

# Jupiter PixelNet

Massively Scalable 4K Display Wall System

InFocus

PixelNet, a Jupiter by InFocus product, is a revolutionary and powerful new way to capture, distribute, control, and display video and audio sources, both direct and over IP, for audiovisual applications. PixelNet 2.0 hardware adds native support for 4K video, fiber network, and audio for a scalable and ultra high definition video distribution system that can support an unlimited number of inputs and displays in multiple locations.

PixelNet 2.0 hardware increases the density of processing power, connecting more sources and displays to a single Input or Output Node, while providing centralized control to support a wide variety of installations with live audio and video, streaming data, and other real-time sources of information for control rooms, conference rooms, lobby displays, offices and classrooms. New features enable real-time HD or 4K information display to a virtually unlimited number of screens at sites spanning a building, a campus, or a continent.

PixelNet systems can scale to connect and distribute video across buildings, campuses, or global networks, and is ideal for the following applications:

- ◆ Redundant control room display walls in multiple locations
- ◆ Manufacturing and process management
- ◆ Digital signage
- ◆ Law enforcement and security monitoring
- ◆ Instructional networks

## More Pixels, More Scalability, More Connections

PixelNet is a complete audio visual distribution platform capable of visualizing any type of data on any size or resolution display. The flexible hardware platform can be deployed as a single signage player, matrix switcher, multi-viewer and video wall processor. Powerful software manages each input and each display in the ecosystem. Displays can be synchronized together to create a video wall of infinite size – all the way up to 4K resolution on each display – or connect hundreds single displays together for the ultimate meeting room visualization tool. PixelNet 2.0 delivers an increased density of processing power and connectivity, which yields a per channel price reduction of 30-40% over its predecessor.



## Powerful Modularity

A PixelNet network is comprised of Input Nodes to capture various types of video data, Output Nodes to drive displays, and switches to interconnect them. PixelNet 2.0 Input and Output Nodes can now be configured with fiber optic connections via SFP+. Fiber network capabilities allow PixelNet 2.0 to support very large distributed systems with an unlimited number of sources and displays across multiple locations and vast geographies. Each Node has two 10Gb SFP+ links to support multiple 4K video streams. Input and output signals can be either direct or IP, but inside the PixelNet domain signals are always digital and can be transmitted extremely long distances without degradation. All video processing is

done in the digital domain, including cropping, scaling, de-interlacing, and noise reduction.

PixelNet is a self-configuring and self-monitoring system designed for 24/7 uptime. All hardware components are autonomous and can be redundant for a fully secure and reliable system.



## Easy to Manage and Control

With PixelNet Domain Control software (PDC), centralized configuration and management of the system and its content is simple. PDC allows operators to visualize any video wall or single display in the network, placing any video or data source in a window anywhere on the wall or within a single screen. A single source of information can stretch across a large video wall for easy viewing, or multiple sources can be viewed in many windows to enable simultaneous monitoring of complex processes.

PDC supports multiple walls at up to 4K resolution, with no limit on number of inputs or number of displays. Applications that would typically require many separate vendors and a heterogeneous solution can instead be managed with a single system of interconnected PixelNet Nodes. Third-party applications and control systems are supported by the included API and network control protocol.

## High Availability Hardware

PixelNet is a high-bandwidth, non-blocking switched network. Data transmission from one PixelNet Node to another is completely independent of other communicating nodes. PixelNet Nodes have a very long MTBF, but even if a Node does fail it will not disrupt the operation of the other Nodes in the network, and a failed Node can easily be replaced while leaving the rest of the network running. For the ultimate in reliability, PixelNet supports fully redundant servers. Add a second PixelNet Domain Control server to automatically take over for critical 24/7 operation.

## Outstanding Visual Quality

Uncompressed video ensures the best pixel quality for crystal clear video, and patented technology creates a video distribution ecosystem capable of handling inputs and outputs in almost any resolution. Autonomous Input and Output Nodes, located anywhere, enable the system to move video from any input to any output. Direct connect and streaming IP inputs signals sources at up to 4K resolution mean ultra-high quality video.

Each PixelNet 2.0 Input Node allows the connection of four 4K or eight 1080p inputs, while each Output Node provides two 4K or six 1080p outputs, all rack-mounted. PixelNet 2.0 hardware features high bandwidth networking for real-time streaming sources, pixel perfect visual quality using uncompressed video, and resolutions ranging up to 4K. New datacenter-grade Jupiter by InFocus switches support up to 100GB Ethernet connections.

All connection between nodes and switches is accomplished using common SFP+ connections. PixelNet is completely digital in nature, and with input sources such as a computer source or an IP video, the network can be digital end-to-end, resulting in the best possible visual performance. Video signals are enhanced through the use of superior video processing technology for de-interlacing, anti-aliasing and inverse telecine, resulting in broadcast-quality display. Any application will benefit from the simple installation and superb visual performance of a PixelNet network.

## Scalable and Extensible

PixelNet is all about scalability. The same component parts can scale from a single input distributed to a single output, to literally hundreds of inputs and outputs, for real-time HD or 4K information display on a virtually unlimited number of screens at sites spanning a building, a campus, or a continent.

Sources can be multicast to create copies without requiring additional hardware. In addition, PixelNet provides enhanced flexibility to display multicast windows within displays or across displays, on a single wall or on multiple walls.

Expanding a PixelNet system is easy. Add Input Nodes or StreamCenters to accommodate more sources. Add more Output Nodes to support more displays.

## Backwards Compatibility

PixelNet 2.0 hardware is backwards compatible with first generation PixelNet systems. PixelNet is easy to install and supported by the self-configuration feature in PixelNet Domain Control which automatically assigns available inputs and outputs.

