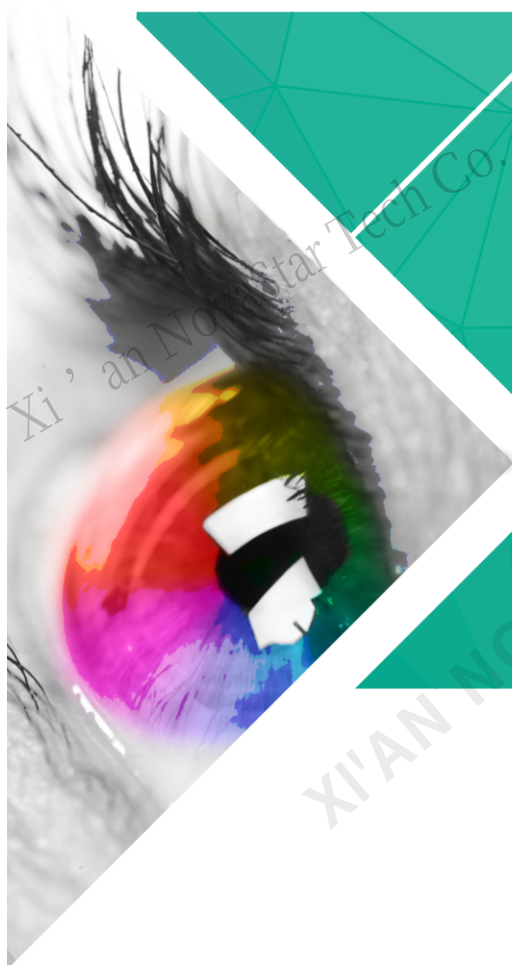




# Taurus Series

## Multimedia Players



## TB2-4G Specifications

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Product Version: V1.0.0

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# 1 Safety

This chapter illustrates Taurus series products safety to ensure storage, transportation, installation and usage safety of the products.

Safety description is applicable to all personnel that contact or use the products. First, pay attention to following points:

- Read throughout the description.
- Save the whole description.
- Be complied with the whole description.

## 1.1 Storage and Transport Safety

- Pay attention to dust and water prevention.
- Avoid long-term direct sunlight.
- Do not place the products in the position near fire and heat.
- Do not place the products in an area containing explosive materials.
- Do not place the products in strong electromagnetic environment.
- Place the products in a stable position to prevent damage or personal injury caused by dropping.
- Save the packing box and materials which will come in handy if you ever have to ship your products. For maximum protection, repack your product as it was originally packed at the factory.

## 1.2 Installation and Use Safety

- Only trained professionals may install the products.
- Do not insert and unplug (power cord plug) when the power is on.
- Devices must be placed horizontally during installation and use.
- Ensure the safe grounding of the device.
- Be careful about electric shock risk.
- Always wear a wrist band and insulating gloves.
- Do not place the products in an area having more or strong shake.
- Perform dust removing regularly.
- Rather than having the product disassembled and maintained by non-certified professionals, please contact NovaStar for maintenance at any time.

- Replace spare parts only with the same parts supplied by NovaStar.

# 2 Overview

## 2.1 Introduction

Taurus series products are NovaStar's second generation of multimedia players dedicated to small and medium-sized full-color LED displays.

### Features

The TB2-4G of the Taurus series products (hereinafter referred to as "TB2-4G") has the following features:

- Powerful processing capability
- Omnidirectional control plan
- Synchronous and asynchronous dual-mode
- Wi-Fi AP connection
- 4G module
- Capable of connecting to PC through USB

In addition to solution publishing and screen control via PC, mobile phones and LAN, the omnidirectional control plan also supports remote centralized publishing and monitoring.

### Other Hardware Features

The hardware of the TB2-4G also has the following features:

- Loading capacity up to 650,000 pixels, with the maximum width of 1920 pixels and maximum height of 1080 pixels
- Wired Gigabit Ethernet
- Stereo audio output
- HDMI input and auto full-screen display
- USB drive importing display
- Onboard light sensor connector allowing for automatic and scheduled brightness adjustment

## 2.2 Application

Taurus series products can be widely used in LED commercial display field, such as bar screen, chain store screen, advertising machine, mirror screen, retail store screen, door head screen, on board screen and the screen requiring no PC.

Classification of Taurus' application cases is shown in [Table 2-1](#).

