the device:

```
$ adb push test.mp3 /storage/emulated/0/Download/test.mp3
```

- o Run Files and go to Downloads, then click the test.mp3 file to play.



## 7.2.9 Multimedia

The Open-Q™ 6490 SOM Dev Kit offers a variety of audio & video codecs for encoding and decoding capabilities based on both software and hardware to enhance the performance of multimedia applications.

The following audio & video codec functionality was validated using CTS media streams; the link to download these streams is here: <https://dl.google.com/dl/android/cts/android-cts-media-1.5.zip>

### 7.2.9.1 Supported Video codec details

Codec	Operation	Encoder/Decoder name
AVC/H264	Qualcomm Hardware Decoder	c2.qti.avc.decoder
HEVC/H265	Qualcomm Hardware Decoder	c2.qti.hevc.decoder
H263	Qualcomm Hardware Decoder	c2.android.h263.decoder
VP8	Qualcomm Hardware Decoder	c2.qti.vp8.decoder
AVC/H264	Qualcomm Hardware Encoder	c2.qti.avc.encoder
HEVC/H265	Qualcomm Hardware Encoder	c2.qti.hevc.encoder

### 7.2.9.2 Supported Audio codec details

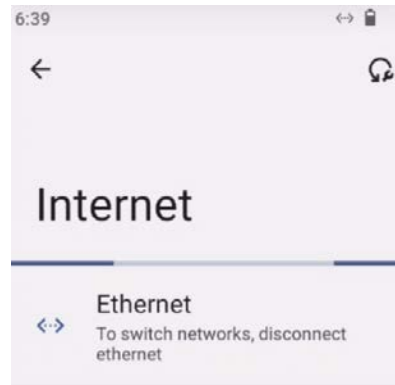
Codec	Operation	Encoder/Decoder name
AAC - LC, HE	Qualcomm Hardware Encoder	OMX.qcom.audio.encoder.aac
AAC	Software Decoder	c2.android.aac.decoder
Vorbis	Software Decoder	c2.android.vorbis.decoder

**NOTE:** Encoding tests were performed using the following Android app: <https://myrecorder.en.uptodown.com/android/download/114611315>). Streaming tests were performed with test streams from various websites.

## 7.2.10 Ethernet

The Open-Q™ 6490 dev kit supports the Ethernet interface up to 1Gbps.

- Connect one end of the Ethernet cable to the Open-Q 6490 and the other end to your router or network switch. that supports 1Gbps ( Lantronix tested with Asus AX3000 WiFi AP)
- Power on device.
- Open the "Settings" app, look for the "Internet" option and select same to access the ethernet settings.



- Configure IP Settings if necessary else DHCP (automatic IP configuration.)
- Use the below command to check the IP address.

```
$ adb shell ifconfig eth0
```

```
eth0      Link encap:Ethernet  HWaddr 00:e0:4c:68:e0:fd  Driver r8169
          inet addr:192.168.30.225  Bcast:192.168.30.255  Mask:255.255.255.0
          inet6 addr: fe80::7b2d:2cb3:24a0:59f5/64  Scope: Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:123 errors:0 dropped:0 overruns:0 frame:0
          TX packets:73 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:17555 TX bytes:8311
```

- Command to check network access:

```
$ adb shell ping google.com
```

```
2|kona:/ # ping www.google.com
PING www.google.com (142.250.196.4) 56(84) bytes of data.
64 bytes from maa03s44-in-f4.1e100.net (142.250.196.4): icmp_seq=1 ttl=118 time=14.1 ms
64 bytes from maa03s44-in-f4.1e100.net (142.250.196.4): icmp_seq=2 ttl=118 time=14.1 ms
64 bytes from maa03s44-in-f4.1e100.net (142.250.196.4): icmp_seq=3 ttl=118 time=14.2 ms
64 bytes from maa03s44-in-f4.1e100.net (142.250.196.4): icmp_seq=4 ttl=118 time=14.2 ms
^C
--- www.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 14.142/14.226/14.291/0.054 ms
kona:/ #
```

### 7.2.10.1 Ethernet Static IP address Configuration

This section provides instructions how to set up and test static IP.

