CUBE X1
Data Manual

1. Version History

Version Number	Revision Date	Revision Notes	Revised By	Approved By
V1.0	2023.07.18	First Edition Release	Wu Pan	
V1.1	2024.11.08	Revise version	Min Liu	

Kiloview CUBE X1 is a compact embedded server specifically designed for routing and distributing NDI network video streams. CUBE X1 features an eight-core high-performance ARM64 processor, equipped with two 10Gb SFP+ Ethernet interfaces and one Gigabit RJ45 Ethernet interface. Its powerful processing capabilities and network throughput allow it to handle up to 16 channels of NDI High-bandwidth or NDI|HX2 or NDI|HX3 stream inputs, and provide no less than 32 channels of NDI network distribution outputs.

The CUBE X1 is built on the kernel of Kiloview's mature NDI CORE server system, and like NDI CORE, the CUBE X1 distributes NDI streams based on a 'copy-forward' model. The 'copy-forward' model fully utilizes the processing capabilities of the server system and high network throughput performance, achieving an 'amplifier' effect for NDI streams, meeting the needs for a large number of concurrent connections from NDI clients, and reducing the access pressure on the NDI source device. Of course, users can also configure the CUBE X1 to operate in the conventional NDI Routing mode, which is the 'jump' mode ①.

The CUBE X1 is compact and powerful. Two CUBE X1 units placed side by side meet the standard 2RU size, and Kiloview offers an optional bracket accessory RC02 for integrating two units into one chassis. In its compact chassis design, the CUBE X1 provides redundant dual power supplies, a 5.5-inch front panel

touch control LCD screen, and quick-switch buttons on the front panel. The CUBE X1 features extremely low power consumption and excellent heat dissipation design; even under full load, its total power consumption does not exceed 20W. The compact structure, superior performance, low power consumption, redundant power supply, and carefully designed cooling system ensure the product operates reliably and stably 24/7 while being environmentally friendly.

Through free software updates in the future, the CUBE X1 will support more extended features, such as building clusters with multiple CUBE X1 units for larger-scale NDI routing and distribution.

2. Features

2.1. High-performance, fully-capable NDI input-output forwarding

- Supports 16x NDI High-bandwidth, NDI|HX2, NDI|HX3 inputs.
- Supports no less than 32x NDI forwarding outputs ②.
- Forwarding latency is less than 6 milliseconds, with no conversion, no damage, and no loss to NDI media content.
- Full protocol and format support for NDI; However, due to varying NDI bandwidth across different video resolution formats, the total number of supported video channels depends on the bandwidth. under typical conditions, NDI High-bandwidth or NDI|HX2 / NDI|HX3 at 1080p60 resolution can support 16x input and 32x output; at 4Kp60 resolution, the scale is roughly halved.
- Supports smooth switching without stuttering or black screen/flickering.
- Supports forwarding of NDI Tally status.
- Supports forwarding of NDI PTZ control signaling.
- Supports bidirectional forwarding of NDI Metadata.
- Supports user-configurable traditional NDI Routing mode, namely 'jump' mode.

2.2. Convenient operation, good interactive experience.

- The front panel 5.5-inch touch LCD screen can preview the NDI video and audio status of all inputs (in VU Meter format).
- NDI input-output switching operations can be executed through touch screen selection and front panel buttons.
- Frequently used NDI output channels can be added to a favorites list for quick selection.
- The front panel LCD screen allows viewing of the host's operating status, system performance, and network upload/download bandwidth status.
- Common system settings can be executed through the front panel LCD screen.
- Remote backend management can be achieved through the Web console.

2.3. Powerful Web console management and control functions

- Secure Web access based on HTTPS.
- Supports real-time preview of NDI input video via the Web.
- Provides various forms of input-output switching control interfaces, such as crosspoints and I/O panels.
- Freely saveable preset templates (i.e., save the corresponding states of all inputs and outputs), with one-click access to preset templates for quick operation.
- Supports customizable rotation switching function (single function rotation), with the source, interval time, and order of rotation switching freely definable.
- Free selection of NDI input, freely defined NDI output.
- Supports NDI auto-discovery, manual discovery, and Discovery Server.
- User and permission management.

