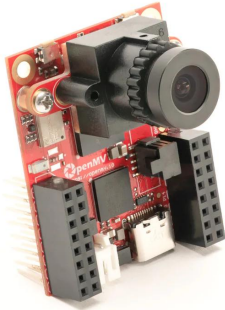


OpenMV Cam RT1062

FCC/CE/IC/RCM Testing Guide



General Notes:

The OpenMV Cam RT1062 is a modular product meant to be built into equipment. As such, it does not come in a case by default, making the device susceptible to ESD if touched on its main PCB. This also means the device radiates noise from its PCB as an unintentional radiator. That said, since it's designed to be built into equipment that has its own case. So, these issues are to be expected.

However, the product is designed to handle ESD shocks to its external interfaces. E.g. any I/O pin that attaches to something in the world. Additionally, we included EMI chokes on high-speed external interfaces to reduce radiated noise.

- The USB-C connector is protected by the [ECMF02-4CMX8](#).
 - This should provide ESD protection on the power and signal lines of the USB connection and reduce radiated EMI on the USB signal lines.
 - The USB-C Shield features a 1nF/1M resistor in parallel to ground to reduce noise from being picked up on the shield connection.
- All I/O pins are protected by the [CPDQT5V0HE-HF](#) and [EMIF06-1005M12](#). These devices should prevent ESD damage to any I/O pin that is exposed.
- The SD Card is protected by the [EMIF06-MSD02N16](#) which is designed to reduce radiated EMI and provide protection to the SD Card I/O pins.

Design Notes:

We intentionally include ESD protection on all signal lines that users interface with on purpose to protect the device from ESD damage which had been breaking previous models of the OpenMV Cam. In particular, USB should be very robust to ESD.

Finally, the product features WiFi/BLE Support onboard. This makes it capable of being an intentional radiator. We include a chip antenna by default so that customers have working WiFi/BLE out of the box. The chip antenna can be removed and replaced with a uFL antenna option for customers who want to integrate the device into a metal box.

Intentional Radiator Notes:

We use the [Murata Type 1DX Module](#) for WiFi 11b/g/n & BLE 5.1 support and the [AMCA31-2R450G-S1F-T3](#) chip antenna with matching components.

USA/Canada:

FCC ID : VPYLB1DX

IC : 772C-LB1DX

Europe:

EN300328 v2.1.1 conducted test report is prepared.

Japan:

Japanese type certification is prepared. R01- P00840

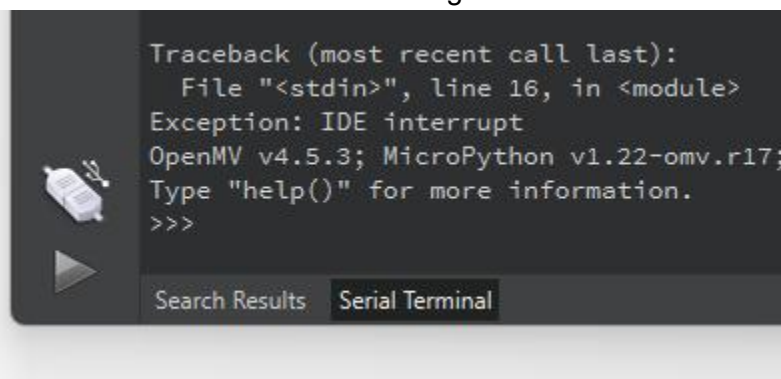
Bluetooth:

QDID: 140301

Testing Guide:

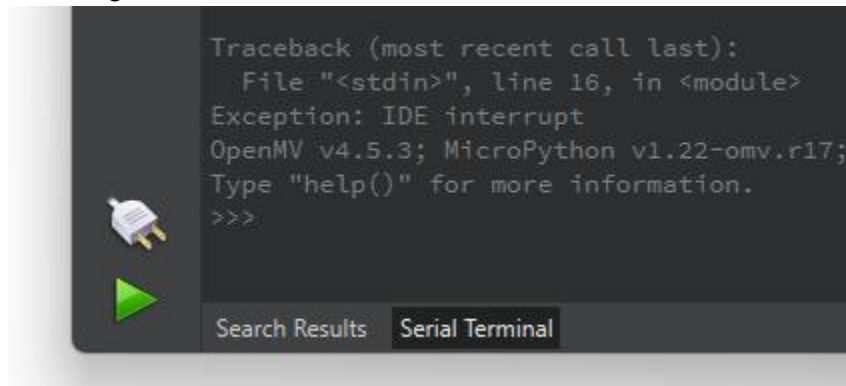
By default when powered on the OpenMV Cam RT1062 will not be doing anything. As such it's not possible to test it fully. To do so you need to download OpenMV IDE and connect it to a computer via USB-C. [Download – OpenMV](#)

1. Once you have the OpenMV Cam connected to your PC and launch OpenMV IDE please click the connect button in the lower right corner of the IDE:

