



ESPORTS SYSTEMS

DESIGN GUIDE

Extron

AV SYSTEMS FOR ESPORTS

As schools and universities develop dedicated facilities to support their esports programs, they are quickly discovering that well-designed AV systems can greatly enhance the user experience and maximize the educational benefits for all participants. To ensure optimum performance, AV systems for esports facilities must meet several key design parameters:

- **High Performance Switching** – supercharged gaming workstations run at high resolutions, refresh rates and color depths. The AV system must be able to switch and distribute these signals with pristine quality and in many cases, zero latency.
- **Future Proof Designs** – Since gaming technology changes rapidly, it is critical that the AV system has the ability to keep up with the demands of gaming systems introduced in the future.
- **Ease of Use** – Esports AV systems can be complex, so an intuitive, easy to use control system is critical since it allows coaching staff to focus on the esports athletes instead of system operations.

Extron





EXTRON AND ESPORTS

Extron is uniquely positioned to deliver the best solutions for your esports applications. We offer a broad range of industry-leading products and technologies that deliver versatility, reliability and unsurpassed performance.

- AV distribution products that support resolutions up to 8K and ensure the image integrity of uncompressed video resolutions, refresh rates, and color space
- Fixed and modular switching platforms with support for HDMI, SDI, twisted pair, and fiber optic signal transport
- Scalable systems support growth and changes that may occur in relation to games of focus and team sizes
- Our system design specialists have the expertise to help you find the optimum solution for your esports facilities.

Looking to Up Your Esports Game?

Contact us at esports@extron.com for design assistance.





EXTRON PRODUCTS AND TECHNOLOGIES

With over 5,000 products, we have the right ones to fit the scale and budget of nearly any esports project. Extron products switch, distribute, stream, and control AV signals from any source to any destination while maintaining signal integrity. They are carefully engineered to provide best-in-class performance, high energy efficiency, and exceptional reliability. Each product is designed to integrate seamlessly with other products to create comprehensive AV system solutions.

AV SIGNAL SWITCHING AND DISTRIBUTION



XTP SYSTEMS

A complete AV distribution platform with unmatched performance and powerful integration features that streamline system design and integration. The XTP platform offers fully integrated switching and distribution systems for digital video and audio, supporting local AV connectivity as well as remote devices over shielded CATx and fiber optic cable.



FOX3 SYSTEMS

The industry-leading family of high-performance matrix switchers and extenders for complete, end-to-end digital distribution and switching of 4K/60 video, stereo audio, USB, control, and 3D sync over fiber optic cable. All FOX3 extenders support native 4K/60 4:4:4 resolutions and Deep Color up to 12-bit.



VIDEOWALL PROCESSORS – QUANTUM ULTRA

Quantum Ultra is a modular 4K videowall processor with high-performance scaling and windowing technology. Quantum Ultra's configurability, features, and performance make it a future-ready solution for any videowall application.



CONTROL SYSTEMS

Extron control systems provide easy, reliable control and monitoring for even the most complex esports installations. Our broad range of control products includes network connected control processors, touchpanels and control apps.



STREAMING AND RECORDING – SMP SERIES

The SMP Series is ideal for live streaming, recording, and playback. These processors capture and encode AV signals from HDMI and 3G-SDI sources. They support simultaneous recording and streaming with independent resolutions and bit rates.



AUDIO PRODUCTS

From speakers and amplifiers, to flexible audio DSP matrix processors, the extensive line of Extron audio products lets you create complete high performance audio systems. Our Dante-enabled offerings provide digital audio distribution over local and wide area network.



EXTRON ESPORTS DESIGN SOLUTIONS

Esports setups vary in scale and capability, incorporating several AV technologies and specific IT network requirements. Venues are unique in design, often built to suit the needs and specifications of the game, or games, that the organization has chosen for competition. The following designs offer examples of typical esports applications. System drawings depict the sources and displays, signal flows between them, and a recommended approach for an effective system design.



PRACTICE FACILITY – PAGE 8

Uncompressed AV signal distribution, observation displays, streaming and recording, audio system, system control



ESPORTS ARENA – PAGE 10

Uncompressed AV signal distribution, videowall and audience displays, system control, broadcast feeds, shoutcaster stations

“Extron worked with us to build out an exceptional facility to service our esports program for its inaugural year. The installation was seamless, and the system assists in coaching as well as showing off the space to new recruits. I could not be happier with the project results.”

