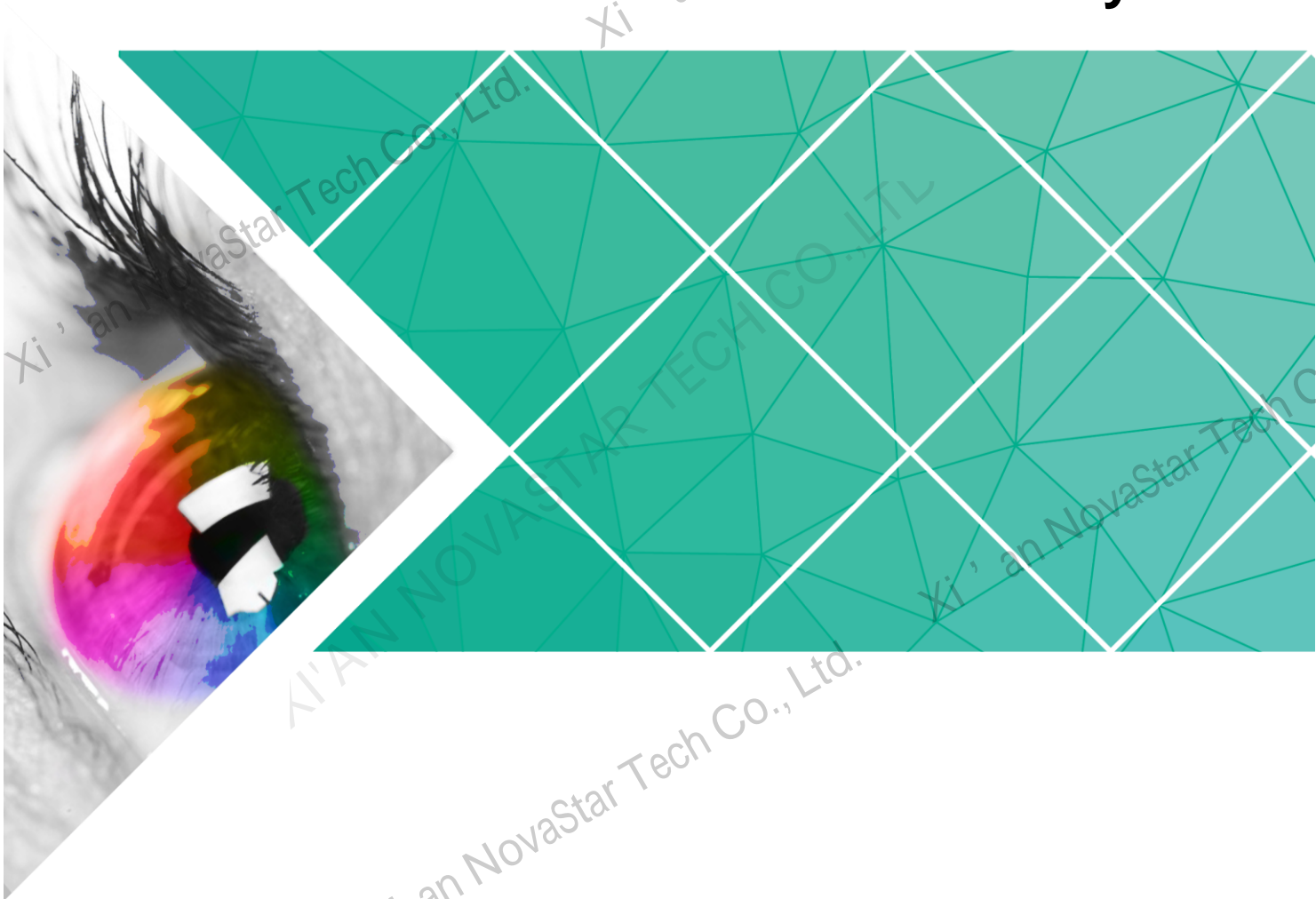


# Taurus Series

## Multimedia Players



## TB8 Specifications

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# Table of Contents

<b>Table of Contents</b> .....	<b>ii</b>
<b>1 Safety</b> .....	<b>1</b>
1.1 Storage and Transport Safety.....	1
1.2 Installation and Use Safety.....	1
<b>2 Overview</b> .....	<b>3</b>
2.1 Introduction.....	3
2.2 Application.....	3
<b>3 Features</b> .....	<b>5</b>
3.1 Synchronization mechanism for multi-screen playing.....	5
3.2 Powerful Processing Capability.....	5
3.3 Omnidirectional Control Plan.....	5
3.4 Synchronous and Asynchronous Dual-Mode.....	6
3.5 Dual-Wi-Fi Mode.....	6
3.5.1 Wi-Fi AP Mode.....	7
3.5.2 Wi-Fi Sta Mode.....	7
3.5.3 Wi-Fi AP+Sta Mode.....	7
<b>4 Hardware Structure</b> .....	<b>9</b>
4.1 Appearance.....	9
4.1.1 Front Panel.....	9
4.1.2 Rear Panel.....	10
4.2 Dimensions.....	11
<b>5 Software Structure</b> .....	<b>12</b>
5.1 System Software.....	12
5.2 Related Configuration Software.....	12
<b>6 Product Specifications</b> .....	<b>13</b>
<b>7 Audio and Video Decoder Specifications</b> .....	<b>15</b>
7.1 Image.....	15
7.1.1 Decoder.....	15
7.1.2 Encoder.....	15

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7.2 Audio.....	16
7.2.1 Decoder .....	16
7.2.2 Encoder .....	16
7.3 Video.....	17
7.3.1 Decoder .....	17
7.3.2 Encoder .....	18

# 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 at 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 at 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.
- Built-in power supply supports 100 V to 240 V AC.
- 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.

- 
- Do not maintain the products without authorization but contact NovaStar as soon as possible.
  - Replace spare parts only with the same parts supplied by NovaStar.

# 2 Overview

## 2.1 Introduction

Taurus series products are the second generation of multimedia players dedicated to small and media size LED full color display developed by NovaStar.

TB8 of the Taurus series products (herein after referred to as “TB8”) feature following advantages, better satisfying users’ requirements:

- Loading capacity up to 2,300,000 pixels
- Synchronization mechanism for multi-screen playing
- Powerful processing capability
- Omnidirectional control plan
- Synchronous and asynchronous dual-mode
