## Introduction

The Atlona **AT-OMNI-521** is a networked AV decoder for HDMI / HDCP 2.2 output supporting resolutions up to 4K/60 4:4:4 and HDR (High Dynamic Range), and RS-232 or IR pass-through. OmniStream is designed for high performance, flexible distribution of AV over standard, off-the-shelf Gigabit Ethernet switches in commercial audiovisual applications. The OMNI-521 decoder features the advanced VCx™ codec which delivers 4K/60 4:4:4 video from encode to decode, with artifact-free presentation of computer-generated content and fast-motion video, and ultra-low latency less than one frame. This decoder is housed in a half-width rack enclosure with front-to-back air flow, and is ideal for high-density, compact installation in distributed, multi-display installations.

## Applications

- **Multi-room or multi-zone AV systems**
  OmniStream enables cost-effective system design, allowing the connection of any number of sources to any number of displays. OmniStream delivers equal performance over new or legacy network cable infrastructure, including CAT 5e.

- **Bars, restaurants, offices, meeting spaces, and other commercial environments**
  Expand the system by adding encoders and decoders, making video wall, digital signage, and many other applications simple and easy.

- **High quality AV presentations**
  OmniStream delivers the uncompromising performance of traditional baseband video systems, making it ideal for applications where both image quality and low latency are crucial.

# Key Features

**Best-in-class AV over IP performance and reliability over Gigabit Ethernet**

- Delivers pristine image quality and ultra-low latency over 1 Gbps (GbE) networks.
- Ideal for integration over new or legacy network cable infrastructure – including CAT 5e.

**AV decoder for HDMI up to 4K/UHD, plus RS-232 or IR control pass-through**

- Decodes video, audio, and control, with the flexibility of receiving them together or from separate network sources.
- Allows wide-ranging versatility for integrators to design systems to specific requirements.

**Supports 4K/60 4:4:4 plus HDR formats**

- Supports HDR10 @ 60 Hz and 10-bit color, as well as HLG (Hybrid Log-Gamma) for 60p HDR broadcast services.
- Supports Dolby Vision™ @ 60 Hz and 12-bit color.

**Advanced VCx codec**

- Delivers 4K/60 4:4:4 with artifact-free presentation of computer-generated content and fast-motion video.
- Ultra-low encode-to-decode latency less than 1 frame.

**High-efficiency coding**

- VCx codec allows numerous 4K streams over 10 Gigabit uplinks between network switches.

**Integrated high-quality scaler**

- OMNI-521 includes an integrated, high-performance scaling engine.
- Provides upscaling and downscaling for a wide array of 4K/UHD, HD, and VESA resolutions.

**HDCP compliance**

- Adheres to the latest HDCP 2.2 specification for High-bandwidth Digital Content Protection.
- Allows protected content streams to pass between authenticated devices.
- HDCP can be disabled through Velocity Device Manager, allowing content to pass to non-compliant displays and teleconference systems. Protected content is not transmitted.

**Ultra-fast switching between 4K/60 video streams[1]**

- Provides instantaneous and precise video and audio HDMI switching.
- Works between streams at different resolutions and frame rates.
- Ideal for mission-critical applications where stable, fast AV switching is required.

**Integrated Ethernet link testing**

- Tests integrity of the network infrastructure between encoders and decoders (cabling, terminations, switch, bandwidth).
- Allows quick, easy verification or troubleshooting from the encoder and decoder web GUI – no need to visually check each display location.

## Key Features (continued)

**Thumbnail preview of encoded video streams**

- View encoder streams as thumbnails on a Velocity touch panel or through the web GUI.
- Ideal for previewing sources before selecting for display.
- Also ideal for validating system operation.

**Simplify integration with plug-and-play network switch compatibility**

- Streamline system setup by using Atlona Certified Switch configurations for popular models from Cisco®, NETGEAR®, and many others.
- NETGEAR switches also available from Atlona (United States and Canada only).
- Saves installation time and costs without the need to manually configure a network switch.

**PoE (Power over Ethernet) powering**

- With PoE, decoders can conveniently be powered over the network from a PoE-equipped network switch.
- PoE simplifies integration without the need for local AC power, and allows centralized power monitoring and management.