*Chris Gaul
Esports Director and Head Coach at Point Park University*

The esports systems in this section represent just two of the most common solutions. We have the products and expertise to create a range of customized systems designed for your specific application.

Email us at esports@extron.com for a custom design consultation.

PRACTICE FACILITY



SPACE REQUIREMENTS

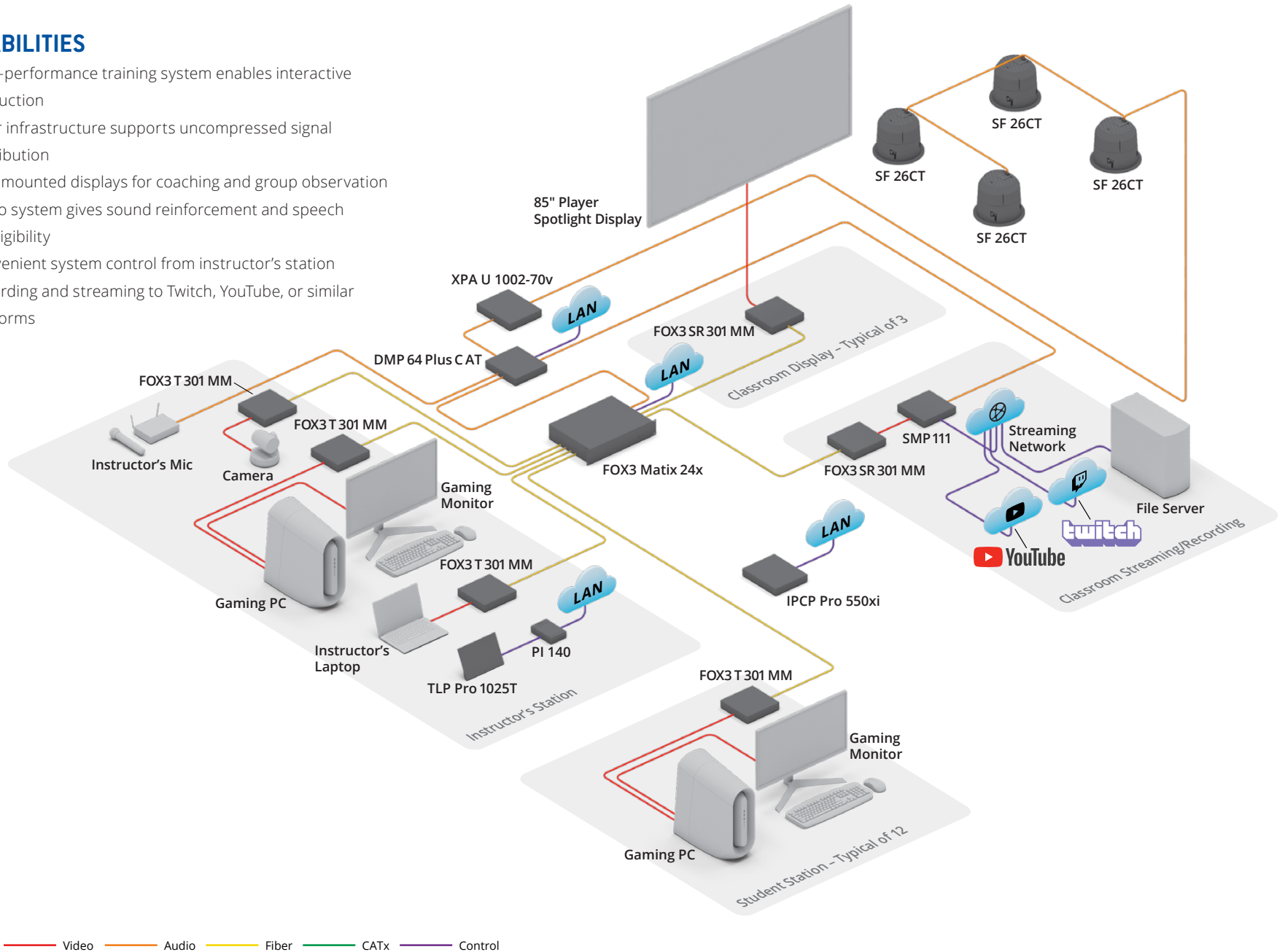
University esports practice facilities are training grounds for future gamers. This state-of-the-art venue features the best available gaming computer stations, powered by 24" gaming monitors and high-performance graphics cards. Esports infrastructure requirements, such as bandwidth, electrical power, and a powerful internet connection separate from the campus network further support activities. Interactive coaching takes place via a dedicated instructor's station that includes flexible control for AV signal routing to several wall-mounted observation displays for group analysis. High resolution video is sent uncompressed over fiber optic cabling to maintain maximum image quality. A streaming media processor completes the system for recording and outbound streaming of gameplay.