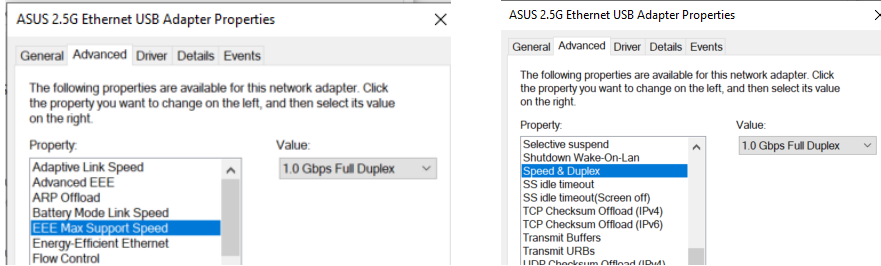
To demonstrate this feature Lantronix used the USB-Ethernet(Asus C2500) adapter to connect between PC and 6490 dev kit.



- For 1G setting, open the "Network Connections", look for the "Ethernet" of the adapter. Here is "Ethernet 9".



- Right click the "Ethernet 9" and click the "Configure"->"Advanced", and then
  - Configure the "EEE Max Support Speed" as "1Gbps Full Duplex".
  - Configure the "Speed & Duplex" as "1Gbps Full Duplex".



- Configure the IP address
  - For PC, set the IP address as 172.16.1.50
  - For 6490 dev kit, set the IP address as 172.16.1.100
    - Use the following command to set the IP address for 6490 dev kit:
      - ifconfig eth0 172.16.1.100
    - Use the following command to ping PC
      - Ping 172.16.1.50

```

lahaia:/ # ifconfig eth0 172.16.1.100
lahaia:/ # ifconfig eth0
eth0      Link encap:Ethernet  HWaddr ec:21:e5:11:4f:ea  Driver tc956x_pci-eth
          inet addr:172.16.1.100  Bcast:172.16.255.255  Mask:255.255.0.0
          inet6 addr: fe80::9bb8:f958:e275:441f/64  Scope: Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:51 errors:0 dropped:0 overruns:0 frame:0
          TX packets:15 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueue len:1000
          RX bytes:6221 TX bytes:2522
          Interrupt:93

lahaia:/ # ping 172.16.1.50
PING 172.16.1.50 (172.16.1.50) 56(84) bytes of data.
64 bytes from 172.16.1.50: icmp_seq=1 ttl=128 time=16.2 ms
64 bytes from 172.16.1.50: icmp_seq=2 ttl=128 time=1.86 ms
64 bytes from 172.16.1.50: icmp_seq=3 ttl=128 time=1.17 ms
    
```

Here is the DHCP for Ethernet on the Open-Q™ 6490 dev kit:

- Use the RJ45 cable to connect the dev and a switch with networking ability.
- Check the IP address by command “ifconfig eth0” (~80s is needed to get the IP address after press power button).

```
lahaina:/ # ifconfig eth0
eth0      Link encap:Ethernet HWaddr ec:21:e5:11:4f:ea  Driver tc956x_pci-eth
inet addr:192.168.128.214 Bcast:192.168.128.255 Mask:255.255.255.0
inet6 addr: fe80::6ec2:c6e8:2f10:3e5c/64 Scope: Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:376 errors:0 dropped:0 overruns:0 frame:0
TX packets:54 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:38687 TX bytes:5847
Interrupt:93
```