**Secure content distribution with AES-128 decryption**

- Decrypt AES-128 content from any OmniStream encoder.
- Ensures secure content delivery across the network.

**Supports industry-standard, network security features and protocols**

- HTTPS, Telnet, SSH, WebSockets with TLS, and AES-128 encryption.

**AES67-compatible**

- OmniStream supports industry standard, AES67-compatible networked audio streams from encoders and audio interfaces.
- Supports multi-channel PCM up to 7.1 channels.

**Video wall processing**

- Processing for video walls with portrait and landscape displays up to 16×16 @ 4K/30 and 2×2 @ 4K/60 with precision wall-tile alignment.

**Enhance AV presentations with visual enhancements**

- Provide corporate or institutional branding by overlaying a logo.
- Display a full-screen image as a backup in an event of an interruption in an AV stream, or between presentations.
- Identify and label presentation content with static or scrolling text.

**EDID management**

- EDID from a connected display can be copied and stored; EDID can also be assigned to a specific timing.
- Ensures desired audio formats and video resolutions are provided to the AV system.

## Key Features (continued)

**Audio processing and pass-through**

- Multi-channel PCM, Dolby® Digital, Dolby Digital Plus™, Dolby TrueHD, Dolby Atmos®, DTS® Digital Surround™, DTS-HD Master Audio™, and DTS:X®.

- Supports multi-channel PCM audio downmixing to two-channel PCM.

**Display control**

- Supports IR, bidirectional RS-232, and CEC to control connected displays.

- Bidirectional TCP proxy enables RS-232 commands over TCP/IP.

**System management**

- Intuitive standalone web GUI.

- Velocity Device Manager – web-based interface for configuration and management of OmniStream systems, and AV over IP cross-connections.

**Compact enclosure**

- Installs side-by-side in a rack with the optional AT-OMNI-1XX-RACK-1RU rack mount shelf.

**Included accessories**

- Surface mounting brackets and RS-232 / IR captive screw connector.

## Specifications

| Video | |
|---|---|
| Signal | HDMI |
| Copy Protection | HDCP 2.2 |
| UHD/HD/SD | 4096×2160 (DCI) @ 30/24 Hz     1920x1080i[1] @ 25/29.97/30 Hz<br>3840×2160[2] (UHD) @ 60/50/24/25/30 Hz     1280x720p @ 30/50/59.94/60 Hz<br>1920x1080p @ 23.98/24/25/29.97/30/50<br>/59.94/60 Hz |
| VESA[3] | 2560x1600          1366x768<br>1920x1200          1360x768<br>1680x1050          1280x1024<br>1600x1200          1280x800<br>1600x900            1280x768<br>1440x900            1152x768<br>1400x1050          1024x768 |
| Color Space | YUV, RGB |

| Encoding | |
|---|---|
| Density | Single decoding engine |
| Compression Format | VCx and VC-2 (SMPTE-2042) |
| Video Quality Optimization | User-selectable: PC Application or Video mode (VC-2 codec only) |
| Chroma Subsampling | (see table below) |

| Chroma | VCx | VC-2 Video |
|---|---|---|
| 4:4:4 | Yes | No |
| 4:2:2 | Yes | No |
| 4:2:0 | Yes | Yes |

| | |
|---|---|
| Color Depth | 8-bit, 10-bit, 12-bit |
| HDR | HDR10, HLG, Dolby® Vision™ |
| Bit Rate | 900 Mbps |
| Latency | 0.5 frame (e.g. 1080p @ 60 Hz latency is < 8 ms between encoder and decoder).<br>1.5 frames in Fast Switching mode (e.g. 1080p @ 60 Hz latency is < 24 ms between encoder and decoder).<br>Note: Unusual network configurations may increase overall latency. |
| Output Resolution in Fast Switching Mode | Up to 4K60 (VCx) or 1080p60 (VC-2) |

| Audio | | | |
|---|---|---|---|
| Pass-through | LPCM 2.0<br>LPCM 5.1<br>LPCM 7.1 | Dolby® Digital<br>Dolby Digital Plus<br>Dolby TrueHD | Dolby Atmos®<br>DTS®<br>DTS-HD Master Audio™ |
| Down-mixing | Multichannel LPCM to two-channel LPCM | | |
| Sample Rate | 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz | | |
| Bit Depth | Up to 24-bit | | |