EXTRON EQUIPMENT LIST

	Qty.
FOX3 T 301 MM	Fiber Optic Transmitter 15
FOX3 SR 301 MM	Fiber Optic Scaling Receiver 4
FOX3 Matrix 24x	Modular Fiber Optic Matrix Switcher 1
SMP 111	Streaming Media Processor and Recorder 1
DMP Plus 64 C AT	Digital Matrix Processor w/ AEC and Dante 1
XPA U 1002-70v	Two Channel Amp, 100 watts at 70 volts 1
SF 26CT	6.5" 2-Way Ceiling Speakers, 70/100V, Pair 4
TLP Pro 1025T	10" Tabletop TouchLink Pro Touchpanel 1
PI 140	Power Injector for TouchLink Pro Touchpanels 1
IPCP Pro 550xi	IP Link Pro Control Processor 1

CAPABILITIES

- High-performance training system enables interactive instruction
- Fiber infrastructure supports uncompressed signal distribution
- Wall-mounted displays for coaching and group observation
- Audio system gives sound reinforcement and speech intelligibility
- Convenient system control from instructor's station
- Recording and streaming to Twitch, YouTube, or similar platforms



ESPORTS ARENA



SPACE REQUIREMENTS

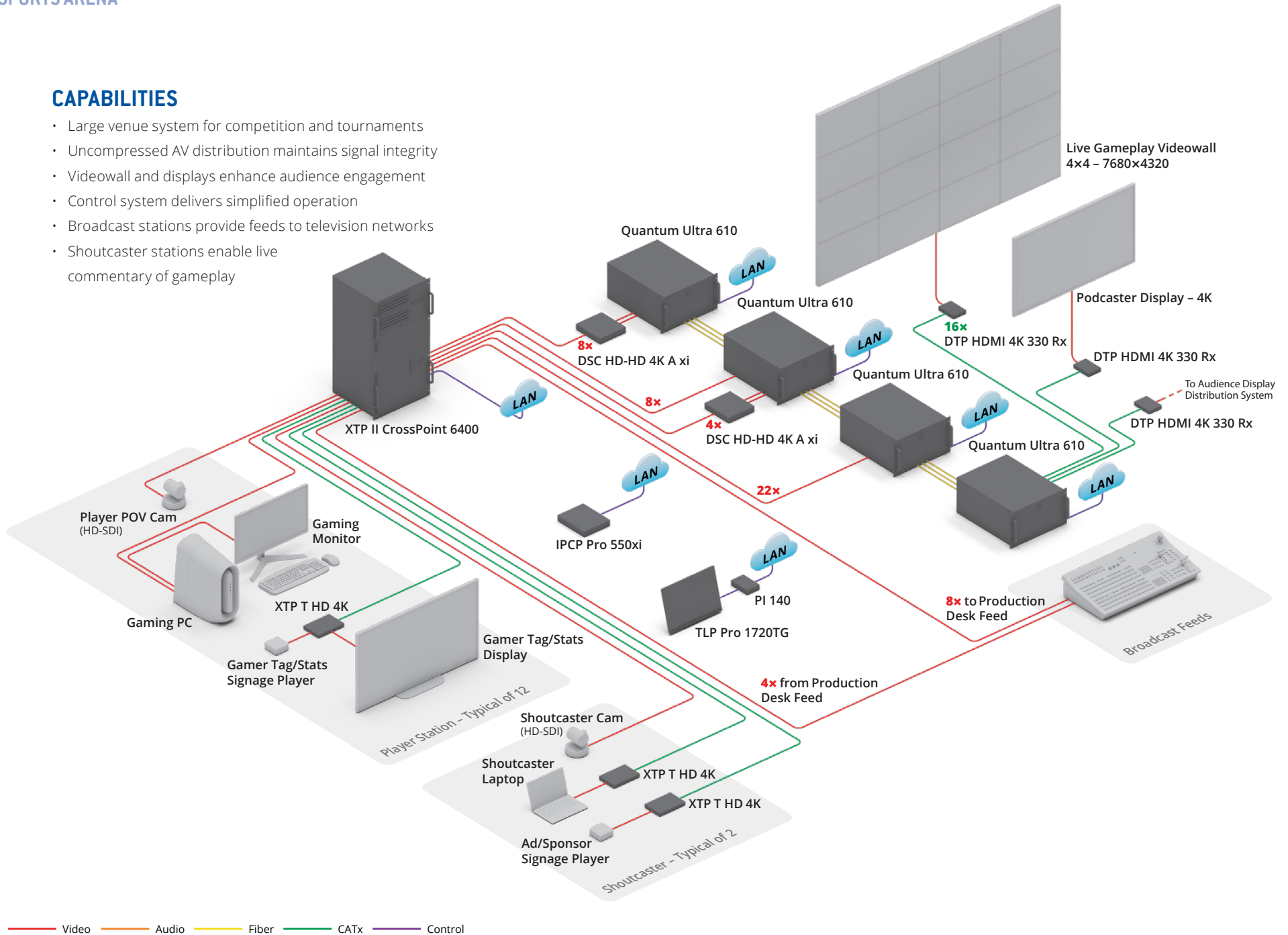
Esports arenas are used for local competition, tournaments, and private events. Audience capacity varies but designs prioritize spectators for a dynamic experience. Design approaches break from typical stadiums with seating positioned towards viewing screens versus the player stage. Roomier concourses are fan-friendly to accommodate tournaments that can last up to eight hours. Spectators enjoy powerful Wi-Fi connections as they interact with others on social media. Shoutcasters add to the experience with energetic announcing and analysis throughout the matches. These venues are outfitted with high-speed internet, advanced technology, large displays, and broadcast studios for live streaming. High-performance, controllable AV systems are deployed to manage the diverse signals.