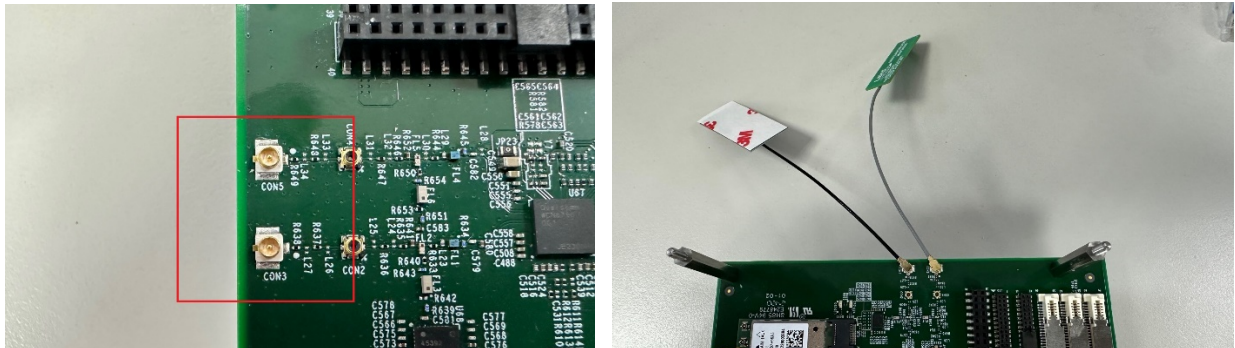
- Then check the network is working by “ping [www.google.com](http://www.google.com)”

```
lahaina:/ # ping www.google.com
PING www.google.com (142.251.33.100) 56(84) bytes of data.
64 bytes from sea30s10-in-f4.1e100.net (142.251.33.100): icmp_seq=1 ttl=57 time=129 ms
64 bytes from sea30s10-in-f4.1e100.net (142.251.33.100): icmp_seq=2 ttl=57 time=130 ms
64 bytes from sea30s10-in-f4.1e100.net (142.251.33.100): icmp_seq=3 ttl=57 time=129 ms
```

## 7.2.11 Wi-Fi

### 7.2.11.1 Wi-Fi Station mode

Open-Q™ 6490 dev kit's Wi-Fi module is notable for supporting enhanced connectivity; in particular, it maximizes wireless capabilities by utilizing external antennas on CON3 and CON5 (which are also used as antenna for BT).



To configure Wi-Fi to connect with an available access point, use the HDMI or a 3<sup>rd</sup> party screen mirroring application like Vysor. Follow these steps to configure Wi-Fi:

- Navigate to the Wi-Fi option in the "Settings" app.
- Browse the available Wi-Fi networks and select the desired access point from the list by providing required credentials if any.
- Ensure that dev kit successfully connects to the chosen Wi-Fi access point to access the internet.



- Command to check Wi-Fi network configuration.  
\$ adb shell ifconfig -a
- Command to check network access:  
\$ adb shell ping google.com

### 7.2.11.2 Wi-Fi AP mode

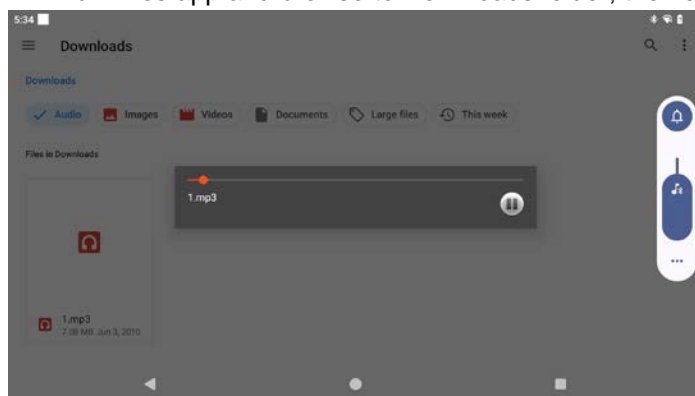
- Go to the Android Settings -> Network & internet -> Hotspot & tethering and enable the Wi-Fi hotspot.