## Available with StreamCenter

StreamCenter is the most advanced and flexible multi-stream decoder anywhere. For applications ranging from security monitoring to traffic management to military command and control, StreamCenter is the affordable solution for high performance decoding of multiple streams. StreamCenter supports more streaming video resolutions and protocols than ever before, including H.264, H.265, MPEG-2, MPEG-4, and MJPEG at resolutions up to 4K.

## Details

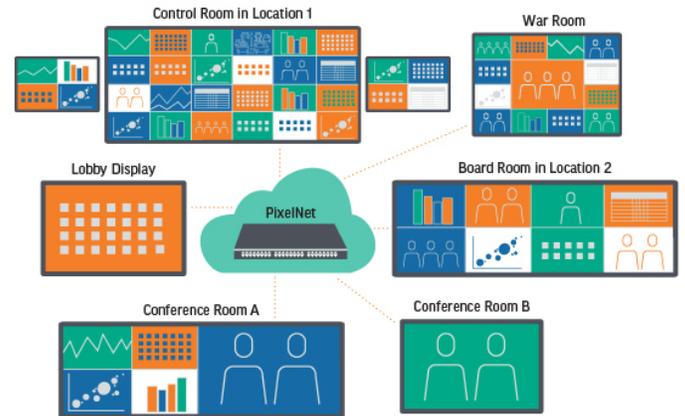
### Building A PixelNet System

**Step One:** Match the input sources with an appropriate Input Node. The PixelNet product line serves the two most common inputs: direct inputs use the PixelNet Input Node and IP streams use StreamCenter for multi-stream decoding.

**Step Two:** Attach a PixelNet Output Node to the displays. Sources can be displayed on the DisplayPort outputs with true flexibility. The PixelNet Output Node can drive a single window on a single screen, multiple windows on a single screen, or an entire display wall. If audio is desired, plug the speakers directly into the Output Node for instant audio.

**Step Three:** Connect the Input and Output Nodes through one or more PixelNet switches. Next, connect StreamCenters to decode and display streaming IP sources – each one can handle 1080 or 4K resolutions. Add more to handle thousands of streams. Switches can be stacked together for larger installations, augmented by a 100GB backbone switch in order to expand the system infinitely. All connections between Nodes and switches are accomplished using fiber optics to extend the distance even further.

**Step Four:** Manage it all with Jupiter's PixelNet Domain Control (PDC) software running on a server connected to the PixelNet switch. A second server running PDC can be added for full, automatic redundancy for mission critical 24/7 operation.



### PixelNet Domain Controller (PDC)

Form Factor	1RU
Power Consumption	400W
CPU Processor	Intel Xeon Processor E5-1620 v4
Drive	256 SSD
Memory	16GB RAM
Input Devices	4x USB 3.0 ports, 8x USB 2.0 ports
Operating System	Windows 10 IOT Enterprise LTSB
PixelNet Network Interface	One 10 Gb/s SFP+ Optical port
API	TCP (Backwards compatible with PixelNet Gen 1)
Video Output Interface	VGA
Output Resolution	1920x1080

### Input Nodes

Form Factor	1RU
Power Consumption	400W

Video Modes	RGB 24, YUV 4:2:2, YUV 4:2:0
Audio	Yes*
PixelNet Network Interface	Two 10 Gb/s SFP+ Optical ports
Video Input Interface	4x or 8x Mini HDMI
Input Resolutions Per Port	Up to 4096x2160 @ 60Hz**, 3840x2160 @ 60Hz**

## Output Nodes

Form Factor	1RU
Power Consumption	400W
Custom Resolution	Yes
Audio	Yes*
PixelNet Network Interface	Two 10 Gb/s SFP+ Optical ports
Video Output Interface	6x DisplayPort 1.2a
Video Output Resolution	6x 1920x1080x60Hz 4x 3840x2160x30Hz 2x 3840x2160x60Hz

## StreamCenter Nodes

Form Factor	1RU
Power Consumption	400W
Operating System	CentOS
Audio	Yes*
Codecs	H.264, H.265, MPEG2, MPEG4, MJPEG
Transports	RTSP, RTMP, RTP, RTCP, TCP, UDP, UDP Multicast
Video Network Interface	Two 1 Gb/s LAN RJ45 ports
PixelNet Network Interface	Two 10 Gb/s SFP+ Optical ports
Inputs	16x H.264 1920x1080x30 8x H.264 1920x1080x60 4x H.264 3840x2160x30 2x H.264 3840x2160x60

## 48 Port 10G SFP+ Uplinkable Switch

Number of Ports	48
Port Speed	10Gbps
Port Connection	SFP+
Uplink Number of Ports	6
Uplink Connection	QSFP28
Uplink Speed	100Gbps
Dimensions (WxDxH)	1RU 17.3 x 16 x 1.7 in. / 440 x 406 x 44 mm
Weight	18.5 lbs. / 8.4 kg
Power	1 + 1 Redundant (550W)
Input Voltage / Frequency	100V~240V AC / 50~60Hz

## 32 Port 100G QSFP+ Backbone

Number of Ports	32
Port Speed	100Gbps
Port Connection	QSFP28

Dimensions (WxDxH)	1RU 17.3 x 16 x 1.7 in. / 440 x 406 x 44 mm
Weight	18.5 lbs. / 8.4 kg
Power	1 + 1 Redundant (550W)
Input Voltage / Frequency	100V~240V AC / 50~60Hz

\*Supported in future release

\*\*In YUV 4:2:0, 12 bits per pixel (8 bits per component)