**OpenNCC IPC**

**User Manual**

|  |  |  |  |
| --- | --- | --- | --- |
| verson | date | author | Revision Description |
| 1.0 | 20210115 | Jerry | Initial Release |
|  |  |  |  |

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# Introduction

## Brief

OpenNCC IPC is an open AI network camera platform, equipped with Intel Movidius Myriad X visual processing unit (VPU). It is a low-power system on chip (SOC), which is used for deep learning of security, UAV, mobile robot, industrial intelligent camera, VR / AR and other artificial intelligence visual application acceleration.

Compared with Myriad 2, Myriad X provides ten times of deep neural network (DNN) performance at the same power consumption. The vector unit of Myriad X is a special save processor optimized for computer vision workload. Myriad also supports the latest LPDDR4.

* Hardware

OpenNCC IPC consists of one sensor board, one core board and one Raspberry Pi. It can carry sensors with different resolutions, global exposure or rolling shutter exposure, and can adapt to C-Port lens.

* Software

OpenNCC IPC provides IPC Source, IPC SDK and IPC Viewer as open sources for further development.

IPC Source is for further OpenNCC IPC device development.

IPC SDK and IPC Viewer is for further client application development.



## Features

●Support RJ45

●Support DCHP/UDP/TPC/IP/IPV4/RTP/RTCP/RTSP/ONVIF

●Support connection with Mouse&Keyboard through USB port

●Support connection with display/monitor through HDMI

●Power: DC 12V

●Embedded with double CNN accelerator

●Compatible with 100+ free pre-trained OpenVINO models

●Support changing models

|  |  |
| --- | --- |
| **AI Features** | |
| **CNN Accelerator Number** | 2 |
| **Support models** | All OpenVINO Models |
| **Support frameworks** | ONNX，TensorFlow，Caffe，MXNet，Kaldi |
| **Software Features** | |
| **ISP** | YES |
| **Protocols** | IPv4, TCP/IP, UDP, RTP, RTCP, RTSP, DHCP, ONVIF |
| **Data Transmission Channel** | Ethernet |
| **Developing languages** | C/C++ |
| **Open resources** | IPC Source, OpenNCC IPC SDK, OpenNCC IPC Viewer, Documents. |
| **Functions** | 1. Get video live streaming 2. Download and change AI models 3. Get AI results 4. Take photos, reset cameras, etc. |
| **Operation System** | Raspberry Pi OS, Linux |
| **Hardware Specifications** | |
| **Camera Size** | 180 mm x 80 mm x 60mm |
| **Camera Netweight** | 670g |
| **VPU** | Intel Movidius Myriad X MV2085 （Memory 8Gb） |
| **SoC** | Raspberry Pi |
| **Data Interface** | RJ45 |
| **Power** | 5V / 2A |
| **Camera Module** | 2.3MP RGB Global Shutter Sensor with C-mount lens |
| **Resolution** | 1920 x 1080 |
| **Frame Rate** | Up to 120Hz |
| **Field of View(Horizontal)** | 15~50° |
| **Working temperature** | 0-40℃ |

## Specifications

# Electrical characteristics

## Interface introduction



* power LED

Red: power on

* Interface 1: HDMI

Raspberry Pi display port.

* Interface 2: USB port

Raspberry Pi USB Port, can be connected with mouse, keyboard, USB, etc..