EXTRON EQUIPMENT LIST

		Qty.
XTP T HD 4K	Twisted Pair Transmitter	16
XTP II CrossPoint 6400	Modular Digital Matrix Switcher	1
HD Pro Plenum Series	HDMI Premium High Speed Optical Cables	58
DSC HD-HD 4K A xi	HDMI 4K/60 4:4:4 Scaler with Dual I/O	12
Quantum Ultra 610	Ultra-High Bandwidth 4K Videowall Processor	4
DTP HDMI 4K 330 Rx	Twisted Pair Receiver	16
TLP Pro 1720TG	17" Tabletop TouchLink Pro Touchpanel	1
PI 140	Power Injector for TouchLink Pro Touchpanels	1
IPCP Pro 550xi	IP Link Pro Control Processor	1

CAPABILITIES

- Large venue system for competition and tournaments
- Uncompressed AV distribution maintains signal integrity
- Videowall and displays enhance audience engagement
- Control system delivers simplified operation
- Broadcast stations provide feeds to television networks
- Shoutcaster stations enable live commentary of gameplay



DESIGN CONSIDERATIONS

System design and equipment selection begin once the game titles and team size have been determined. This dictates the type and amount of equipment needed for player stations. Typical gaming stations include several items that need to be addressed. The quality or even brand of peripherals will affect perception.



A Typical Gaming Station:

- High-performance PC
- Gaming monitor – 24" to 32"
- Multi-output graphics card
- Microphone
- Keyboard/mouse
- Webcam
- Headset
- High-end furniture

The high resolutions and refresh rates require high-performance AV equipment. HDMI 2.0 products with 18 Gbps capability are necessary for 1080p with a 240 Hz refresh rate, amounting to a 17.82 Gbps data rate. Detailed performance capabilities should be clearly listed within product specifications.

PC Capabilities – Off the shelf and custom

- Motherboard – mid-range generally suffices
- System RAM – 16 GB, recommended
- Drive – SSD recommended over mechanical hard drive
- Processor – AMD and Intel, recommended, 6 core, ideal start point
- GPU – AMD's Radeon or NVIDIA's GeForce, VRAM – 4-8 GB
- Cooling – Standard for CPU and performance GPUs, advanced cooling options available for added protection and noise minimizing
- PSU – important to buy quality for reliability and protection of expensive components

Gaming Monitors

- Sizes – generally 24", 27", or 32"
24" most common due to viewability, no need to turn head, eyes on target
- Sync technology – AMD Freesync and Nvidia G-Sync for compatibility with AMD Radeon and Nvidia GeForce graphic cards
- Refresh rate affects smoothness of gameplay – image tearing and judder

Gaming Resolutions and Refresh Rates

- Resolutions – 1080p, 1440p (2560x1440) and 4K
More pixels make GPU work harder - 1080p often preferred due to ability to defer resources to higher frame rate output
- Refresh Rates – up to 240 Hz
Common: 60, 120, 144, 165, and 240 Hz
- Ideal combination: 1080p at 240 Hz = 17.82 Gbps data rate

DXP HD 4K PLUS Series Specification

Video input

Number/signal type	4, 8, or 16 HDMI digital video (HDCP compliant)
Connectors	4, 8, or 16 female HDMI type A
Horizontal frequency	15 KHz to 270 KHz for resolutions up to 18 Gbps
Vertical frequency	24 Hz to 240 Hz for resolutions up to 18 Gbps

NOTE: Use our calculator (www.extron.com/8Kdata rate) to determine video parameters supported by these data rates.