## 7.2.12 Bluetooth

### 7.2.12.1 A2DP

The 6490 dev kit plays the sourcing role and outputs audio stream to Bluetooth headphones.

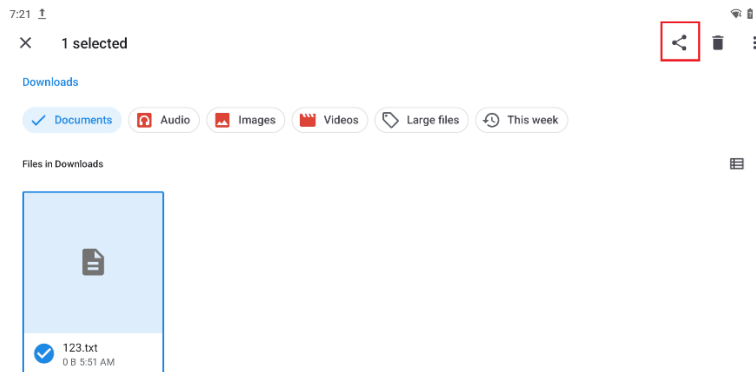
- Put a sample audio file to /storage/emulated/0/Download/ on the device.  
\$ adb push 1.mp3 /storage/emulated/0/Download/1.mp3
- Go to the Android Settings -> Connected devices -> Pair new device, then select the Bluetooth headphone to pair.
- Run Files app and browse to Downloads folder; then click 1.mp3 to play.



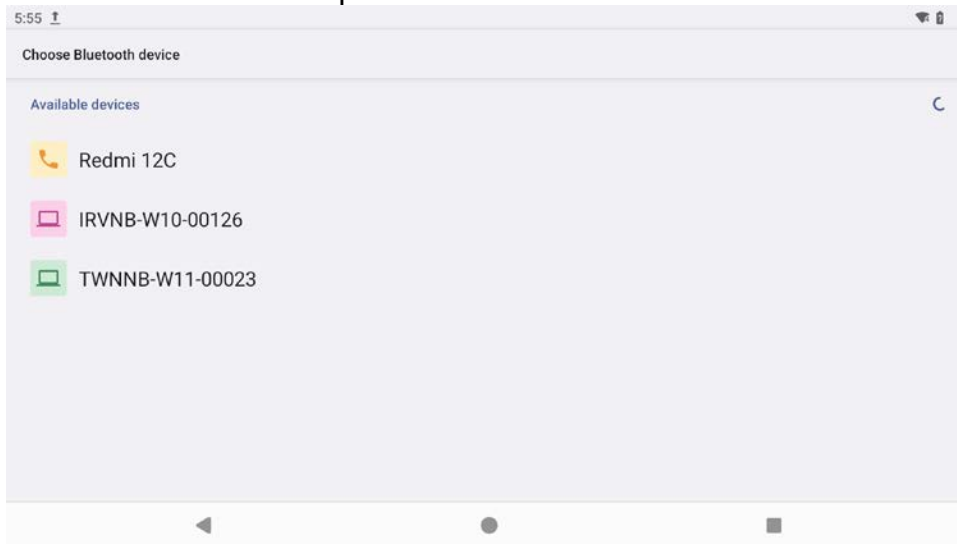
### 7.2.12.2 File Transfer

Go to the Android Settings -> Connected devices -> Pair new device, then select a PC/smartphone to pair.

- Run Files app, long press a file and click “share” icon.