- Dual-Wi-Fi mode

**Note:**

If the user has a high demand on synchronization, the time synchronization module is recommended. For details, please consult our technical staff.

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

## 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</li></ul>

Classification	Description
	hotel, cinema and shopping mall, such as chain store screens.
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 Synchronization mechanism for multi-screen playing

The TB8 support switching on/off function of synchronous display.

When synchronous display is enabled, the same content can be played on different displays synchronously if the time of different TB8 units are synchronous with one another and the same program is being played.

## 3.2 Powerful Processing Capability

The TB8 features powerful hardware processing capability:

- 1.5 GHz eight-core processor
- Support for H.265 4K high-definition video hardware decoding playback
- Support for 1080P video hardware decoding
- 2 GB operating memory
- 8 GB on-board internal storage space with 4 GB available for users

## 3.3 Omnidirectional Control Plan

Table 3-1 Control Plan

Control Plan	Connecting Mode	Client Terminal	Related Software
Program publishing and screen control through PC	Connection via network line Connection via Wi-Fi	PC	ViPlex Express NovaLCT
Program publishing and screen control through LAN	Connection via LAN	PC	ViPlex Express NovaLCT

Control Plan	Connecting Mode	Client Terminal	Related Software
Program publishing and screen control through mobile phone	Connection via Wi-Fi	Mobile phone and Pad	ViPlex Handy
Cluster remote program publishing and screen control	Wi-Fi AP+Sta/wired	Mobile phone, Pad and PC	VNNOX ViPlex Handy ViPlex Express
Cluster remote monitoring	Wi-Fi AP+Sta/wired	Mobile phone, Pad and PC	NovaiCare ViPlex Handy 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 programs, 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.

### 3.4 Synchronous and Asynchronous Dual-Mode

The TB8 supports synchronous and asynchronous dual-mode, allowing more application cases and being user-friendly.

When internal video source is applied, the TB8 is in asynchronous mode; when HDMI-input video source is used, the TB8 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.