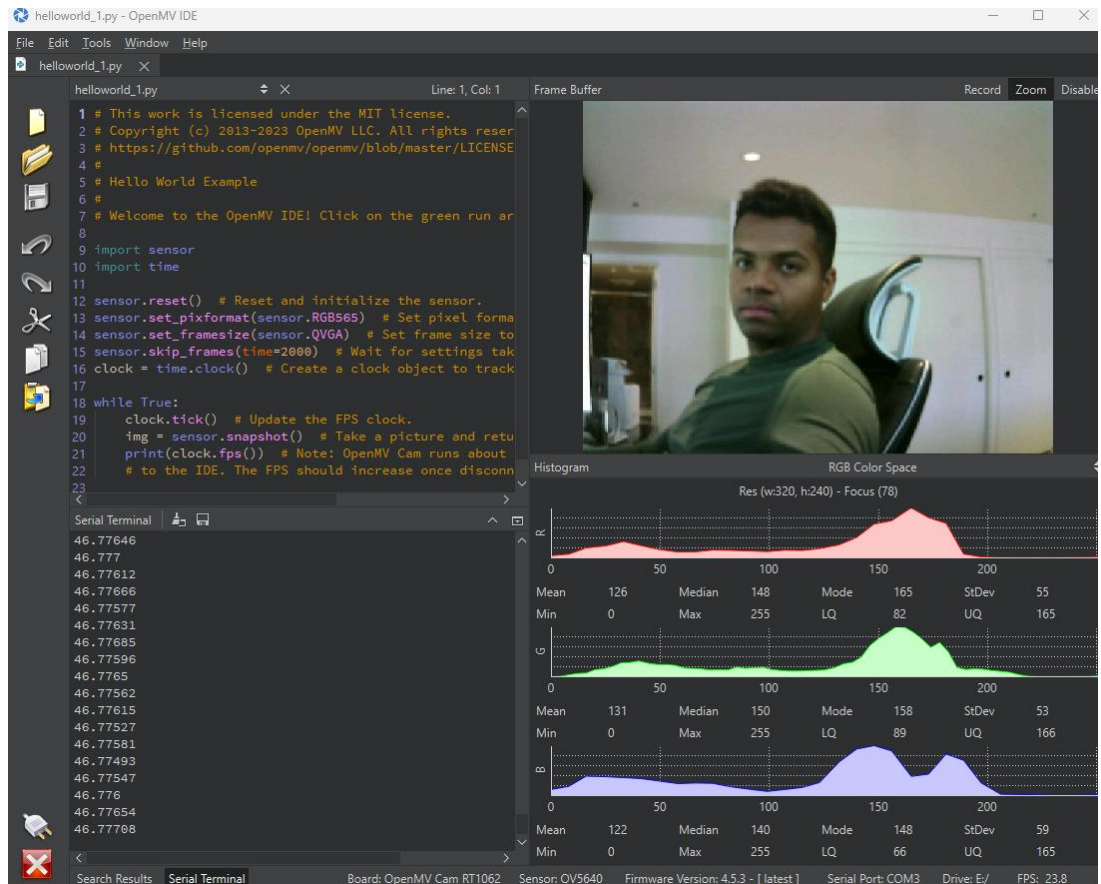


a.

- i. Note that the USB symbol should appear when the camera is detected by the IDE.
2. The IDE will ask you to update the firmware on your camera if it's out of date. Say yes.
3. After connecting to the IDE a run button will be available:



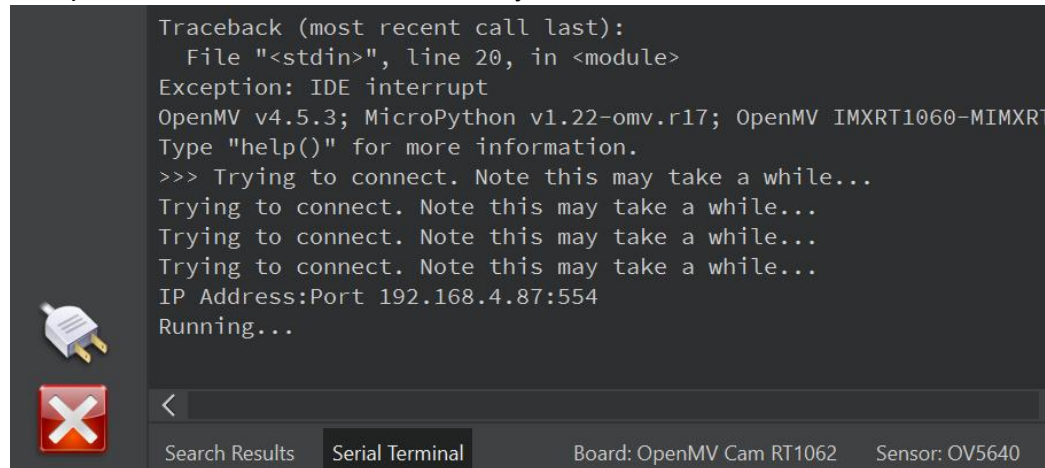
- a.
4. Please click on the run button to start the "Hello World" script, which will stream video from the camera to the PC.