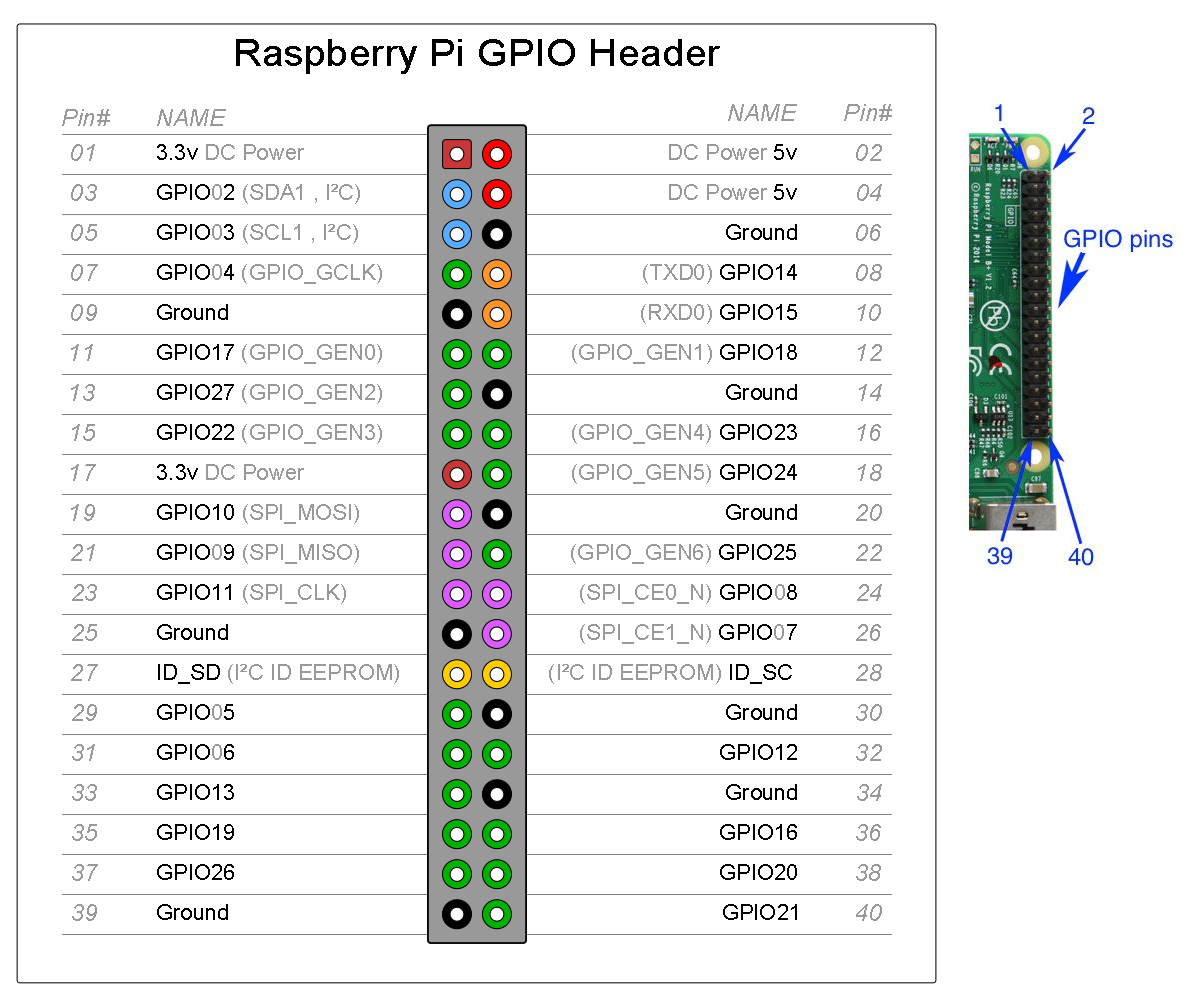
* Interface 3: RJ45

Raspberry Pi Gigabit Ethernet port, can be used for remote monitoring and downloading AI models.

* Interface 4: Programmable interface 485+/-, IO1, IO2, IO3, electrical characters.

Raspberry Pi interface table:

|  |  |  |  |
| --- | --- | --- | --- |
| PIN# | NAME | Raspberry Pi pin status | OpenNCC interface status |
| 03 | GPIO2 | Output: High | Output: Low（0V） |
| Output: Low | Output: High (3.3V) |
| 05 | GPIO3 | Input: High | Input: Low(0V) |
| Input: Low | Input: High(3.3V) |
| 07 | GPIO4 | Output: High | Output: Low（0V） |
| Output: Low | Output: High(3.3V) |
| 08 | GPIO14(TXD0) | Output | High: (RS485+: 0V, RS485-: 5V)  Low: (RS485+: 5V, RS485-: 0V) |
| 10 | GPIO15(RXD0) | Input |



Interface 5：power input

DC 12V input，ranges from 10V to 14V.