Table 2-1 Application

| Classification  | Description                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Market type     | <ul style="list-style-type: none"><li>• Advertising media: To be used for advertising and information promotion including bar screen and advertising machine.</li><li>• Digital signage: To be used for signage display in retail stores including retail store screens and door head screens.</li><li>• Commercial display: To display commercial information of hotel, cinema and shopping mall, such as chain store screens.</li></ul> |
| Networking mode | <ul style="list-style-type: none"><li>• Independent screen: Use a PC or the client software of a mobile phone to enable single-point connection and management of a screen.</li><li>• Cluster screen: Use the cluster solution developed by NovaStar to realize centralized management and monitor of multiple screens.</li></ul>                                                                                                         |
| Connection type | <ul style="list-style-type: none"><li>• Wired connection: A PC connects to Taurus through the Ethernet cable or LAN.</li><li>• Wi-Fi connection: PC, Pad and mobile phone can connect to Taurus through Wi-Fi, which can be enabled in the case without PC in conjunction with ViPlex software.</li></ul>                                                                                                                                 |



# 3 Features

## 3.1 Powerful Processing Capability

- 1.2 GHz four-core processor
- Support for 1080P video hardware decoding
- 1 GB operating memory
- 8 GB on-board internal storage space with 4 GB available for users

## 3.2 Omnidirectional Control Plan

Table 3-1 Control Plan

| Control Plan                                                | Connecting Mode               | User Terminal            | Related Software                            |
|-------------------------------------------------------------|-------------------------------|--------------------------|---------------------------------------------|
| Solution publishing and screen control through PC           | Ethernet cable<br>Wi-Fi       | PC                       | ViPlex Express<br>NovaLCT                   |
| Solution publishing and screen control through LAN          | LAN                           | PC                       | ViPlex Express<br>NovaLCT                   |
| Solution publishing and screen control through mobile phone | Wi-Fi                         | Mobile phone and Pad     | ViPlex Handy                                |
| Cluster remote solution publishing and screen control       | Ethernet cable<br>Wi-Fi<br>4G | Mobile phone, Pad and PC | VNNOX<br>ViPlex Handy<br>ViPlex Express     |
| Cluster remote monitoring                                   | Ethernet cable<br>Wi-Fi<br>4G | Mobile phone, Pad and PC | NovaiCare<br>ViPlex Handy<br>ViPlex Express |

Cluster control plan is a new internet control plan featuring following advantages:

- More efficient: Use the cloud service mode to process services through a uniform platform. For example, VNNOX is used to edit and publish solutions, and NovaiCare is used to centrally monitor display status.
- More reliable: Ensure the reliability based on active and standby disaster recovery mechanism and data backup mechanism of the server.
- More safe: Ensure the system safety through channel encryption, data fingerprint and permission management.
- Easier to use: VNNOX and NovaiCare can be accessed through Web. As long as there is internet, operation can be performed anytime and anywhere.
- More effective: This mode is more suitable for the commercial mode of advertising industry and digital signage industry, and makes information spreading more effective.

### 3.3 Synchronous and Asynchronous Dual-Mode

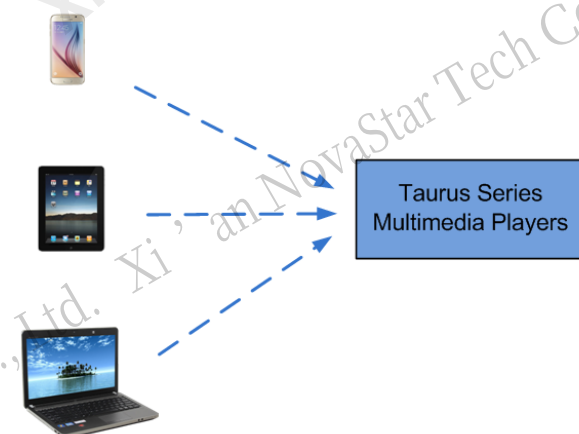
The TB2-4G supports synchronous and asynchronous dual-mode, allowing more application cases and being user-friendly.

When internal video source is applied, the TB2-4G is in asynchronous mode; when HDMI-input video source is used, the TB2-4G is in synchronous mode. Content can be scaled and displayed to fit the screen size automatically in synchronous mode.

Users can manually and timely switch between synchronous and asynchronous modes, as well as set HDMI priority.