An excerpt of the product specifications for the DXP HD 4K PLUS Series



EQUIPMENT AND REQUIREMENTS

The growth of esports and many types of supporting venues brings numerous opportunities for designers and integrators. Key markets include higher educational institutions with grant availability in this area. Considerable opportunities also exist for other educational environments and private facilities. Esports systems are comprised of specialized equipment that must meet strict requirements to qualify for use in tournaments.

Player Stations – Keeping the gameplay pure for the player is the main priority. Player input should register from point of entry to display with zero lag and latency. Compromises in this area could mean the difference between winning and losing.

Networking – The network must have high-speed broadband internet strong enough to support the digital action of all the gamers playing simultaneously. Slow connections will frustrate players and spectators will lose interest quickly—those on-site and streaming from home on Twitch or YouTube.

AV Infrastructure – Esports venues provide an engaging experience for players and fans alike. The infrastructure must be robust enough to accommodate all the signals sent throughout the facility. Signal transport technologies include copper, fiber, and streaming. It is best practice to maintain unaltered, end-to-end signal paths.

Streaming/Broadcasting – Broadcast stations and production rooms are used for streaming and creating content for programs and events. Streaming is a large part of the esports ecosystem with outbound streaming to Twitch, YouTube, and other platforms. Production switchers and high-end cameras are used for support within the venue and serve as broadcast feeds to ESPN, FOX, and other television networks.

Account Establishment – Esports clubs and leagues interact with host service organizations like Twitch, Valve/Steam, Discord, PlayVS, and many others. Participants will need accounts for the selected provider prior to entering tournaments and season gameplay.



Equipment Associated to Esports Venues

- AV Switching and distribution
- Videowalls and processors
- Streaming and recording
- Flat panel displays
- Projectors and screens
- Sound system
- Control system
- Microphones – fixed and wireless
- Network services
- Digital signage
- Gaming station equipment
- Rigging and lighting
- Broadcast cameras
- Production monitors
- Production switchers
- PTZ cameras
- POV cameras
- High-end furniture



TEAM MONEY
\$11,100

EQUIP VALUE
\$12,250

1	NAF	\$4,000
2	ELIGE	\$3,500
3	NITRO	\$7,750
4	TACO	\$3,450
5	TWISTZZ	\$4,500



6	DEADFOX	\$4,100
7	WOXIC	\$7,050
8	ANGE1	\$6,550
9	ISSAA	\$5,000
10	BO	\$5,000

11	HELLRAISERS	\$11,100
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TEAM MONEY
\$21,100

EQUIP VALUE
\$11,100

TEAM LIQUID



HELLRAISERS



EVOLUTION OF THE ESPORTS ECOSYSTEM

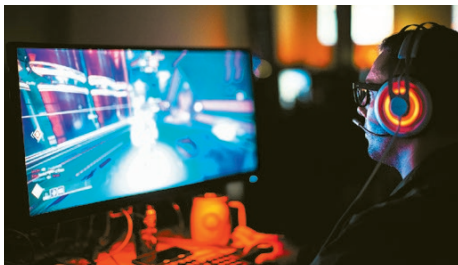
Esports competition continues to enjoy increased popularity and rapid adoption professionally and at educational institutions. According to market research, global esports revenues are expected to surpass \$1 billion USD in 2020. The worldwide esports audience grew by more than 12 percent in 2019, reaching 443 million people, with heavy growth in Asia, North America, and Europe.

Like traditional sports, esports fosters teamwork, communication, and problem solving. The unique performance needs of esports facilities requires a broad level of knowledge and expertise to ensure the AV system provides a good experience for players and spectators alike. Even if you are starting completely from scratch, don't feel overwhelmed. We are esports experts.