# IPC operation instructions

* Host Environments

Ubuntu 16.04、 Ubuntu 18.04

* Related Versions

IPC Viewer V1.0.0

IPC Hardware V1.0

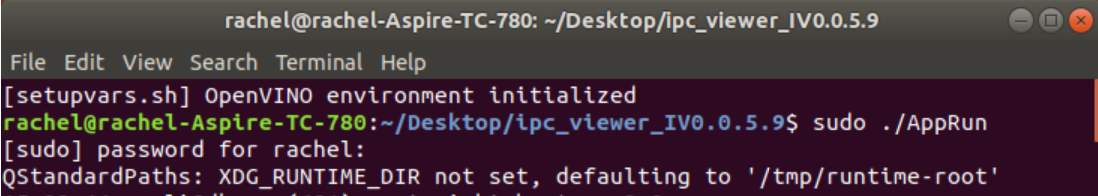
IPC SDK（R21.01.01）

* System operation
  1. Connect the display to the device via an HDMI cable.
  2. Power on the device, the display shows the startup process of Raspberry Pi.
  3. User management
     1. Username: root, Password: 123
     2. Username: admin, Password: admin123
* Getting Started

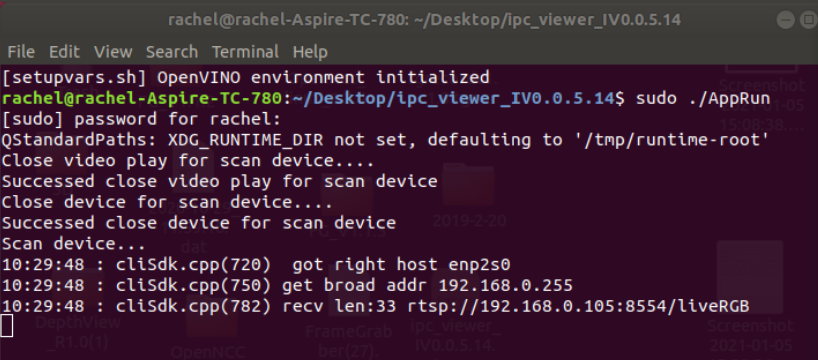
1. Connect the device to the router via the network cable.
2. Keep PC and device in the same LAN.
3. Power on the device.



1. Download IPC Viewer from https://gitee.com/eyecloud/openncc\_ipc
2. When the download is complete, unzip it and open the folder.
3. Run " sudo ./AppRun” in the path IPC Viewer

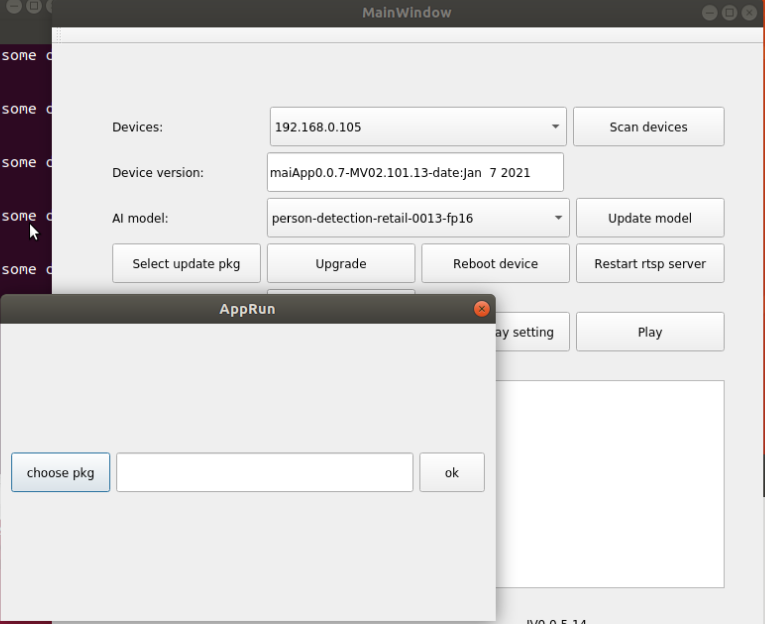


1. Click "Scan Devices" on IPC Viewer to scan all devices in the same LAN, results will be shown in the thermal as below:

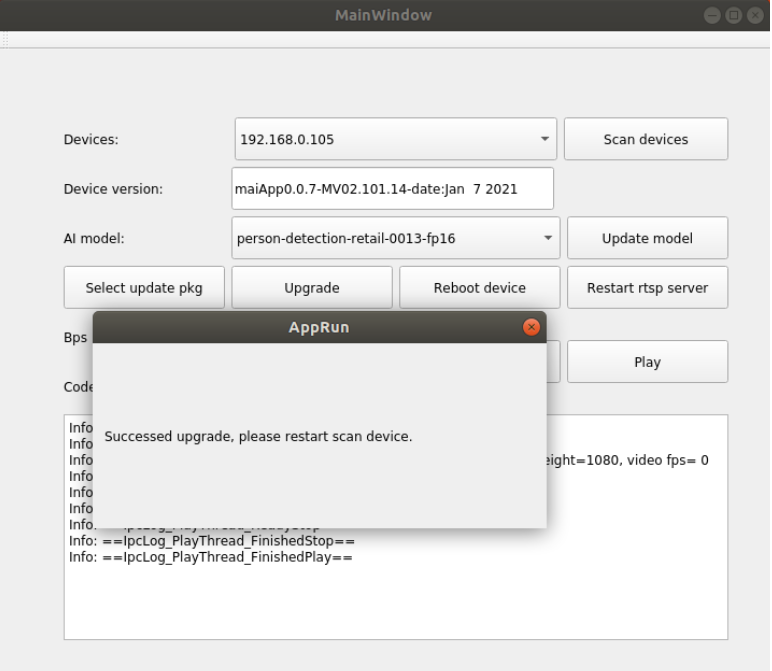


1. Select one of the IP addresses to operate the device.

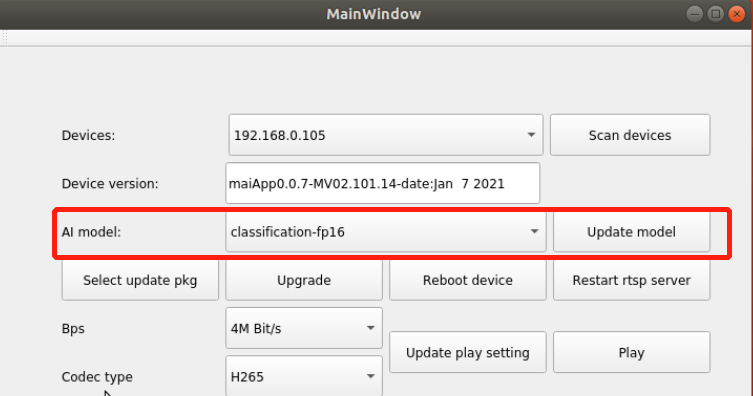
* Upgrading
  1. Click “Select update pkg”，then click "choose pkg" on the pop-up window.



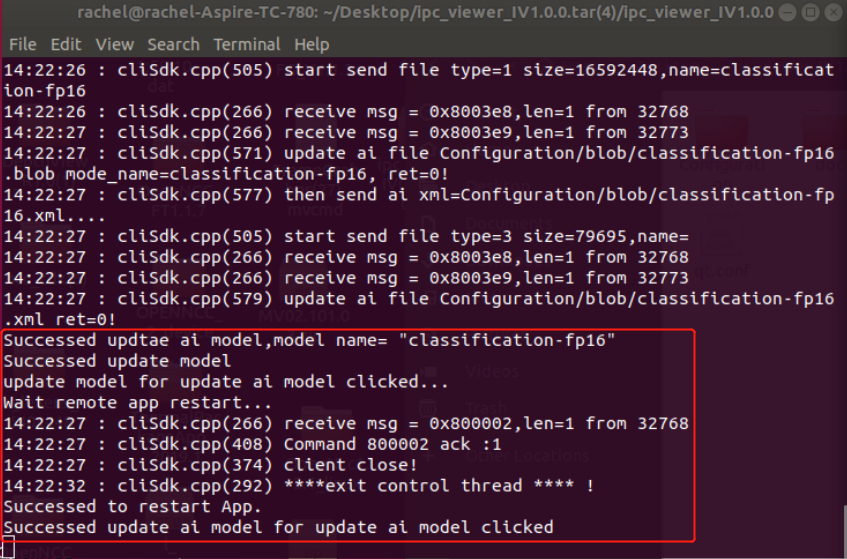
* 1. Click “ok”, then this window will close automatically.
  2. Click “Upgrade”，then the device will be automatically upgraded.
  3. When the upgrade is complete, a success message will prompt.