### 3.4 Wi-Fi AP Connection

The TB2-4G has permanent Wi-Fi AP. The SSID is "**AP + the last 8 digits of the SN**", for example, "**AP10000033**", and the default password is "**12345678**". The TB2-4G requires no wiring and users can manage the displays at any time by connecting to the TB2-4G via mobile phone, Pad or PC.



TB2-4G's Wi-Fi AP signal strength is related to the transmit distance and environment. Users can change the Wi-Fi antenna as required.

## 3.5 4G Module

The TB2-4G is designed with 4G module. You can connect to the Internet via 4G network after turning on mobile data network in the client software ViPlex.

Wired network is prior to 4G network. When both of the networks are available, the TB2-4G will choose signals automatically according to the priority.

## 3.6 Connecting to PC Through USB

The TB2-4G offers one USB Type B port allowing PC to be directly connected without requiring other operations and you can configure screens, publish solutions , etc. by using NovaLCT and ViPlex Express on Windows.

# 4 Hardware Structure

## 4.1 Appearance

### 4.1.1 Front Panel

Figure 4-1 Front panel of the TB2-4G



Note: Product images provided in this file are for reference only, and the actual products shall prevail.

Table 4-1 Description of TB2-4G front panel

| Name     | Description                                                                                                                                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SWITCH   | Button for switching between synchronous and asynchronous modes <ul style="list-style-type: none"><li>Always on: Synchronous mode</li><li>Off: Asynchronous mode</li></ul> |
| SIM CARD | SIM card slot                                                                                                                                                              |

| Name     | Description                                                                                                                                                                                                                                                                                       |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PWR      | Power status indicator<br>Always on: Power input is normal.                                                                                                                                                                                                                                       |
| SYS      | System status indicator <ul style="list-style-type: none"> <li>Flashing once every 2 seconds: The system is operating normally.</li> <li>Flashing once every 0.5 second: The system is downloading data from the Internet.</li> <li>Always on/off: The system is operating abnormally.</li> </ul> |
| CLOUD    | Internet connection status indicator <ul style="list-style-type: none"> <li>Always on: The unit is connected to the Internet and the connection status is normal.</li> <li>Flashing once every 2 seconds: The unit is connected to VNNOX and the connection status is normal.</li> </ul>          |
| RUN      | FPGA status indicator<br>Same as the signal indicator status of the sending card: FPGA is operating normally.                                                                                                                                                                                     |
| HDMI IN  | HDMI1.4 input                                                                                                                                                                                                                                                                                     |
| USB 1    | USB2.0 port                                                                                                                                                                                                                                                                                       |
| ETHERNET | Gigabit Ethernet port                                                                                                                                                                                                                                                                             |
| WiFi-AP  | Wi-Fi AP antenna port                                                                                                                                                                                                                                                                             |
| 4G       | 4G antenna port                                                                                                                                                                                                                                                                                   |