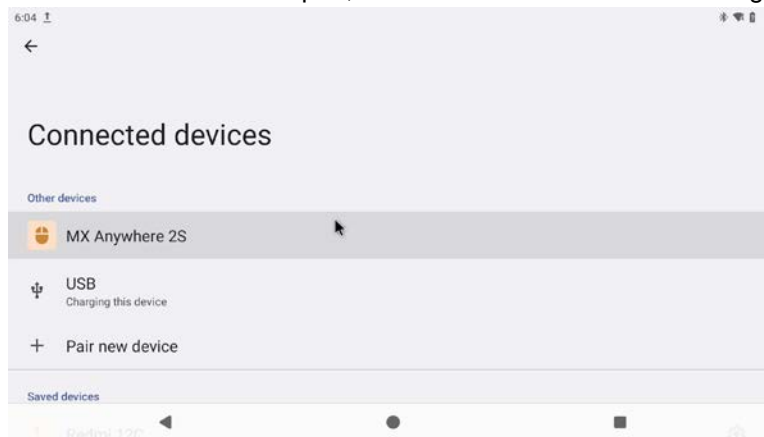


- Select the PC/smartphone to send to.



### 7.2.12.3 HID

- Steps to validate Bluetooth HID functionality on the dev kit:
  - Pair the Bluetooth HID device with the dev kit.
  - For a mouse or trackpad, test cursor movement and clicking functionality in different applications.



### 7.2.12.4 Bluetooth Low Energy

We used the Texas Instruments CC2541 keyfob reference design to validate BTLE functionality.

- Run nRF Toolbox app and connect to Keyfobdemo.

