iSwitch 2000HC-R

4K HDMI and USB-C AV over IP RX/Decoder

Datasheet V1.0

CONTENT

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1. INTRODUCTION

1.1 OVERVIEW

The **iSwitch 2000HC-R** series decoders work with the encoders **(iSwitch 2000H-TR/ iSwitch 2000U-TR/ iSwitch 2000HC-T)** to receive and decode AV signals over standard Gigabit Ethernet networks. They support UHD resolutions up to 3840 × 2160 @ 60 Hz, 4:4:4. They provide end-to-end AV over IP solutions, enabling flexible routing of audio, video, USB, RS-232, and IR signals across networked AV systems.

With Dante support, the decoders integrate with Dante-enabled audio systems for flexible audio distribution. Supporting low-latency transmission and scalable system deployment, they are suitable for a wide range of professional AV applications, including classrooms, conference rooms, auditoriums, and other commercial environments.

Note: *Dante license need to be purchased separately and activated. Dante is not activated by default.*

1.1 FEATURES

- Features **three Ethernet ports**, any of which can be used to transmit A/V streams, control data, and Dante audio streams.
- Supports input and output resolutions up to **3840 × 2160 @ 60 Hz, 4:4:4**.
- Supports **video walls up to 16 × 16**.
- Supports **HDR10** and **Dolby Vision**.
- Supports **CEC** one-touch-play and standby commands for powering displays on/off, as well as CEC Frames.
- Supports **multi-channel audio** up to PCM 7.1, Dolby Atmos, DTS-HD Master Audio, and DTS:X.
- Supports HDMI **eARC** audio return.
- Provides analog **audio de-embedding**.
- **HDCP 2.2/2.3** compliant.
- Flexible routing of **audio, video, USB, RS-232, and IR** signals independently or together throughout the matrix system.
- Extends **audio, video, USB, RS-232, IR, and power** signals up to 328 ft (100 m) over a single Cat 5e (or higher) cable.
- Provides **1-frame latency**.
- Supports **bidirectional RS-232** communication.
- Supports **bidirectional IR** passthrough for controlling remote source and display devices between encoders and decoders.
- Supports **IR generation**, allowing IR codes to be sent via API.
- Features **dual USB engines** for high-performance USB 2.0 over IP, enhanced camera support, and seamless KM over IP switching and roaming.
- Supports **point-to-point, point-to-multipoint, multipoint-to-point, and multipoint-to-multipoint** applications.
- Supports **PoE+**, allowing the unit to be powered by compatible power sourcing equipment,

such as a PoE-enabled Ethernet switch, eliminating the need for a local power adapter.

- Provides “Fit In” and “Stretch Out” modes for video wall processing, as well as video rotation management. Decoded video can fill a video wall, maintain aspect ratio, and rotate **180° and 270°** clockwise to meet various display requirements.
- Supports **DHCP** by default and falls back to Auto-IP if no DHCP server is detected.
- Supports control via **Telnet API** or an IP controller **(iSwitch 2000-CTL)**.
- Supports **Telnet, SSH, HTTP, and HTTPS** protocols.
- Supports **2-channel Dante** receive and 2-channel Dante transmit audio streams when Dante is licensed **(default: Dante unlicensed).**

1.2 PACKAGE CONTENTS

- 1 x iSwitch 2000H-R Decoder Unit
- 1 x 12V DC 3A Power Adapter (US/EU/UK/AU)
- 1 x 3.5mm 3-pin Phoenix Male Connector
- 1 x IR Emitter (3.94ft/1.2m)
- 1 x Broadband IR Receiver (3.28ft/1.0m, 30–50kHz)
- 4 x Wall-Mount Brackets
- 4 x Screws