## 4.1.2 Rear Panel

Figure 4-2 Rear panel of the TB2-4G

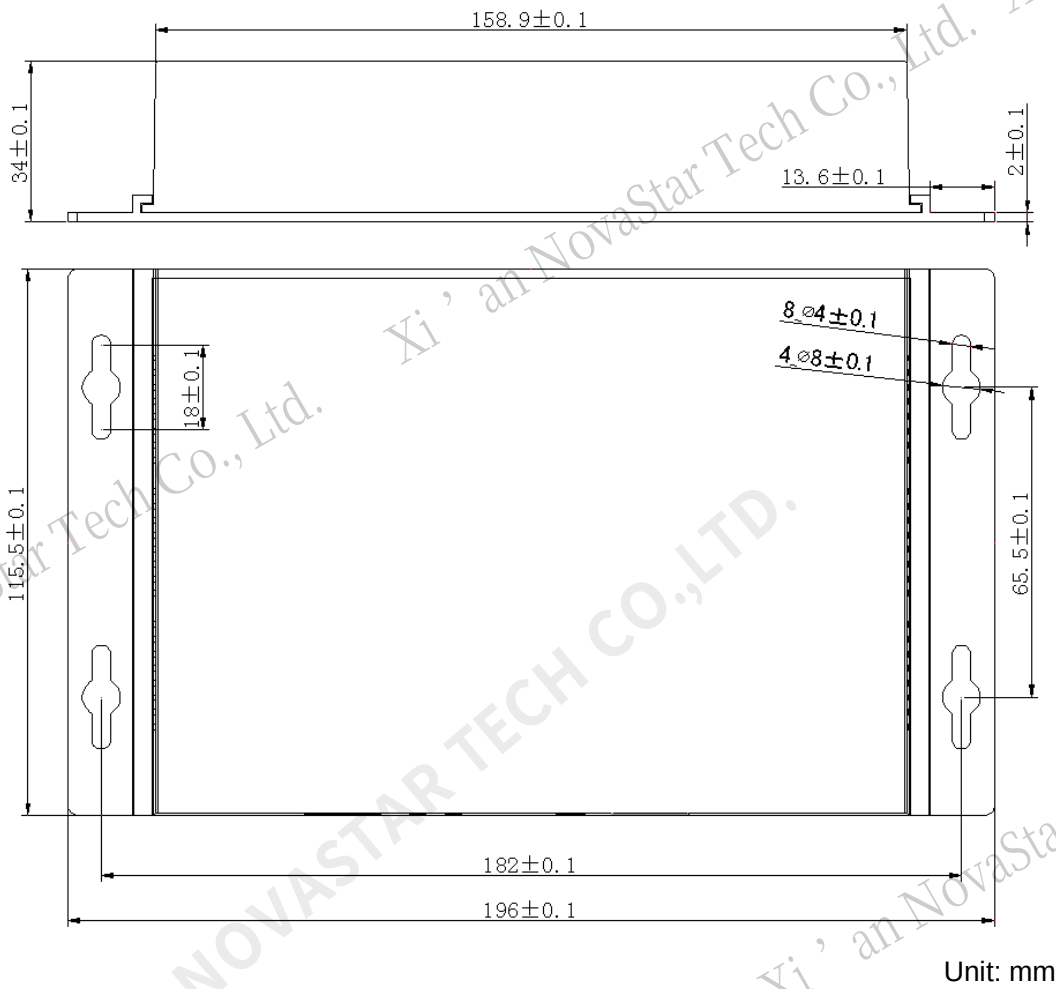


Note: Product images provided in this file are for reference only, and the actual products shall prevail.

Table 4-2 Description of TB2-4G rear panel

| Name   | Description                                                                |
|--------|----------------------------------------------------------------------------|
| PWR    | Power input                                                                |
| AUDIO  | Audio output                                                               |
| USB 2  | USB Type B port                                                            |
| RESET  | Factory reset button, hold down for 5 seconds to reset to factory defaults |
| LEDOUT | Output Ethernet port                                                       |

4.2 Dimensions



# 5 Software Structure

## 5.1 System Software

- Android operating system software
- Android terminal application software
- FPGA program

Note: The third-party applications are not supported.

## 5.2 Related Configuration Software

Table 5-1 Related configuration software

| Software       | Description                                                                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| ViPlex Handy   | Mobile phone client software of the TB2-4G includes Android and iOS which are mainly used for screen management, editing, and solution publishing. |
| ViPlex Express | PC client software of the TB2-4G only includes Windows which is mainly used for screen management, editing, and solution publishing.               |
| NovaLCT        | Display screen configuration software works in Windows only, and is used to adjust screens to the best display status.                             |

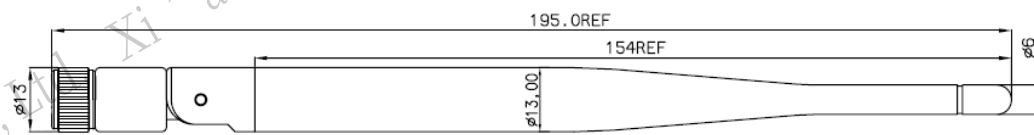


# 6 Product Specifications

## Specifications

| TB2-4G Item             | Sub-Item                  | Specifications                                                                                                                                                                |
|-------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Physical specifications | Dimension (H×W×D)         | 196.0 mm × 115.5 mm × 34.0 mm                                                                                                                                                 |
|                         | Input voltage             | 5 V DC                                                                                                                                                                        |
|                         | Maximum power consumption | 15 W                                                                                                                                                                          |
|                         | Storage temperature       | 0°C–50°C                                                                                                                                                                      |
|                         | Storage humidity          | 0% RH–80% RH                                                                                                                                                                  |
|                         | Operating temperature     | -40°C–75°C                                                                                                                                                                    |
|                         | Operating humidity        | 0% RH–80% RH                                                                                                                                                                  |
|                         | Operating memory          | 1 GB                                                                                                                                                                          |
|                         | Internal storage space    | 8 GB on-board with 4 GB available for users                                                                                                                                   |
| Packing information     | Dimension (H×W×D)         | 335 mm × 190 mm × 62 mm                                                                                                                                                       |
|                         | List                      | <ul style="list-style-type: none"> <li>• TB2-4G LED multimedia player x 1</li> <li>• Power adapter (5V 3A) x 1</li> <li>• One column Wi-Fi omnidirectional antenna</li> </ul> |