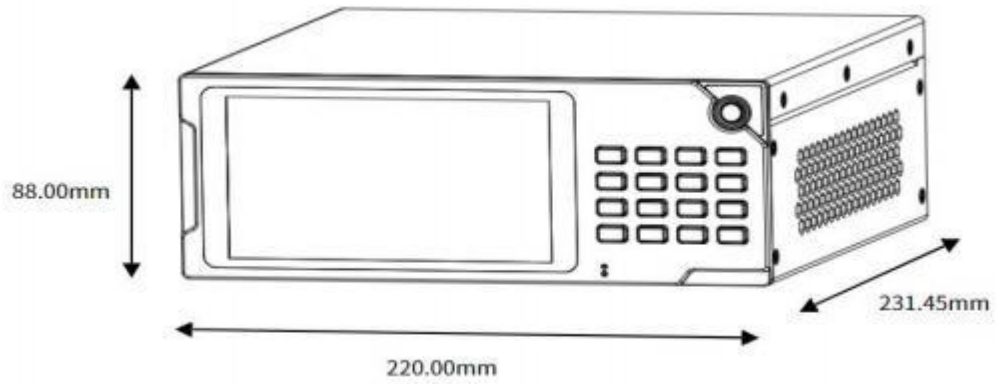
2.4. Flexibility and scalability

- Software upgrades are free for life, allowing access to more future feature expansions.
- Supports NTP synchronization timing for Kiloview NDI devices.
- More features are subject to official announcements.

2.5. Compact, robust, high reliability, low power consumption embedded hardware server

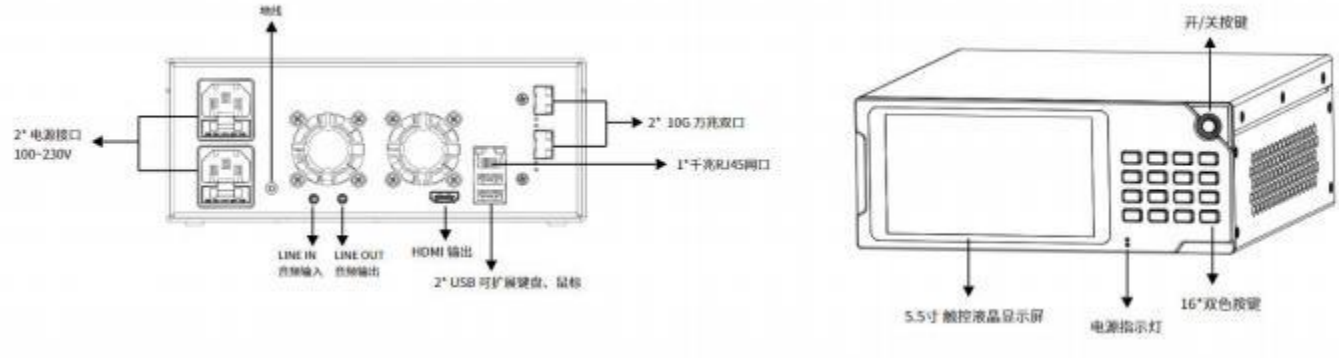
- 8-core ARM64 high-performance processor.
- Equipped with two 10GbE SFP+ Ethernet ports and one 1GbE RJ45 Ethernet port.
- Redundant dual backup power supply.
- Half-width 2RU standard rack size, two CUBE X1 units can be horizontally stacked to form a standard 2RU rack size, Kiloview provides optional assembly. Bracket accessory RC02 chassis.
- Equipped with a 5.5-inch touch display and 16 dual-color numeric keys.
- Equipped with two USB 2.0 ports, allowing connection of a mouse and keyboard for input/output switching, and can also connect a USB drive for system upgrades.
- Equipped with an HDMI 2.0 output interface.
- The maximum power consumption of the entire machine under full load does not exceed 20W, and it features an intelligent active cooling design.
- Reinforced structural design with good shock resistance and drop performance.