1.3 SPECIFICATIONS

Video	
Input Video Port	2 x RJ-45; 1 x Optical
Input Video Type	IP Stream
Input Resolutions	3840 x 2160p@24/25/30/50/60Hz 4:4:4, 1920 x 1200@50/60Hz, 2400x1350p@60Hz, 1920 x 1080p@24/25/30/50/60/100/120Hz, 1920 x 1080i@50/60Hz, 1680 x 1050@60Hz,1600 x 1200@60Hz, 1600 x 900@60Hz, 1400 x 1050@60Hz, 1440 x 900@60Hz, 1366 x 768@60Hz, 1360 x 768@60Hz, 1280 x 1024@60Hz, 1280 x 960@60Hz, 1280 x 800@60Hz, 1280 x 768@60Hz, 1280 x 720p@60/100/120Hz, 1024 x 768@60Hz, 800 x 600@60Hz, 720 x 576p@50Hz, 720 x 480p@60Hz, 640 x 480p@60Hz
Output Video Port	1 x HDMI Type A (19 pins)
Output Video Type	HDMI 2.0, HDCP 2.2/2.3
Output Resolutions	Up to 3840 x 2160p@60Hz 4:4:4
Input/Output Video Signal	0.5~1.2 V p-p
Input/Output DDC Signal	5 V p-p (TTL)
Video Impendence	100 Ω
End-to-End Latency	For 4K@60Hz: • Normal mode: 19ms • Ultra Low Latency mode: 4ms
Maximum Data Rate	18 Gbps (6 Gbps per color)
Maximum Pixel Clock	600 MHz

Audio	
Input Audio Port	2 x RJ-45; 1 x Optical; 1 x S/PDIF IN
Input Audio Signal	• LAN: Fully supports audio formats in HDMI 2.0 specification, including PCM 2.0/5.1/7.1, Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X

Audio	
	• S/PDIF IN: Digital audio
Output Audio Port	1 x HDMI; 1 x 3.5mm stereo jack
Output Audio Signal	• HDMI: Fully supports audio formats in HDMI 2.0 specification, including PCM 2.0/5.1/7.1, Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X • AUDIO OUT: Analog
Dante Audio Type	LPCM 2.0, 44.1/48/88.2/96 kHz

Control	
Control Method	Telnet API; IP Controller **(iSwitch 2000-CTL)**

General	
Operating Temperature/ Humidity	32°F – 113°F (0°C – 45°C), 10% – 90%, non-condensing
Storage Temperature/ Humidity	-4°F – 158°F (-20°C – 70°C), 10% – 90%, non-condensing
ESD Protection	Human body model: ±8kV (air-gap discharge) / ±4kV (contact discharge)
Power Supply	12V DC 3A; PoE+
Power Consumption	• No load: 5W • Typical: 7.8W (device only) • Max.:20.6W (with USB power output)
Device Dimension (W x H x D)	8.46" x 0.98" x 6.30" (215 mm x 25 mm x 160 mm)
Net Weight	2lbs (0.91kg)

2. PANEL OVERVIEW

2.1 FRONT PANEL

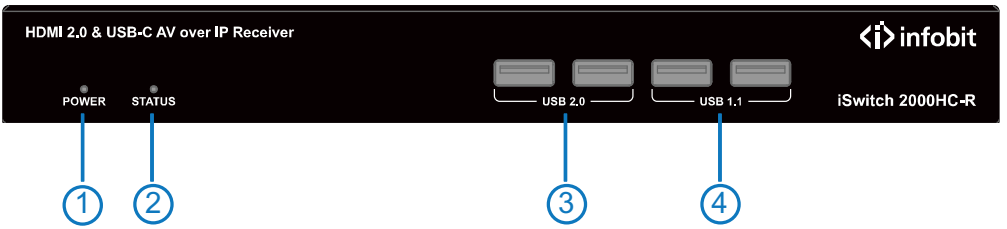

Figure 1: Front Panel

#	Name	Description
1	POWER LED	• **On**: The device is powered on. • **Blinking**: The device is booting. • **Off**: The device is powered off.
2	STATUS LED	• **On**: The device is working properly. • **Blinking**: The device is connected to the network but doesn't detect valid signal input. / The device is connected to the network but doesn't route to any encoder. • **Blinking slowly**: The device is being upgraded. • **Blinking rapidly**: The Find me function is activated through the control API to help locate a specific device. For more information, refer to the API documentation.