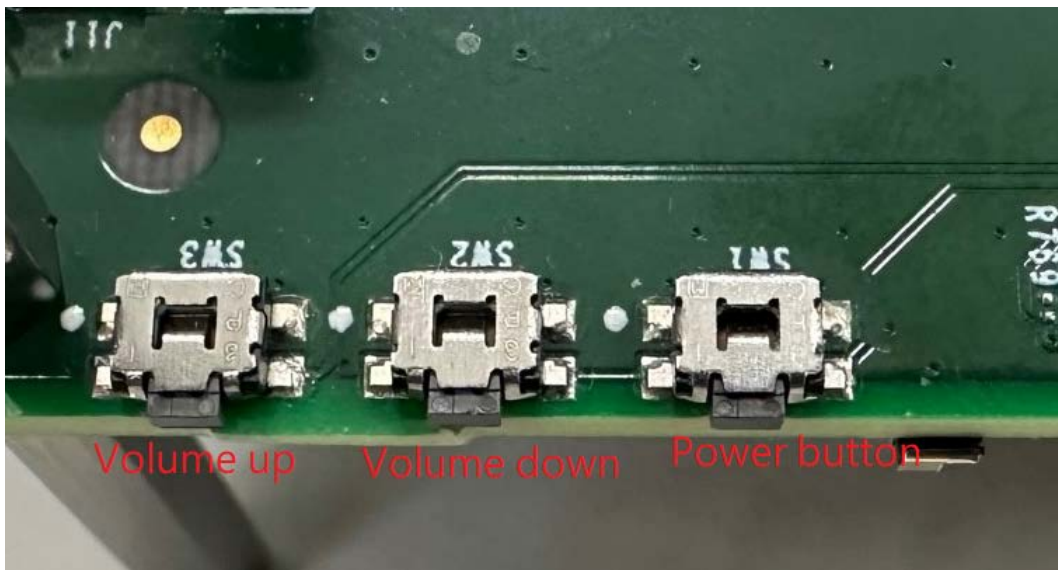


### 7.2.13 Buttons

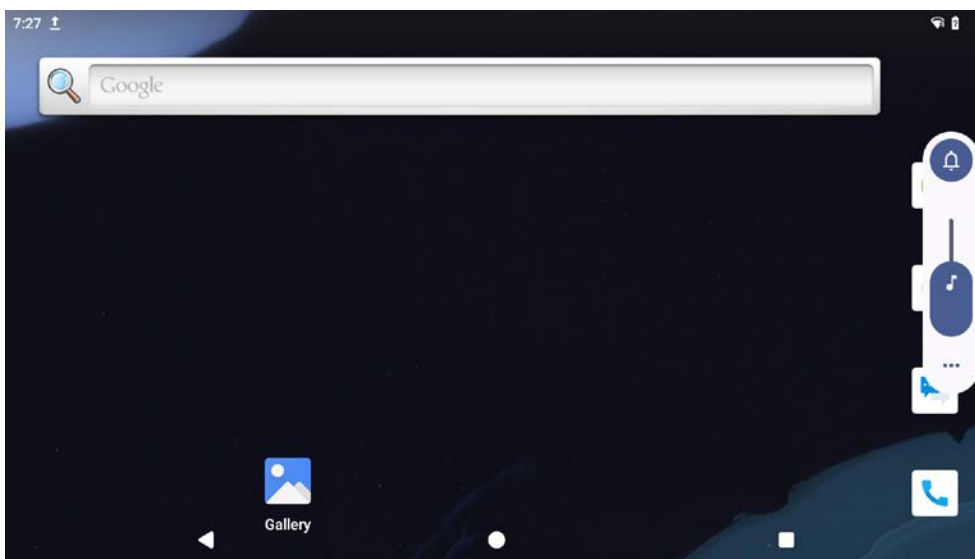
This release includes functionality for the power button and volume up button (Volume Down is not supported on this rev. of HW). These buttons can be validated by pressing them.

**Power Button:** Pressing the power button initiates the respective power actions, such as device wake-up/sleep/shutdown.





Volume up button is able to adjust the audio levels.



### 7.2.14 microSD

Support for a microSD card as internal and removable storage (Class 10, up to 128 GB)

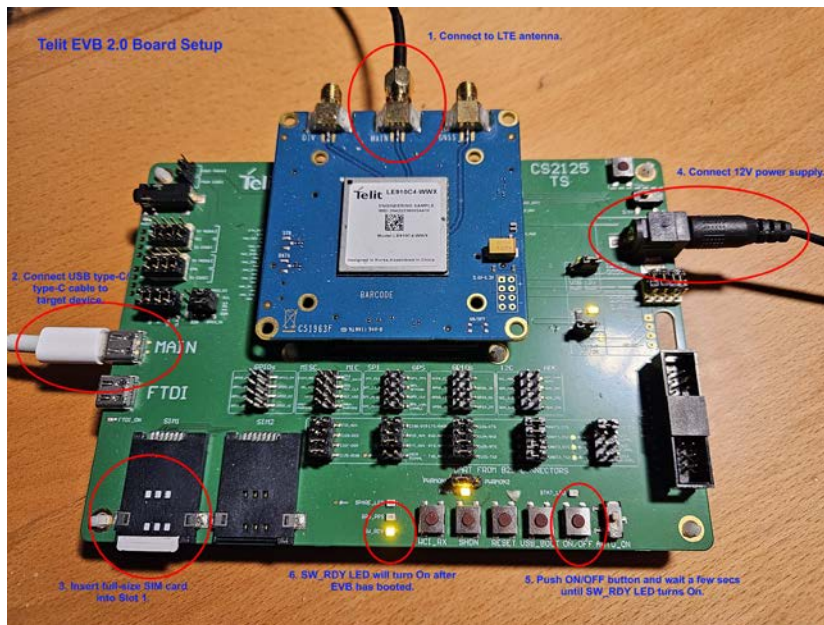
### 7.2.15 Debug UART

Support for the Debug UART interface via USB serial port (or serial pin header)