- a.
5. The camera is now streaming video. All its circuits should be energized at this time. You should be able to test for unintentional radiation and check it against ESD.
 - a. The device may reboot when subjected to ESD.
 - b. The device may reboot when subjected to strong RF interference.
 - c. The system should not permanently break though.

WiFi Testing Guide:

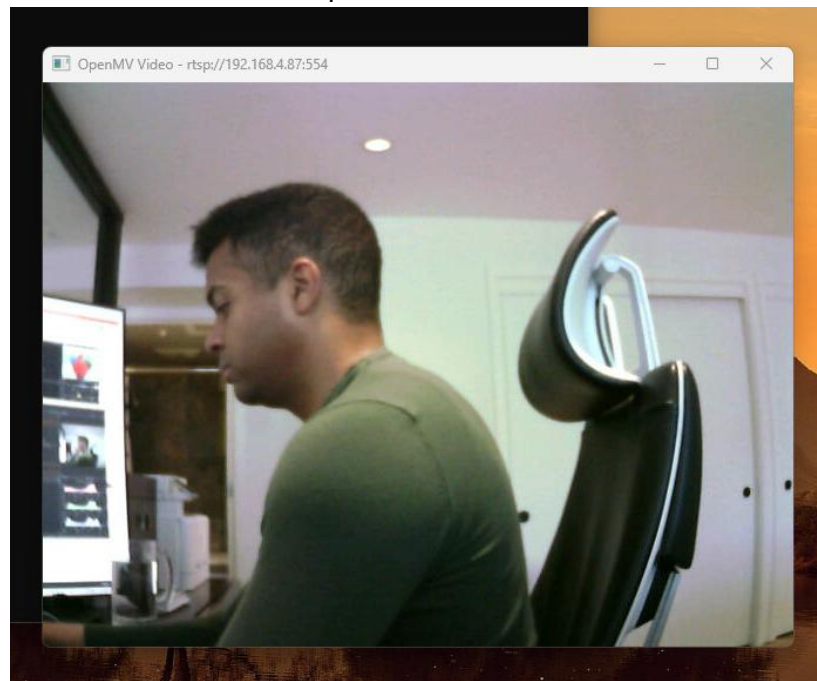
1. Please go to File->Examples->RPC Library->Web Servers->rtsp_video_server_wlan.py
 - a. This example will stream video data via the WiFi antenna.
2. Scroll down in the script until you find this line of code:
 - a. `network_if.connect("your-ssid", "your-password")`
 - i. Please replace these strings with the correct values for your network.
3. Run the script. The camera should connect to your network after a while:



```
Traceback (most recent call last):
  File "<stdin>", line 20, in <module>
Exception: IDE interrupt
OpenMV v4.5.3; MicroPython v1.22-omv.r17; OpenMV IMXRT1060-MIMXRT
Type "help()" for more information.
>>> Trying to connect. Note this may take a while...
Trying to connect. Note this may take a while...
Trying to connect. Note this may take a while...
Trying to connect. Note this may take a while...
IP Address:Port 192.168.4.87:554
Running...
```

Search Results Serial Terminal Board: OpenMV Cam RT1062 Sensor: OV5640

- a.
4. Go to Tools->Video Tools->Play RTSP Stream
 - a. Enter the IP address printed out by the camera and press play
 - b. Make sure to uncheck the stream video over TCP box.
 5. A video window like so should open:



- a.
6. The camera is now streaming video and transmitting/receiving data via WiFi. You should be able to test if it's in radiation compliance.

BLE Testing Guide:

1. Please go to File->Examples->Bluetooth->ble_blinky.py
 - a. This example will test the ble antenna.
2. **Make sure you have Firmware Version 4.5.4.**
 - a. **If not go to Tools->Install the Latest Development Release**
3. Run the script.
 - a. If you did not update the firmware to 4.5.4 BLE will be broken on the RT1062.
4. The device is not advertising via BLE. You may now test it.

If you want to interact with this demo script see the below:

5. On your phone, please install **NORDIC nRF Connect**.
 - a. This app can scan for bluetooth devices
6. A device called "mpy-blinky" should appear.
 - a. Please connect to it.
7. Under the "Client" Tab in the "Attribute Table" you should see a up arrow which allows you to send BLE packets to the camera.
 - a. Click the up arrow and select the "UnsignedInt" type and write the value of "0".
 - b. The Blue LED on the OpenMV Cam should turn off.
 - c. Click the up arrow and select the "UnsignedInt" type and write the value of "1".
 - d. The Blue LED on the OpenMV Cam should turn on.

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. such modifications could void the user's authority to operate the equipment.

The device has been evaluated to meet general RF exposure requirement.

To maintain compliance with FCC's RF exposure guidelines, the distance must be at least 20 cm between the radiator and your body, and fully supported by the operating and installation configurations of the transmitter and its antenna(s).