#	Name	Description
		• **Off**: The device is not connected to the network.
3	USB 2.0	2 × USB 2.0 Type-A ports. Connect to USB devices for USB extension or roaming. The two ports share a total current of 1.5 A.
4	USB 1.1	2 × USB 1.1 Type-A ports. Connect to USB devices for USB extension or roaming. The two ports share a total current of 1 A.

2.2 REAR PANEL

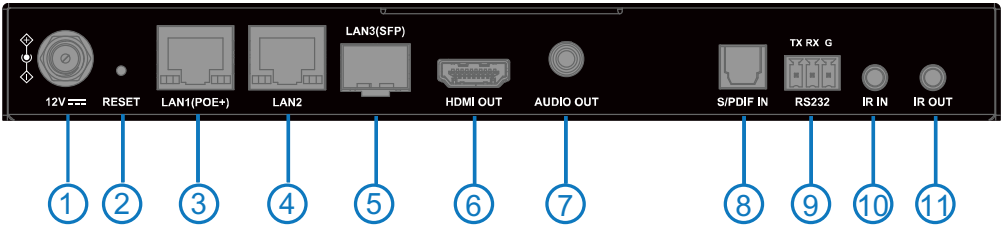

Figure 2: Rear Panel

#	Name	Description
1	12V	12V DC power connector. Connect to the included power adapter for power input.
2	RESET	Press and hold the recessed button for at least five seconds, then release to restore the device to its factory default settings. **Note:** Restoring factory default settings erases all configurations and custom data. Back up any important settings before proceeding.
3	LAN1(POE+)	By default, use one of the following ports to connect the device to an Ethernet switch for transmission of A/V streams, Dante audio streams, and control data: LAN1(POE+), LAN2, or LAN3(SFP). **LAN1 (POE+)** - Supports PoE+. **LAN2** - When configured as an independent Dante port, LAN2 is used for Dante audio transmission, while LAN1(POE+) or LAN3(SFP) is used for A/V streams and control data. **LAN3 (SFP)** - Connect this optical port to a Gigabit Ethernet switch using a single-mode or multimode SFP module. - SFP module is not included. - The maximum transmission distance depends on the specifications of the installed SFP module. **IMPORTANT:** - By default, connect only one of the LAN1 (POE+), LAN2, or LAN3 (SFP) ports to an Ethernet switch. - When LAN2 is configured as an independent Dante port, LAN2 can be connected to a dedicated Dante network, while either LAN1(POE+) or LAN3 (SFP) can be used for A/V streams and control data. Do not connect both LAN1(POE+) and LAN3(SFP) simultaneously, as this may cause unexpected network behavior.
4	LAN2	
5	LAN3(SFP)	
6	HDMI OUT	19-pin HDMI Type-A port. Connect to an HDMI display.
7	AUDIO OUT	3.5mm TRS port. Connect to an audio receiver for unbalanced stereo output.

#	Name	Description
8	S/PDIF IN	Optical S/PDIF connector for digital audio input. Received S/PDIF audio can be transmitted to the encoder.
9	RS232	3-pin phoenix connector. Connect to an RS-232 device for directional RS-232 communication.
10	IR IN	3.5mm TRS jack. Connect to an IR receiver for IR communication with an IR emitter at the encoder side on the network.
11	IR OUT	3.5mm TS jack. Connect to an IR emitter that is with 5V output for IR communication with an IR receiver at the encoder side on the network.