* Switching model
  1. Select the model in the AI model column.

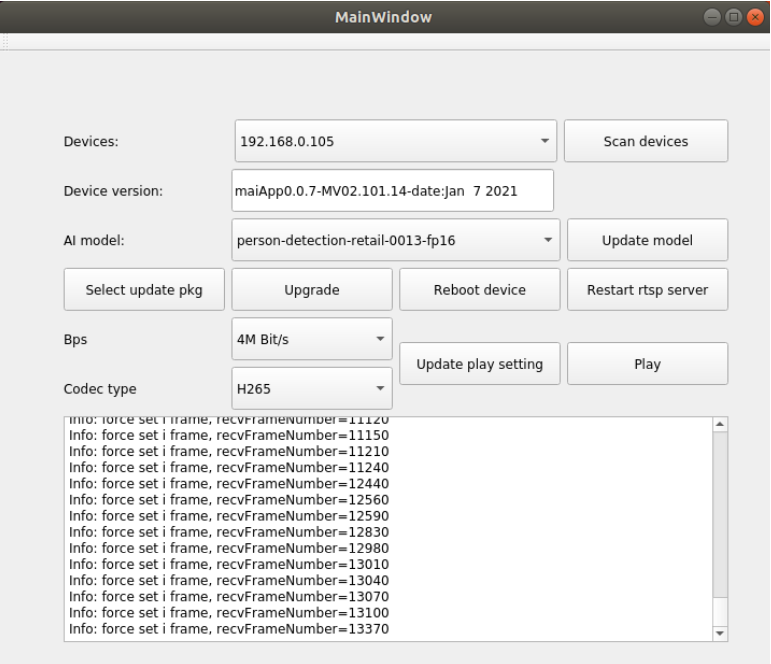


* 1. Click “Update model”, until the terminal prompts that the update has been successful.



* 1. Click "Play" and the model runs normally.
* Operation Instructions

1. Scan devices: Scan devices within the same LAN.
2. Devices: The scanned devices will be displayed in the list, it can be select.
3. Device version: Display the version of the hardware and software.
4. AI model: After modifying the model, click "Update Model" to make it effective.
5. Select update pkg: Select the SDK upgrade package and click "Upgrade" to upgrade. After successful upgrade, the device needs to be rescanned.
6. Reboot device: Click to reboot the device.
7. Restart rtsp server: Click to restart the RTSP service on the device side.
8. Bps: The transfer rate can be modified.
9. Codec type: The encoding type can be modified.
10. Update play setting: After the transmission rate and encoding type are modified, it can only be effective by clicking update play setting.
11. Play: Click to start livestream.



# SDK Function

Main functions of SDK

1. Gets SDK version information.
2. Auto scan ipc rtsp url in the same LAN with client
3. Connect to our device.
4. Close the connected session with device Get device firmware version.
5. Get the current AI mode which used in device.
6. Delete AI mode in device.
7. Changed the AI mode in device.
8. Read AI meta data from device.
9. Get video encode param.

Visit the website for more details.

URL: https://gitee.com/eyecloud/openncc\_ipc

# FAQ

Q1: There is no image after connecting OpenNCC IPC with a display through HDMI.

A1: This issue happens normally because OpenNCC IPC has been powered on before it connected to the display. To solve the issue, please try to power off OpenNCC IPC first, then connect it with the display, and power on OpenNCC IPC again in the end.

Q2: The power indicator can’t be turned on.

A2: Recheck the input power and make sure the voltage is between 10V to 14V.

Q3: OpenNCC IPC and Viewer has been connected properly, but there is no livestreaming.

A3: Click “Restart rtsp server” on OpenNCC Viewer.

Q4: OpenNCC IPC has been connected, but OpenNCC Viewer can’t scan it.

A4: Recheck and make sure OpenNCC IPC is powered on and connected with the PC in the same LAN.