Introduction

The Atlona OmniStream™ R-Type 521 (AT-OMNI-521) is a single-channel networked AV decoder for HDMI 2.0 / HDCP 2.2 output supporting resolutions up to UHD @ 60Hz and HDR (High Dynamic Range), and RS-232 or IR pass-through. It is part of the OmniStream R-Type Series, designed for high performance, flexible distribution of AV over standard off-the-shelf Gigabit Ethernet switches in residential and light commercial audio visual applications.
The OmniStream 521 is HDCP 2.2 compliant and ideal for the latest Ultra High-Definition and HDR sources. It features advanced high-quality VC-2 visually lossless video compression, optimized for motion video content.
The Atlona OmniStream™ 521 achieves extremely low, sub-frame latency when paired with OmniStream Encoders. This single-channel decoder is housed in a half-width rack with front-to-back air flow enclosure, and is ideal for high-density, compact installation in a centralized equipment location.

Applications

- **Multi-room or whole-house AV systems**
  OmniStream R-Type enables cost-effective system design, allowing the connection of any number of sources to any number of displays, throughout a residence.

- **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.

- **Home theater and gaming**
  OmniStream R-Type 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

AV decoder output for HDMI 2.0 up to 4K/UHD, plus RS-232 or IR control pass-through

- Decode 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 UHD @ 60 Hz plus HDR formats

- Ideal for new and emerging UHD and HDR-capable sources and displays.
- Supports HDR10 @ 60 Hz and 10-bit color, as well as HLG (Hybrid Log-Gamma) for current 60p HDR broadcast services.
- Supports Dolby® Vision™ @ 60 Hz and 12-bit, delivering best-in-class dynamic HDR experience. Included as of firmware version 1.2.5.

High performance, visually lossless video decoding

- SMPTE 2042 VC-2 video decoder with absolutely minimal, sub-frame latency from encode to decode.
- Ensures optimal, pristine-quality graphics and motion video presentations, and is ideal for applications requiring interactivity.

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 AMS, allowing content to pass to non-compliant displays and teleconference systems. Protected content is not transmitted.

Simplify integration with plug-and-play network switch compatibility

- Streamline system setup by using Atlona Certified Switch configurations for popular models from Cisco, Luxul, Pakedge, and many others.
- Saves installation time and costs without the need to manually configure a network switch.

PoE (Power over Ethernet) powering

- With standard 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.

Key Features (continued)

AES67-compatible

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

Built-in high-quality scaler

- Integrated high-performance scaling engine provides upscaling and downscaling for a wide array of UHD, HD, and VESA resolutions.
- Ideal for applications when the video output resolution needs to match the different capabilities and requirements of sources, displays, codecs, and other equipment.
- 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.

Ultra-fast switching

- Eliminates black screen displays during HDMI and HDCP handshake.
- High-quality video scalers and internal frame rate converters provide instantaneous and precision video and audio HDMI switching.
- Ideal for mission-critical applications where stable, fast AV switching is required.

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.

Audio processing and pass-through

- Multichannel PCM, Dolby® Digital, Dolby Digital Plus™, Dolby TrueHD, Dolby Atmos®, DTS® Digital Surround™, DTS-HD Master Audio™, and DTS:X®.
- Supports multichannel PCM audio downmixing to two-channel PCM.

Display control

- Supports IR, bidirectional RS-232, and CEC to control connected displays.
- Bidirectional conversion of control data from TCP/IP to and from RS-232.

Key Features (continued)

System Management

- Intuitive standalone web GUI.
- Atlona Management System (AMS). 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.

Award-winning 10-year limited product warranty

- Ensures long-term product reliability and performance in commercial systems.
- Specify, purchase, and install with confidence.

Specifications

Video	
HDMI Specification	HDMI, HDCP 2.2
UHD/HD	4096×2160 (DCI) @ 30/24 Hz 1080i[1] @ 25/29.97/30 Hz 3840×2160 (UHD) @ 60/50/24/25/30 Hz 720p @ 30/50/59.94/60 Hz 1080p @ 23.98/24/25/29.97/30/50/59.94/ 60 Hz
VESA[2]	2560x1600 1366x768 1920x1200 1360x768 1680x1050 1280x1024 1600x1200 1280x800 1600x900 1280x768 1440x900 1152x768 1400x1050 1024x768
Color Space	YUV, RGB

Decoding	
Density	One decoding engine
Decoding Format	VC-2 (SMPTE-2042)
Video Quality Optimization	Motion Video
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) 1.5 frames in Fast Switching mode (e.g. 1080p @ 60 Hz latency is < 24 ms between encoder and decoder) Note: Unusual network configurations may increase overall latency
Output Resolution in Ultra-Fast Switching Mode	1080p @ 60 Hz

Audio	
Pass-through	LPCM 2.0, LPCM 5.1, LPCM 7.1, Dolby® Digital, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos®, DTS®, 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 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 infi-nite), positioning, and adjustable color and alpha (transparency) channels.
Slate / Logo Insertion[3]	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 115200 Bidirectional pass-through from control system to network Bidirectional TCP Proxy (RS-232 commands over IP)	
IR	Pass-through from control system to network Pass-through from network to control system	

Connectors	
HDMI	1 - Type A, 19-pin, female, locking
ETHERNET[4]	1 - RJ45, 10/100/1000 Mbps
RS-232 / IR	1 - Euroblock, 6-pin (2 ports); RS-232 on port 1 and 2, 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	

Environmental		
Cooling System	Front-to-rear airflow, temperature-controlled fans	
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	

Chassis		
Dimensions (H x W x D)	1.34 in x 8.19 in x 4.41 in 34 mm x 208 mm x 112 mm	
Weight	1.5 lbs / 0.7 kg	

Certification		
Device	CE, FCC, CB, RoHS	

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

Footnotes

(1) Scaling and deinterlacing are not supported at 1080i.

(2) All VESA resolutions are 60 Hz.

(3) Slate insertion is limited to 1080p.

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

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