### 3.5 Dual-Wi-Fi Mode

The TB8 have permanent Wi-Fi AP and support the Wi-Fi Sta mode, carrying advantages as shown below:

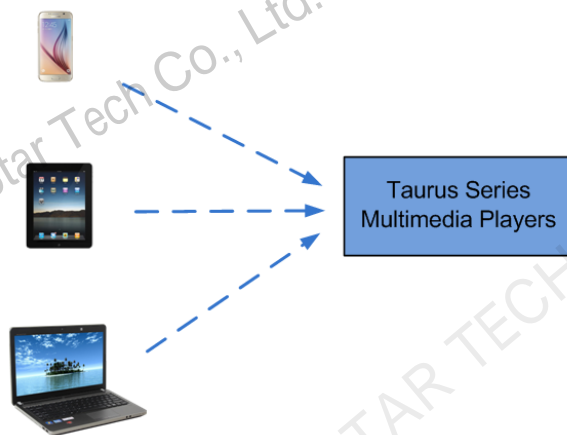
- Completely cover Wi-Fi connection scene. The TB8 can be connected to through self-carried Wi-Fi AP or the external router.

- Completely cover client terminals. Mobile phone, Pad and PC can be used to log in TB8 through wireless network.
- Require no wiring. Display management can be managed at any time, having improvements in efficiency.

TB8's Wi-Fi AP signal strength is related to the transmit distance and environment. Users can change the Wi-Fi antenna as required.

### 3.5.1 Wi-Fi AP Mode

Users connect the Wi-Fi AP of a TB8 to directly access the TB8. The SSID is "**AP + the last 8 digits of the SN**", for example, "**AP10000033**", and the default password is "**12345678**".



### 3.5.2 Wi-Fi Sta Mode

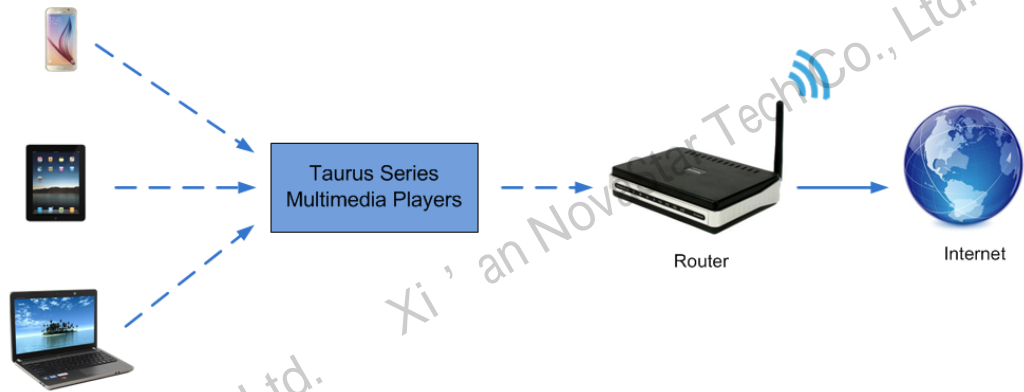
Configure an external router for a TB8 and users can access the TB8 by connecting the external router. If an external router is configured for multiple TB8 units, a LAN can be created. Users can access any of the TB8 via the LAN.



### 3.5.3 Wi-Fi AP+Sta Mode

In Wi-Fi AP+ Sta connection mode, users can either directly access the TB8 or access internet through bridging connection. Upon the cluster solution, VNNOX and

NovaiCare can realize remote program publishing and remote monitoring respectively through the Internet.



# 4 Hardware Structure

## 4.1 Appearance

### 4.1.1 Front Panel

Figure 4-1 Front panel of the TB8



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

Table 4-1 Description of TB8 front panel

Name	Description
PWR	Power status indicator 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 Same as the signal indicator status of the sending card: FPGA is operating normally.

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>

### 4.1.2 Rear Panel

Figure 4-2 Rear panel of the TB8



Note: Images provided in this document are for reference only, and the actual products shall prevail.