3. SYSTEM CONNECTION

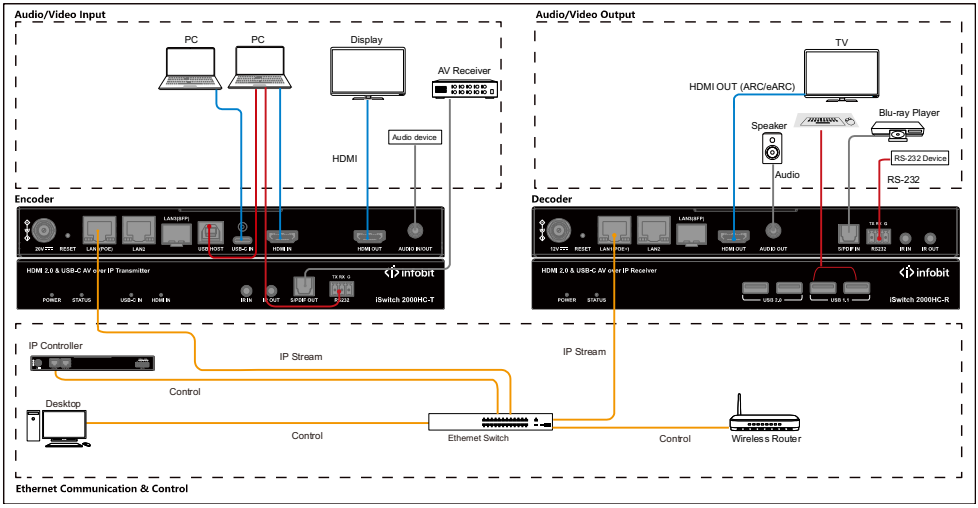

Figure 3: Basic System Connection

Notes

- If the Ethernet switch doesn't support PoE, connect each encoder and decoder to its corresponding power adapter.
- The **HDMI OUT** port on the decoder supports ARC/eARC for returning audio from a connected TV.
- The **AUDIO IN/OUT** port on TX can be configured as an audio input or output.
- The S/PDIF ports support digital audio transmission between the encoder and decoder.