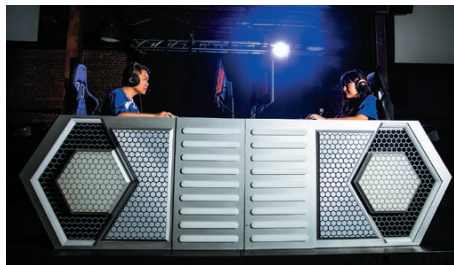
EGAMING VERSUS ESPORTS

Esports originates from egaming. The difference between egaming and esports is easy to understand; think recreational gaming versus competitive gaming for prizes and recognition.

Esports is played at club levels with leagues. Tournaments and championships often involve monetary awards. These matches consist of individuals or teams playing against each other. This can take place directly in game or indirectly against individual times and scores. Popular tournaments are played in large arenas and are set up like a basketball game or concert with audience sizes up to 30,000 people.



Recreational Gamer



Competitive Esports Gamers

GROWTH AND MARKET POTENTIAL

Esports enjoys hundreds of community-based web sites for news and live streaming. It is expected to cater to 646 million players and viewers by 2023. Esports is driven by the larger egaming industry, which is estimated to be valued at \$93 billion USD. Ongoing discussions are taking place for esports inclusion in the 2024 Olympics.

Rapid growth continues across private, education, and live event sectors with competition and multipurpose arenas quickly becoming part of the landscape in many cities. These venues offer general gaming for the public and are also used for tournaments. In many cases, repurposing of existing facilities is taking place. For example, movie theaters are finding new life by transforming into esports venues. Fans can watch major tournaments and participate in local competitions.

PARTICIPANTS AND ROLES

The esports ecosystem is vast. As with any large industry, it is comprised of many supporting groups and disciplines. These include game developers, recruiters, agents, sponsors, and PR managers. All of whom are highly involved in daily management with continued industry growth in mind.

The main cast of characters associated to competitions include the following:

- Players
- Coaches
- Analysts
- Admins and Referees
- Shoutcasters
- Hosts
- Observers
- Audience
- Organizers and support staff



EVOLUTION OF THE ESPORTS ECOSYSTEM CONTINUED

ORGANIZATIONS AND GOVERNING BODIES

The esports industry lacks unified governing bodies at all levels, despite its size, popularity, and influence. It is somewhat fragmented with several organizations around the world vying for supremacy. The intellectual property aspect of the games themselves makes it difficult since these interested groups are not in control of the rules and gameplay. Despite this situation, there is common interest and activity by all to further advance the industry. Mergers and partnerships are announced regularly as this market continues to grow and mature.

PLATFORMS FOR LEAGUES AND TOURNAMENTS

Individuals, pro teams, and educational institutions participate in competition by establishing clubs and joining leagues. There are several gaming platforms catering at various levels for tournament play, such as Battlefy, Toornament, TESP, PlayVS, and others. Many will partner with game publishers to pull data from matches for performance tracking of individual players.

GAME CATEGORIES AND TEAM FORMATS

Like traditional sports, team size along with player positions and responsibilities depend upon the game being played. Competition usually takes place in 1v1, 3v3, 4v4, 5v5, and 6v6 formats with backups also included on team rosters. There are four main genres in terms of game types. First, strategy games, which include MOBA – multiplayer online battle arena and RTS – real-time strategy. The other popular genres include FPS – first-person shooter, sports games, and fighting games.



Types of Systems:

- General Gaming Centers
- Game Labs
- Practice Facilities
- Multipurpose Spaces
- University Competition Rooms
- Esports Arenas

ESPORTS IN EDUCATION



Esports requires a tremendous amount of critical thinking, collaboration, and creativity from players to achieve and sustain success. With easy access and a low cost to entry, esports reaches beyond traditional sports in education to create an all-inclusive environment that breaks barriers.

Engaged students perform better in school. Esports has the unique ability to appeal to and engage a wider audience. For many students, esports is the first time they have participated in a coached, athletic activity. Educators are realizing that like traditional sports, esports fosters teamwork, communication, and problem solving.

More than 170 US colleges and universities have introduced varsity esports programs. Colleges actively recruit gamers for their esports teams, courting them with substantial scholarships.

By playing games, younger students gain important skills that prepare them for college and career. At the club level, students are peer coaches, graphic designers, fundraisers, and game strategists – roles that build career competencies. Esports also presents professional business opportunities, such as esports marketing, business management, event planning, and game development.



Esports Benefits:

- Sense of Community and Leadership
- Character Development
- Scholarship Opportunities
- Embodies ISTE Standards
- Increase Achievement and Accountability
- STEM Engagement

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www.extron.com/esports