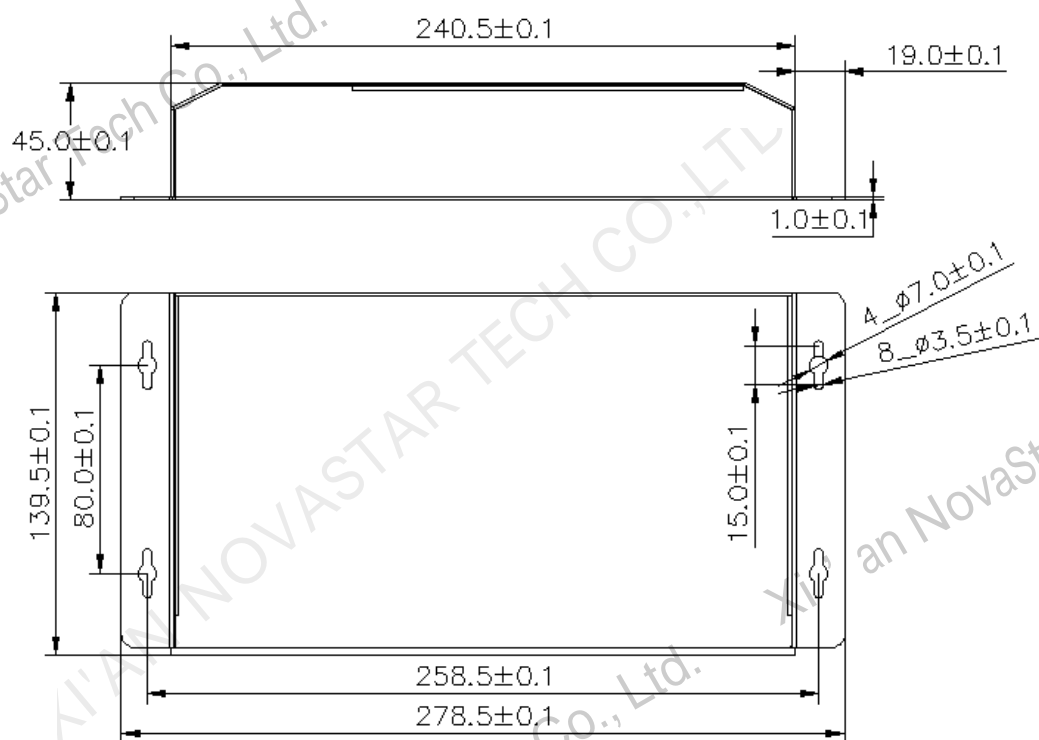
Table 4-2 Description of TB8 rear panel

Name	Description
TEMP	Temperature sensor port
LIGHT	Light sensor port
WiFi-AP	Wi-Fi AP antenna port
WiFi-STA	Wi-Fi Sta antenna port
COM1	Reserved
COM2	Reserved
ETHERNET	Gigabit Ethernet port Indicator status: <ul style="list-style-type: none"> <li>Yellow indicator always on: The unit is connected to 100M Ethernet cable and the status is normal.</li> <li>Green and yellow indicators always on at the same time: The unit is connected to Gigabit Ethernet cable and the status is normal.</li> </ul>
USB	USB 2.0 port
HDMI	<ul style="list-style-type: none"> <li>IN: HDMI 1.4 input</li> <li>OUT: HDMI 1.4 output</li> </ul>
AUDIO OUT	Audio output
RESET	Factory reset button Press and hold the button for 5 seconds to reset the unit to factory settings.

Name	Description
LED OUT	Output Ethernet port
ON/OFF	Power switch
100-240V~,50/60Hz	Power input

## 4.2 Dimensions

Unit of the dimension chart is "mm". Ground connection is enabled for location hole (GND).



# 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 TB8 includes Android and iOS which are mainly used for screen management, editing, and program publishing.
ViPlex Express	PC client software of the TB8 only includes Windows which is mainly used for screen management, editing, and program publishing.
NovaLCT	Display screen configuration software works in Windows only, and is used to adjust screens to the best display status.