4. TYPICAL APPLICATIONS

4.1 VIDEO WALL APPLICATION

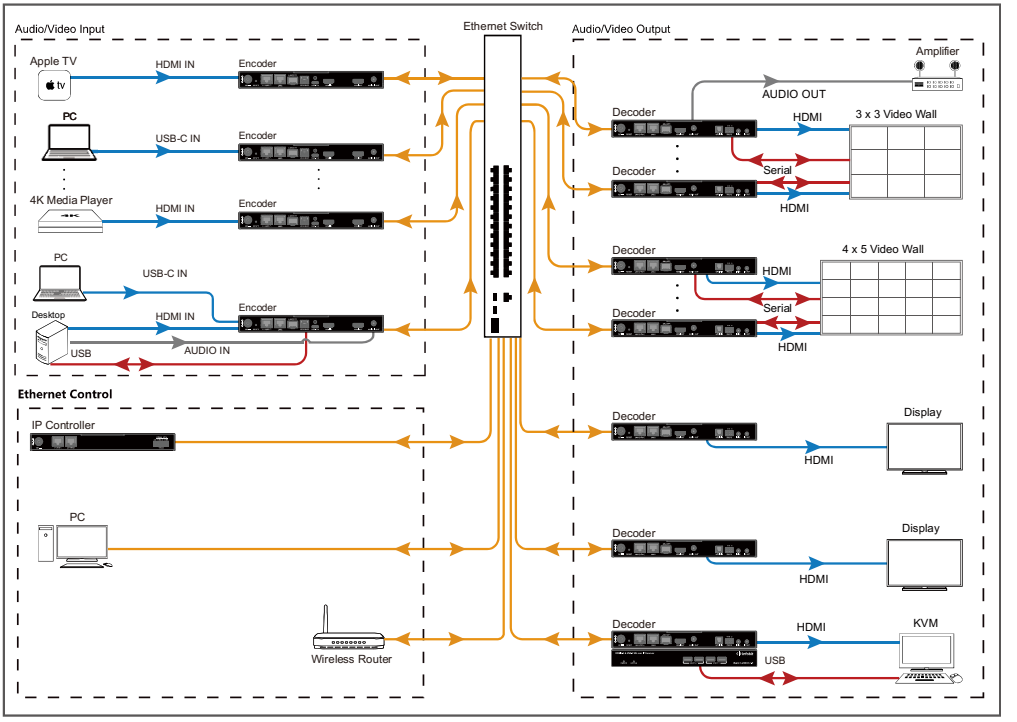

Figure 4: Video Wall Application

4.2 MULTI-ROOM AV DISTRIBUTION

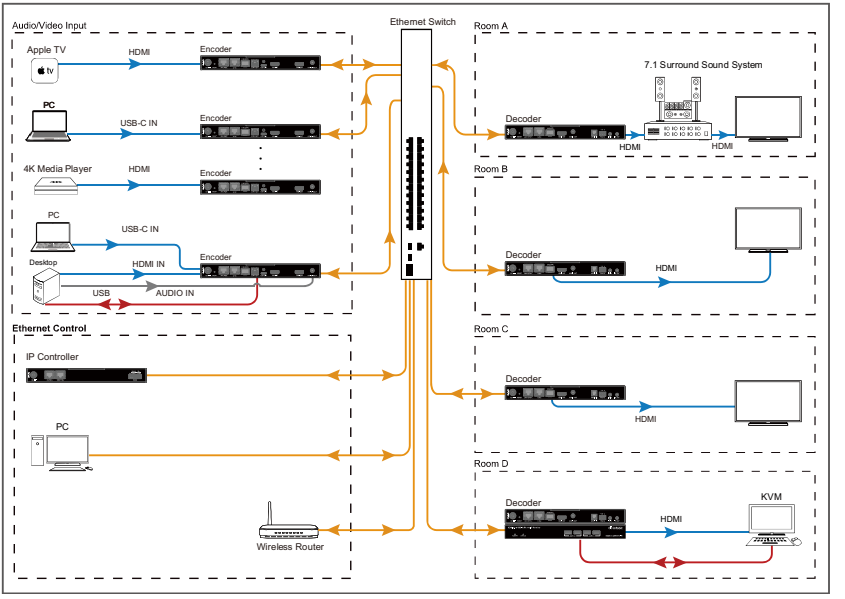

Figure 5: Multi-Room AV Distribution

4.3 DANTE AUDIO DISTRIBUTION

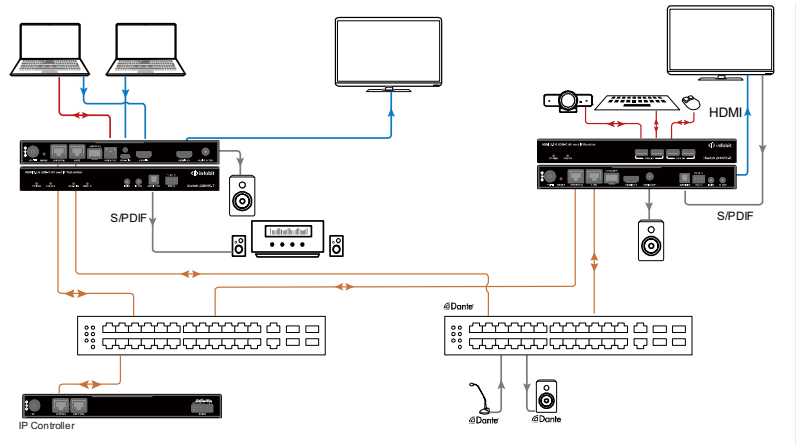

Figure 6: Dante Audio Distribution

Note: LAN 1 (PoE+) / LAN 3 carries A/V and control data. LAN 2 carries Dante audio and connects to a dedicated Dante network. The Ethernet ports connect to separate networks.