## Wi-Fi Antenna



# 7 Audio and Video Decoder Specifications

## 7.1 Image

### 7.1.1 Decoder

| Type | Codec                 | Supported Image Size          | Container | Remarks                                                                                                    |
|------|-----------------------|-------------------------------|-----------|------------------------------------------------------------------------------------------------------------|
| JPEG | JFIF file format 1.02 | 48x48 pixels~8176x8176 pixels | JPG, JPEG | Not Support<br>Non-interleaved Scan<br>Software support SRGB<br>JPEG<br>Software support Adobe<br>RGB JPEG |
| BMP  | BMP                   | No Restriction                | BMP       | N/A                                                                                                        |
| GIF  | GIF                   | No Restriction                | GIF       | N/A                                                                                                        |
| PNG  | PNG                   | No Restriction                | PNG       | N/A                                                                                                        |
| WEBP | WEBP                  | No Restriction                | WEBP      | N/A                                                                                                        |

### 7.1.2 Encoder

| Type | Codec         | Supported Image Size          | Maximum Data Rate | File Format           | Remarks |
|------|---------------|-------------------------------|-------------------|-----------------------|---------|
| JPEG | JPEG Baseline | 96x32 pixels~8176x8176 pixels | 90Mpixels/Second  | JFIF file format 1.02 | N/A     |

## 7.2 Audio

### 7.2.1 Decoder

| Type                | Codec                                                                               | Channel | Bit rate                                                 | Sampling rate | File Format                     | Remarks                               |
|---------------------|-------------------------------------------------------------------------------------|---------|----------------------------------------------------------|---------------|---------------------------------|---------------------------------------|
| MPEG                | MPEG1/2/2.5 Audio Layer1/2/3                                                        | 2       | 8kbps~320Kbps, CBR and VBR                               | 8KHZ~48 KHz   | MP1, MP2, MP3                   | N/A                                   |
| Windows Media Audio | WMA Version 4, 4.1, 7, 8, 9, wmapro                                                 | 2       | 8kbps~320Kbps                                            | 8KHZ~48 KHz   | WMA                             | Non-support WMA Pro, lossless and MBR |
| WAV                 | MS-ADPCM, IMA-ADPCM, PCM                                                            | 2       | N/A                                                      | 8KHZ~48 KHz   | WAV                             | Support 4bit MS-ADPCM, IMA-ADPCM      |
| OGG                 | Q1~Q10                                                                              | 2       | N/A                                                      | 8KHZ~48 KHz   | OGG, OGA                        | N/A                                   |
| FLAC                | Compress Level 0~8                                                                  | 2       | N/A                                                      | 8KHZ~48 KHz   | FLAC                            | N/A                                   |
| AAC                 | ADIF, ATDS Header AAC-LC and AAC-HE, AAC-ELD                                        | 5.1     | N/A                                                      | 8KHZ~48 KHz   | AAC, M4A                        | N/A                                   |
| AMR                 | AMR-NB, AMR-WB                                                                      | 1       | AMR-NB 4.75~12.2kbps@8kHz<br>AMR-WB 6.60~23.85kbps@16kHz | 8KHZ, 16KHz   | 3GP                             | N/A                                   |
| MIDI                | MIDI Type 0 and 1, DLS version 1 and 2, XMF and Mobile XMF, RTTTL/RTX, OTA, iMelody | 2       | N/A                                                      | N/A           | XMF, MXMF, RTTTL, RTX, OTA, IMY | N/A                                   |

### 7.2.2 Encoder

| Type | Codec          | Channel | Bit rate               | Sampling rate | Container          | Remarks |
|------|----------------|---------|------------------------|---------------|--------------------|---------|
| AMR  | AMR-NB, AMR-WB | 2       | 4.75kbps~12.2Kbps, CBR | 8KHZ, 16KHZ   | 3GPP               | N/A     |
| AAC  | AAC-ADTS-LC    | 1       | 4.75kbps~60Kbps, CBR   | 8KHZ~44.1KHZ  | AAC, 3GPP, Mpeg2TS | N/A     |