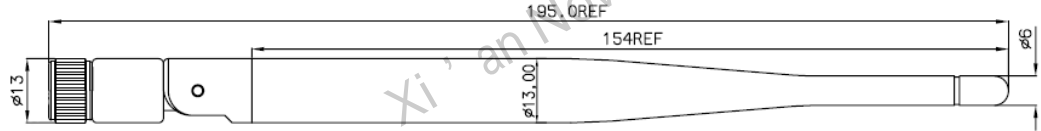
# 6 Product Specifications

## Specifications

Item	Sub-Item	Specifications
Physical specifications	Dimensions (W × D × H)	278.5 mm × 139.5 mm × 45.0 mm
	Weight	1335.7 g
	Input power supply	100 V–240 V AC
	Maximum power consumption	20 W
	Storage temperature	0°C–50°C
	Storage humidity	0% RH–80% RH
	Operating temperature	-40°C–80°C
	Operating humidity	0% RH–80% RH
	Operating memory	2 GB
	Internal storage space	8 GB on-board with 4 GB available for users
Packing information	Dimensions (W × D × H)	375 mm × 280 mm × 108 mm
	List	<ul style="list-style-type: none"> <li>• TB8 LED multimedia player x 1</li> <li>• Columned Wi-Fi omnidirectional antenna x 2</li> <li>• One AC power cord x 1</li> </ul>
Characteristics	<ul style="list-style-type: none"> <li>• 4 Ethernet ports support 2.3 megapixel loading capacity, with maximum width of 4096 pixels and maximum height of 1920 pixels.</li> <li>• Support dual-Wi-Fi, and features Wi-Fi AP and Wi-Fi Sta functions.</li> <li>• Support Gigabit wired network.</li> <li>• Support stereo audio output.</li> <li>• Support HDMI Loop.</li> <li>• Support HDMI input mode.</li> <li>• Support HDMI input full-screen self-adaptive display.</li> <li>• Support manual and timing switching between synchronous</li> </ul>	

	<p>and asynchronous modes.</p> <ul style="list-style-type: none"><li>• 2-Way USB Host interface supports USB drive importing display.</li><li>• Onboard brightness sensor interface supports automatic and timing smart brightness adjustment.</li></ul>
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### 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	48x48pixels~8176x8176pixles	JPG, JPEG	Not Support Non-interleaved Scan Software support SRGB JPEG Software support Adobe 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	96x32pixels~8176x8176pixles	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 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~44.1KH Z	AAC, 3GPP, Mpeg2TS	N/A

## 7.3 Video

### 7.3.1 Decoder

Type	Codec	Supported Image Size	Maximum Frame Rate	Maximum Bit Rate (Ideal Case)	File Format	Remarks
MPEG-1/2	MPEG-1/2	48x48pixels~1920x1088pixels	30fps	80Mbps	DAT, MPG, VOB, TS	Support Field Coding
MPEG-4	MPEG-4	48x48pixels~1920x1088pixels	30fps	38.4Mbps	AVI, MKV, MP4, MOV, 3GP	Not support MS MPEG4 v1/v2/v3 Not support GMC
H.264/AVC	H.264	48x48pixels~4096x2304pixels	T1&T2&TB1&TB2: 1080P@60fps Other models: 4K@25fps,1080P@60fps	T1&T2&TB1&TB2: 57.2Mbps Other models: 100Mbps	AVI, MKV, MP4, MOV, 3GP, TS, FLV	Support Field Coding Support MBAFF
MVC	H.264 MVC	48x48pixels~1920x1088pixels	60fps	38.4Mbps	MKV, TS	Support Stereo High Profile only
H.265/HEVC	H.265/HEVC	64x64pixels~4096x2304pixels	T1&T2&TB1&TB2: 1080P@60fps Other models: 4K@60fps,1080P@60fps	T1&T2&TB1&TB2: 57.2Mbps Other models: 100Mbps	MKV, MP4, MOV, TS	Support Main Profile Support Tile & Slice
GOOGLE VP8	VP8	48x48pixels~1920x1088pixels	30fps	38.4 Mbps	WEBM, MKV	N/A
H.263	H.263	SQCIF(128x96), QCIF(176x144), CIF(352x288), 4CIF(704x576)	30fps	38.4Mbps	3GP, MOV, MP4	Not support H.263+
VC-1	VC-1	48x48pixels~1920x1088pixels	30fps	45Mbps	WMV, ASF, TS, MKV, AVI	N/A
MOTION JPEG	MJPEG	48x48pixels~1920x1088pixels	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	144x96pixels~1920x1088pixels	30fps	20Mbps	MOV, 3GP	Not support MBAFF
Google VP8	VP8	96x96pixels~1920x1088pixels	30fps	10Mbps	WEBM	N/A