3. CUBE X1 Product Dimension Diagram



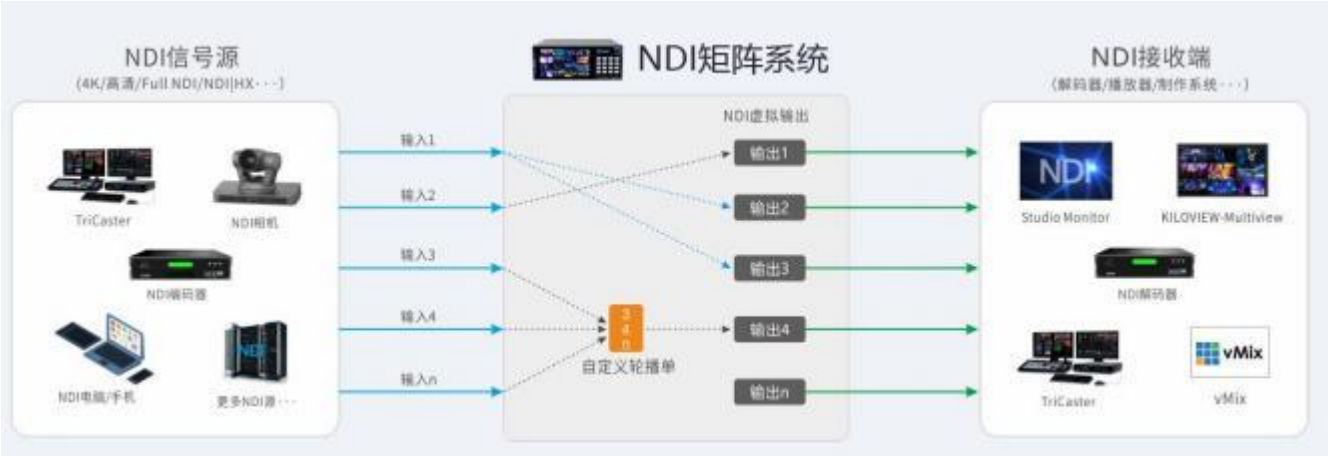
CUBE X1 Product Dimension Diagram

4. CUBE X1 Product Interface Diagram



CUBE X1 Product Interface Schematic

5. CUBE X1 Application Topology Diagram



CUBE X1 Product Application Topology Diagram

CUBE X1 Product Parameters

Product Model	CUBE X1
CPU	8-Core ARM64 High-Performance Processor
Network Interface	2x 10GbE SPF+ 1x 1GbE RJ45
HDMI interface	1x HDMI 2.0 OUT
USB interface	2x USB 2.0 (Type-A)
Audio input/output	1x 3.5mm LINE IN 1x3.5mm LINE OUT
Button	1x Power 16x Numeric
Screen type	5.5 inch LCD capacitive touch display, resolution 1920x1080@50Hz
Processing capability	Input: Up to 16x NDI High-bandwidth or NDI|HX2 or NDI|HX3, total input bandwidth not exceeding 2.5Gbps; Output: Up to 32x NDI output channels, with a concurrent connection count of no less than 32 connections, total output bandwidth not exceeding 5Gbps. Assess the actual input/output capability based on the above input/output capabilities. Typical scenarios: For NDI streams with a resolution of 3840x2160 (4K), 250Mbps/stream: 8 inputs, 16 outputs; for NDI streams with a resolution of 1920x1080 (1080p), 150Mbps/stream: 16 inputs, 32 outputs.
NDI format support	NDI HB NDI|HX2 NDI|HX3 Support for various resolution formats
NDI Tally	Support (forwarding)
NDI PTZ control	Support (forwarding)
NDI Metadata	Support (forwarding)
Power supply	2x AC 100 ~230V redundant hot backup power supply
Management method	Web
Dimensions	220.00 x 231.45 x 88.00mm

CUBE X1 Product Specification Sheet

①: When the NDI client connects to the output channel of the CUBE X1, the output channel notifies the NDI client to reconnect to the NDI source.

②: The CUBE X1 can create up to 32x NDI output channels, but each channel can establish 1 or more NDI connections. The specific number of connections depends on the total network bandwidth and the overall performance of the CUBE X1.