## 7.3 Video

### 7.3.1 Decoder

| Type       | Codec      | Supported Image Size                                                                                                  | Maximum Frame Rate                                                                          | Maximum Bit Rate<br>(Ideal Case)                                           | File Format                      | Remarks                                          |
|------------|------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------|--------------------------------------------------|
| MPEG-1/2   | MPEG-1/2   | 48×48 pixels~1920×1088 pixels                                                                                         | 30fps                                                                                       | 80Mbps                                                                     | DAT, MPG, VOB, TS                | Support Field Coding                             |
| MPEG-4     | MPEG-4     | 48×48 pixels~1920×1088 pixels                                                                                         | 30fps                                                                                       | 38.4Mbps                                                                   | AVI, MKV, MP4, MOV, 3GP          | Not support MS MPEG4 v1/v2/v3<br>Not support GMC |
| H.264/AVC  | H.264      | T1&T2&TB1&TB2&T1-4G&T2-4G&TB1-4G&TB2-4G: 48×48 pixels~1920×1088 pixels<br>Other models: 48×48 pixels~4096×2304 pixels | T1&T2&TB1&TB2&T1-4G&T2-4G&TB1-4G&TB2-4G: 1080P@60fps<br>Other models: 4K@25fps, 1080P@60fps | T1&T2&TB1&TB2&T1-4G&T2-4G&TB1-4G&TB2-4G: 57.2Mbps<br>Other models: 100Mbps | AVI, MKV, MP4, MOV, 3GP, TS, FLV | Support Field Coding<br>Support MBAFF            |
| MVC        | H.264 MVC  | 48×48 pixels~1920×1088 pixels                                                                                         | 60fps                                                                                       | 38.4Mbps                                                                   | MKV, TS                          | Support Stereo High Profile only                 |
| H.265/HEVC | H.265/HEVC | T1&T2&TB1&TB2&T1-4G&T2-4G&TB1-4G&TB2-4G: 64×64 pixels~1920×1088 pixels<br>Other models: 64×64 pixels~4096×2304 pixels | T1&T2&TB1&TB2&T1-4G&T2-4G&TB1-4G&TB2-4G: 1080P@60fps<br>Other models: 4K@60fps, 1080P@60fps | T1&T2&TB1&TB2&T1-4G&T2-4G&TB1-4G&TB2-4G: 57.2Mbps<br>Other models: 100Mbps | MKV, MP4, MOV, TS                | Support Main Profile<br>Support Tile & Slice     |
| GOOGLE VP8 | VP8        | 48×48 pixels~1920×1088 pixels                                                                                         | 30fps                                                                                       | 38.4 Mbps                                                                  | WEBM, MKV                        | N/A                                              |
| H.263      | H.263      | SQCIF(128×96), QCIF(176×144), CIF(352×288), 4CIF(704×576)                                                             | 30fps                                                                                       | 38.4Mbps                                                                   | 3GP, MOV, MP4                    | Not support H.263+                               |
| VC-1       | VC-1       | 48×48                                                                                                                 | 30fps                                                                                       | 45Mbps                                                                     | WMV, ASF                         | N/A                                              |

| Type        | Codec | Supported Image Size          | Maximum Frame Rate | Maximum Bit Rate (Ideal Case) | File Format  | Remarks |
|-------------|-------|-------------------------------|--------------------|-------------------------------|--------------|---------|
|             |       | pixels~1920×1088 pixels       |                    |                               | TS, MKV, AVI |         |
| MOTION JPEG | MJPEG | 48×48 pixels~1920×1088 pixels | 30fps              | 38.4Mbps                      | AVI          | N/A     |

**Note:** Output data format is YUV420 semi-planar, and YUV400(monochrome) is also supported for H.264.

### 7.3.2 Encoder

| Type       | Codec | Supported Image Size           | Maximum Frame Rate | Maximum Bit Rate (Ideal Case) | File Format | Remarks           |
|------------|-------|--------------------------------|--------------------|-------------------------------|-------------|-------------------|
| H.264/AVC  | H.264 | 144×96 pixels~1920×1088 pixels | 30fps              | 20Mbps                        | MOV, 3GP    | Not support MBAFF |
| Google VP8 | VP8   | 96×96 pixels~1920×1088 pixels  | 30fps              | 10Mbps                        | WEBM        | N/A               |