| Protocols | |
|---|---|
| Video Streaming | RTP |
| Audio Streaming | RTP, up to 7.1 channels<br>AES67, up to LPCM 7.1 channels |
| Addressing | DHCP, static |
| Encryption | AES-128 |
| QoS Tagging | RFC 2475 |
| Discovery | Multicast DNS, LLDP, SAP |
| Management | HTTPS, SSH, Telnet, and WebSockets with TLS |
| IP Multicast | IGMPv2 and IGMPv3 support |

| Graphics Features | |
|---|---|
| Text Insertion | Adjustable height/width, scrolling (speed, direction, or static), iterations (up to infinite), positioning, and adjustable color and alpha (transparency) channels. |
| Slate / Logo Insertion[4] | PNG file format, adjustable aspect ratio (keep or stretch), horizontal/vertical size, screen position; slate mode can be set to off, manual (image always displayed, superimposed on the source signal, and will remain if source signal is lost), auto (image will only be displayed when source signal is lost). |

| Control | | |
|---|---|---|
| CEC | Supported and triggered from control systems and OmniStream encoders | |
| RS-232 | Device control and configuration; supports baud rates from 2400 to 9600<br>Bidirectional pass-through from control system to network<br>Bidirectional TCP Proxy (RS-232 commands over IP) | |
| IR | Pass-through from control system to network<br>Pass-through from network to control system | |

| Connectors | |
|---|---|
| HDMI | 1 - Type A, 19-pin, female, locking |
| ETHERNET[5] | 1 - RJ45, 10/100/1000 Mbps |
| RS-232 / IR | 1 - Euroblock, 6-pin (2 ports); RS-232 on port 1 only, IR on port 2 only |

| Indicators and controls | |
|---|---|
| PWR | 1 - LED, tricolor (red, amber, green) |
| LINK | 1 - LED, bicolor (red, green) |
| ID | 1 - Momentary, tact-type, backlit (blue); sends an identification broadcast message over the network to any listening devices. |
| Reboot | 1 - Momentary, tact-type |

| Power | | |
|---|---|---|
| PoE | IEEE 802.3af | |
| Consumption | Up to 12 W | |
| BTU/h | 40.9 | |

| Environmental | Fahrenheit | Celsius |
|---|---|---|
| Operating Temperature | +14 to +122 °F | -10 to +50 °C |
| Storage Temperature | +14 to +140 °F | -10 to +60 °C |
| Operating Humidity (RH) | 20% to 95%, non-condensing | |
| Maximum Operating Altitude | 2000 meters | |
| Cooling System | Front-to-rear airflow, temperature-controlled fans | |

| Chassis | Inches | Millimeters |
| --- | --- | --- |
| Dimensions (H x W x D) | 1.34 x 8.19 x 4.41 | 34 x 208 x 112 |

| Weight | Pounds | Kilograms |
| --- | --- | --- |
| Unit | 1.5 | 0.7 |

| Certification | | |
| --- | --- | --- |
| Device | CE, FCC, CB, RoHS | |

| Compliance | | |
| --- | --- | --- |
| NDAA-889 | Yes | |
| TAA | Yes | |

| Warranty | |
| --- | --- |
| Device | To view the product warranty, use the following link: https://atlona.com/warranty |

## Footnotes

(1) Interlaced sources are passed-through without modification, and do not support scaling, video wall, logo insertion, text insertion, or fast switching.

(2) Using VCx, streaming is supported up to 4K60 4:4:4.  Using VC-2 Video Mode, 4K60 and 4K50 resolutions will be chroma subsampled to 4:2:0 before streaming.

(3) All VESA resolutions are 60 Hz.

(4) Slate insertion is limited to 1080p only.

(5) Maximum distance per hop is 330 feet (100 meters), depending upon network configuration.

## Accessories

| Description | SKU |
| --- | --- |
| Rack Mount Shelf for OmniStream | AT-OMNI-1XX-RACK-1RU |
| IR Emitter Cable for OmniStream Systems | AT-OMNI-IR-TX |
| IR Receiver Cable for PoE Extenders | AT-IR-SC-RX |
| LinkConnect™ HDMI to HDMI Cable | AT-LC-H2H |

## Copyright, Trademark, and Registration

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