### 7.2.16 4G Modem (data-only)

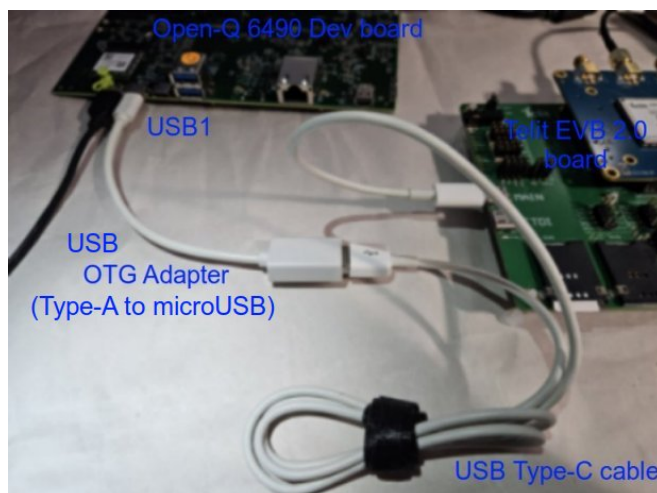
This feature requires a separate modem board which is not included as part of the Open-Q™ 6490 SOM Dev Kit.

Currently, only the Telit EVB 2.0 evaluation kit with LE910C4-WWX modem module (4G LTE) is supported. It is connected to the Open-Q™ 6490 dev board through the SIP USB1 port. Please see schematic to determine the physical port.



Steps for setting up Telit EVB 2.0 with Open-Q™ 6490 dev board:

- Connect the LTE antenna to the SMC male connector labelled "MAIN" (middle connector) on the Telit EVB.
- Using a USB cable, connect the Telit EVB USB-C port labelled "MAIN" to the Open-Q SIP USB1 port. The Open-Q physical port will depend on the hardware mods and breakout connector used. Please see schematic to determine the physical port to connect to. See picture below.



- Insert a full-size active SIM card into the slot labelled "SIM1" on Telit EVB.
- Connect the 12V power supply to the Telit EVB power connector.
- Push the "ON/OFF" button and wait a few secs. for the "SW\_RDY" LED to turn on after it has booted.
- Power-On the Open-Q™ 6490 dev board and wait at least 1-1/2 mins. before performing the test steps.

Test steps:

- In a serial console or adb shell, 'ping' a known website (e.g.: google.com) and confirm that a response is received:

```
console:/ # ping google.com
PING google.com (142.250.69.206) 56(84) bytes of data.
64 bytes from sea30s08-in-f14.1e100.net (142.250.69.206): icmp_seq=1 ttl=51 time=32.7 ms
64 bytes from sea30s08-in-f14.1e100.net (142.250.69.206): icmp_seq=2 ttl=51 time=39.9 ms
```

## 7.3 Known Issues of Android 13 Release v1.0

Below are the identified issues in the Open-Q™ 6490 SOM Dev Kit Android 13 Release 1.0. Updates will be provided as these issues are resolved.

The following list identifies the known issues in this software release.

- Volume down key needs the HW rework or the new HW version to support.
- HDMI, miniDP and USB type C display are supported only if inserted prior to boot and when device is not in the low suspend mode (low power state).
- No audio support for the main HDMI, miniDP and USB Type C display.
- The MAC address on the WIFI/BT interface is not correct.
- Ethernet MAC address is not unique per device.
- Performance for Ethernet udp transport is low.
- OV9282 and IMX577 camera module can't be used at the same time. Need to configure the DIP switch:
  - OV9282 -> SW6 bit2 switch to on.
  - IMX577 -> SW6 bit2 switch to off.
- Continuous log messages related to SIM appear in debug serial port:

```
[ 85.079758][ T1] init: Control message: Could not find 'android.hardware.secure_element@1.2::ISecureElement/SIM1' for
ctl.interface_start from pid: 566 (/system/bin/hw servicemanager)
[ 86.089535][ T1] init: Control message: Could not find 'android.hardware.secure_element@1.2::ISecureElement/SIM1' for
ctl.interface_start from pid: 566 (/system/bin/hw servicemanager)
[ 87.099784][ T1] init: Control message: Could not find 'android.hardware.secure_element@1.2::ISecureElement/SIM1' for
ctl.interface_start from pid: 566 (/system/bin/hw servicemanager)
```

- Suppress these messages using:
 

```
$ su
# dmesg -n 3
```